

**INSTITUTIONAL ARRANGEMENTS FOR SUPPLY OF WATER AND  
SANITATION SERVICES IN CHINSALI URBAN, ZAMBIA**

**BY**

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## DECLARATION

I, **Douglas Mackenzie Chimangeni**, do hereby declare that this dissertation is a result of my own archival and field research. I further declare that all figures and plates except for those whose sources have been acknowledged are original and that this work has not been submitted to any University for any academic award.

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## APPROVAL

This dissertation by Douglas Mackenzie Chimangeni is approved as a partial fulfillment of the requirement of the award of the degree of Master of Science Environmental and Natural Resources Management of the University of Zambia.

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## **DEDICATION**

To my Wife Fanny, Daughters Namulinda, Sibongile and Son Kochelani Chimangeni for their patience and sacrifice during my period of study.

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## ABSTRACT

The study is an investigation of institutional arrangements for supply of water and sanitation services in Chinsali Urban, Zambia. The study aimed at assessing the institutional arrangements for supply of water and sanitation services in Chinsali Urban in Muchinga Province. The objectives of the study were to identify the institutional arrangements for water supply and sanitation services in Chinsali Urban, to assess how the institutional arrangements affect water supply and sanitation services in Chinsali Urban and to assess the challenges and opportunities of service delivery for water supply and sanitation services in Chinsali Urban. The significance of the study was to gather information on how institutional arrangements affect the supply of water and sanitation services in urban areas. It will add to the body of knowledge on challenges and opportunities of institutions and Commercial Utilities (CUs). Furthermore, policy makers in the water supply and sanitation services sector will be able to make periodic assessments on how institutional arrangements can further improve service delivery. The study used a mixed method approach of qualitative and quantitative methods to collect data in the field. From 557 households connected to the CU reticulation system, 139 households were stratified and proportionally sampled using probability simple random sampling according to residential density cluster, while purposive sampling was used on two key informants from the CU and one from Chinsali Municipal Council and probability simple random sampling was used for communities with water Kiosks. The instruments for collecting data included questionnaires, semi-structured interviews, focus group discussions, field observations and documents review. Quantitative data were analysed using descriptive statistics and Percentage Analysis Technique (PAT), while qualitative data were analysed using content analysis. The study findings showed that the institutions that are responsible for supply of water and sanitation services in Chinsali Urban are the Community Based Organisations (CBOs), Chambeshi Water and Sewerage Company (ChWSC) as the CU, Chinsali Municipal Council (CMC) Water Supply and Sanitation Unit responsible for urban water supply and sanitation services and the Ministry of Local Government and Housing (MLGH) through the Department of Housing and Infrastructure Development (DHID). The study revealed that the current water supply does not meet the current water demand of the population of Chinsali Urban. From the 139 households, (61 percent) received water between one hour and four hours per day. Focus Group Discussions (FGDs) also showed that water supply was insufficient in communities that use water Kiosks. Only ten percent of the households are connected to the sewerage system of the CU. Respondents were satisfied with the billing and affordability of the water supplied by the CU. Challenges that ChWSC faces are dilapidated infrastructure; power outages and administrative bureaucracy due to provincial separation. Water supply interruptions and limited sanitation services due to population increase were the challenges faced by households. Findings from the study showed that Chinsali Urban has the necessary institutional arrangements for supply of water and sanitation services like other urban areas in Zambia. Four institutions were identified (CBO), (ChWSC), (CMC) and (MLGH). The institutional arrangements in Chinsali Urban have affected the delivery of water supply and sanitation services in the negative and positive way as evident from the findings in the study. The major challenges to WSS services are dilapidated infrastructure and power outages which reduces the CU's capacity from performing at the expected level as service provision is compromised. Chinsali Urban has good opportunities to increase and improve WSS services due to the current project for WSS services funded by the MLGH. The project is expected to increase water supply from the current 2,600m<sup>3</sup>/day to 7,400m<sup>3</sup>/day if and when the project is finished.

**Key Words:** Institutional Arrangements, Commercial Utility (CU), Water Supply, Sanitation

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## **ABBREVIATIONS AND ACRONYMS**

|        |  |
|--------|--|
| ADF    | African Development Fund                             |
| AMCOW  | African Ministers Council on Water                   |
| BCHOD  | Brian Colquhoun Hugh O'Donnell                       |
| CBD    | Central Business District                            |
| CBOs   | Community Based Organisations                        |
| ChWSC  | Chambeshi Water and Sewerage Company                 |
| CMC    | Chinsali Municipal Council                           |
| CSO    | Central Statistical Office                           |
| CUs    | Commercial Utilities                                 |
| DANIDA | Danish International Development Agency              |
| DHID   | Department of Housing and Infrastructure Development |
| DTF    | Devolution Trust Fund                                |
| DWA    | Department of Water Affairs                          |
| EU     | European Union                                       |
| FGDs   | Focus Group Discussions                              |
| FNDP   | Fifth National Development Plan                      |
| GIS    | Geographical Information System                      |
| GOD    | Government of Denmark                                |
| GRZ    | Government of the Republic of Zambia                 |
| GTZ    | Germany Technical Corporation                        |
| ILO    | International Labour Organisation                    |
| IUCN   | International Union for the Conservation of Nature   |

|                |  |
|----------------|--|
| JMP            | Joint Monitoring Programme                         |
| LCC            | Lusaka City Council                                |
| LWASCO         | Lusaka Water and Sewerage Company                  |
| m <sup>3</sup> | Cubic Metre  |
| MDGs           | Millennium Development Goals                       |
| MEWD           | Ministry of Energy and Water Development           |
| MLGH           | Ministry of Local Government and Housing           |
| NGOs           | Non-Governmental Organisations                     |
| NRWSSP         | National Rural Water Supply and Sanitation Program |
| NUWSS          | National Urban Water Supply and Sanitation         |
| NWASCO         | National Water Supply and Sanitation Council       |
| PAT            | Percentage Analysis Technique                      |
| SENU           | Special Education Need Unit                        |
| SNDP           | Sixth National Development Plan                    |
| SNV            | Netherlands Development Organisation               |
| SPSS           | Statistical Package of Social Sciences             |
| SSA            | Sub-Saharan Africa                                 |
| SUWASA         | Sustainable Water and Sanitation in Africa         |
| SWSS           | Supply of Water and Sanitation Services            |
| UfW            | Unaccounted for Water                              |
| UN             | United Nations                                     |
| UNDP           | United Nations Development Programme               |
| UNEP           | United Nations Environment Programme               |

|        |  |
|--------|--|
| UNICEF | United Nations International Children’s Education Fund |
| USD    | United States Dollar                                   |
| VAREN  | Vision Africa Regional Network                         |
| VIPs   | Ventilated Improved Pit Latrines                       |
| WHO    | World Health Organisation                              |
| WMU    | Waste Management Unit                                  |
| WSS    | Water Supply and Sanitation                            |
| ZABS   | Zambia Bureau of Standards                             |
| ZEMA   | Zambia Environmental Management Agency                 |
| ZESCO  | Zambia Electricity Supply Corporation                  |
| ZMW    | Zambian Kwacha   |



## KEY TERMS USED

**Water Supply:** may be defined as having reasonable access to safe water supply, including treated surface water, untreated but uncontaminated water such as piped water, roof catchments and ground water (Ong'or and Long-Cang, 2007). In other terms, access is further said to be measuring the performance of a system against constitutionally defined rights of citizens to water. An indicator may be the coverage of the water service over the population (Gumbo *et al.*, 2003).

**Sanitation:** is said to be the collection, transport, treatment and disposal or reuse of human excreta, domestic waste water and solid waste which is associated with the promotion of human and environmental hygiene (UN, 2008).

**Institutional Arrangements:** are a composite of laws, policies, systems, customs and management strategies established by society or organisations to legislate, plan and manage scarce resources and competing values for a social or organisational purpose Sorensen and McCreary (1990).

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1 Introduction**

The chapter gives a brief background to the study of the global and Zambian state of water supply and sanitation services. It highlights how the institutional arrangements of the sector have changed in Zambia over the past twenty six years. Also included in this chapter are the statement of the problem, aim, the objectives of the study, research questions, the significance of the study and the organisation of the dissertation.

#### **1.2 Background to the Study**

Water is an important commodity for humans because it is paramount to their social and economic well-being. Globally, improving water supply, sanitation and hygiene has the potential to prevent at least 9.1 percent of the disease burden, or 6.3 percent of all deaths World Health Organisation/United Nations International Children Education Fund (WHO/UNICEF, 2000). In addition, children under the age of five represent 90 percent of all deaths caused by diarrhoea diseases associated with poor water and sanitation and these occur mostly in developing countries (WHO/UNICEF, 2000). In 2013, there were 2.5 billion people who lacked improved sanitation and were projected to decrease only to 2.4 billion by 2015 (WHO/UNICEF, 2012). The primary and best documented benefit of increased access to safe water and sanitation, means hygienic behaviours arises and a significant reduction in the incidence of water-related diseases including diarrhoea disease, trachoma, schistosomiasis, and hook worm infections Danish International Development Agency (DANIDA, 2006).

The Government of the Republic of Zambia committed its self to one of the Millennium Development Goals (MDG) 7(c) set in 2000, by investing in the provision of safe drinking water, which is critical for enhancing health and the productive lives of the people. In areas where access to water and sanitation have visibly improved yielded direct economic benefit for the people of Zambia, Government of the Republic of Zambia (GRZ, 2010). The Water Supply and Sanitation (WSS) services sector in Zambia have seen some changes since the 1990s due to policy changes. Water supply and sanitation services in most towns in Zambia saw a change of institutions responsible for provision of the two basic services as local municipal councils handed over the running of the sector to Commercial Utilities (CUs) in

the early 2000s. The Government perceived these institutional changes to be inevitable in view of the change in the macro-economic environment in which liberalisation and private enterprise became the norm (GRZ, 1994). The water and sanitation sector was considered at the forefront of the *'delivery of basic services'* agenda to improve public health and wellbeing as a significant number of preventable diseases such as cholera, dysentery and typhoid in Zambia are related to poor water supply and sanitation, Sustainable Water and Sanitation in Africa (SUWASA, 2012). Through the 1997 water and sanitation act, the Government thus spearheaded the transfer of water supply and sanitation services provision from the local municipal councils to semi-autonomous entities such as (CUs), private providers and a regulator the National Water Supply and Sanitation Council (NWASCO). Reforms and commercialisation of the water sector have taken place in Zambia to improve water supply and sanitation services, but these policy changes have not shown the desired increase in service delivery in most towns in the country. Access to water supply and sanitation services in most towns in Zambia depends mostly on institutions responsible for provision of the two basic services. As of 2014, the estimated water supply and sanitation for urban areas was 83.8 percent and 60.7 percent, respectively (Nwasco, 2014). Furthermore, Zambia has seen limited or no progress in the provision of the two basic services between 1990 and 2015, as there was a drop from 59 percent to 56 percent for water and from 47 percent to 36 percent for sanitation (UNICEF/WHO, 2015). Therefore, the present study seeks to investigate institutional arrangements for supply of water and sanitation services in Chinsali Urban of Muchinga Province.

### **1.3 Statement of the Problem**

Water and sanitation have a profound impact on public health, economic activities and environmental quality in society and the country as a whole. Therefore, the prerequisite for any sustainable development scenario is that the institutions that are assigned with the provision of water supply and sanitation services actually possess the capability to carry out this task. A well-balanced arrangement of flexible, dynamic institutions is the best assurance that water and sanitation services remain accessible in the present and the future. There is need for the right quantity and quality of water supply and sanitation services that are delivered to the population and that people receive assured services regardless of their socio-economic status in society (WHO/UNEP, 1997). The Water and Sanitation sector in Zambia has undergone reforms that have led to the formation of various institutions that aim to ensure

that the citizens are provided with better services. These institutions, however, can only execute these functions if they have good policy support and arrangements to provide service delivery and further expand and maintain the existing infrastructure for the ever increasing population in the country (NWASCO, 2015). These institutions experience water supply and sanitation inefficiencies that are reflected by disruptions in supply, frequent water distributions system breakdown, prolonged waiting periods of connections and unaccounted for water losses in the distribution network (NWASCO, 2016). Chinsali District recently attained municipality and provincial capital status. With this institutional status change, it is expected that the population of Chinsali Urban will increase due to immigration of people into the district. The population increase will consequently lead to an increase in demand for water supply and sanitation services, as these will be shared among human consumption, businesses and constructions, which will affect the service delivery and will also pose challenges. Thus, the study seeks to establish how institutional arrangements affect water supply and sanitation services in Chinsali Urban.

#### **1.4 Aim**

The aim of the study was to assess the institutional arrangements for water supply and sanitation services in Chinsali Urban.

#### **1.5 Objectives**

The objectives of the study were three fold.

- (i) To identify the institutions for water supply and sanitation services in Chinsali Urban,
- (ii) To assess how the institutional arrangements affect delivery of water supply and sanitation services in Chinsali Urban,
- (iii) To assess the challenges and opportunities of service delivery for water supply and sanitation services in Chinsali Urban.

#### **1.6 Research Questions**

- (i) What institutional arrangements exist for water supply and sanitation services in Chinsali Urban?

- (ii) How have the institutional changes affected water supply and sanitation service delivery in Chinsali Urban?
- (iii) What are the challenges and opportunities for improved water supply and sanitation services in Chinsali Urban?

### **1.7 Significance of the Study**

A lot of praise in the (WSS) sector has been put on reforms, regulations, commercialisation and institutional arrangements that exist in Zambia. But there are still some bottlenecks in the institutional arrangements, because of their inability to fully provide the expected service delivery and challenges that have come with them. Hence, the water supply and sanitation sector has not fully been able to achieve sustainable service delivery to the population. The study findings will contribute to the understanding of how institutional arrangements can affect water supply and sanitation services delivery in urban areas, Chinsali in particular. It will also add to the body of knowledge on challenges and opportunities of institutions and Commercial Utilities (CUs) in the water supply and sanitation sector. In the water supply and sanitation services provision, policy makers will be able to make reviews on how institutional arrangements can further improve service delivery. Furthermore, other developmental players in the water and sanitation sector such as Non-Governmental Organisations (NGOs) and Donors may use the study findings for future developments as options for promoting access to service delivery in growing towns in Zambia.

### **1.8 Organisation of the Dissertation**

The dissertation is divided into seven chapters. Chapter one describes the background to the study and provides the research problem, questions and objectives. Moreover, it presents the scope and significance of the study in view of research findings. The second chapter is a review of literature on water supply and sanitation in the World, Sub Saharan Africa and Zambia and the institutional arrangements for supply water and sanitation services in urban areas of Zambia. Chapter three explains the study area in relation to geographical location, climate, and socio-economic characteristics. Chapter four gives a description of the methodology with respect to research design and other related aspects is also provided under the same chapter. Chapter five presents the research results and is followed by their discussion in chapter six. Finally, chapter seven consists of conclusions and recommendations.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Introduction

This chapter covers literature reviewed on current Global, African and Zambian perspectives to safe Water Supply and Sanitation. It further covers the current institutional arrangements of water supply and sanitation services in small towns of Zambia and how they affect water supply and sanitation services. The last section of the chapter is about review of literature on some institutional challenges and opportunities to water supply and sanitation services in urban areas of Zambia.

#### 2.2 Safe and Adequate Water Supply and Sanitation: Global Perspective

In the world many people still do not have access to water and sanitation services that can enhance their health and general well-being. It was estimated that by the turn of the 21st century, between 1.6 billion and 2.2 billion people, the majority of whom lived in developing countries, lacked access to safe drinking water (WHO/UNICEF, 2000). At the Millennium Summit in September, 2000, world leaders recognised access to water supply and sanitation as being very important for not only human development, but also economic development and henceforth adopted water supply and sanitation (MDG 7.c), as one of the MDGs (<http://www.unmillenniumproject.org/goals/>). The United Nations' (MDGs) had set a target of halving the proportion of people without access to safe drinking water and sanitation by 2015. Much, if not all of this work, was to be done in developing countries where an estimated 1.2 billion are without access to safe drinking water, and 2.5 billion are without adequate sanitation (WHO/UNICEF, 2004).

According to the latest estimates of WHO/UNICEF Joint Monitoring Programme (JMP, 2013) for Water Supply and Sanitation, collected in 2011 and released in early 2013, 36 percent of the world's population representing about 2.5 billion people lacked improved sanitation facilities and about 780 million people still use unsafe drinking water sources. There was evidence that the world target of the MDGs goal of universal access to improved water and sanitation of at least 75 percent was not reached at the end of 2015 (WHO/UNICEF, 2013). This meant that the world was well off the target by about 11 percent. In global terms, there are also contrasts between the developed and developing

countries in terms of the access to the services (WHO/UNICEF, 2013). The African continent was at risk of not meeting many of the (MDGs). With regard to sustainable access to safe drinking water and basic sanitation the 2011 UN (MDG 7.c) report acknowledges that while significant progress has been made in expanding access to water, sanitation lags far behind, Netherlands Development Organisation (SNV, 2012).

Within the developing countries there are also contrasts to access to water and sanitation services in urban areas. The contrasts that occur within the urban setup of the developing countries are between the formal and informal settlements. According to WHO/UNICEF (2000), it was estimated that 27 percent and 18 percent of the population in Africa and Asia respectively lived in informal settlements of the cities. In most cases, the urban poor cannot access benefits from piped water services, as there are few piped water reticulation systems in most informal settlements. Due to the limited piped water reticulation system, residents of these low-income settlements generally receive poorer water services. In many developing countries, the urban poor resort to purchasing water from the more expensive water vendors, who supply water with doubtful safety quality (WHO/UNICEF, 2000). Due to these service delivery challenges that commercial utilities face in most developing countries further problems are encountered in urban areas. Rapid urbanization in developing countries is often accompanied by overwhelming demands on existing water systems and illegal connections to distribution systems in poor neighbourhoods such as squatter settlements and shanty compounds.

