

**THE EFFECTIVENESS OF AHC-MMS IN THE PROVISION OF
DOMESTIC WATER SUPPLY TO LOW COST MINE TOWNSHIP: A
CASE STUDY OF CHIBWE TOWNSHIP IN CHINGOLA.**

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**THIS PROJECT REPORT HAS BEEN SUBMITTED TO THE
GEOGRAPHY DEPARTMENT IN PARTIAL FULFILLMENT OF THE
AWARD OF THE BACHELOR OF SCIENCE DEGREE IN NATURAL
RESOURCES.
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Declaration

I Zulu Enoch .S. declare that this project has been composed by me and that the work is my own. All map and diagrams were drawn and designed by me; and all quotations have been distinguished marks or otherwise. The sources of all the materials used have been specially acknowledged and the project has not been previously submitted for an academic awards.

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SIGNATURE..........

SUPERVISOR: MRS.C.K.MUZYAMBA

SIGNATURE..........

Dedication

With honor and dignity I dedicate this report to my parents, brothers, sisters and friends for the encouragement they gave me while I pursued my studies because it is only them who inspired the deepest love that profound desire for me to learn.

ACKNOWLEDGEMENT

I would like to express my gratitude to a number of people who made the completion of this project a reality. Many thanks to my supervisor Mrs.C.K Muzyamba for her parental guidance, patient scrutiny of the manuscript and valuable advice.

Many thanks to Mr.G. Hampanye who help me develop my project proposal. My thanks also go to Mr. Chileshe and Mr. Mporokoso who assisted me with geographical map from the surveys department of konkola copper mines

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ABSTRACT

Water is essential to all, as basic daily human needs of life. It is important that people have access to enable them survive. The importance of water as a basic need cannot be over emphasized. Zambia has the largest water resources in southern Africa covering 63% of the entire water resource and yet 38% of its total population in urban areas and 55% in rural areas have no access to domestic water (Chibwe, Kambole and Nyambe 2002). To enable accessibility of domestic water supply, the Zambian government has embarked on an on commercialization of the water sector. Four commercial utility companies have been formed on the Copperbelt and these are Mulonga, Kafubu, Nkana and Assets holding company mining municipal services (AHC-MMS). Of these AHC-MMS provides domestic water to the mine township only.

Ever since its inception (AHC-MMS) several changes have been established in the provision of domestic water supply to mine townships. Among the changes that AHC-MMS has introduced are those of water tariffs and maintenance works. Initially water use to be a free commodity and all maintenance works were done by Zambia Consolidated Copper Mine (ZCCM). After the privatization of the copper mines the investors had no interest in the provision of domestic water supply. AHC-MMS was formed to provide domestic water to the mine townships.

Both scheduled and non-scheduled techniques were used in the collection of data. 51 respondents out of 66 successfully returned the questionnaires. AHC-MMS' Operational Engineer was interviewed using the non-scheduled techniques. The researcher did observations of the study area.

Generally the study revealed that there is inconsistency in the provision of domestic water and AHC-MMS does not respond within 24 hours to reported maintenance work despite of having revenue efficiency of 75% in Chibwe Township. Furthermore the study revealed that most of the infrastructures are in bad condition and the commercial utility company is in the process of replacing the old pipes, valves and tap among other infrastructures. AHC-MMS hope to improve the effectiveness of the provision of domestic water supply once the rehabilitation work is completed by the year 2005.

List of Abbreviations used

AHC-MMS	Assets Holding Company Mining Municipal Services
CU	Commercial Utility
GWP	Global Water Partnership
NWASCO	National Water Supply and Sanitation Council
NWP	National water policy
PPP	Public Private Partnership
PCU	Programme Co-ordinating Unit
UNDP	United nations Development programme
WHO	World Health Organization
WB	World Bank

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CHAPTER ONE

INTRODUCTION

1.0 Overview

Water is a very essential commodity for life and plays an important role in augmenting our standard of living. It is a vital resource of the environment in that it supports many forms of life on which our well being ultimately depends. Appropriate utilization of water can help alleviate poverty by enhancing important benefits such as good health and economic development through the generation of energy from hydropower, use for agricultural production, transportation and domestic use. Inappropriate exploitation of water resources results in intensified suffering such as agricultural drought that could lead to poverty as a result of low food production.

Even though water plays an important role in sustaining human life, many people still have no access to drinking water. By the year 2000, a quarter of the world's total population had no access to drinking water while a million still die from water related diseases annually such as diarrhoea, dysentery, to mention but a few (Nyoni and Moyo 2000). The demand for water is very high and yet many countries are faced with a lot of problems in sustainable management of water. Access to drinking water in Zambia is estimated at 62% for the total population living in urban areas and 45% in rural areas (Chibwe, Kampala and Nyambe 2002). In spite of these figures, real coverage is much lower and varies considerably from one place to another.

In its quest to resolve the sustainability of water supply, the Zambian Government since 1993 has been engaged in reforms of supplying and distributing drinking water to all its

population. In March 1993, the Programme Co-ordinating Unit (PCU) was established as an inter-ministerial committee whose responsibility was to steer the implementation of the water sector reforms. Ten years later when PCU was evaluated, and it was found out that it (PUC) had failed to deliver the services.