The problems with water quality in the distribution system are, especially serious in developing countries where there are inadequate resources to maintain the distribution system infrastructure and disinfectant residual (Moe and Rheingans, 2006). Many systems have cracks and high leakages which lead to contamination of water. This is further worsened by frequent power outages that contribute to low or negative pressure in the pipes which allows contaminated water or wastewater surrounding the pipes to be drawn in through cracks. Many of the largest documented waterborne diseases like cholera, dysentery and typhoid outbreaks in the last two decades have been associated with cross-contamination in the distribution system (Moe and Rheingans, 2006).

The current situation in water and sanitation services for millions of peri-urban areas mostly does not support poor residents and this is a major challenge for the 21st century. The peri-urban residents generally receive erratic and inadequate water and sanitation services, while

better off residents in the formal areas of the urban receive reasonable levels of service often at subsidised rates (Gutierrez, 2007). This is further worsened by the economic developments that come with new infrastructure, that demand more water reticulations. The population growth and unequal income levels in these urban areas has also led to high water demand and within the population high income leading to high consumption patterns of water by the elites.

### **2.3 Safe and Adequate Water Supply and Sanitation: African Perspective**

As of 2012 UNICEF/WHO analysis of data from 25 countries in Sub-Saharan Africa (SSA), representing 48 percent of the region's population, revealed that women and girls bear primary responsibility for water collection, at considerable cost in terms of their time. In these 25 countries, it is estimated that women spend a combined total of at least 16 million hours each day collecting drinking water (UN, 2013). According to Ladenburg (2012), at least 25 percent of countries in Africa are already experiencing water pressure, another 11 countries are expected to join them by 2025 at which time nearly 50 percent of Africa's predicted population of 1.45 billion people will face water stress or scarcity. Nearly half of the populations (300 million people) in Sub-Saharan countries lack access to a supply of safe water and 41 per cent lack adequate sanitation (Ladenburg, 2012).

Africa is, especially being affected as most Governments and other institutions are failing to harness the little water that is there. It has been a problem of provision and distribution more than availability (UN, 2013). This has forced many people to experience hardships, especially women having to walk long distances in search of water (UN, 2013). The situation is that the water resource is available but sometimes the utilities and the Government might not put in the relevant robust measures to harness the available water resource for people to adequately access the water. These are the foreseen challenges to water access and sustainable sanitation services. Overall, policy-making and co-coordinating bodies to give central direction to water supply and sanitation services are being or still not well established in most Sub-Saharan countries. Demand management mechanisms are weak because of absence of relevant rules and regulations for water supply and sanitation services (Donkor and Wolde, 1997).

For the water supply sector to function effectively there is need to have well defined institutional frameworks. According to the African Ministers Council on Water (AMCOW) (2010), Ghana's water and sanitation sector has a well-established institutional set-up with



clear lines of responsibility. All subsector policies have been consolidated into the National Water Policy and the National Environmental Sanitation Policy, both of which were approved by Parliament and are now in the public domain (AMCOW, 2010).

Many countries in Sub-Saharan Africa have found that liberalisation reforms in the water sector have not resulted in significant service delivery improvements even where service providers have stepped in. This is often because the reform instruments such as service delivery agreements, contracts, legal instruments and parliamentary acts were not well designed for the circumstances (DANIDA, 2006). Many urban water systems in developing countries are characterised by heavy losses both financially and of water itself. Furthermore, the water losses are resulting in poor service delivery. Water losses are seriously affecting performance of commercial water utilities in developing countries. As a result many of the commercial water utilities operate at technical efficiency levels well below a best-practice frontier that is determined by the relatively efficient (Makaya and Hensel, 2014). The poor water supply service is one which very much affects the levels of good and sustainable sanitation, because sanitation services in urban areas depends on good water supply.

It has been realised that in most African countries, there is failure to increase access to sanitation services which acts as hindrance on development and makes the realisation of broader development outcomes both unlikely and unsustainable. Lack of investment in sanitation reveals a blind spot in development policy, failure to recognise sanitation's integral role in reducing possible diseases and poverty. The rationale for sanitation investments is clear and yet is overlooked by Governments. Sanitation is lagging as the most off-track MDG sector, while there is strong evidence that it is one of the most cost-effective public health policy interventions. The potential for far-reaching development outcomes is huge and yet the sanitation sector remains largely neglected by the donors and donor recipient Governments (Cumming, 2009). Due to the failure to attain MDGs, specifically Goal 7c for water and sanitation, there was a drive towards a robust approach which led to the adoption of the Sustainable Development Goals (SDGs) set an ambitious vision to achieve universal access to "safely managed" water and sanitation (including hygiene) defining a higher level of service, whilst prioritising the poorest and most vulnerable people (UNICEF, 2016).

According to Manase *et al.* (2010), institutional and legislative arrangements affect the nature of the relationship between sanitation agencies and peri-urban communities, which in turn affects the provision of sanitation services. The gap between local authorities and the peri-

urban communities is further widened by the absence of efficient communication structures that can help to coordinate activities between the two parties effectively. There is no effective representation of the peri-urban communities in South Africa, Zambia and Zimbabwe. Councillors and Members of Parliament in these three countries tend to serve the needs of elites while Community Based Organisations (CBOs) are weak, lack legal recognition, or do not exist (Manase *et al.* 2010; SUWASA, 2012). As is the case with institutional arrangements, sanitation agencies and the peri-urban communities have different views about financial issues. Whereas sanitation agencies are worried about cost recovery and economic efficiency, the peri-urban communities are more worried about affordability and poverty. Government subsidies are poorly targeted, resulting in benefits to the elites and those already connected to sewers. Subsidies also introduce market distortions, which discourage private investment and encourage waste of merger resources (Manase *et al.*, 2010).

In most African countries institutions for water supply and sanitation have their responsibilities fragmented among various sectoral ministries and administrative agencies has resulted in proliferation of authorities and uncoordinated planning for water and sanitation sector giving way to overlap of activities and waste of scarce resources (Donkor and Wolde, 1997). These situations of using different sectoral ministries have further led to the water and sanitation sector to experience duplications and contradictions in their functions, hence rendering a disservice to the consumers. In Malawi for instance, organisations like WaterAid and Religious groups have carried out some research through field work and have developed programmes for implementation in water supply and sanitation sector. Programmes like Water Point Mapping and Inventory exercises were carried out which can also be used for planning and investment in the sector. But what is ironic is that the adoption and widespread use of these programmes can face considerable opposition, not least because of their potential for rearranging the peculiar form of power relations that have evolved within particular institutional and political environments (Gutierrez, 2007).

#### **2.4 Safe and Adequate Water Supply and Sanitation: Zambian Perspective**

Zambia is well endowed with water relative to other countries in Southern Africa. The renewable water resource per capita is estimated at about 8,700 m<sup>3</sup> per year, well above the average for Sub-Saharan Africa 7,000 m<sup>3</sup> per person per year and the global average 8,210 m<sup>3</sup> per person per year (World Bank, 2009). Zambia is a large country with low population density with almost two thirds of the population living in rural areas. In 2010, the census

showed that the population of Zambia was 13,092,666, the population distribution had 60.5 percent (7,919,216) living in rural areas and 39.5 percent (5,173,450) living in urban areas Central Statistical Office (CSO, 2010). Rural water supply and sanitation coverage was estimated at 37 percent and 13 percent respectively, with the corresponding urban figures standing at 36 percent and 40 percent (Water Aid, 2010). At the end of 2015, the estimated water supply and sanitation for urban areas was 83.5 percent and 61.4 percent respectively (NWASCO, 2015). Zambia has made progressive steps towards the realisation of the human right to water and sanitation and ensures that this becomes a reality for its people. This has been achieved through implementing two national level policies, namely the National Rural Water Supply and Sanitation Programme (NRWSSP) (2007), and the National Urban Water Supply and Sanitation Programme (NUWSSP) (2011). These programmes have seen the Government increase access for the population over time. As of 2015, the year for attaining MDGs, was estimated that 65 percent of Zambians had access to improved water and 43 percent were able to access improved sanitation. Although 65 percent of Zambians have access to improved water, this leaves over 5,000,000 people (35 percent of the population) in the country without access to improved water. Only 43 percent of people are able to access improved sanitation, which is a very low percentage of the overall national population, resulting in over 8,000,000 people without access (Washwatch, 2015).

The rural and urban populations have access to water and sanitation services from different available source in the country. In rural areas people mostly access water from streams, rivers, wells, boreholes and very few have access to piped water, of which most of the sources are considered unsafe. The sanitation services are usually accessed through pit latrines, Ventilated Improved Pit latrines (VIPs), other use open defecation methods and very few have access to flushable toilets due to limited access to piped water. The rural population is catered for by a national institution the NRWSSP that tries to improve the delivery of the two basic services. The overall goal of the NRWSSP which is to run from 2006 to 2015 is to provide sustainable access to water supply and sanitation in rural areas so as to facilitate the achievement of the MDG for water and sanitation and to contribute towards poverty alleviation of Zambia's rural population African Development Fund (ADF) (2006).

The Government of Zambia for many years has been trying with concerted efforts to provide access to water supply and sanitation services to its people. The Government further recognises the important role of the donor community in supplementing Government efforts in the water sector, through various projects of infrastructure development, maintenance and

rehabilitation and capital intensive programmes that require substantial financial resources (GRZ, 1994). This is further confirmed by one of the major funders the World Bank, which since 1995, has provided over US\$90 million to improve access to water and sanitation services in Zambia. The funding has contributed to improving the health of Zambians, specifically the welfare of women and children by releasing them from the burden of fetching water from unsafe sources (World Bank, 2006). Due to the poor performance of the local authorities to properly deliver water supply and sanitation services to the residents, the Zambian Government and the donor community decided to fund the sector (GRZ, 1994). From the mid-1990s, Government and donor funding came due to the fact that most municipalities and councils lacked the resources and the management to properly operate and maintain the water and sewerage systems. This led to the continuous deterioration in the already ageing infrastructure, high levels of losses and frequent disease outbreaks when water was inadequately treated due to shortages of chemicals in the water treatment plants (Robinson, 2002).

The Zambian Government's focus on providing adequate, safe and cost-effective water supply and sanitation services to ensure the health and well-being of the citizenry, is articulated in the Fifth National Development Plan (FNDP) which has demonstrated through continued efforts to meet the MDGs. The Government's goal is to increase sustained access to water supply and sanitation in both urban and rural areas by strengthening the institutional and policy frameworks and improving systems for service delivery (GRZ, 2006). Medium-term targets defined under MDG 7 (c) require increasing the proportion of the population with sustainable access to an improved water source from 49 percent in 1990 to 75 percent by 2015. This is equivalent to an additional 2.5 million people of the population having access to improved water (World Bank, 2009). The sector goal was expected "*to achieve 75 percent accessibility to reliable adequate safe water and 60 percent adequate sanitation by 2015 in order to enhance economic growth and improve the quality of life*". In order to achieve the Sixth National Development Plan (SNDP) objective of promoting sustainable water resources development and sanitation, the strategic focus of the sector was to provide water and sanitation infrastructure and develop skills to ensure effective water resource management and the efficient provision of reliable and safe water and sanitation services (GRZ, 2011).

In 2014 only about 50 percent of Zambia's population had access to adequate sanitation as urban coverage was about 60.7 percent, while about 83.8 percent had access to water supply. The report indicates that in 2014, there was a slight decline in the national water coverage

figure from 83.9 percent to 83.8 percent despite an increase in the number of household connections. This was attributed to increased population, social, economical and developmental activities in urban and peri-urban areas which have led to increase the demand for water and sanitation services (NWASCO, 2014).

## **2.4 Institutional Arrangements**

The Zambian Government conducted reforms in the water sector through the Water Act 1994, which were aimed at having institutions that would improve the management and utilisation of the water resources. Challenges in water resource management such ageing infrastructure led to water losses, and with declining funding meant the sector could neither be upgraded nor extended to expanding city areas. Cost recovery policies through the reforms eventually led to attempts at commercialisation of the water supply and sanitation services through the passing of the Water and Sanitation Act in 1997 and the establishment of a regulatory authority, the National Water Supply and Sanitation Council (Dagdeviren, 2008). Furthermore, these reforms were also meant to improve the provision of water supply and sanitation to the Zambian citizens.

Under the new institutional set-up or structure of the Water Supply Sanitation (WSS) Sub-sector key Government institutions for the water and sanitation sector are the Ministry of Energy and Water Development (MEWD) which has overall responsibility for the water sector and for national water policy formulation and through the Department of Water Affairs (DWA) for water resources planning, management and development including water resources assessment. The Ministry of Local Government and Housing (MLGH) through the Department of Housing and Infrastructure Development (DHID) has the responsibility for water supply and sanitation (GRZ and GOD, 2011). The Local Government Act Cap 283 gives local authorities the prime responsibility for the provision of domestic water supply and sanitation services to all areas within their boundaries. The local authorities are empowered to make by-laws, set standards and guidelines for provision of services. The Water Supply and Sanitation Act No. 28 of 1997 specifies that local authorities may provide urban Water Supply and Sanitation services and establishes NWASCO as the regulator for the Water Supply and Sanitation sector. Local authorities may provide by themselves or through commercial utilities licensed and regulated by NWASCO.

NWASCO, which began its operations in 2000 is a regulator created for the purpose of ensuring efficient and sustainable Water Supply and Sanitation services through the enforcement of the Water Supply and Sanitation Act No. 28 of 1997. The regulator's critical role is to balance consumer interests by safeguarding them against exploitation whilst ensuring that commercial utilities are viable institutions (NWASCO, 2013). The overall responsibility for providing water supply and sanitation services in the country falls under Ministry of Local Government and Housing (MLGH) while NWASCO handles regulatory functions. In line with the Water Supply and Sanitation Act, MLGH has encouraged local authorities to establish CUs to manage water supply and sanitation services in urban centres which is vital for ensuring cost recovery and sustainability of these services (ADF, 2006). The FNDP was clear on the provision of water supply and sanitation services in urban areas as to support to the National Urban Water Supply and Sanitation programme (NUWSS) development that focuses on enhancing institutional capacities, policy and legal frameworks, and information management for planning and development at national, provincial and district levels (GRZ, 2006).

The water supply and sanitation sector in Zambia is managed by two ministries that are concerned with the implementation of the programmes under the sector. The National Water Supply and Sanitation Council (NWASCO) and Water Supply and Sanitation (WSS) report to two different ministries, these are likely to be sources of contradictions and duplication of activities. GTZ (2008:10) reported that *“In Zambia, after considerable discussion, the Government finally decided that NWASCO should report through the Ministry of Energy and Water Development, while WSS services were under the Ministry of Housing and Local Government.”* It can be seen that there was an element of struggle or unclear lines of operation between the two ministries and the two institutions. This can further be seen within and outside other institutions that facilitate the provision of water supply and sanitation services.

Before the resolution to separate the roles of the two ministries and institutions the institutional arrangement hindered development in the delivery of the services to the citizens. The two major ministries continued to disagree on the reporting mechanism of the regulator and compete for the water supply component. In the current institutional setting, there are no structures in the country that have been consciously set up to specifically provide water supply services to the low income population. The presence of Water Trusts in some peri-urban areas may have eased the delivery of services, but the lack of proper collaboration

between the regulators and the community, seem to have eroded the gains in the sector (Kagaya and Mwanamwambwa, 2006). The situation is exacerbated by the confusion brought about by policy, regulatory and a re-arrangement of the coordination institutions in the sector, this has had a saddening consequence, where the current low levels of access to water supply are not a direct reflection of water unavailability, but rather a result of low level of infrastructure and socio-economic development (Nkhuwa, 2009). The unclear lines of institutional leadership between two ministries involved in water supply and sanitation provision MEWD and MLGH, were at choice words as to who provides institutional leadership led to donor mistrust and loss of confidence. The lack of sectoral coherence in investment plan combined with capacity for planning and implementation discouraged donors from engaging in programme support in the sector (Gutierrez, 2007).

The CUs were established under the local private company legislation, The Companies Act, Chapter 388 of the Laws of Zambia. The Companies Act promotes adherence to good corporate governance which NWASCO also promotes. As limited companies, the utilities have the ability to operate according to commercial principles in the best interest of shareholders, the municipalities. This being the case, it may not be appropriate to have elected officials be part of the Board of Directors. Elected officials are councilors who are politicians elected by the residents of the city at the same time that they elect the President and members of parliament. The companies have Boards of Directors who oversee the general operations of the company by its management. Present guidelines are outdated, vague and couched in very general terms. For example, the guidelines do not address the need for codes of ethics or guiding principles for governing the boards in their charters (SUWASA, 2012). Due to some vague institutional arrangements in the sector in the year 2012, all CUs operated without Boards of Directors for the entire period which affected a number of important decisions with negative consequences, which limited the operations of the CUs. This situation is contrary to the principles of good corporate governance (NWASCO, 2012).

In Zambia most of the institutional changes are not accompanied by tough political decision making the usual stumbling blocks revolve around investment priorities, tariffs and cost recovery (DANIDA, 2006). The reform instruments for the Government may be explicitly pro-poor, while the aims of the CUs are often based on a “*western*” concept of the water business, which does not reflect the reality of developing country cities and towns where large proportions of the population are not connected to the network, they lack the needed focus on innovation and service expansion in informal settlements (DANIDA, 2006). Further,

inadequate co-ordination in developmental planning has resulted in the allocation of plots without first providing the necessary services such as roads, water and sewerage reticulation systems. This has contributed to indiscriminate drilling of boreholes by individuals and companies thereby depleting underground water (NWASCO, 2016). As regards to new districts where new consumers are expected to increase, despite having a clear institutional set-up, there is inadequate consultation and co-ordination among stakeholders resulting in consumers not receiving satisfactory services in new development areas. There is also lack of standardised information, outdated development plans and failure to identify focal point institutions in land development which has led to new districts not to be able to receive water supply and sanitation services in the expected time frame (NWASCO, 2010-2011).

The creation and declaration of new districts in most parts of the country has come with institutional arrangements that have less coordination for most CUs, traditional and the local authorities. The provision of service of water supply and sanitation needs collaboration and coordination if it has to be achieved to serve the population. Limited coordination in developmental planning among CUs, Traditional and Planning Authorities in new development areas for the provision of water supply and sanitation services has seen the main goal fail to achieve access to service provision (NWASCO, 2012).

## **2.5 Institutional Challenges**

The water sector in Zambia has been undergoing legal and institutional reforms since the nineties. Although some measure of success has been achieved in transforming the sector a number of challenges remain such as access to adequate, safe drinking water and sanitation facilities in urban and peri-urban areas remain (GRZ, 2011). The weakness in institutional infrastructure due to inadequate policies and legislation to guide the multi-dimensional aspects of water resources and its consequence in poor management and proliferation of authorities and duplication of efforts continue to undermine implementation of programmes of water supply and sanitation services (Donkor and Wolde, 1997).

Most if not all of the CUs were formed from the local authorities that used to run the water supply and sanitation sector. Therefore, they inherited most of the systems that the public institutions used for service provision and challenges were inevitable. Therefore, the experience of making the transition from a publicly oriented service to a commercial operator has not been an easy task for the CUs (SNV, 2012). This has been experienced by new



companies that inherited badly maintained infrastructure coupled with high levels of Unaccounted-for Water (UfW) as high as 65 percent in some instances (World Bank, 2009). Other problems included poor revenue collection and billing management, huge operational costs and limited customer awareness and outreach (SNV, 2012). Furthermore, weak coordination mechanisms, lack of baseline information for planning purposes, and weak human and institutional capacity for managing and implementing programmes in the water supply and sanitation sector (GRZ, 2011).

All CUs inherited dilapidated and inadequate design capacity infrastructure from the Local Authorities. To compound this, the rate of urbanisation and population growth has not been matched by the rate of infrastructural development, specifically for water supply and sanitation thereby impacting negatively on service delivery. As of the 2011/2012, the National Coverage for water supply was 81.8 percent and that for sanitation at 56.7 percent from 47 percent in 2001/2 (NWASCO, 2013).

In the quest to ease some financial difficulties, the Government has created the Devolution Trust Fund (DTF), a financing mechanism targeted at peri-urban areas. The CUs are able to apply for the funds to improve water supply and sanitation in peri-urban areas through the local authorities. There are, however, still disagreements about the role of the DTF, including its financing mechanisms. Investment plans are in place, although the Government's contribution remains low, as donors remain the main funders (UNDP, 2009). There has been no proper direction on how projects can be carried out for water supply and sanitation. Even in the new millennium, the identification of workable models of social service provision, including community water supply, continues to be hindered by the project framework within which most development agencies operate (UNDP, 2009).

The few attempts to focus on institutions have been largely externally-propelled, with such capacity assessment of water supply institutions frequently pointing to broad gaps, including Government under-funding and capacity over-stretch, inappropriate incentive systems, and inadequate administrative structures and delivery mechanisms (Busari and Dlamini, 2001). There has been a tendency of having uncoordinated projects between the Government and the NGOs and other donors in the water and sanitation sector over the years. The different parts do not communicate adequately for the betterment of the sector. ADF (2006) observed uncoordinated Government and donor projects often leading to duplication of efforts and unnecessary expenditure that would have been channeled to other sectors in need.

At community level, the evaluation of the community-managed Water Trusts carried out in mid-2004 showed that the majority of service recipients were satisfied with the level of service in terms of reliability, continuity, customer relations, price and flexibility of payment methods. However, there was no evidence of direct contact between the Water Trust and the Regulator. Therefore, it shows that there was lack of better institutional arrangement to ensure that communities served by the Water Trust fully benefit from the water services regulatory systems (Kagaya and Mwanamwambwa, 2006). The kiosk systems presently being piloted in Zambia's peri-urban areas would appear to have considerable potential, provided the CUs are put on a proper footing. As things stand at present, the imposed weaknesses of the CUs could easily result in irregular supplies to the kiosks and a lack of the back-up and support needed to make the concept flourish (Robinson, 2002).

The major challenges that NWASCO faces, however, involves balancing the interests of competing parties, boards and managing directors of CUs would prefer some tariffs to increase, but political leaders seek to have time horizons for tariffs that extend to the next election. This means the regulator has to adhere to some political pressure not to increase the tariffs. This is where there is a challenge on the autonomy and this affects the operational and financial sustainability of even the CUs. Boards and managing directors for both the regulator and CUs are also appointed by some politicians with vested interest (SUWASA, 2012).

The CUs have some serious challenges in the provision of water supply and sanitation services to their customers. Lusaka Water and Sewerage Company (LWASCO), a public liability company which is owned by Lusaka City Council (LCC), is legally responsible for provision of water and sanitation services to all residents of Lusaka City. However, service levels provided by the water utility are inadequate, because of poor efficiency levels as reflected by high 'unaccounted-for' water (UfW) of about 58 percent. The service provision challenges are further worsened by increase in population and consequent proliferation of informal and unplanned settlements that do not make the situation easy for the company. As of 2004, service coverage was estimated at 34 percent of the city population, and parameters such as service continuity and reliability were not much better and the trends were not peculiar to Lusaka (Kagaya and Mwanamwambwa, 2006).

There have been situations where the CUs have not operated with autonomy due to their historical and present connections with Government institutions such as the local authorities and Central Government. This has led to the CUs not to operate in an economically

sustainable manner. The culture of low tariffs has been sustained by populist political positions at the national level but with no possibility of Central Government committing to fill the resource gap. The approach of the Government, with the support of various donors, to the establishment of the CUs has largely been to stick within the existing system of having the lowest tariffs to serve the poor (Robinson, 2002). In addition, the service situation lacks sustenance to justify setting appropriate tariffs. There are also cultural, religious and social factors against implementing appropriate and sustainable water tariffs. Lack of adequate funds has resulted in unsatisfactory operation and maintenance of water supply and sanitation systems (Donkor and Wolde, 1997).

Manzung *et al.* (2012) argues that despite the intervention of Government, donors and other benefactors, provision of safe water and adequate sanitation continues to be a challenge in most urban centres to the extent that prospects for achieving sustainable water service outcomes are low. A sustainable water service outcome approach is meant to address the water needs of residents rather than focus on cost recovery through the front door by making water users pay for what are called economic tariffs, or through the back door by letting residents bear a disproportionate burden of ameliorating the water shortages.

Zambia Electricity Supply Corporation (ZESCO) power supply outages also adversely affected service provision in terms of extra costs incurred on the part of the CUs. The fluctuation of power supply leads to high or low voltage in the supply system, which consequently causes electrical machines in the water and sewerage plants to get damaged for a number of CUs which are very costly to replace (NWASCO, 2012). The frequent power outages experienced in the country in recent years have negatively affected operations of most CUs, due to the reduction in quantities of water produced and distributed. This has had a ripple effect of low revenues generated and decreased consumer confidence in service delivery because of reduced hours of supply. The situation is worsened because most of the CUs have old and inadequate water storage facilities that cannot mitigate the effects of power outages (NWASCO, 2013).

In some peri-urban areas, the supply of water is done through communal taps or kiosks that are run through community based management systems. But these also face some challenges in their access to water supply. The supply is often erratic at the communal taps, mainly due to power outages. It takes a long time to repair taps when broken down and at some places,

taps are very limited in capacity and poorly maintained due to lack of finance, technical staff and are also extensively vandalised, resulting in frequent breakdowns (IUCN, 2004).

There has been a continuous trend of rural-urban migration which has led to urban growth consequently leading to the ever-increasing demand of water and sanitation services which has left many water utilities unable to provide services to new and potential customers. The CUs are unable to keep up service standards in areas already covered while maintaining existing networks and other infrastructure. The failure by the CUs to service new and potential customers is further worsened as city planners and policy-makers may both be unable and unwilling to address the problem of low service provision. Furthermore, economic costs for investing in new water and sanitation projects can be prohibitive, as financial institutions may not be interested in making funds and loans available for such capital projects (Grönwall *et al.*, 2010).

The creation of new Districts in the country has seen some projects towards the constructions of infrastructure for water supply and sanitation services. But there have been unfortunate situations of poor workmanship in the constructions. This has been aggravated by inadequate capacity in the human resource to supervise technical projects which has led to delayed completion of projects and wastage of financial resources. As a consequence, access to water supply and sanitation services and revenue to the CUs has been deferred (NWASCO, 2015).

### **2.5.1 Institutional Opportunities**

According to NWASCO (2012), the declaration of a number of rural areas as new districts by the Government, will enable CUs to incorporate the newly created districts in the licensed service areas for service provision. This will further expand the opportunity for the sector to increase access to water supply and sanitation services and aid meeting the Vision 2030 of universal coverage for water supply and sanitation services. The sector will further support the development of a coherent policy on water supply and sanitation being spearheaded by the MLGH. The ministry provides to the CUs to expand the supply capacity of the systems.

In the quest to ensure better service delivery by most CUs, the best opportunities can come through the promotion of commercial sustainability of CUs. This can only be achieved by ensuring continued progress towards reaching full cost recovery coupled with improvements in service delivery. By rehabilitating the old infrastructure of the various CUs around the country, it is expected that the level of ‘unaccounted-for’ water will reduce. This will lead to

CUs being able to get enough revenue equivalent to the amount of water that the CUs produce (NWASCO, 2012).

In Zambia, most CUs rely on Government and donors funds for capital investments. However, as provided for in the Water Supply and Sanitation Act of 1997, the Regulator (NWASCO) has the powers to establish a fund to assist in extending water supply and sanitation services to the urban poor. The Devolution Trust Fund (DTF) was formed autonomous from NWASCO. The DTF is a basket fund that makes grants available through applications by the country's commercial water utilities, and is in turn financed by foreign donors such as the World Bank, Danida and the EU. The DTF was created to contribute to capacity building among water providers who would probably otherwise not consider extending their services to poor areas (Mbilima, 2010).

## **2.6 Institutional Arrangement for Supply of Water and Sanitation Services Gaps in Zambia**

Most of the studies concerning Water Supply and Sanitation Services in Zambia have concentrated on how the sector has evolved in the past 25 years since the change in the macroeconomic environment. The studies that looked at the impacts of reforms, which initiated major changes in the organisation and management of water supply services starting from the 1990s (Chitonge, 2011). Mbilima (2010) further looked at reforms as being paramount to a successful operating of the sector as, lack of clearly defined roles and jurisdictional responsibilities led to both policy gaps and duplication of efforts in the sector. In addition to reforms, regulations were seen as ones that highlighted on the importance of an institutional set-up of the regulator, tools for regulations, their effectiveness and impact on the sector (Mbilima, 2010).

Commercialisation of the sector is another aspect that emanated from the reforms over the years, due to increased population and inadequate funding for operation and maintenance of water service systems. This made it extremely difficult for most of the local authorities to cope with the growing demand for water and sanitation services among others. Therefore, reforms in the sector culminated in the full-scale commercialisation of water services in major cities and towns. Through reforms, regulation and commercialisation improved access to water is now perceived as a function of an efficient, market-oriented, institutional system

serving knowledgeable and rational water consumers, who are willing and able to pay for the service. (Chitonge, 2010; Kazimbaya-Senkwe and Guy, 2007).

There are aspects of how really the reforms, regulations and commercialisation have trickled down service provision to the consumers as the main beneficiaries to their impacts are usually seen to be the elites of the society and mainly in the major towns along the line of rail. Some of the benefits of reforms, regulations and commercialisation have not been felt in other towns off the line of rail. Within the main towns the populations in the peri-urban areas have received little attention from the institutions that are expected to serve them with services. Although there has certainly been progress in the urban water subsector, a specific area still requiring attention is that of sustained service delivery. Low levels of budget utilisation have led to low expenditure for urban water, while deteriorating infrastructure restricts CUs from making progress. As noted above, growing urbanisation will only increase the need to address the urban subsector's needs AMCOW (2010).

## CHAPTER THREE

### DESCRIPTION OF THE STUDY AREA

This chapter looks at description of the study area consisting of geographic location, climate, soils, vegetation, demographic and socio-economic characteristics.

#### 3.1 Location

Chinsali District is found in the Muchinga Province of Zambia, and is the provincial headquarters of Muchinga province. The District was pronounced Provincial Headquarters following the detachment of Muchinga from Northern Province in 2011 and is currently the only district in the Province which has attained Municipality status. It lies in the North Eastern Region of Muchinga Province and shares its boundaries with Mungwi to the North-West, Chama to the East, Isoka to the North-East, Nakonde to the North and Shiwang'andu to the South. (Figure 3.1)

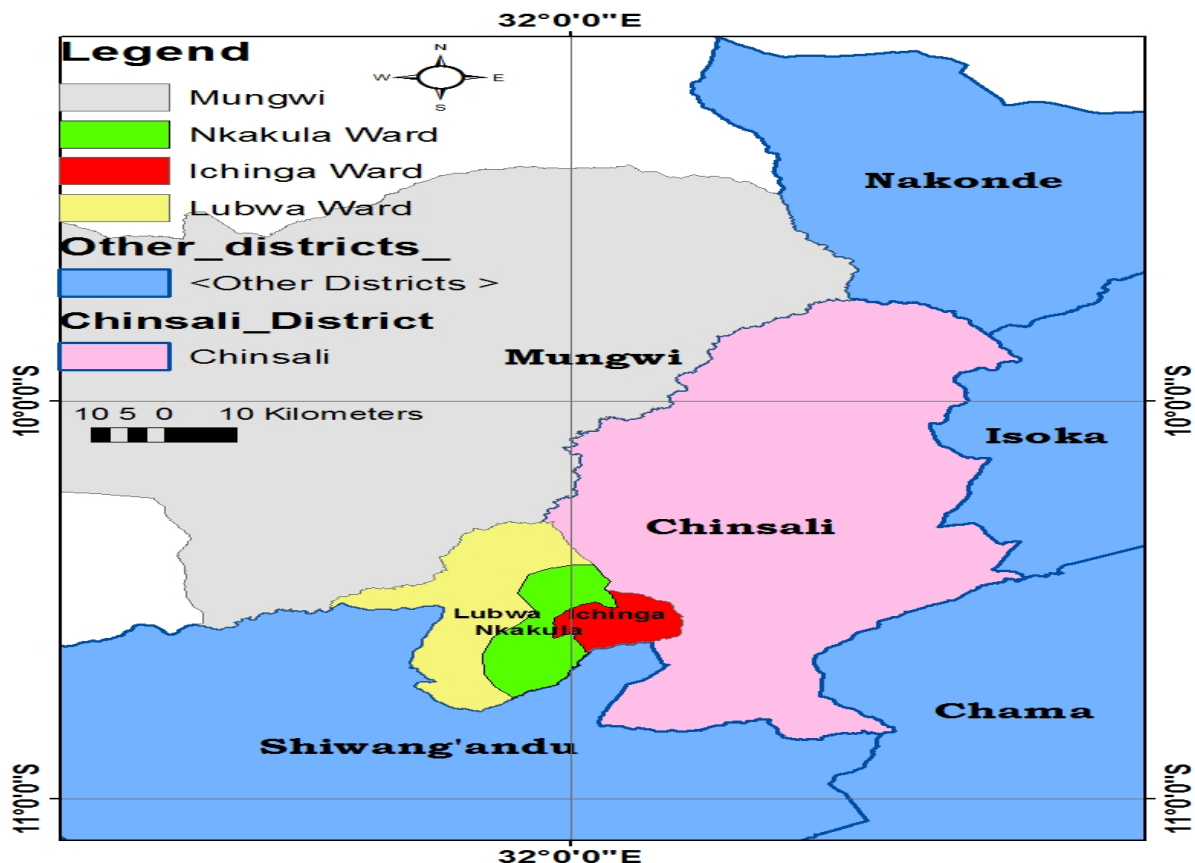


Figure: 3.1 Location of Chinsali Urban,  
(Source: Chinsali Municipal Council, 2016)

## **3.2 Physical characteristics of the Study Area**

The Chinsali District covers a surface area of approximately 15, 566, 62 square kilometers and lies at an altitude of between 1500 meters and 1800 meters above sea level (GRZ, 1968). Among the notable physical features in the district are the Muchinga Escarpment highlands which slope diagonally from the north eastern to the south-western part of the District. The western region consists of the lowlands, that have rivers and wetlands of Lubu River with its tributaries – Kalungu to the North and Chambeshi River to the West

### **3.2.1 Climate**

Chinsali District experiences a tropical type of climate characterised by three distinct seasons. The cool dry season, which stretches from May to August, the hot dry season from August to November and the rain season from November to April and temperatures ranges from 18-24°C, with an average rainfall of 1100mm per year (GRZ, 1968).

### **3.2.2 Soils**

Soils found in the district are highly leached due to high rainfall received in the district. The soils are mainly acidic with very low content of calcium and magnesium. This type of clay soil, has very low capacity to hold nutrients (Brammer, 1976). However, the district has some patches of fertile soils. Trapnell (1996) states that soils which occur in areas below the plateau level in the district are much more fertile. These areas have soils which are deeply and strongly weathered than plateau soils.

### **3.2.3 Vegetation**

According to GRZ (1968), Miombo types of woodlands tend to dominate the vegetation and the predominant tree species are *Brachystegia Isoberlinia*, *Isoberlinia Paniculata*, *Brachystegia Longfolia* and *Brachystegia Hockii*. There is also Lake Basin, Chipya which is associated with the Chambeshi River and its flood plain. It is commonly surrounded by a band of much darker *Brachystegia Speciformis* woodlands (GRZ, 1968).