Following the failure of PCU, the Zambian Government embarked on an on-going commercialization of the water sector. Commercialization of the water sector in Zambia initiated the formation of the commercial utility companies by the local government to be the service providers on their behalf. Commercial Utilities (CUs) have been formed in six provinces. By the year 2003, there were nine commercial utility companies that were involved in the production and distribution of water in Zambia. Of the nine utility companies involved in the supply of water, Chipata and Lusaka water and sewerage companies are the oldest having been formed in 1992 and 1998 respectively (National Water Supply and Sanitation Council (NWASCO) 2001/2002). The other commercial utility companies involved in the supply of water came into operation between 2001 and 2002. They include Southern, North -Western, Nkana , Kafubu, and Mulonga and Asset Holding Company Mining Municipal Services (AHC-MMS).

1.2 Background

Commercialization of the water sector on the Copperbelt was as a result of privatization of the Zambia Consolidated Copper Mines (ZCCM). Initially, ZCCM supplied water in the mine townships and used to subsidise on water and electricity. Both water and electricity were free commodities to the resident of the mine townships. After the sale of the mines, the new investors had no interest in the provision of water to the mine

townships, as this was an added cost to them. With this situation at hand, the Zambian government had no option but to find water providers to these areas. It managed to secure a loan from the World Bank (WB) and formed the public private company the AHC-MMS. This company was formed as an interim measure to provide water to mine residential areas in Chililabombwe, Chingola, Kalulushi, Kitwe, Luanshya and Mufulira. This was intended as a temporary arrangement that was to be phased out once the best option for water resources delivery on the Copperbelt was agreed upon (NWASCO 2001/2002).

Ever since the inception of AHC-MMS, different changes have been introduced in their effort to serve and distribute water to the former ZCCM residential areas. Before the copper mines were privatized, there was no billing system. All maintenance work was done by ZCCM and water was supplied on a 24 hours basis. Now, since ZCCM no longer supplied water to the mine residential areas it was therefore inevitable to carry out investigations on the operations of AHC-MMS, more especially on the provision of water to the residents of Chibwe Township in Chingola.

1.3 Statement of the problem

The privatization of the copper mines on the Copperbelt led to the transformation of the water sector from that of being a free commodity to that of the paid commodity. Before the copper mines were sold off, all the processes involved in the supply and distribution of water was done by ZCCM. After the privatization of the copper mines the private sector (water utility company) took over the responsibility of supplying and distributing

water to all mine townships. With this arrangement, AHC-MMS assumed all the maintenance, repair works, the supply distribution of water to all mine Townships including Chibwe. It was in this view that the research sought to find out the effectiveness of the AHC-MMS in its quest to provide water to Chibwe Township in Chingola.

Aim

To ascertain the effectiveness of AHC-MMS' operations in the provision of domestic water to Chibwe township.

Objectives

- I. To find out the consistency of domestic water supply in Chibwe Township under the operations of AHC-MMS.
- II. To establish the revenue collection efficiency from water bills by the commercial utility company.
- III. To examine the attitude of Chibwe residents towards payments of water bills.
- IV. To find out the company's response towards maintenance work.
- V. To assess the efficiency of the criteria used by AHC-MMS to determine tariffs.

1.4 Research questions

- I. Is there consistency of domestic water supply in Chibwe Township under the operations of AHC-MMS?
- II. Does AHC-MMS have efficient revenue collection methods from water bills?

III. What attitude do Chibwe residents have towards payments of water tariffs?

IV. How does AHC-MMS respond to maintenance work?

V. Is there any efficiency in the criteria that AHC-MMS uses to determine water tariffs?

1.5 Justification

The importance of this study emanates from the significance played by water in the well being of the community. Water governs the location of settlements and its availability or lack of it can cause death among people, animals and plants. The intrinsic value of water causes conflicts not only between countries but also among communities within the country.

In spite of the important role played by water in our lives, not all the people in Zambia have access to drinking water even though many reforms have been carried out. Therefore it is from this understanding that the research was conducted to assess whether there has been any improvement in the water sector in Chibwe township. In this way, policy makers and planners, including the government, autonomous organizations such as the National Water Supply and Sanitation Council (NWASCO), Commercial Utility Companies and the Local Authority could evaluate the performance of the commercialization of the water sector especially on the copperbelt.

The local community will benefit from the research as well through the AHC-MMS effort to resolve the water problems that the residents of Chibwe Township are facing. This will lead to an improvement in the supply of water to Chibwe Township. In

addition, the research will add on to the stock of already existing knowledge.

1.6 Scope of the study

This study is limited to the investigation of the public private company, AHC-MMS in its provision of water to Chibwe Township. This study involved the distribution of questionnaires to residents of Chibwe Township, and carry out interviews with a representative of the company. The main focus of the study was to examine the effectiveness of AHC-MMS in its operation in the provision of domestic water to the residents of Chibwe Township.

1.7 Definition of terms

Management Contract

Management contract is where the ownership and investment is the duty of the public, but operation is performed by the private operator (World Bank 1994)

Public Private Partnership (PPP)

The term Public Private Partnership (PPP) describes a spectrum of possible relationships, between public and private actors, for the co-operation.

Asset Holding Company Mining Municipal Services (AHC-MMS)

AHC-MMS is a private limited utility water company and provides sewerage services to mine townships on the Copperbelt.

1.8 Organization of the report

The project report comprises of six additional chapters. The Second chapter is the Literature Review. Chapter Three looks at the study area, and gives information relevant to the study. Chapter Four outlines the methods that were used to carry out the study. The findings of the research are presented in Chapter Five. Chapter Six deals with the discussion of the results. Conclusions and recommendations are made in chapter seven.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

The chapter looks at the three major issues which are: the accessibility of water on the global scale, the performance of private utility companies in other countries in the provision of water and the Zambian situation of public-private utility companies in the on-going commercialization of the water sector.