### **3.3 Socio-Economic Characteristics**

#### **3.3.1 Demographic Factors**

Chinsali District has 87,248 people and the population density of Chinsali is 9.6 people per square kilometer (CSO, 2010). The population is fairly distributed with 51 percent of the total population being female and 49 percent male. Children below 15 years represented an estimated 48.8 percent of the population while children below the age of five constituted approximately five percent, with women in child bearing age forming 22 percent of the population (CSO, 2010).

The township boundaries covers the majority of the population of the wards of Lubwa, Ichinga and Nkakula; projecting a township population of 32,080 in 2010. Having the projected population increase of 1.4 percent, coupled with its declaration as the capital for Muchinga Province, the population within the township planning boundaries of Chinsali District has so far increased to more than the envisaged 33,447 persons between 2010 and 2013(CMC, 2013).

#### **3.3.2 Education and Health**

The district has five secondary schools, namely; Chinsali Girls, Kenneth Kaunda, Chinsali Day, Kalwala and Mulilansolo. There are 65 primary schools and 16 community schools. In addition to Government schools there is one private school, Special Education Need Unit (SENU). Chinsali District has seen some tertiary education facilities being setup apart from those that were already in existence. There is one Skills Resource Centre for the youths, newly opened Robert Makasa University. Zambia Open Learning College and Mufulira College of education have opened branches in the district. The district has one community hospital and one antenatal and an under five clinic in the Central Business District (CBD), while in Lubwa area, there is also a health centre. The other health centre is located about 70 kilometers to the north east of the CBD at Mulilansolo.

#### **3.3.3 Economic Activities**

Chinsali District is predominantly rural and does not have major industries. The majority of the population in Chinsali engages in small scale farming of crops such as maize, rice, cassava, millet, groundnuts, beans and sweet potatoes. The commonest type of farming practiced is mainly the shifting cultivation traditionally known as the “Chitemene System”.

Chinsali District currently has few commercial farms, though there is Mbesuma State Ranch about 70 kilometers to the North-East.

Other economic activities include small scale fishing done in the waters of Chambeshi and Lubu rivers and the Nashinga plains. There is also the rearing of livestock such as cattle, poultry, pigs and goats. The people of Chinsali also trade in groceries, building materials, hardware and also engaged in the barter system exchanging agricultural produce for second hand clothing and other necessities as a means of sustaining their livelihood (CMC, 2013). In terms of mineral wealth, the district has a number of minerals that are yet to be exploited. In order to tap these minerals, some local people have formed the Chinsali Small Scale Mining Association.

It is however, anticipated that the elevation of the district as Provincial Capital will present various investment opportunities that will translate into significant levels of economic growth and infrastructure development. Already, the almost completed Robert Makasa University and the construction of provincial administration offices, provincial police headquarters, cultural centre, and provincial forestry office, office of the president, water dam, new Bus station, house construction on the new Chinsali has commenced and the construction of Heads of department offices at skills are nearing completion. The construction of Mulilansolo and Chinsali-Kasama roads is under-way. A provincial vaccine cold room has been constructed. The private and individual property developers have also enhanced the construction industry.

## **CHAPTER FOUR**

### **METHODOLOGY**

The chapter outlines the data sources, sample population, sampling procedure, data collection instruments and data analysis. The term methodology refers to the overall approaches and perspectives to the research process as a whole and is concerned with issues such as why you collect certain data, what data you collect, where you collect it, how you collect and analyse it (Collis and Hussey, 2003).

#### **4.1 Research Design**

The study used a mixed method of both qualitative and quantitative approaches because of the nature of data that were collected. The use of these two approaches allowed the researcher to take into account various outcomes from the responses of the different instruments of data collection that were employed in the study. The use of both qualitative and quantitative methods was seen as the best way the objectives of the research could be achieved over time through detailed in-depth data collection, employing multiple sources of information (Creswell, 1998).

#### **4.2 Selection of Study Area**

Chinsali Urban was selected based on the fact that the area is likely to face a strain on resources like water due to population increase likely to be caused by its attainment of municipality and provincial capital status. The strain on water supply and sanitation services is likely to have negative impacts on the delivery to the vulnerable members of the population on accessibility, because of other preferred economic demands. The researcher also considered that Chinsali Urban has been serviced by Chambeshi Water and Sewerage Company (ChWSC) for both water supply and sanitation services for the past thirteen years and information available on the study was going to be of great value. Furthermore, how the district was coping with the new institutional status in relation to the institutional arrangements for supply of water and sanitation services.

### **4.3 Target Population**

The district has a total of 19,218 households and the number of households in the three wards of Nkakula, Ichinga and Lubwa within Chinsali Urban boundary is approximately 6,715 (CSO, 2010). The three wards in Chinsali Urban have 557 households connected to Chambeshi Water and Sewerage Company (ChWSC) reticulation system and 25 percent of the household were selected for the study according to their categories of low, medium and high density residential areas. After assessing the total sample population of households which was 557, 25 percent of total sample population which equated to 139 households which were studied and three communities from the six communities with kiosks were also studied.

### **4.4 Sampling Procedure**

Sampling procedure refers *“to that part of the research plan that indicates how cases are to be selected for observation”* (Kombo and Tromp, 2006:78). The township households in the three wards that are supplied by Chambeshi Water and Sewerage Company are currently 557. The households are categorised into low, medium and high density residential areas. From 139 households based on residential categories, they were selected using probability interval/systematic random sampling method at an interval of four households to collect information from respondents to avoid biasness. A good rule of thumb is one that overlaps 25 percent or less still suggest statistical significance, Payton, (2003), further consider the probability of overlap under various alternative formulations of the problem. Households were also proportionally selected based on housing category of low density 155 (39), medium density 225 (56) and high density 177 (44) residential areas as shown in Table: 1.

### **4.5 Sample Size Calculations**

A percentage is a fraction with denominator 100, i.e.  $25\% = 25/100$ . Calculation of quantity of a given percentage is done by taking 25% of the total sample population, i.e.  $25/100$  of 177 high density residential houses will be  $25/100 \times 177 = 44$  households. Therefore, the mathematical calculation was done from the total household population of 557, using the 25 percentage sample size for each residential area starting from the high, medium and low density and finally come up with the sample population of 139 households that were considered for the study.

**Table 1: Household Samples according to Residential Densities**

| Houses Type             | No. | Percent (%) | Sample Size |
|-------------------------|-----|-------------|-------------|
| High Density            | 177 | 25          | 44          |
| Medium Density          | 225 | 25          | 56          |
| Low Density             | 155 | 25          | 39          |
| Total Population Sample | 557 | 25          | 139         |

**Source: Field Data, 2016**

For communities that use water kiosks, using interval/systematic random sampling at an interval of two communities was used from the six communities to come up with three communities that receive such services. According to Onwuegbuzie and Collins (2007), a study must have a minimum of three focus group discussions to generate sufficient data and this was used in this research. For the Focus Group Discussions (FGDs) the participants were selected with the help of the community leadership in the various kiosks points. Six members from each of the three communities were purposively selected using Community Based Organisations (CBOs) leaders for the FGDs. It is recommended that for FGDs to be conducted well and gather sufficient data, a range of between six and 12 participants should be selected (Onwuegbuzie and Collins, 2007; Longhurst, 2010).

The key informants from the Commercial Utility (CU), the branch manager at Chinsali office and another officer at the Headquarters in Kasama and an official from Chinsali Municipal Council (CMC) in-charge of water supply and sanitation unit were purposively sampled because of the knowledge that they possess on the topic under study. Usually, purposive sampling involves choosing participants considered to be knowledgeable and informed about the topic of the study (McMillan and Schumacher, 2006).

#### **4.6 Data Collection Instruments**

The instruments that were used to collect data in this study included questionnaires (Appendix I), semi-structured interviews (Appendices II, III and IV) and focus group discussions (Appendix V), review of documents and observation.

A questionnaire is simply a guide or instrument with close or open ended questions to which respondents must react (White, 2008). The questionnaires were used to collect data sets from the selected respondents in relation to the service delivery by the CU.

An interview is an instrument that is used to collect data through direct contact between an interviewer and respondents presumed to have certain experiences that enhance in-depth understanding of the problem under investigation (Borg and Gall, 1996; Denscombe, 2001). The semi structured interviews were used to collect data sets on institutional arrangements and were administered to CU officials and an official from CMC.

A focus group discussion is a small gathering of individuals who have a common interests or characteristics assembled by the researcher who uses the group and its interactions as a way to get in-depth information about a particular topic (Kartz and Williams, 2002). The focus group discussions were used to collect data sets in relation to how communities run water supply in kiosks and service delivery by the CU. FGDs were ideal because they offered the researcher, an opportunity to study the ways in which individuals collectively make sense of a phenomenon, and construct meaning around it (Bryman, 2004), enabling an in-depth exploration of the phenomenon which cannot be discussed in face-to-face interview or questionnaire. Furthermore, FGDs allow multiple and contrasting perspectives to be contested, and encouraged participants to defend and clarify their views (Bryman, 2004).

Data were also obtained through review of documentation from annual reports from the regulator NWASCO and other government documents. Field observations were used to assess the condition of infrastructure such as reservoirs, the reticulation system, and community kiosks. Furthermore, information was collected to enhance the research, through secondary sources of data that was collected through unpublished reports, text books and other materials that have relevant information to the topic.

#### **4.7 Ethical Consideration**

An introductory letter was obtained from the Department of Geography and Environmental Studies to seek authority from the CU, from the District Commissioner, Chinsali Municipal Council and the Community leaders for the Community Based Organisations (CBOs) to inform them about the purpose of the study. Both written and verbal consent was obtained from the concerned parties. The researcher adhered to anonymity and confidentiality of the respondents from households throughout the research process. Assistance was sought from

the community leadership through the CBOs to inform the people about the study and explain to the people what it meant to be involved in participating in focus group discussions. The leaders of the CBOs were informed in advance prior to the focus group discussions that the study was purely for academic purposes. They were also assured of anonymity and confidentiality apart from being requested to go through the issues raised for confirmation and clarification.

#### **4.8 Pre-Testing**

A pre-test was carried out to determine whether the questions to be asked were practical, correct, not leading or sensitive. The pre-test was used on respondents from the some households, but who were not part of the actual research. This was done for some households after which the researcher addressed the flaws in the responses of questionnaires and later made necessary corrections.

#### **4.9 Data Analysis**

According to White (2008), data analysis is the climax of the research, and it involves selecting, categorising, comparing, synthesising and interpreting information collected to provide explanations of the single phenomenon of interest. Questionnaires generated much of the quantitative data in the research, while semi-structured interviews and focus group discussions generated the qualitative data. The data from the focus group discussions were categorised according to the themes and summarised for easier analysis since the summaries were complemented by the field notes taken by the researcher during the discussions. Document analysis and observation was categorised and arranged according to key concepts which corresponded with research questions, and was presented in a descriptive manner.

Quantitative data were analysed using descriptive statistics and Percentage Analysis Technique (PAT). The researcher generated statistical information such as frequencies and percentages. Content Analysis was used to analyse the qualitative information. In this context, content analysis is an approach used to analysis documents and text that seek to qualify contents in terms of predetermined categories and in a systematic and replicable manner (Bryman and Bell 2011). Analysed data have been presented in form of pie charts and graphs.

#### **4.10 Limitations of the Study**

Most of the people showed less interest in both household questionnaires and focus group discussions due to lack of incentives and felt that the research would not impact their lives positively as most researchers do not give them feedback. Some institutional bureaucracy made it difficult to collect more information to add to the study. Therefore, data collected in the study needed the input of the researcher to find alternative sources of filling the information gaps that come because of the above stated limitations. The research would have brought out more quality and comprehensive information on this important topic if conditions were conducive. The final outcomes of the research were partially affected in the sense that some gaps were identified in the operations of institutions. Furthermore, some important institutions such as the CU, CMC and MLGH were not clearly giving out important information and how it affected the water supply and sanitation sector.



## CHAPTER FIVE

### PRESENTATION OF RESULTS

This chapter presents the results of the study. The first section covers institutional arrangements that provide water supply and sanitation services in Chinsali Urban. The second section looks at how institutional arrangements affect delivery of water and sanitation services in Chinsali Urban. The last section of the chapter covers the challenges and opportunities for water supply and sanitation services in Chinsali Urban.

#### **5.1 Identified Institutions for Water Supply and Sanitation in Chinsali Urban**

The research identified four major institutions of water supply and sanitation in Chinsali Urban and these were Community Based Organisations (CBOs), Chambeshi Water and Sewerage Company (ChWSC), Chinsali Municipal Council (CMC) and Ministry of Local Government and Housing (MLGH)

##### **5.1.1 Community Based Organisations (CBOs).**

CBOs are institutions that are in a peri-urban area of Chinsali Urban, called Choshi and these institutions co-ordinate the operations of the water selling points called Kiosks (Figure 5.1 a). In this peri-urban area, there are six kiosks selling points and three were chosen for the Focus Group Discussions (FDGs). From the three FDGs conducted, they all confirmed of having running committees of ten members each. The committees have a Chairperson, Secretary, Treasurer and seven committee members and the treasurer is usually the Kiosk water vendor. The Kiosk water vendor (Figure 5.2 b), collects money for the water sold and is paid 40 percent of the monthly sales by the CU. Equally there is no sanitation programme related to sewerage management that the CBOs currently manages or runs because of lacking institutional arrangements between the CU or CMC and also due to the fact that most of the households use pit latrines.

##### **5.1.2 Chambeshi Water and Sewerage Company (ChWSC)**

ChWSC is the Commercial Utility (CU) that provides Water and Sanitation services in Chinsali Urban. It provides services to 10 residential areas, businesses, institutions such as the police, prisons, hospital and other Government departments. It has a full operational office in Chinsali Urban which is run by a manager and 12 supporting workers. The CU has

its headquarters in Kasama, where all operational directives are given. The company collaborates with the main shareholder Chinsali Municipal Council (CMC) through the Water Supply and Sanitation Unit and the main stakeholder, the Ministry of Local Government and Housing (MLGH) through the Department of Housing and Infrastructure Development (DHID). The key informant from ChWSC revealed that the company's institutional arrangements are made up of the commercial department that collects revenue from various clients on behalf of the CU and the technical department that conducts various maintenance activities on the infrastructure of the CU. He further explained that the CU has external institutions that are not directly involved in WSS sector, but monitor and supervise the performance of the CU operations in Chinsali Urban. These are Zambia Bureau of Standards (ZABS) which monitors the quality standards of water supplied by the CU. The Department of Water Affairs (DWA) manages and regulates the water resources on behalf of the Ministry of Energy and Water Development (MEWD). The Zambia Environmental Management Agency (ZEMA) ensures that the water sources are not polluted and possible sewerage treatments are done according to their guidelines. He further said all these institutions ensure that the CU attains service level guarantees.

### **5.1.3 Chinsali Municipal Council (CMC)**

CMC is the main institution in the provision of Water Supply and Sanitation (WSS) services in Chinsali Urban. It is the main shareholder in Chambeshi Water and Sewerage Company (ChWSC) implying that the shares that the CU has belongs to CMC. It has a special unit that oversees all activities of WSS services in Chinsali Urban. The special unit for WSS services usually holds collaborative meetings with the CU on matters concerning Chinsali Urban and its WSS services. The unit also links the CU to the mother ministry, the Ministry of Local Government and Housing (MLGH) in matters that need the attention of the ministry through the Department of Housing and Infrastructure Development (DHID) at provincial level.

### **5.1.4 Ministry of Local Government and Housing (MLGH)**

MLGH is also a key stakeholder in the provision of WSS services in Chinsali Urban. It provides an oversight role in the operations of the CU, such as policies, technical and financial support through the Department of Housing and Infrastructure Development (DHID). The other roles include ensuring that the CU provides quality and good service to the clients and working with the regulator the National Water and Sanitation Council

(NWASCO). The two institutions work together where good performance is rewarded by grants for projects and poor performance is met with penalties such as suspension of top managers of CUs.

(a)



(b)



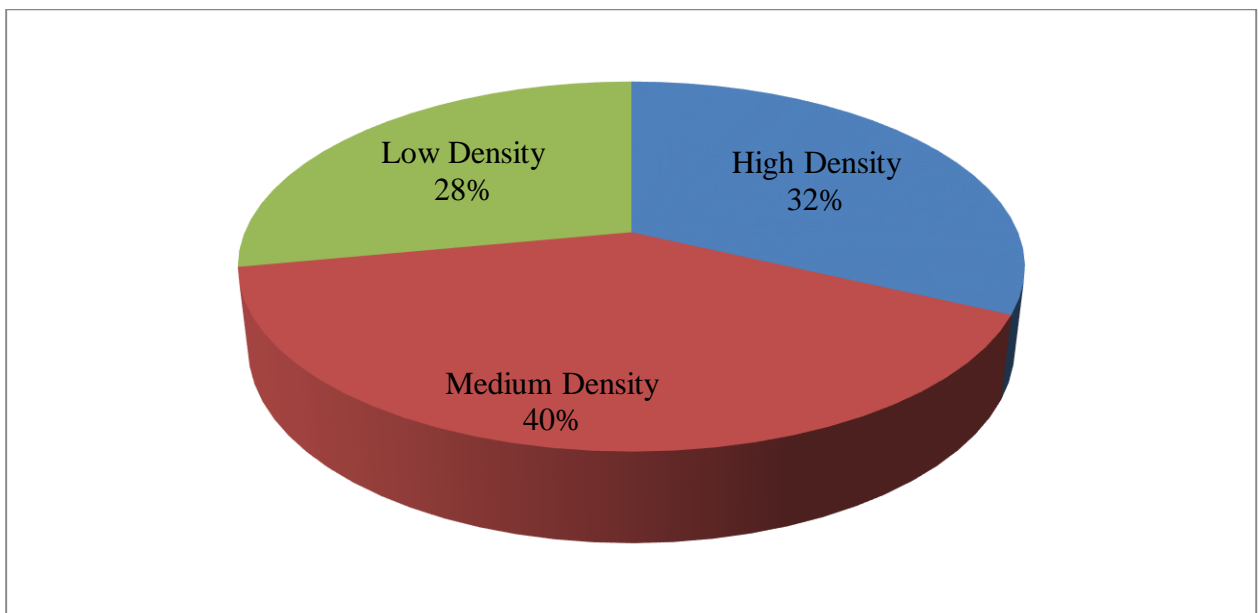
**Figure 5.1: Photo (a) Water Kiosk and Photo (b) Water Kiosk Vendor**

**(Source: Field Data, 2015)**

## 5.2 Institutional Arrangements Affecting the Supply of Water and Sanitation Services in Chinsali Urban

### 5.2.1 Household Information on Water Supply

From the 139 households selected (40%) of the respondents were from the medium density while (32%) were from high density and (28%) were from low density residential areas (Figure 5.2).