2.1 Accessibility of water supply in the world

Water supply has been a concern of humanity ever since people started living in organized communities. Extensive works were constrained by ancient civilizations in cities as different as Rome in Europe and Machu Puhu in South America.

In modern times, the stimulus towards development of water came in the middle of the 19th century as urban populations were on the increase following the industrial revolution. In the 1950s, the international community began to focus on drinking water supply, with the World Health Organization (WHO) as a major advocate for action. The WHO emphasized the link between water supply and health. In the 1960s, there was the need for low cost technology to solve the water supply problems of the Third World countries. Urban areas were given the first priority for low cost technology. Thereafter, a concern for rural areas came into consideration also toward the end of the decade. In spite of all these efforts that have been done, about 1.1 billion people lack access to drinking water

in the world today (Pottinger, 2001).

In order to improve the accessibility of water, many companies in the world today have embarked on programs that are aimed at encouraging community participation (United Nations Development Programme, 2001). For several years, the term community participation has been used in water management. This phenomenon meant that all communities were to take part and help with projects.

Despite the efforts that have been made to involve community participation, many people still have inadequate water supply. One third of the world's population lives in areas with water deficit (Pottinger, 2001). In South America, 30% of the people face the problem of water deficit, 33% of the entire people population of Europe experience a water deficit. Asia has a water deficit of 60% and, 80% for the entire population of Africa (UNDP, 2001). Africa has the largest fresh water resources but yet has the largest water deficit.

In terms of accessibility, there are differences as well from one continent to another. According to the UNDP 2000 report, Asia and South America have 56% of their population with access to safe drinking water. Europe, North America, and Australia have only 34% of their population with access to safe drinking water. Africa has only 10%. Yet again Africa, Zambia not an exceptional case, has the lowest percentage of its population with access to safe drinking water despite its largest coverage of fresh water resources on the surface and underground.

The United Nations holds global and regional meetings that aim at sustainable use and management strategies of water resources in its quest to solve the problems of water accessibility. In 1996, the Global Water Partnership (GWP) was established as an international network open to all organizations involved in water resource management

(GWP, 2001). Through GWP, regional organizations have been formed in their efforts to improve the water accessibility. In 2000, in Southern Africa, the Southern Africa Water Partnership (SAWP) was launched. SAWP looks at improving the regions water management. Beside all the guidelines, many countries still face the same problem. Commercialization of the water sector through private participation in the water sector is one of the modalities that are being implemented in many countries. Private involvement in water sector has been promoted in many countries worldwide.

2.2 Private sector involvement in the provision of water in other countries

A worldwide crisis over water is brewing. According to the United Nations (1992) more than one billion people were living without any access to domestic water in 1990 and many countries with 40% of the world's population were suffering from serious water shortages. Water consumption is increasing every 20 years, and yet at the same time, water resources are depleted. The World Bank (WB) predicts that by the year 2025, two third of the world's population will suffer from the lack of clean and safe water (Classon, 1995).

However, many governments yet have failed in their obligation to provide universal access to water. This situation has enabled the World Bank and other international institutions to claim that the public sector is the answer through commercialization of the water sector. Many private utility companies have been formed in the supply and commercialization of the water sector.

In Mexico, the government launched a comprehensive privatization program that was aimed at improving gross water efficiency. Before the privatization of the water sector,

85.6% of the country's 19.3 million households had running water, while 74.7% had drainage systems and, less than 15% of the wastewater was treated before discharge. After the privatization of the water sector in that country, there was an improvement in the efficiency in water tariff collection. Within seven to ten years, unaccountability of water reduced from 30 to 20% of water produced (UNDP, 1999).

The government of Venezuela has for the past year involved the private sector in improving water management. In 1997, the Venezuelan government signed a management contract with a Spanish firm in the state of Monagas. The management contract between the Spanish company and the government improved the quality of water and collection of money from the bills (UNDP, 1999).

Guinea is one of the least developed in the urban water supply sector in West Africa. Less than 40% of urban dwellers had access to piped water. Where connections existed, services were often interrupted and water treatment inadequate. To improve this situation, the government of Guinea in 1989 entered into a lease arrangement of private sector operation of water services in the capital city, Conakry, and sixteen towns. Two organizations were awarded the contract to run the water sector. These were, a state owned national water authority, Societe Nationale des Eaux de Guinee (SONEG), and, a water management company, Societe Exploitation des Eaux de Guinee (SEEG). By the year 1996, connections were increased from about 12000 to more than 23000. Metering increased from 5% to 98% for the private customers and to 100% for government customers. According to UNDP (1999), investment in new water supply capacity, combined with rehabilitation and maintenance, have brought about sustainable increase in the population with access to safe water from 38% in 1989 to 47% in 1996.

The involvement of the private sector has yielded much of the needed results in many countries. In its effort to improve the water sector, the Zambian government has initiated the commercialization of water by involving the private sector

2.3. Private sector involvement in the water sector in Zambia

The driving force behind increased private involvement in water supply in Zambia has been caused by the government's inability to provide the services that meet the demands of an ever-expanding population. According to the findings of the Program Co-ordination Unit, it was revealed that the water sector is faced with several problems. Some of the problems highlighted were: non-allocation of clear responsibility to municipal organizations, inadequate financial resources to meet the cost of extending coverage of water to the majority of the population and, shortage of qualified and experienced personnel. Other problems included poor operation and maintenance of facilities in urban and rural areas and low tariff collection, which was more pronounced in urban areas. The sector was thus unable to sustain itself.