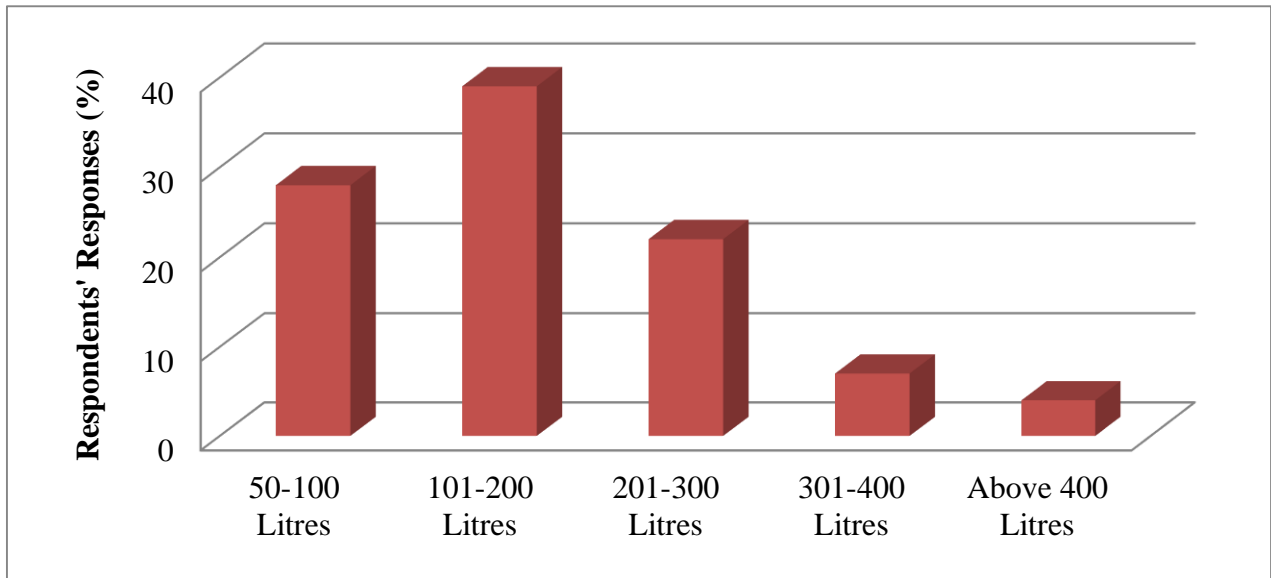


**Figure 5.2: Respondent According to the Residential Density.**

**Source: Field Data, 2016.**

The gender distribution in the research showed that (57%) were male while (43%) were female. Furthermore, in terms of length of occupancy of the household (47%) had occupied the houses between one year and four years whereas (36%) had occupied the houses between five years and nine years and (17%) had occupied the houses for 10 years and above. Field data for household sizes indicated that (21%) of households had below five people while (64%) of the households had between five and ten people and (15%) of the households had above ten people occupying them.

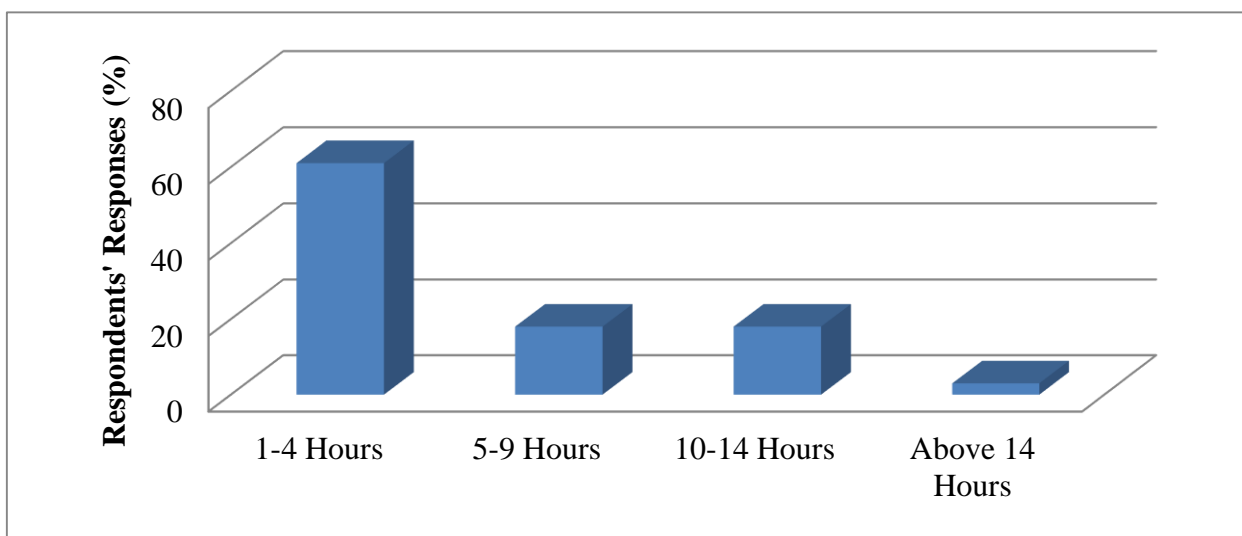
The water consumption pattern by households per day shows (28%) of the households consumed between 50 and 100 litres whereas (39%) percent of the households consumed between 101 and 200 litres. However, (22%) of the households consumed between 201 and 300 litres while seven percent of the households consumed between 301 and 400 litres and only (4%) of the households consumed above 400 litres of water per day (Figure 5.3).



**Figure 5.3: Water Consumption Per Day.**

**Source: Field Data, 2016.**

Most of the households (61%) received water between 1 and 4 hours per day, while only three percent received water above 14 hours of water supply per day (Figure 5.4).



**Figure 5.4: Water Supply Hours Per Day.**

**Source: Field Data, 2016.**

The majority of respondents expressed dissatisfaction on the water supply as (79%) received insufficient amounts of water and by contrast (21%) received sufficient amounts of water per day. From the 139 respondents (52%) attributed insufficient supply as reason for water supply dissatisfaction while (48%) attributed supply interruption for water supply dissatisfaction.

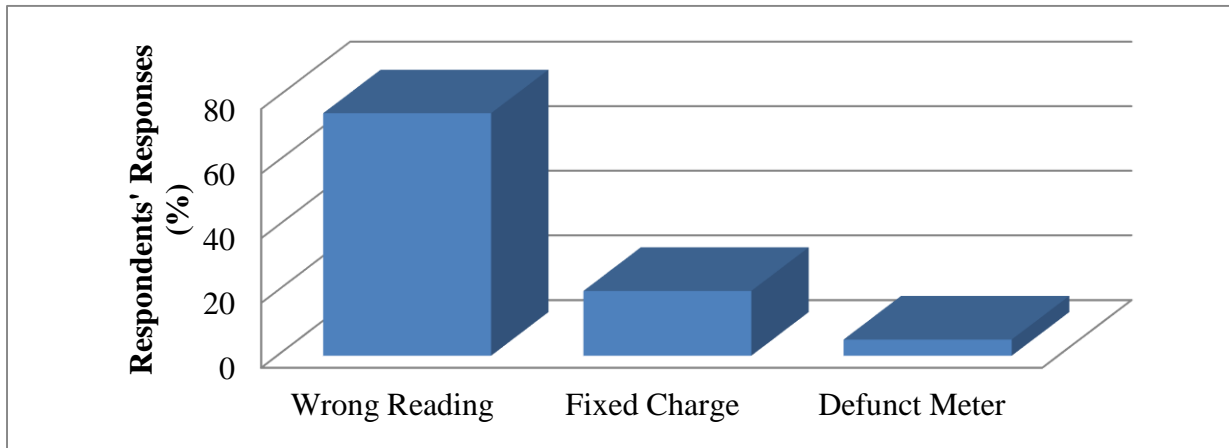
The interview conducted with the key informant of the CU considered the aspect of quantity of water supplied by the company per day. He said the company supplies an average of 2500m<sup>3</sup> of water per day. He further went on to confirm that the current supply does not meet the current water supply demand of the population of Chinsali Urban and no statistical information was available at hand to give the actual deficit for water supply.

The key informant also said the CU loses water through broken pipes and this leads to most residents not getting enough water supply. In fact, the current unaccounted for water for the CU in Chinsali Urban was at (40%).

In the three kiosks points where the FGDs were conducted, participants all confirmed that water supply was insufficient and that the situation has been deteriorating for the past three years. The period for water supply was usually 2 hours per day and that most of the time water was supplied during the night times between 23:00 hours and 01:00 hours. The general supply was not to their satisfaction and the situation was getting worse. They also had perceptions that other residential areas like the high, medium and low density residential areas were receiving better water supply than their Kiosk points.

From the 139 households (83%) were metered and only (17%) were not metered. Furthermore, (73%) of the respondents expressed satisfaction with the billing system of water while 27 percent were not satisfied with the billing system of water.

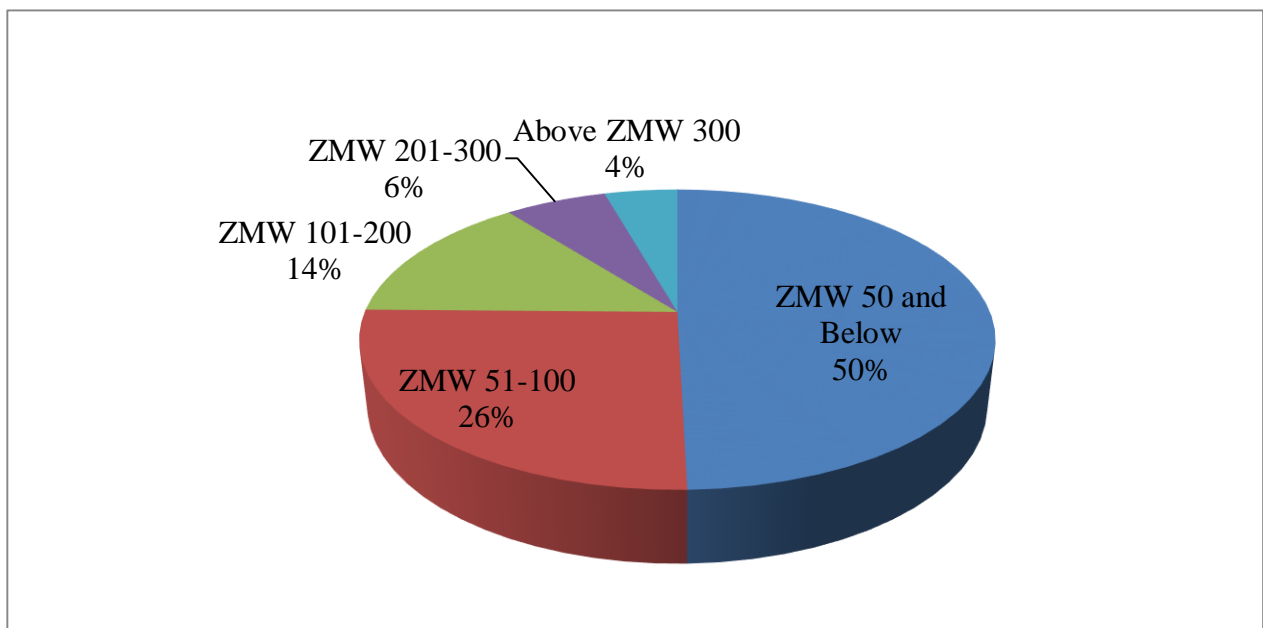
Among the respondents who expressed dissatisfaction with the billing system, (75%) attributed their dissatisfaction to wrong meter readings whereas (20%) attributed dissatisfaction to being on fixed charge and only five percent attributed their dissatisfaction to dysfunctional meters (Figure 5.5).



**Figure 5.5: Respondents Billing Complaints.**

**Source: Field Data, 2016**

Most of the respondents (50%) spent ZMW 50 and below, while (26%) spent between ZMW 51-100, (14%) spent between ZMW 101-200. Whereas six percent spent between ZMW 201-300 and only (4%) spent above ZMW 300 per month for water supply and sanitation services (Figure 5.6).



**Figure 5.6: Cost of Water Supply and Sanitation Services**

**Source: Field Data, 2016.**

The key informant from the CU revealed that the meter charges were according to consumption ranges of 0-6m<sup>3</sup> at ZMW 3.16, 6-10m<sup>3</sup> at ZMW 3.86, 10-15m<sup>3</sup> at ZMW 4.91 and above 15m<sup>3</sup> at ZMW 6.67. He further gave a breakdown of the service tariffs according to residential status for unmetered domestic customers who were at fixed charges, Low cost service charges were at ZMW 72, Medium cost were at ZMW 128 and High cost were at ZMW 189. The rate of Kiosks for water was at ZMW 3.75 per m<sup>3</sup>. From the FGDs, all the three groups gave the same rate of payments for water at the rate of ZMW 0.50 per 20 litres.

Among the 139 households, (86%) were able to afford the expenses in contrast to (14%) who were not able to afford the expenses of water supply and sanitation services. The branch manager for the CU further gave a fair assessment of the customers' response towards payments for services. In the Focus Group Discussion, in the three kiosks points, the members of the community were agreeable to the affordability of the water as they were all able to buy the water at affordable prices.

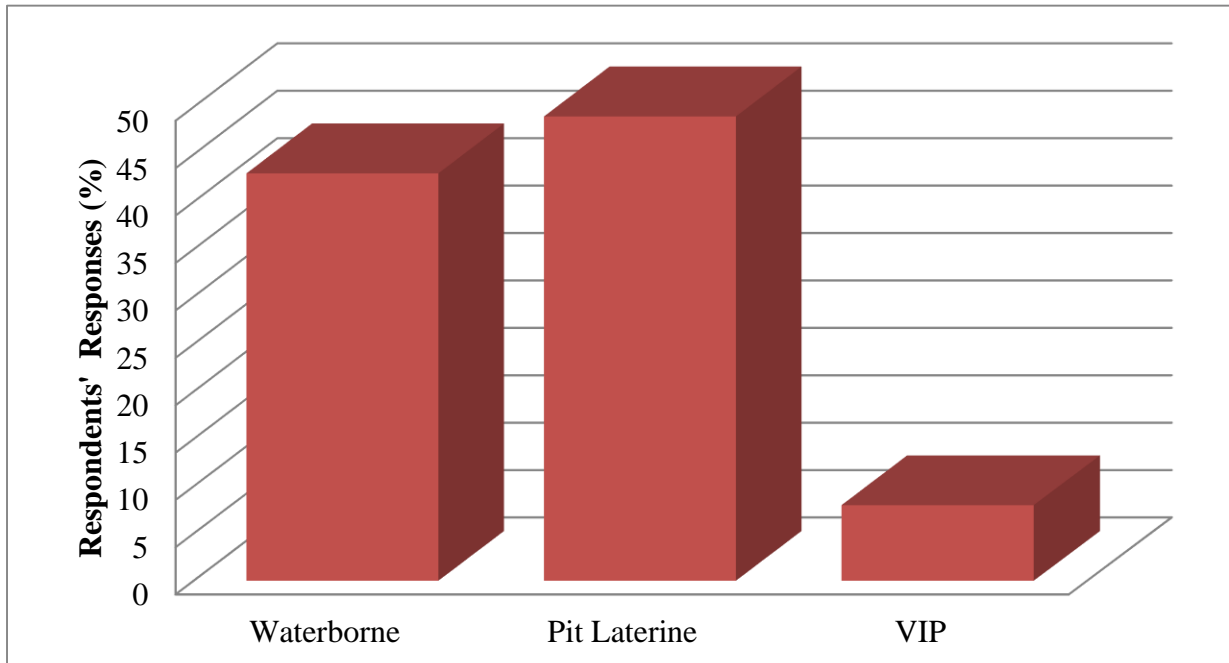
### **5.2.2 Household Information on Sanitation Services**

Among the 139 respondents in the study the majority (79%) were not connected to the sewerage system in contrast to (21%) who were connected to the sewerage system of the CU. According to the key informant's statistics, the CU currently services only (10%) of the households with sewerage services and he also confirmed that the company does not meet the sewerage demand of Chinsali Urban. He went further to give statistical information of having (90%) of the current population not connected to the sewerage services of the company.

No discussion on sanitation was taken into account with the participants of the FGD, because there are no sewerage lines to any toilet in the community as most households use pit latrines. Furthermore, the community has no sanitation programme that is being conducted with either the CU or CMC.



The sanitation situation in households indicated that (49%) used pit latrines while (43%) used waterborne toilets whereas (8%) percent used VIP toilets (Figure 5.7).