In order to improve the water sector, the government embarked on a reform process following Cabinet's decision in March 1993. In 1994, the government announced a National Water Policy (NWP). NWP was initiated to promote sustainable water resources development with a view to facilitate an equitable provision of water, adequate quantity and quality for all competing groups of users at acceptable costs and ensuring security of supply under varying conditions. In 1997, the Water and Sanitation Act was ratified by the government in order to proceed with the decentralization, creation of economically viable commercial utilities holding the assets of the systems and establishment of a

regulatory body for urban water and sewerage (NWASCO 2002/2003).

After the reforms were adopted, the most significant fundamental change in water supply provision in Zambia has been the on-going commercialization of the water supply. The commercialization of the water sector in Zambia has led to the formation of commercial utility companies.

By the year 2002, Zambia had nine commercial water utility companies providing water services to 47% of the urban population (NWASCO Report 2001/2002). Currently, the commercial utility companies have covered only six provinces. These are Copperbelt, Southern, Eastern, and North Western, Lusaka and Western provinces. The Commercial Utilities (CUs) formed in these provinces are Asset Holding Company Mining Municipal Services (AHC-MMS), Nkana, Kafubu and Mulonga water and sewerage companies on the Copperbelt province, Chipata and Lusaka water and sewerage companies in Eastern and Lusaka provinces respectively. Others are Southern, Western and North-Western water and sewerage companies located in Southern, Western, and North Western provinces. The commercial utility companies were formed to ensure that the majority of Zambians, if not all, receive adequate safe water at an affordable cost.

2.4 Establishment of commercially viable water supply and sanitation utilities on the Copperbelt

The initiation of the CU companies on the Copperbelt started after the privatization of the copper mines. Initially, the provision of water and sanitation services in the mine township was done by ZCCM. Following the sale of the mines, there was a transition from the public to private sector. The provision of water was commercialized. Water was no longer a free commodity. Commercialization of the water sector was done in line with

the government policy of attracting investment to the private sector from both the donors and international financing institutions due to anticipated higher probability of sustainability and viability (NWASCO, 2001/2002 Report). The Copperbelt has a population of 1,581,221 served by four utility providers that pump water estimated at 190 million cubic meters annually (CSO, 2000).

2.5. Management contract of AHC-MMS and government in the provision of water and sanitation

The management contract that initiated the take over of AHC-MMS from ZCCM was signed in 2000 after the copper mines were privatized. This contract was intended as a temporal arrangement that was supposed to be phased out once a viable company for water and sanitation service delivery on the Copperbelt had been formed (NWASCO 2001/2002). A loan was secured from the World Bank (WB) by the Zambian government to facilitate the formation of AHC-MMS. AHC-MMS was formed on the basis that the government had an obligation to provide universal access to water. Arising from this, hence the need to find out the operations and effectiveness of AHC-MMS to the residents of Chibwe Township in Chingola.

CHAPTER THREE

STUDY AREA

3.0 Introduction

This chapter gives the description of Chibwe Township and includes the historical overview, location, relief and geology, water sources, population and housing.

3.1 Historical overview

Chibwe Township is found in Chingola, the second largest town on the Copperbelt, and once upon a time the cleanest town of Zambia. The township was built in the 1940s to house the lowly paid miners working for Nchanga Division of the ZCCM, which was then called Nchanga Consolidated Copper Mines (NCCM). The residential area was designed for low cost houses with seventeen streets, one school, two taverns, two churches and two community halls that are the recreation training centres. Initially, the maintenance of these facilities was by ZCCM. Besides, the former mining giant of the country used to provide free water and sewerage, power supply and sanitation services. After the mines were sold the new investors had no interest in the provision of these facilities. There after the houses were sold to the occupants and the provision of water and sewerage was taken over by AHC-MMS after it signed a management contract with the government. The provision of electricity was taken over by ZESCO; maintenance of roads was taken over by the council and maintenance of houses was taken over by the occupants. Currently, Chibwe Township comprises people from different organizations apart from the mining industry because some houses have either been put on rent or sold.

3.2 Location

Chibwe Township is located north of Chingola town. To the north of the township is Nchanga Open pit mine, and Nchanga Township to the west. Kabundi Township is in the south. Geographically, Chibwe township is located between latitude $12^{\circ} 31' S$ and $12^{\circ} 32' S$ and longitude $27^{\circ} 53' E$ and $27^{\circ} 54' E$ (Konkola Copper Mine 2000).

3.3 Climate

Chibwe Township is found in the sub tropics with the climate that has mild summer rainfall between November and April; cool and dry season between April and August and dry hot season between August and November. The average annual rainfall is approximately 1195 mm. Mean daily temperature range is between 17 and 23 degrees Celsius.

3.4 Relief and Geology

Chibwe Township lies on a high flat land about 1330 meters above sea level. Beneath the land surface lies Nchanga Red Granite rock rich in copper ores. The Nchanga Red Granite is mantled by Lufuba Gneisses and Schist (Smith 1964). The topography is pre Katanga era controlled by the deposition of older near shore member of the lower roan succession