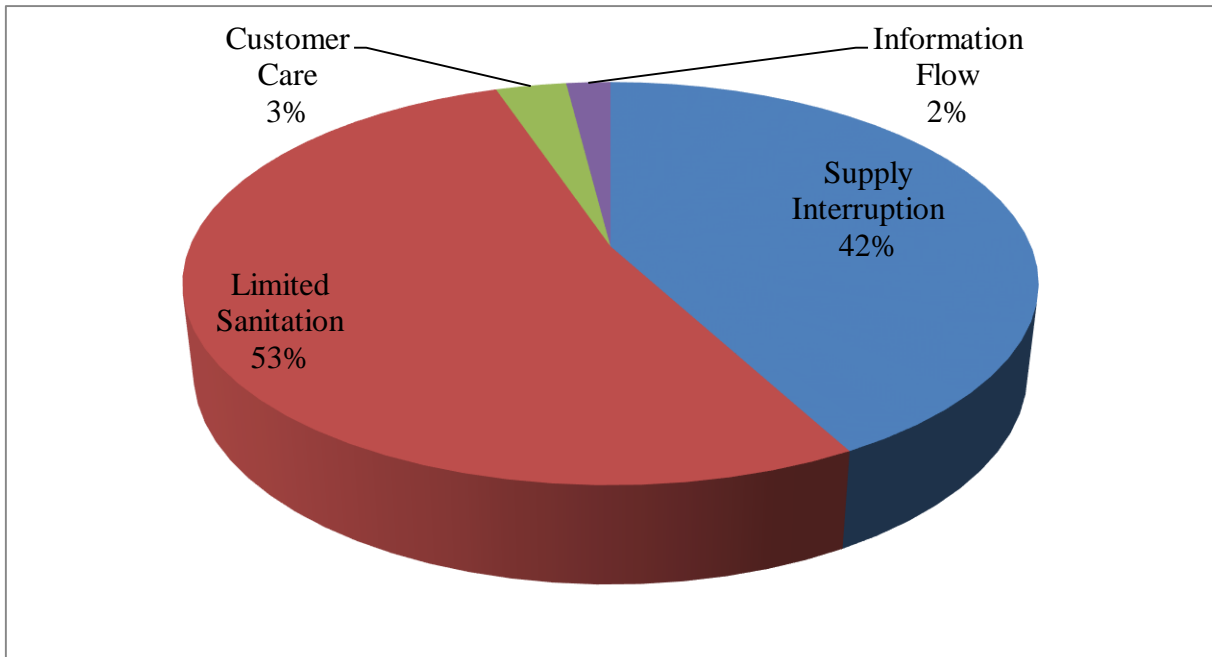


**Figure 5.7: Household Toilet Type.**

**Source: Field Data, 2016.**

### 5.3 Challenges of the Current Institutional Arrangements

Among the 139 respondents, (53%) were facing limited conventional sanitation challenges while (42%) were having interruption of water supply. Only (3%) had customer care challenges whereas two percent had information flow challenges (Figure 5.8).

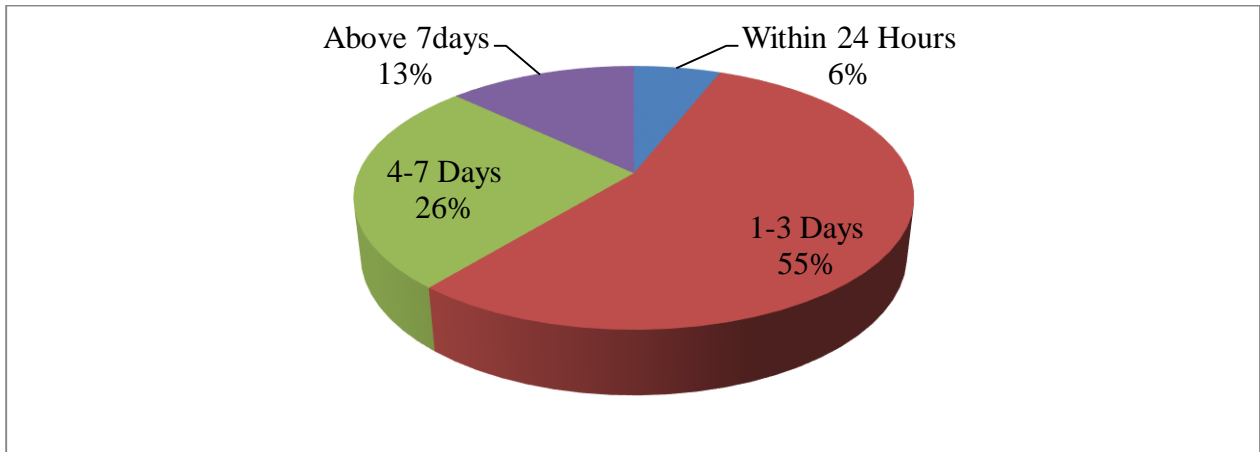


**Figure 5.8: Challenges in Water Supply and Sanitation Services.**

**Source: Field Data, 2016.**

According to respondents, water supply interruption was the most current pressing challenge even though conventional sanitation was the major challenge in water supply and sanitation services. The majority (68%) said water supply interruptions were frequent in occurrence while (32%) said they were less frequent in occurrence.

Among the 139 respondents (55%) said interruptions lasted between 1 and 3 days while (26%) said between 4 and 7 days whereas (13%) said they lasted above 7 days. Only (6%) said interruptions lasted for 24 hours (Figure 5.9).



**Figure 5.9: Period of Water Supply Interruption.**

**Source: Field Data, 2016.**

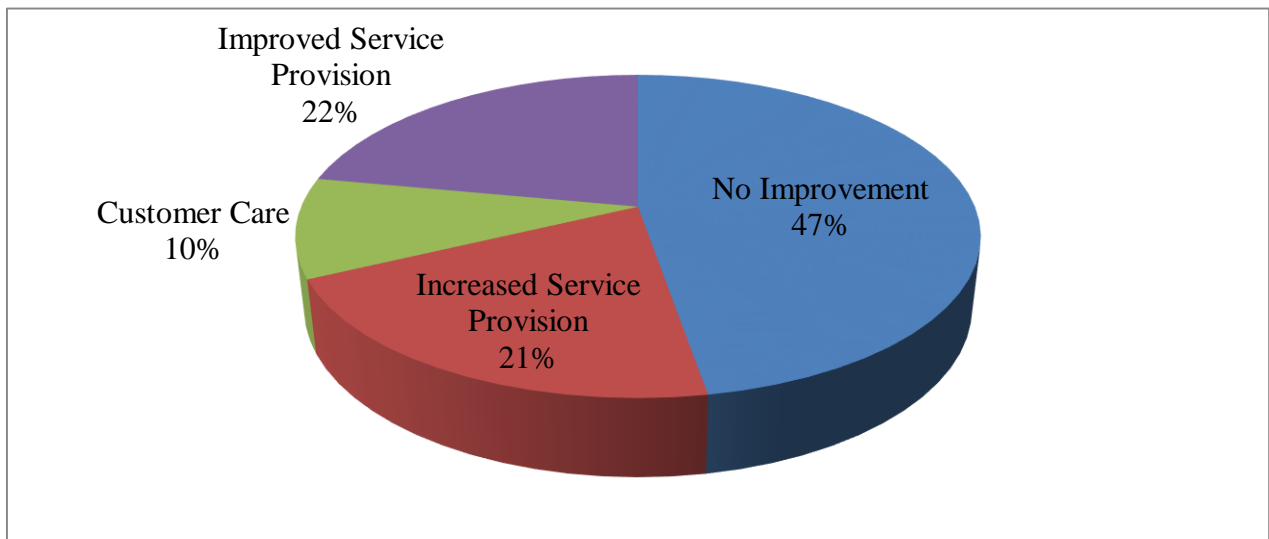
In an interview with the key informant from the CU, some challenges were highlighted that the CU faces in Chinsali Urban. He highlighted that the CU's infrastructure was dilapidated and most of it is old and has not been replaced in recent years. He also said regular breakdown of machinery at the water treatment plant was another challenge. The dilapidated infrastructure of the CU in Chinsali Urban has been the reason why the town had been experiencing water supply interruptions frequently. Limited human resource was also cited as a challenge, as the CU was failing to cater for the ever growing population in Chinsali Urban. The frequent power outages being experienced in the country have not spared the CU operations in Chinsali Urban, as they fail to meet the demanding water supply needs. Chambeshi Water and Sewerage Company (ChWSC) Chinsali branch is still reporting to ChWSC Kasama in Northern Province and Chinsali Municipal Council (CMC) reports to Ministry of Local Government and Housing (MLGH) in Muchinga Province. This current institutional arrangement of the CU and CMC having different centres of authority to report in two different provinces makes collaborations between the ChWSC and CMC difficult as some operations and decisions pass through red tape and bureaucracy. The key informant from the CU further alluded to the fact that the CU's current institutional arrangements is of low capacity and needs improvements to meet the current technology. He further said some workers needed to be trained further and the CU needed the introduction of the instrumentation department which he said was very important for better service delivery.

The key informant from CMC WSS alluded to the fact that some institutional challenges in collaborating with the CU since Chinsali District, attained provincial status. The CMC and CU offices have two different offices of authority to report to in two different provinces. This is due to the fact that the CU's headquarters is in Kasama, Northern Province, while CMC's headquarters is in Muchinga Province. Therefore, the two institutions experience duplication of efforts, red tape and bureaucracy. This has led to some programmes being delayed or fails to take effect.

Among the communities that use water kiosks some challenges were highlighted, such as lack of institutional collaboration between the Community-Based Organisations (CBOs) and the CU. The three groups in the Focus Group Discussion (FGD) all alluded to the fact that collaboration between the CBOs and the CU has been reducing over the years. In the past one year no form of collaboration had occurred positively and even when committee members visit the CU office to report any problem the CU rarely responded. The CU usually refers to the fact that their operations and decision making depends on the directives and responses from Kasama. The other challenge is that there are regular breakdowns of the Kiosks taps and no member of the community is able to repair the taps. The kiosk water vendors all complained that despite being able to sell some quantity of water in the past one year they have not been paid any amount.

### 4.3.1 Opportunities of the Current Institutional Arrangements

Regarding improvements in the sector in recent years, (47%) of respondents said no improvement had occurred while (22%) said there was improved service provision, whereas (21%) said there was increased service provision and only ten percent said there was better customer care (Figure 5.10).



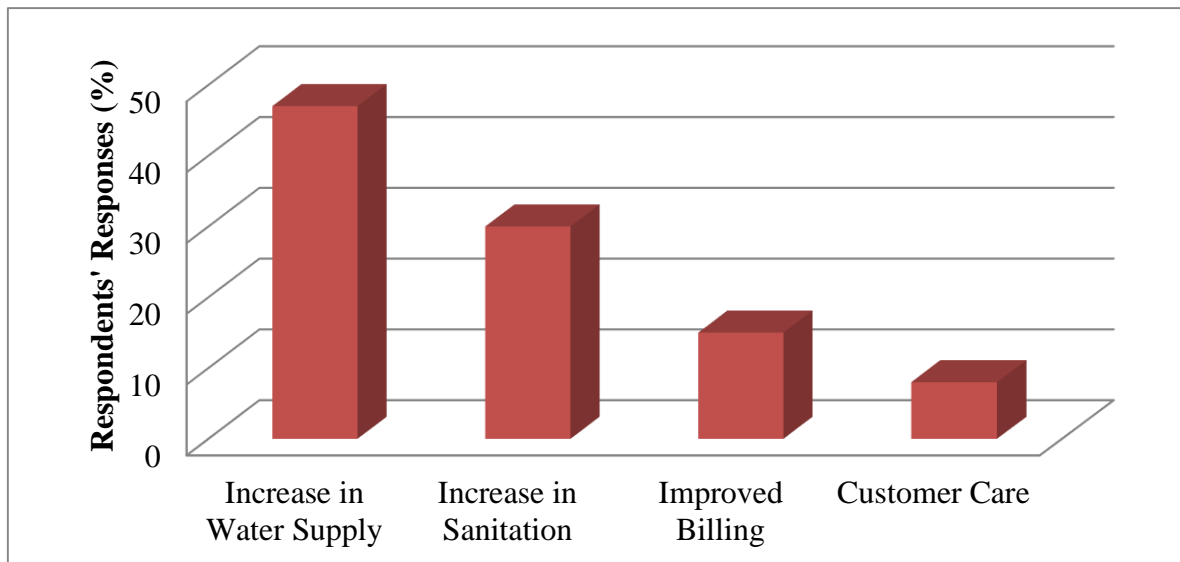
**Figure 5.10: Recent improvements in Water Supply and Sanitation.**

**Source: Field Data, 2016.**

The interviewee with the key informant from the CU said there were high opportunities for the CU as there is a new project funded by the MLGH which started three years ago and had reached an advanced stage. The project is aimed at improving and increasing capacity of WSS services. He said the company will be able to meet the high demand for the services with high service delivery. He further alluded to opportunities for better service delivery, through training of some workers so as to cope with the demands of the current institutional arrangement and getting experience with latest technologies.

The key informant from CMC also said that Chinsali Urban will have an improved WSS service delivery once the new project for WSS is completed, which the MLGH has funded and being spearheaded by DHID.

Respondents expressed expected opportunities in the water supply and sanitation which showed that (47%) of the respondents expected an increase in water supply while (30%) of the respondents expected increase in sanitation services whereas (15%) of respondents expected improved billing and only (7%) of respondents expected improved customer care as indicated in (Figure 5.11).



**Figure 5.11: Respondents Expected Opportunities.**

**Source: Field Data, 2016.**

#### 4.4 Summary

The chapter looked at the presentation of results of the study in line with the objectives. The results shows that the institutions that are responsible for supply of water and sanitation services in Chinsali Urban are the CBOs, ChWSC as the CU, CMC Water Supply and Sanitation Unit and the MLGH through DHID. Results further shows that the current water supply does not meet the current water demand of the population of Chinsali Urban. From the 139 households, (61 percent) received water between one hour and four hours per day. Focus Group Discussions (FGDs) also showed that water supply was insufficient in communities that use water Kiosks. Respondents were satisfied with the billing and affordability of the water supplied by the CU. Results also shows that only ten percent of the households are connected to the sewerage system for sanitation services. Challenges that ChWSC faces are dilapidated infrastructure; power outages and administrative bureaucracy due to provincial separation. Water supply interruptions and limited sanitation services due to population

increase are the challenges faced by households. Respondents further expected to have high increase in water supply and improved sanitation in future.

## **CHAPTER SIX**

### **DISCUSSION**

Chapter six discusses the results of this study in the context of the objectives/research questions and reviewed literature. The first section covers the institutions responsible for supply of water and sanitation services in Chinsali Urban. The second section focuses how institutional arrangements have affected the supply of water and sanitation services in Chinsali Urban. The last section deals with the challenges and opportunities for improved service delivery in Chinsali Urban.

#### **6.1 Identified Institutions for Supply of Water and Sanitation Services in Chinsali Urban**

##### **6.1.1 Community Based Organisation (CBOs)**

CBOs in Chinsali Urban are institutions that facilitate and operate water selling points called Kiosks and these operate in a peri-urban area of Chinsali Urban. The presence of CBOs in Chinsali Urban conforms to other similar institutions in other urban areas in the Zambia that facilitate the provision of WSS services to most peri-urban areas. The CBOs collaborate with the CUs as they act as institutions that link the peri-urban communities and CUs to effectively ensure better supply of water in the peri-urban areas around the country. The kiosk system in Chinsali Urban like other urban areas in Zambia is meant to provide water supply to poor people in the peri-urban areas at affordable prices. In some peri-urban areas the supply of water is done through communal taps or kiosks that are run through community-based management systems (IUCN, 2004). This study found that in Chinsali Urban the CBOs and ChWSC are currently not collaborating in matters concerning improvement of water supply to the community. The current water supply is erratic and insufficient for the population in the peri-urban and the two parties have not been able to find a solution to address the problem. Robinson (2002) noted that the Kiosk systems presently being piloted in Zambia's peri-urban areas would appear to have considerable potential, provided the CUs are put on a proper footing with the communities where they operate the system.



The CBOs in Chinsali's peri-urban like in other urban areas in Zambia does not run any communal toilets as there are no institutional arrangements for such facilities. According to Manase *et al.* (2010), institutional and legislative arrangements affect the nature of the relationship between sanitation agencies and peri-urban communities, which in turn affects the provision of sanitation services. The gap between local authorities and the peri-urban communities is further widened by the absence of efficient communication structures that can help to coordinate activities between the two parties effectively.

### **6.1.2 Chambeshi Water and Sewerage Company (ChWSC)**

ChWSC is the official CU that provides the supply of water and sanitation services in Chinsali Urban. The CU began operations in Chinsali Urban in the year 2003, when the process of transfer of supply of water and sanitation services was streamlined from the local authorities to the CUs. The Government perceived the transfer of water supply and sanitation services as institutional changes that were inevitable in view of the change in the macro-economic environment in which liberalisation and private enterprise became the norm (GRZ, 1994). This was due to the fact that the local authorities were unable to provide effective supply of water and sanitation services. In line with liberalisation policies there was need for change of responsibility for institutions that would provide water supply and sanitation services. The Government thus spearheaded the transfer of water supply and sanitation services provision from the local municipal councils to semi-autonomous entities such as CUs and private providers. Furthermore, in line with the Water Supply and Sanitation Act No. 28 of 1997, MLGH encouraged local authorities to establish CUs to manage water supply and sanitation services in urban centres which is vital for ensuring cost recovery and sustainability of these services (ADF, 2006). All these measures were aimed at streamlining institutions that would enhance the provision of water supply and sanitation services to most citizens in the urban areas of the country. Although various reforms have taken place, this study revealed that most of the CUs like ChWSC were still struggling in providing the expected service delivery.