3.5 Drainage

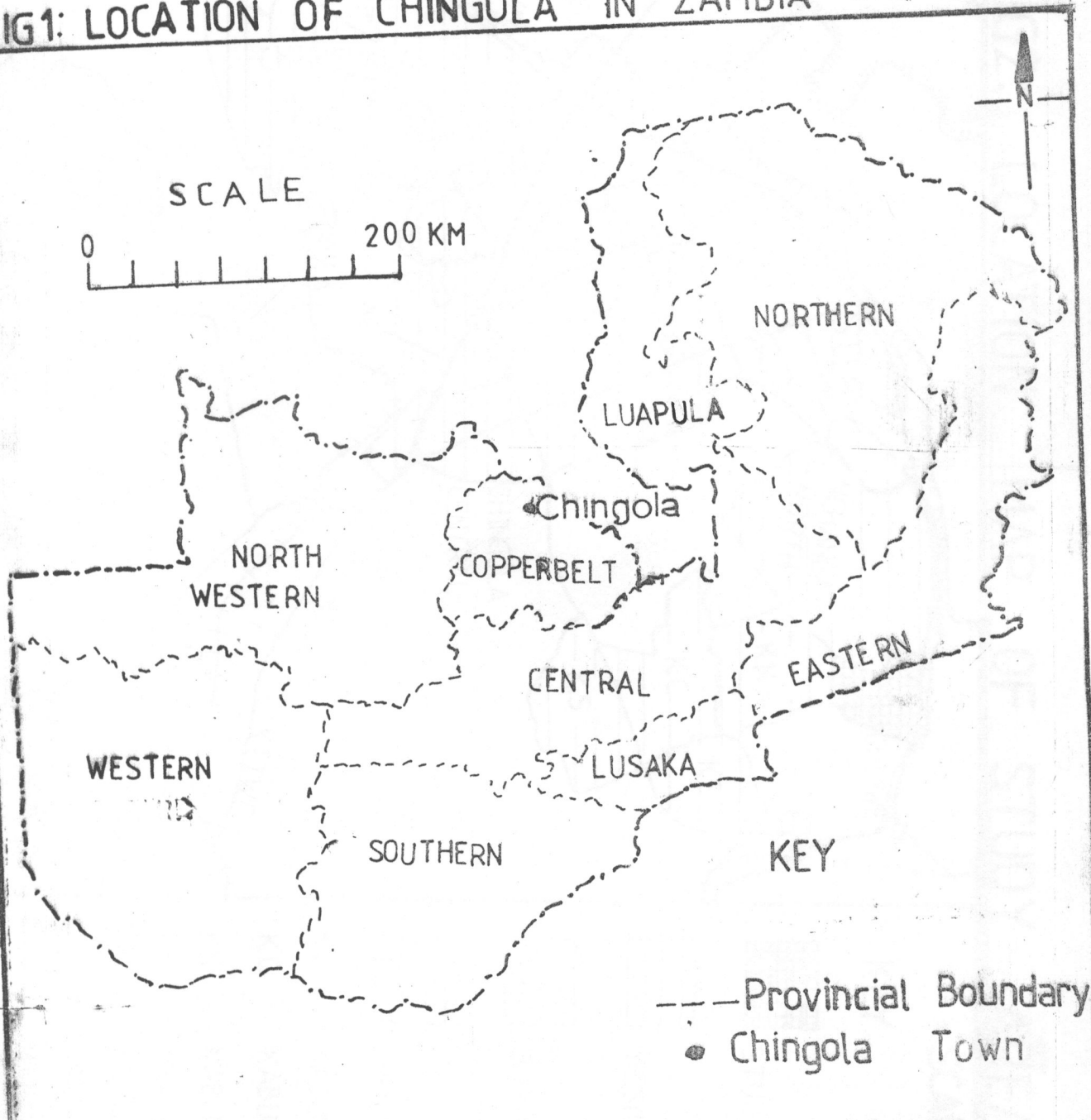
Chingola town has three drainage basins that belong to the Zambezi drainage system. These are the Kafue River, Chingola Stream, Mushishima stream and Nchanga underground stream. All the streams are the tributaries of the Kafue River. The Kafue River is found north of Chingola. Chingola stream flows through the second-class shopping center, industrial area and join the Mushishima before joining the Kafue River. The Nchanga underground stream joins the Kafue River north of the town.

3.6 Populations and Housing

Chibwe Township had a population of 4122 people by the year 2000 (CSO 2000). Houses in Chibwe Township are of the same size. They are detached houses with one bedroom, living room, a kitchen and bathroom and toilet. All the houses in this township have piped water supply, power supply, and refuse collection points.

FIG1: LOCATION OF CHINGOLA IN ZAMBIA

18°S



Adapted from Zambia in Maps (Davies 1971 P51)

22°E

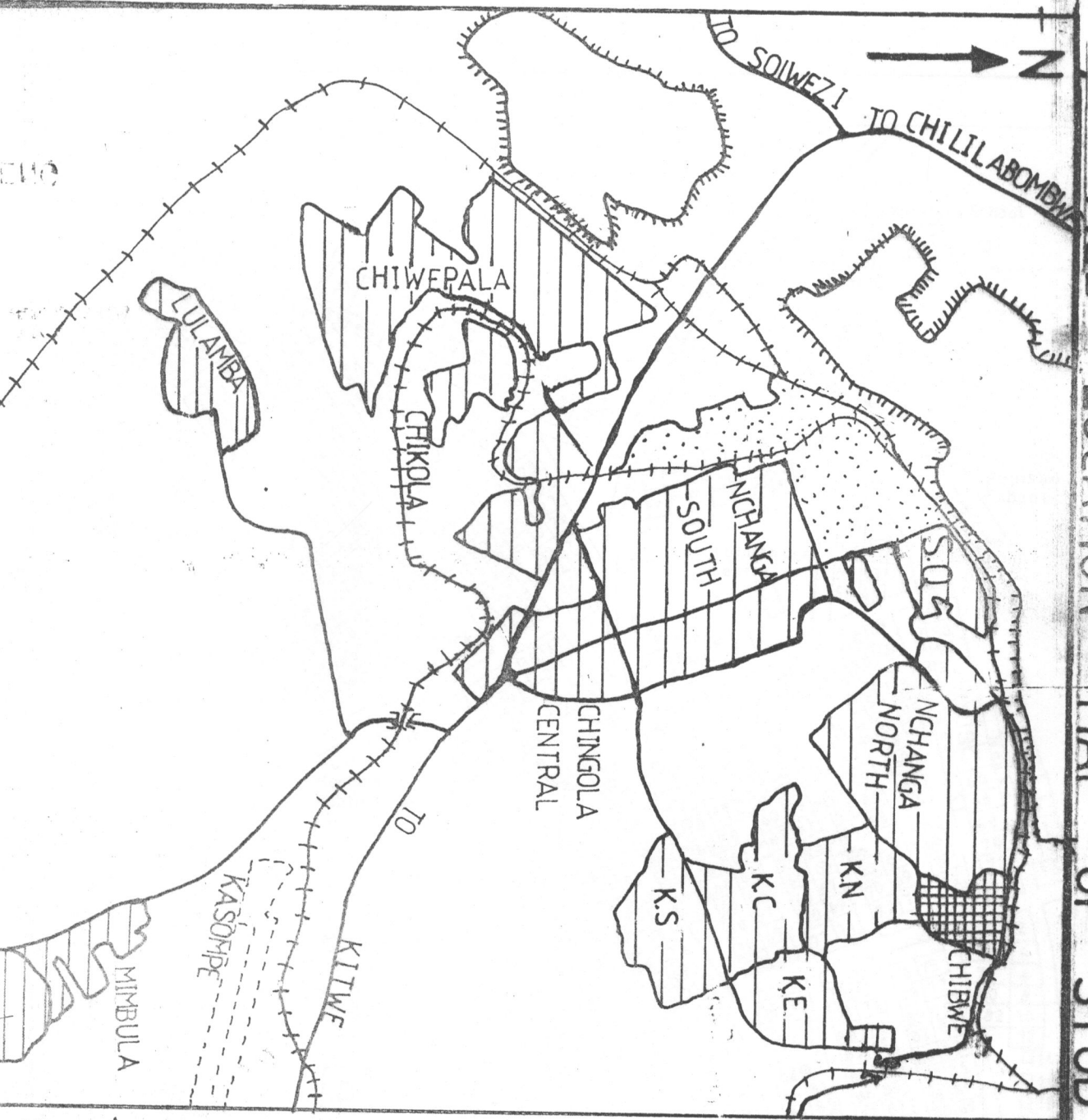
33°E

33°

126



FIG2: LOCATION MAP OF STUDY AREA



SCALE 1:50,000

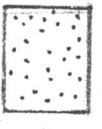
KEY



STUDY AREA



RESIDENTIAL AREA



INDUSTRIA AREA



OPEN PIT MINE

KE

KABUNDI EAST

KC

KABUNDI CENTRAL

KN

KABUNDI NORTH

KS

KABUNDI SOUTH

SQ

SINGLE QUARTERS



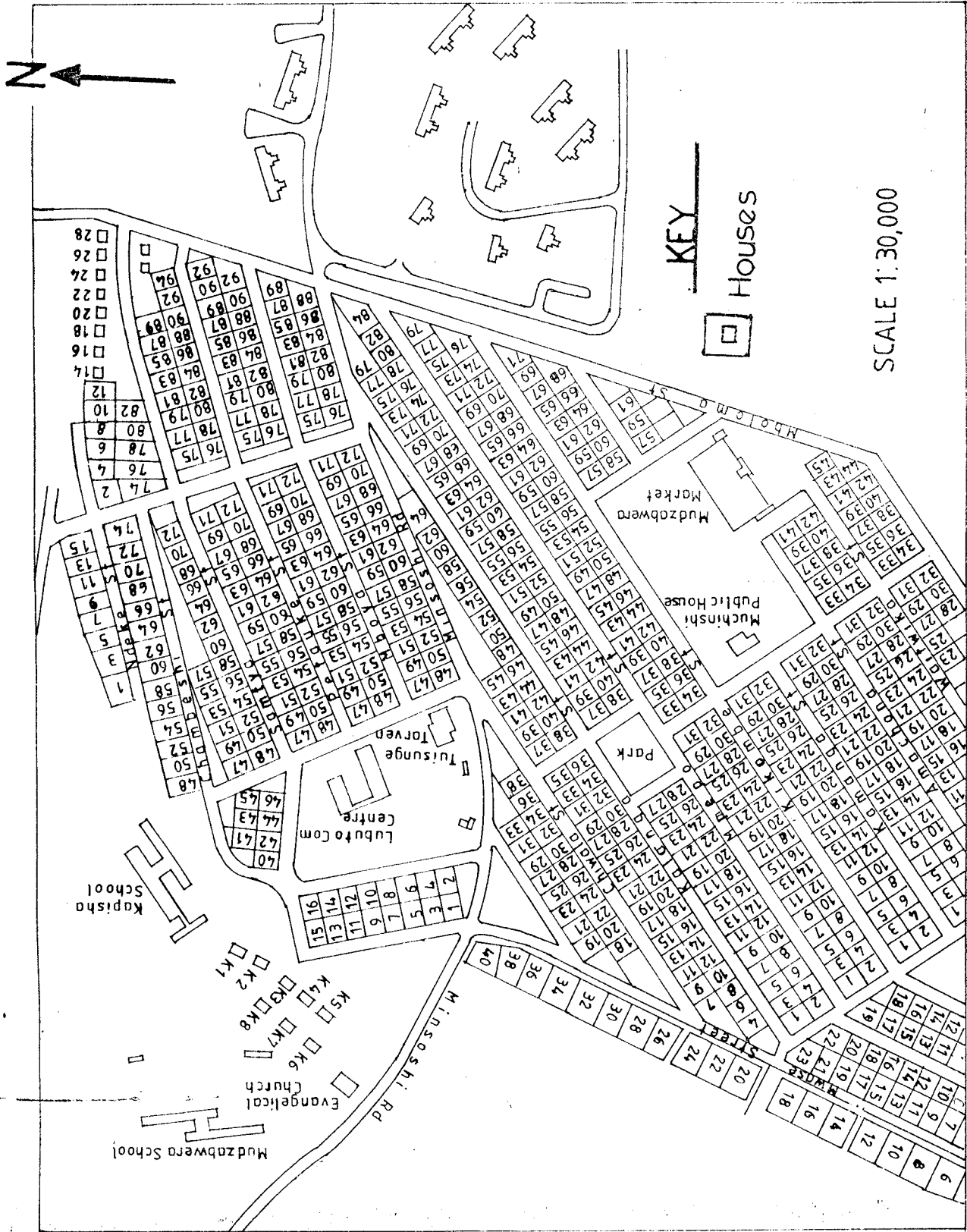
RAIL LINE



MAIN ROAD

SOURCE COMPILED FROM SHEET 1227

FIG. 3: STREET MAP OF CHIBWE TOWNSHIP



KEY
Houses

SCALE 1:30,000

CHAPTER FOUR

RESEARCH METHODS

4.0 Introduction

This chapter discusses the sources of data, the techniques used in collection, analysis, and presentation of data. The limitations that were encountered during the research are discussed.

4.1 Sources of data

The data was collected from both primary and secondary sources.

4.1.1 Sources of primary data

Primary data was obtained from the questionnaires, non-scheduled interviews and observations that were made during the research.

4.1.1.1 Questionnaires

Questionnaires were distributed to the residents of the Township. These were used in order to obtain data on the consistency of domestic water supply in Chibwe Township under the operations of AHC-MMS and to assess the altitude of the residents toward payment of water bills. This instrument enabled the researcher to fulfill objective one, three and four.

4.1.1.2 Non-Scheduled interviews

Non-scheduled interviews were conducted with AHC-MMS operational

engineer based in Chingola. .

Data on the commercial utility company's response towards maintenance work, collection efficiency of water bills, the company's views over consistence of water supply, and the criteria that the company uses in charging monthly fixed charges were obtained from this instrument.

Part of objective One and objectives Two, Three, Four, and Five were achieved form this technique of data collection.

4.1.1.3 Observations

Observations on the operations of AHC-MMS in the supply of domestic water were done by the researcher .The conditions of the water pipes; taps and valves in the study area were observed. Other observations made were on the water pressure in different locations within Chibwe Township and the rehabilitation work the company AHC-MMS has embarked on.

4.1.2 Secondary sources