### **6.1.3 Chinsali Municipal Council (CMC)**

CMC being the main shareholder of ChWSC has the mandate to ensure for the supply of water and sanitation services. The local authority has the prime responsibility to ensure the population of Chinsali Urban receives the services that they deserve. It works hand in hand

with ChWSC to deliver the services to the population. The Local Government Act Cap 283 gives local authorities the prime responsibility for the provision of domestic water supply and sanitation services to all areas within their boundaries. The local authorities are empowered to make by-laws, set standards and guidelines for provision of services. The Water Supply and Sanitation Act No. 28 of 1997 specifies that local authorities may provide urban Water Supply and Sanitation services. Hence, CMC ensures that both the Local Government and Water and Sanitation Acts are followed as they are the principal guidelines for service delivery to the population of Chinsali Urban.

#### **6.1.4 Ministry of Local Government and Housing (MLGH)**

MLGH is the main stakeholder for supply of water and sanitation services in Chinsali Urban through the Department of Housing and Infrastructure Development (DHID). The Ministry of Local Government and Housing (MLGH) through the Department of Housing and Infrastructure Development (DHID) has the responsibility for water supply and sanitation services (GRZ and GOD, 2011). The Zambian Government conducted reforms in the water sector through the Water Act of 1994, which aimed at having institutions that would improve the management and utilisation of the water resources. Even after reforms in the water sector there were still some bottlenecks on how the sector was to be managed between ministries and this led to the provision of water supply and sanitation services to lag behind. This was due to the fact that there were overlaps and duplications of roles among ministries and institutions. GTZ (2008:10) reported that *“In Zambia, after considerable discussion, the Government finally decided that NWASCO should report through the Ministry of Energy and Water Development (MEWD), while WSS services were under the Ministry of Housing and Local Government (MLGH).”*

There was an overlap of responsibility between the Ministry of Energy and Water Development (MEWD) and Ministry of Local Government and Housing (MLGH) as to which ministry would take responsibility of water resources management and water supply and sanitation services. According to SUWASA (2012) the sector suffered from lack of a comprehensive and clear sector policy and strategy to guide the provision of services, lack of a legislative and regulatory framework, unclear roles and responsibilities of institutions led to either gaps or duplication of efforts. Hence, there was an agreement between the two ministries to have specific roles and institutions that were to be supervised by each ministry for effective service delivery. This study found that the current situation on the ground is that

the gaps and duplication of efforts by institutions have been reduced and different institutions perform specific roles according to ministerial placements.

## **6.2 Institutional Arrangements Affecting the Supply of Water and Sanitation Services in Chinsali Urban**

### **6.2.1 Water Supply Period**

The first aspect of how the institutional arrangements have affected water supply and sanitation services will be discussed based on the period of water supply to households per day that are connected to ChWSC water supply system in Chinsali Urban. One striking finding was that the majority (61%) of the respondents were receiving water supply for a period of one to four hours per day as the current water supply was considered insufficient and erratic. This was far below the acceptable benchmark for water supply per day. The supply hours considered to be acceptable by NWASCO is 16 hours for CUs in cluster two, where ChWSC belongs. Even the average water supply for ChWSC in the two provinces it services in the year ending 2015 was at 15 hours per day of water supply which was higher compared to 2014 (NWASCO, 2015).

The situation of insufficient and erratic water supply was also confirmed from the Focus Group Discussions (FGDs) in the peri-urban area of Chinsali Urban. All the three groups in the study agreed that they received water supply between one and two hours per day. In most cases, these people cannot access benefits from piped water services, as there are limited water reticulation systems in most informal settlements. Due to the limited piped water reticulation system, residents of these low-income settlements generally receive poorer water services. In many developing countries, the urban poor resort to purchasing water from the more expensive water vendors, who supply water with doubtful technical quality (WHO/UNICEF, 2000). Gutierrez (2007) also noted that the current situation in water and sanitation services for millions of peri-urban mostly does not support poor residents. The poor peri-urban residents generally receive erratic and inadequate water services, while better off residents in the formal areas of the urban receive reasonable levels of service often at subsidised rates.

The population in the peri-urban area of Chinsali Urban believed that the residents from other residential areas like the low, medium and high density residential areas received longer periods of water supply per day than their communities. But to the contrary even those in

other residential areas of Chinsali Urban such as low, medium and high density residential areas also receive insufficient and erratic supply of water per day. Hence, the communities who use water kiosks and other residential areas that are connected to the CU water supply system were all experiencing the same insufficient and erratic water supply per day due to population increase in Chinsali Urban. Chinsali Urban like other urban areas, having been elevated from a district to provincial capital and municipality status in 2012, has experienced population increase, which has affected water supply hours to households that used to receive longer periods of water supply per day. This mainly can be attributed to population increase the district has experienced in recent years coupled with various economic, social and developmental activities that have increased the demand for water supply in Chinsali Urban. Manzungu *et al.*, (2012) argues that despite the intervention of Government, donors and other benefactors, provision of safe water and adequate sanitation continues to be a challenge in most urban centres to the extent that prospects for achieving sustainable water service outcomes are low. There is evidence that the institutional changes in Chinsali Urban have affected negatively the supply of water and sanitation services. Therefore, this study found that the current service provisions do not meet the demands of the current population, as most residents expressed dissatisfaction with the services delivered to them.

### **6.2.2 Water Supply Coverage**

In Chinsali Urban, the actual water supply coverage has been increasing in recent years but the CU statistics are not updated to give a clear figure of the exact increase. The evidence is through the challenges that respondents alluded to insufficient and erratic water supply that has been experienced in recent years. The insufficient and erratic water supply is attributed to population increase meaning more connections have been done to increase the water supply coverage. From the CUs in the country there was an overall increase from (66.1 %) in 2014 to (73.8 %) in 2015 (NWASCO, 2014; 2015). But even with the increase in water supply the figures are below the acceptable (80 %) benchmark set by the regulator for all CUs. (NWASCO, 2015) reports that in 2014, there was a slight decline in the national water coverage figure from (83.9 %) to (83.8 %) despite an increase in the number of household connections. This is attributed to increased population in urban and peri urban areas. Increasing economic development in most parts of the country, rapid population growth and urbanization have all contributed to high demand for water (NWASCO, 2014; 2015). According to VAREN (2015), Zambia has seen no progress over time in urban areas' access

to improved water supplies, with access actually dropping from (88 %) in 1990, to (85 %) in 2012. This is a great concern as urban populations have dramatically increased in the same period, resulting in even fewer people having access to water and sanitation resources they need.

### **6.2.3 Water Supply Metering**

From the study findings in the study, the majority of the households (83 %) in Chinsali Urban were metered out of the 139 households. This is a positive sign of customers having a fair charging system and high meter ratio according to the guidelines of the institutional regulator for water supply and sanitation, National Water and Sanitation Council (NWASCO). Though the figures for Chinsali Urban seem impressive the actual metering ratio for ChWSC in the year ending 2015 was at (48 %), the lowest among CUs in Zambia (NWASCO, 2015). According to NWASCO (2014), the regulator selected (100 %) metering as one of the benchmarks to be met by CUs with the ultimate aim of achieving universal metering. The statistics from Chinsali Urban of (83%) metering is almost in line with the ultimate aim of the regulator. Wallingford (2001) suggested that high metering rate is an essential part of water demand management strategy and any programme to reduce the unaccounted for water (UfW) and increase financial revenue. Gumbo (2002) further supports the relationship by concluding that cities performing well in terms of water demand management have also higher metering coverage figures.

But high metering percentage does not assure consumers of sufficient water supply. In most CUs the reticulation system may be broken down and there is high Unaccounted for Water (UfW) that will reduce water supply. The UfW average for the country's CUs was at (51 %) at the end of 2015. There was a bit of encouragement on the part of ChWSC in Chinsali Urban as the figures stood at (40 %) for UfW, but it is still above the regulator's benchmark of (25 %). The UfW percentages are a reflection of the losses that the CUs in the country have in terms Non-Revenue Water (NRW) which is relatively high (NWASCO, 2015).

### **6.2.4 Service Costs**

The study showed that 50 percent of the respondents in the study were paying monthly water charges of ZMW 50.00 or below. The study further showed that (86 %) of the 139 respondents were able to afford the water bills. The high percentage of the respondents that were able to afford the water bills showed that the charges for water were within their

monthly earnings. According to the World Bank (2004) recommendation, households should not spend more than a maximum of 5 percent of monthly income on water supply and sanitation services. This is also in line with economic accessibility of water as Water Aid (2011), also maintains that for water to be economically accessible, a household's monthly expenditure on water should not exceed 5 percent of its monthly income. Although this study did not take into account of household monthly income levels in Chinsali Urban, the payments can be considered to be less than five percent of the monthly income for most residents of Chinsali Urban. This also conforms with the Zambian Government's policy of making water affordable to all citizens to enhance their health and wellbeing. The Zambian Government's focus on providing adequate, safe and cost-effective water supply and sanitation services to ensure the health and well-being of the citizenry, as articulated in the Fifth National Development Plan (FNDP) which has demonstrated through continued efforts to meet the MDGs (GRZ, 2006).

In communities that use water Kiosks during the FGDs, all the three groups confirmed of having affordable water charge rate of ZMW 0.50 for 20 litres of water. In the quest to ease some financial difficulties, the Government has also created the Devolution Trust Fund (DTF), a financing mechanism targeted at peri-urban areas. The CUs are able to apply for the funds to improve water supply and sanitation in peri-urban areas through the local authorities (UNDP, 2009). There is evidence of Government effort to subsidise the population in the peri-urban areas to have easy access to water supply, as CUs through Government financial assistance are able to increase and improve water supply service through the use of DTF.

#### **6.2.6 Sewerage Connections and Sanitation**

Chinsali Urban has a low level of connectivity to sewerage services through the CU and this can be attributed to the historical rural setup of the district. Before attaining provincial capital and municipality status, the district used to develop slowly and little investment was made towards increasing or improving the sewerage system over the years. Only (30%) of the households in the study are connected to the CU sewerage system. This is further confirmed from household types of toilets that use waterborne toilets standing at (43%). Though the figure for waterborne toilets is (43%) the actual percentage for those connected to the CU sewerage system is (30%) of the households sampled and the other (13%) use on site sanitation in the form of septic tanks.

The (57%) majority use either pit latrines or Ventilated Improved Pit latrines (VIP) as forms of toilets. ChWSC currently services only ten percent of the household population in Chinsali Urban as (90%) of the household populations are not connected to the ChWSC sewerage system. There has been less investment throughout the country in sanitation services as figures for sanitation are always lower than water supply whenever sector or annual reports are published for water supply and sanitation. For instance as of 2015, the estimated water supply and sanitation for urban areas was (83.5%) and (61.4%) respectively (NWASCO, 2015). It is also very worrying that no progress is evident in access to sanitation over the past decades. Rather than increasing and improving access over time, the country has seen access drop from (60.8%) in 1990, to (56.4%) in 2012 in urban areas. The ability to access sufficient, acceptable sanitation is worsening (Washwatch.org).

The situation of low sewerage connectivity is not peculiar to Zambian CUs, but across Sub-Saharan African Countries. Noel *et al.* (2010) noted that in Tanzania staff from two major CUs also indicated that sanitation was a serious problem that their organizations had been unable to sustainably address, in both CUs, connection to sewerage systems was only between 10 and 12 percent. The rationale for sanitation investments is clear and yet is overlooked by governments. Sanitation is lagging as the most off-track MDG sector, while there is strong evidence that it is one of the most cost-effective public health policy interventions. Despite the huge impact of lack of sanitation on the world population, sanitation is often given low priority at international, state and local levels. Sanitation projects are often less favoured by politicians than high-prestige projects such as airports and dams. The potential for far-reaching development outcomes is huge and yet the sanitation sector remains largely neglected by the donors and donor recipient Governments (Paterson *et al.*, 2006; Cumming, 2009).

The provision of sanitation services is generally a problem in Southern Africa as studies in South Africa, Zambia and Zimbabwe showed some weak institutional arrangements towards service provision. As alluded to earlier in the chapter institutional and legislative arrangements affect the nature of the relationship between sanitation agencies and peri-urban communities, this in turn affects the provision of sanitation services. The gap between local authorities and the peri-urban communities is further widened by the absence of efficient communication structures that can help to link the two parties effectively. There is no effective representation of the peri-urban communities in the three countries (Manase *et al.*, 2010). The study revealed that sanitation is neglected compared to water supply at almost all

levels of delivery, is due to the fact that the economic impacts that can be recovered from sanitation investment are less tangible.

### **6.3 Institutional Challenges**

#### **6.3.1 Households Challenges**

In Zambia after the reforms and liberalisation processes, most if not all of the Commercial Utilities (CUs) were formed from the local authorities that used to run the water supply and sanitation sector. Therefore, the CUs inherited most of the systems that the public institutions used for service provision and challenges were inevitable. As it has been experienced making the transition from a publicly oriented service to a commercial operator has not been an easy task for the CUs. This was due to the fact that the new CUs inherited a badly maintained infrastructure coupled with high levels of unaccounted for water of about (65 %) in some instances. To compound this, the rate of urbanisation and population growth has not been matched by the rate of infrastructural development specifically for water supply and sanitation thereby impacting negatively on service delivery (SNV, 2012; NWASCO, 2013).

#### **6.3.2 Community Challenges**

In the peri-urban areas of Chinsali Urban where water kiosks are used, water supply interruptions were also said to be frequent as the water supply deteriorated in recent years due to lack of maintenance of the system. This is not peculiar to Chinsali peri-urban area as even in other peri-urban areas around the country similar challenges of lack of maintenance of kiosks are experienced. When taps are broken down, it takes a long time to repair them. At some places, taps are very limited in capacity and poorly maintained due to lack of finance and technical support. In most cases the taps are also extensively vandalised, resulting in frequent breakdowns (IUCN, 2004).

#### **6.3.3 ChWSC Challenges**

During an interview with the key informant of the CU, it was highlighted that dilapidated infrastructure was one of the major challenges. The poor state of infrastructure of ChWSC was further confirmed by an appeal for financial assistance by the board vice-chairperson of ChWSC, who said the CU was scouting for US\$ 120 million to overhaul its water reticulation system and expand operations (Times of Zambia, 2015). The current situation shows that



most CUs in Zambia struggle to attract investments in the water supply and sanitation services sector, as most financial institutions are not willing to lend CUs substantial amounts of money to invest in the sector. The economic costs for investing in new water and sanitation projects can be prohibitive, and financial institutions may not be interested in making funds and loans available for such capital projects (Grönwall *et al.*, 2010). Even when the Government of Zambia tries to subsidise the funding of CUs through the DTF, there are still some disagreements about the role of the DTF, including its financing mechanisms. CUs are able to prepare project proposals and investment plans, but the Government's contribution still remains low, as donors remain the main funders of DTF (UNDP, 2009).

The water supply interruptions that CUs have been experiencing were also attributed to power outages that the whole country has been experiencing for the past ten years. Due to the power outages most CUs have struggled to fully provide services to most of their customers. Most CUs have had to repair their machinery which has been damaged due to the fluctuating power supply. ZESCO power supply outages adversely affected service provision in terms of reduced service hours and reduced revenue. The unreliable power supply has led to fluctuation of power where there is high or low voltage experienced in the supply system. The low and high voltage situation consequently causes electrical machines in the water and sewerage plants to get damaged for a number of CUs which are very costly to replace (NWASCO, 2012). The frequent power outages experienced in the country in recent years have negatively affected operations of most CUs, due to the reduction in quantities of water produced and distributed. This has had a ripple effect of low revenues generated and decreased consumer confidence in service delivery because of reduced hours of supply. The situation is worsened because most of the CUs have old and inadequate water storage facilities that cannot mitigate the effects of power outages (NWASCO, 2013).

The challenges of power outages that CUs faces were further highlighted by ChWSC in Chinsali Urban in a report on how they reduced daily water pumping capacity in a particular month. According to BCHOD (2013:1) report “*ChWSC operators reported that due to ZESCO power supply outages and fluctuations daily water production lately stood between 300m<sup>3</sup>/day and 2,600m<sup>3</sup>/day depending on the power supply status during the day. During the week beginning 21st and ending 27th July 2013 the water production was reported as 1,200m<sup>3</sup>/day. This low production was attributed to persistent ZESCO power supply fluctuations*”.

ChWSC has other challenges of human resources as the company is unable to attract qualified human resource due to limited financial capacity. The situation currently being experienced by ChWSC has compromised the operations of the company to fully provide quality service to the customers. The Government observed that there was weak coordination mechanisms, lack of baseline information for planning purposes, and weak human and institutional capacity for managing and implementing programmes within the water supply and sanitation sector (GRZ, 2011). In situations where CUs have implemented projects most of them have been of poor quality due to inadequate capacity in the human resource to supervise technical projects. This has further led to delayed completion of projects and wastage of financial resources. As a consequence, access to water supply and sanitation services and revenue to the CUs has been deferred (NWASCO, 2015).

## **6.4 Institutional Opportunities**

### **6.4.1 Opportunities in Water Supply and Sanitation Services in Zambia**

Zambia as a country has high opportunities to increase and improve the water and sanitation sector as the country has high capacity of water in the rivers and lakes around the country. Zambia is well endowed with water relative to other countries in Southern Africa. The renewable water resource per capita is estimated at about 8,700 m<sup>3</sup> per year, well above the average for Sub-Saharan Africa (SSA) 7,000 m<sup>3</sup> per person per year and the global average 8,210 m<sup>3</sup> per person per year (World Bank, 2009). The opportunities to further increase and improve the delivery of water supply and sanitation services to the Zambian citizens can further be enhanced by the enshrining of water and sanitation as a human right in the country's constitution. The Zambian Government has recognised the human right to water and sanitation for the citizens. Over the past two decades, preceding Governments in Zambia have become signatories to key international declarations and treaties and there is a specific clause on the human right to water and sanitation in the national constitution. The country has made advanced steps in helping to ensure that people constitutionally have the right to sufficient, adequate and safe water and sanitation and have the ability to hold the Government accountable to fulfilling this right (VAREN, 2015). Therefore, this constitutional commitment offers various institutions in the water supply and sanitation sector to further take advantage and increase and improve the delivery of the two basic services.