Secondary data was collected from the reports, newsletters, books, magazines and Geographical maps which were obtained from UNDP, World Bank, AHC-MMS, and the survey department of KCM respectivelySources of data on the accessibility of water supply in the world and, private sector involvement in the provision of water in other countries were from reports by UNDP, World Bank, and Kassum (1995).

Data on the private sector involvement in the water sector in Zambia and the

establishment of commercial utility companies on the Copperbelt were collected from urban and peri-urban water supply and sanitation sector reports, and the National Water Policy. Information on the population and the number of households were obtained from the Central Statistics Office and the Survey Department of Konkola copper mines of Chingola. Newsletters from AHC-MMS and reports from NWASCO provided diagrams on the revenue collections efficiency of the private utility company (AHS-MMS).

4.2 Sampling procedure

Chibwe Township has a total number of 660 households. 66 households of representing 10% of the entire township were sampled. Out of the 66 respondents only 51 were able to successfully return the questionnaires.

Interval sampling method was used because the township is a well-planned residential area with streets and well numbered houses. Besides, this method of sampling ensured equal presentation in that different streets have different numbers of households and this enables streets with more households to have more representation and vice versa, as shown in table 1. In this way fairness was achieved on the number of representatives from each street in the entire township. The procedure below was used;

4.2.1 Calculating of the sampling Fraction (f)

$$f = n/N$$

Where,

f is the sampling fraction

n is the sample size

N is the population of households

$$f = 660/66$$

$$f = 10$$

4.2.2 Sampling fraction was multiplied by the number of households in every street to obtain the sample from each street.

4.2.3. Every 10th household starting from the first household each street was picked

Table 1. Selection of street sample size

<u>Name of street</u>	<u>Numbered of Household x</u>	<u>fx</u>	<u>Sample</u>
Mboroma	40	40 *0.1	4
Waitwika	40	40 *0.1	4
Amachona	41	41*0.1	4
Katanga	41	41*0.1	4
Kilobit	61	61*0.1	6
Mpepo	72	72 *0.1	7
Kalong	71	71*0.1	7
Chewelah	41	41*0.1	4
Chi Wanda	20	20*0.1	2
Kazunga	20	20*0.1	2
Mwase	27	27*0.1	3
Mbooya	40	40*0.1	4
Petauke	36	36*0.1	4
Samfya	40	40*0.1	4
Chambeshi	20	20*0.1	2
Ndeke	30	30*0.1	3
Minsoshi	20	20*0.1	2
Total	666		66

Source: field survey, 2004.