#### **6.4.2 Opportunities for CUs in Zambia**

According to NWASCO (2012), the declaration of a number of rural areas into new Districts by the Government, will enable CUs to incorporate the newly created districts in the licensed service areas for service provision. This is similar to the declaration of Chinsali district to provincial capital and municipality status. As a new upgraded town there is opportunity to increase access to water supply and sanitation services and aide meeting the Vision 2030 of universal coverage for water supply and sanitation services. There are also further efforts to rehabilitate the current infrastructure of the water supply and sanitation services as the current infrastructure is old to sustain the expected high capacity for water supply and sanitation (NWASCO, 2016). There are efforts country wide to improve and increase service delivery most CUs are trying to overhaul their water supply and sanitation systems to enhance their service delivery. In the quest to enhance better service delivery, the sector aims to promote commercial sustainability of CUs by ensuring continued progress towards reaching full cost recovery coupled with improvements in service delivery. By rehabilitating the old infrastructure of the various CUs around the country, it is expected that the level of ‘unaccounted-for’ water will reduce. This will lead to CUs being able to get revenue equivalent to the amount of water that the CUs produce (NWASCO, 2012).

#### **6.4.3 Opportunities for Chinsali Urban in Water Supply and Sanitation**

Chinsali Urban has potential to improve water supply and sanitation due to the fact that the town is located in the Agroecological Region III which receives above 1000 mm of rains with an average rainfall of 1100mm per year (GRZ, 1968). The district has seen investment in infrastructure development in recent years that has extended to increase and improvement of water supply and sanitation services. The Ministry of Local Government and Housing (MLGH) through the Department of Housing and Infrastructure Development (DHID) is currently funding a water supply and sanitation project to cater for the growing population of Chinsali Urban. The key informants from the CU and Chinsali Municipal Council (CMC) both said that the district has high opportunities to increase and improve the supply of water and sanitation services because of the current project funded by the MLGH. The current water treatment plant for ChWSC has an average production capacity of 2,600m<sup>3</sup>/day. With the new project and assuming no power supply problems, the new water treatment plant will have an average production capacity of 4800m<sup>3</sup>/day. The total average water production capacity available for the entire Chinsali District over the stipulated design period between

2013 and 2043 will be 2,600m<sup>3</sup>/day plus 4,800m<sup>3</sup>/day which will be equivalent to 7,400m<sup>3</sup>/day (DCHOD, 2014). The expected total water production for Chinsali Urban will be sufficient to cater for the projected population by 2043.

## **6.5 Summary**

Findings from the study showed that Chinsali Urban has the necessary institutional arrangements for supply of water and sanitation services like other urban areas in Zambia. Four institutions were identified (CBO), (ChWSC), (CMC) and (MLGH). The institutional arrangements in Chinsali Urban have affected the delivery of water supply and sanitation services in the negative and positive way as evident from the findings in the study. The major challenges to WSS services are dilapidated infrastructure and power outages which reduces the CU's capacity from performing at the expected level as service provision is compromised. Chinsali Urban has good opportunities to increase and improve WSS services due to the current project for WSS services funded by the MLGH. The project is expected to increase water supply from the current 2,600m<sup>3</sup>/day to 7,400m<sup>3</sup>/day if and when the project is finished.

## CHAPTER SEVEN

### CONCLUSIONS AND RECOMMENDATIONS

This chapter concludes findings of the study based on the objectives of the research. It explains the institutions for supply of water and sanitation services in Chinsali Urban and how institutional arrangements have affected the supply of water and sanitation services. Lastly the chapter looks at the challenges and opportunities to improve of service delivery followed by recommendations from the study.

#### 7.1 Conclusions

The aim of the study was assessing institutional arrangements for water supply and sanitation services in Chinsali Urban. Findings from the study showed that Chinsali Urban has the necessary institutional arrangements for supply of water and sanitation services like other urban areas in Zambia. Chinsali Urban has the Community Based Organisations (CBOs) that are responsible for facilitating for the operations of water selling points called Kiosks in the peri-urban areas. The CBOs act as links between their communities and the CU for the smooth running of water supply services in the peri-urban areas. There are no communal toilets that the CBOs run as most households use pit latrines and it is the responsibility of every household to construct one for their use. Chambeshi Water and Sewerage Company (ChWSC) is the Commercial Utility (CU) that supplies water and sanitation services in Chinsali Urban and has an institutional responsible for services provision to some residential areas, businesses and Government institutions.

Chinsali Municipal Council (CMC) is the main shareholder in the CU and responsible for all WSS services in the urban area. The Local Government Act Cap 283 gives local authorities the prime responsibility for the provision of domestic water supply and sanitation services to all areas within their boundaries. Ministry of Local Government and Housing (MLGH) is the main stakeholder in WSS services as it plays an oversight role in the operations of the CU through policies, financial and technical support. MLGH through the Department of Housing and Infrastructure Development (DHID) which is the technical department that coordinates all WSS projects in Chinsali Urban. Hence, the MLGH has the responsibility for water supply and sanitation services and also ensures good service delivery by the CU.

The institutional arrangements in Chinsali Urban have affected the delivery of water supply and sanitation services in the negative and positive way as evident from the findings in the study. Currently the water supply in Chinsali Urban is erratic and insufficient to sustain the ever increasing population of Chinsali Urban. This was confirmed from most respondents who said the water supply used to be reliable and sufficient in the past. But after the district became a municipality and provincial capital for Muchinga Province, the water supply has become erratic and insufficient. On the positive note most households were metered and they expressed their ability to pay for water charges. The levels of sewerage connectivity to households are very low as evident from the households that use waterborne toilets.

The major challenges to WSS services are dilapidated infrastructure and power outages which reduces the CU's capacity from performing at the expected level as service provision is compromised. ChWSC Chinsali branch also faces challenges attributed to the fact that the headquarters for the CU are in Kasama, Northern Province and Chinsali is in Muchinga Province. This has made collaboration between the CU and Chinsali Municipal Council (CMC) under Muchinga Province became difficult as operations of the CU and CMC undergo duplications leading to bureaucracy and red tape.

Chinsali Urban has good opportunities to increase and improve WSS services due to the current project for WSS services funded by the MLGH. The project is expected to increase water supply from the current 2,600m<sup>3</sup>/day to 7,400m<sup>3</sup>/day if and when the project is finished. The development will also increase and improve the water supply and sanitation services to the ever growing population of Chinsali Urban provided the current old reticulation system is overhauled and a new reticulation system is laid to meet the service demand.

## **7.2 Recommendations**

1. ChWSC in Chinsali Urban should increase the number of kiosks as the population in the peri-urban communities had increased since the first kiosks were built.
2. The CU needs an overhaul of infrastructure for both water and sewerage reticulation system.
3. There is need for the CU to acquire some generators or solar powered pumps that can help ease the power outages problem.

4. Chinsali branch of the CU should improve the use of latest technology such as Geographical Information System (GIS) software technology for better service delivery.
5. ChWSC in Chinsali Urban reporting to Kasama should be delinked from Kasama and have its own CU running in the urban area.
6. The MLGH should create a new CU that would be under Muchinga Province to serve Chinsali Urban well.
7. There should be periodic assessments of institutional arrangements on service delivery after the completion of the much awaited new water and sewerage treatment plant for Chinsali Urban.

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2.4. Does the water supply period per day meet your satisfaction?

(1) Yes

(2) No

2.4.1. If your answer in above question is No, Explain.....

.....  
.....

2.5. Does the water quality make you be sure of its safety?

(1) Yes

(2) No

2.5.1. If your answer in above question is NO, Explain.....

.....  
.....

### 3.0. Section C: Household Information on Sanitation

3.1. Is your household connected to the sewerage system of the Commercial Utility (CU)?

(1) Yes

(2) No

3.2. What type of a toilet does your household use?

(1) Flash toilet (2) Very Improved Pit Latrine (3) Septic Tank System (4) Pit Latrine

### 4.0 Section D: Institutional Arrangements

4.1. Is your household water supply system metered?

(1) Yes

(2) No

4.2. Is the billing system currently being used meet your satisfaction?

(1) Yes

(2) No

4.2.1. If the answer for the above question is NO, Explain.....

.....  
.....



5.2. What further improvement would you like to see in water supply and sanitation in Chinsali urban?

- (1) Increase in water supply hours      (2) Increase in sanitation services
- (3) Improved Billing and Metering                      (4) Improved information flow
- (5) Improved customer relations and care.

5.3. Does your household wish to see continuity with the current system or there has to be a change to improve the supply of water and sanitation services under current arrangements?

.....  
.....

**Thank you for taking some time off your busy schedule to give me this information.**

## **Appendix II: Interview Guide for Commercial Utility (CU) Branch Manager**

I am Chimangeni Douglas Mackenzie from the University of Zambia (UNZA) doing research for my Master of Science Degree in Environment and Natural Resources Management. I am here to gain an understanding of the Institutional Arrangements for Supply of Water and Sanitation Services in Chinsali Urban of Muchinga Province. Any information collected will be kept confidential and used for academic purposes only. Therefore feel free to express your thinking.

### Identification

Name:.....

Position:....., Length in Position: .....Years

Date:....., Time.....

Contact Address/

Phone #: .....

1. Explain the main areas that your company provides its water supply and sanitation services in Chinsali urban?
2. What is the approximate percentage of the population does the company provide service for both water supply and sanitation respectively in Chinsali urban?
3. What amount of water is the company able to supply per day to Chinsali urban?
4. What is the estimated current demand for water supply for Chinsali urban?
5. Does your company meet the demand of the water supply to the customers' satisfaction?
6. If not what is the estimated current water deficit for customers in Chinsali urban?
7. What is the current percent of Unaccounted for Water (UfW) in your reticulation system?
8. What is the current service coverage of sanitation services for customers in Chinsali urban?
9. Does your company meet the customers' demand for sanitation services in Chinsali urban?
10. What is the approximate deficit for sanitation service in Chinsali urban?
11. What are the current tariff for water supply and sanitation service?
12. Are the services tariffs separated between water supply and sanitation services?

13. Give a brief assessment of your relations with the customers in terms of your service provision?
14. How would you describe the customers' response towards payments of services?
15. How the company's institutional arrangements before Chinsali district were attained provincial capital and municipality status?
16. What are the current company's institutional arrangements after Chinsali district attained provincial capital and municipality status?
17. What are the current plans by the company for improved water supply and sanitation services in Chinsali urban with the expected population increase?
18. How regular does your company collaborate with other institutions for water supply and sanitation to improve service delivery?
19. What level of collaboration exists between the company and the Ministry of Local Government and Housing?
20. What level of collaboration is there between your company and the local municipal council in terms of supply of water and sanitation services?
21. What are the major mechanisms of cooperation between the company and the local municipal council?
22. What are the opportunities of the company to provide for water supply and sanitation services in the current institutional arrangements in Chinsali urban?
23. What are some of the current institutional challenges that the company faces in its service provision in Chinsali urban?
24. What are some institutional mechanisms put in place by the company to overcome some of the challenges faced to deliver better services?
25. Which areas of operations do you think the company needs to improve for better service delivery?

**Thank you for taking some time off your busy schedule to give me this information.**

### **Appendix III: Interview Guide for Commercial Utility (CU) Head Office**

I am Chimangeni Douglas Mackenzie from the University of Zambia (UNZA) doing research for my Master of Science Degree in Environment and Natural Resources Management. I am here to gain an understanding of the Institutional Arrangements for Supply of Water and Sanitation Services in Chinsali Urban of Muchinga Province. Any information collected will be kept confidential and used for academic purposes only. Therefore feel free to express your thinking.

#### Identification

Name.....

Position: ....., Length in the Position: .....Years

Date: ....., Time.....

Contact Address/

Phone #: .....

1. Mention and explain the major institutional agencies that facilitate for supply of water and sanitation services in Zambia?
2. What are the institutional arrangements for supply of water and sanitation in Chinsali urban?
3. What mandate do the major institutions have over service delivery in Chinsali urban?
4. How do these institutions facilitate for the Commercial Utility (CU) to provide for service delivery in Chinsali urban?
5. What is the importance of these institutions for supply of water and sanitation service sector?
6. What are the benefits of the CU to work hand in hand with institutions that facilitate provision for supply of water and sanitation in Chinsali urban?
7. Do major institutions help the CU to access funds from Banks, Donors and the Government to improve service delivery Chinsali urban?
8. What conditions are to be met for external finance to be accessed by the CU?
9. What are the CU's institutional arrangements to ensure for service delivery?

10. Give a brief explanation of the pre-liberalisation and post liberalisation institutional arrangements for supply of water and sanitation services?
11. Over the years how have institutional changes influenced or affected service delivery in Chinsali urban?
12. How adequate are the current institutional arrangements for supply of water and sanitation services?
13. What are some of the effects of the current institutional arrangements on service delivery in Chinsali urban?
14. What are some of the challenges that have been experienced in the current institutional arrangement by the CU?
15. What institutional mechanisms are in place to overcome some challenges mentioned above?
16. What are some of the institutional opportunities available for improvement for supply of water and sanitation services in Chinsali urban?
17. What changes do you think can be made to the current institutional arrangements for supply of water and sanitation services?

**Thank you for taking some time off your busy schedule to give me this information.**

## Appendix IV: Interview Guide for Ministry of Local Government and Housing

### Official (Municipal Council)

I am Chimangeni Douglas Mackenzie from the University of Zambia (UNZA) doing research for my Master of Science Degree in Environment and Natural Resources Management. I am here to gain an understanding of the Institutional Arrangements for Supply of Water and Sanitation Services in Chinsali Urban of Muchinga Province. Any information collected will be kept confidential and used for academic purposes only. Therefore, feel free to express your thinking and knowledge on the topic at hand.

#### Identification

Name: .....

Position....., Length in the Position: .....Years

Date: ....., Time: .....

Contact Address/

Phone #: .....

1. What are the institutional arrangements to water supply and sanitation services in Chinsali urban?
2. What are some of the institutional arrangements that exist within your ministry that facilitate for water supply and sanitation services in Chinsali urban?
3. What particular roles does your ministry play in facilitating for water supply and sanitation services in Chinsali urban?
4. How does the ministry work with the Commercial Utility (CU) to ensure for better service delivery of the two basic services in Chinsali urban?
5. What mechanisms are available for the CU to access for any form of funding from your ministry or outside the ministry to improve service delivery of the basic services?
6. What conditions should the CU meet to access particular funding available in your ministry or outside the ministry?
7. How regular is the funding available to the CU?



8. How has the ministry helped to ensure for better institutional arrangements for the CU to operate in a conducive environment for better service delivery in Chinsali urban?
9. What is the current capacity of water resource for Chinsali?
10. Does the current water resource meet the current demand for water supply in Chinsali urban?
11. What is the estimated current water supply and sanitation coverage for the population of Chinsali urban respectively?
12. What is the estimated current water supply and sanitation coverage deficit for Chinsali urban respectively?
13. Over the years how have the institutional arrangements for water supply and sanitation services evolved from the pre-liberalisation and post-liberalisation eras?
14. How were the institutional arrangements for supply of water and sanitation services before Chinsali district attained provincial capital and municipality status?
15. With the recent attainment of Chinsali as a provincial capital and municipality status, what new institutional arrangements are in place to cater for an increased demand of water supply and sanitation services in Chinsali urban?
16. How does your office harmonise the allocation of plots and service provision such as water supply and sanitation services?
17. What mechanisms does your office and the CU use to provide particular areas with water supply and sanitation service?
18. What plans are there between your office and the CU for service provision in newly planned settlements?
19. What challenges does your ministry face in the current institutional arrangements for supply of water and sanitation services in Chinsali urban?
20. What institutional mechanism has the ministry put in place to overcome some challenges mentioned above?
21. What opportunities are presently being implemented by your ministry for supply of water and sanitation in Chinsali urban?
22. What changes would your ministry propose to the current institutional arrangements in the water supply and sanitation sector for future improvement in the sector?

**Thank you for taking some time off your busy schedule to give me this information.**

**Appendix V: Questions for Focus Group Discussion (Communities)**

I am Chimangeni Douglas Mackenzie from the University of Zambia (UNZA) doing research for my Master of Science Degree in Environment and Natural Resources Management. Thank you for joining this discussion. I am here to gain an understanding of the Institutional Arrangements for Supply of Water and Sanitation Services in Chinsali Urban of Muchinga Province and get your opinions about the topic at hand. Any information collected will be kept confidential and used for academic purposes only. Participation in the discussion does not attract any monetary gain. Therefore feel free to express your thinking.

Identification

Name of Community: ..... Ward: .....

Number of FGD Participants: .....Male and.....Female

Date: .....Time.....

1. What is the approximate population in your community?
2. What is the approximate population that has access to water supply from your kiosk?
3. How much is the unit of sale for water at your kiosk?
4. What is the approximate amount of water that a household buys per day?
5. What is the average amount of water that your kiosk pumps out per day?
6. Who is in-charge of managing the kiosk operation and maintenance?
7. How much collaboration is there between the community and the Commercial Utility (CU) Company?
8. What are the main areas of collaboration does the community and the (CU) engages in?
9. What is the condition of your water supply facility?
10. How regular does the kiosk pump undergo maintenance?
11. Are there people within the community who are skilled to maintain or repair the kiosk pump?

12. Does the water supply experience interruptions?
13. How does the company inform you about any impending interruption?
14. How is the money collected for water sales accounted for by the kiosk operator?
15. How does the community look at the current institutional arrangements to supply of water and sanitation?
16. What are the opportunities in your community for water supply and sanitation services?
17. What are some of the challenges for water supply and sanitation services in your community?
18. What improvements does the community expect to have towards water supply and sanitation?

Is there any information I have not asked for which you would like to share with me? Or are there any questions you would like to ask?

**Thank you for taking some time off your busy schedule to give me this information.**