4.3 Sample size

Apart from the fifty one (51) respondents the researcher interviewed AHC-MMS' operational engineer based in Chingola using a non-scheduled interview technique.

4.4 Methods of data analysis

Data collected from the study has been presented using various statistical techniques such as percentages, graphs and charts.

4.5 Limitations encountered during the research.

During the research two limitations were encountered. The limitations encountered include the following;

(a) Finances were not enough to adequately cater all the trips to and from Ndola to obtain data on the study area from ZCCM Achieves. However, most valuable information was all the same obtained.

(b) Time

The respondents took more time to answer the questionnaires than expected. Therefore eleven (11) questionnaires were not obtained from some respondents due to time limitation.

CHAPTER FIVE: RESEARCH FINDINGS

5.0 Introduction

This chapter present the findings on the consistence of water supply in Chibwe Township provided by AHC-MMS, the attitude of Chibwe residents towards maintenance works. Besides, the chapter considers the revenue collection efficiency of water tariffs by the commercial utility company AHC-MMS, and the criteria used in charging monthly water bills.

5.1.1 The Company's view on the consistency of water supply in

Chibwe Township

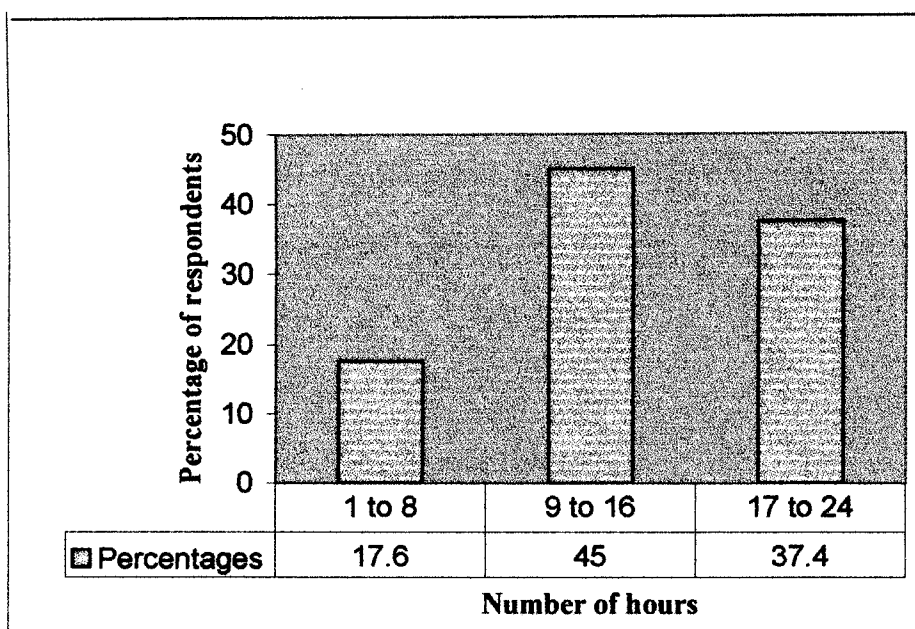
AHC-MMS supplies domestic water to Chibwe Township on an average of sixteen hours per day. The provision of water within Chibwe Township varies from one location to another. From time to time, there are break downs and the company is forced to close valves to some sections of the community to pave way for repair work which is an on going programmed. This has affected the consistency of water provision in Chibwe Township to an extent that not all the houses can have constant water supply for 24hours. Time and again, the supply of domestic water is disrupted to enable installation of new equipment. Illegal reconnection by some customer who default payment affected the consistency of water supply. in the process of reconnection some customers have ended damaging water pipes thus causing uncontrollable flow of water and reduction in pressure in some households within the township.

5.1.2 Residents' views on the consistency of water supply

On average, many residents of Chibwe Township receive domestic water supply on an average number of hours ranging between nine and sixteen hours. The findings reviewed 17.6% of the respondents receive domestic water supply between 1 and 8 hour per day, 45% receive domestic water supply between 9 and 16 hours per day 37.4% receive domestic water supply between 17 and 24 hours per day.

Figure 5.1 illustrates the duration of domestic water supply to Chibwe Township

Figure 5.1: Duration of Provision of Domestic Water Supply in Chibwe Township



Source: Field Survey, 2004

5.3 AHC-MMS' views over the tariff of domestic water

AHC-MMS started providing domestic water supply to Chibwe Township, after the privatization of ZCCM. Before then, water used to be a free commodity. ZCCM had the

capacity to finance all the expenses that were involved in the production, treatment and distribution of domestic water supply in all mine townships. At the time of the study AHC-MMS was charging ZMK 25000.00 per month. The monthly charge was not enough to cover all the costs that are involved in the of purchase of water chemicals, pipes and valves. Therefore the commercial utility company was considering increasing the monthly charge by a percentage that was not disclosed by the operational engineer. Besides AHC-MMS use the tariff system that does not have flow meters as this will be explained later in the chapter. After the mines were sold to private investors there was a transformation in the operation and transfer of assets from public to public-private company. Water was no longer provided free because the commercial utility company AHC-MMS unlike ZCCM has no financial capacity to provide domestic water for free. Therefore, the billing system was introduced to make the company AHC-MMS financially viable, efficient and effective in their provision of domestic water supply. The billing system that was employed by the company does not involve the use of meters, as it will be explained later in the chapter.

5.4 Revenue collection efficiency from water bills

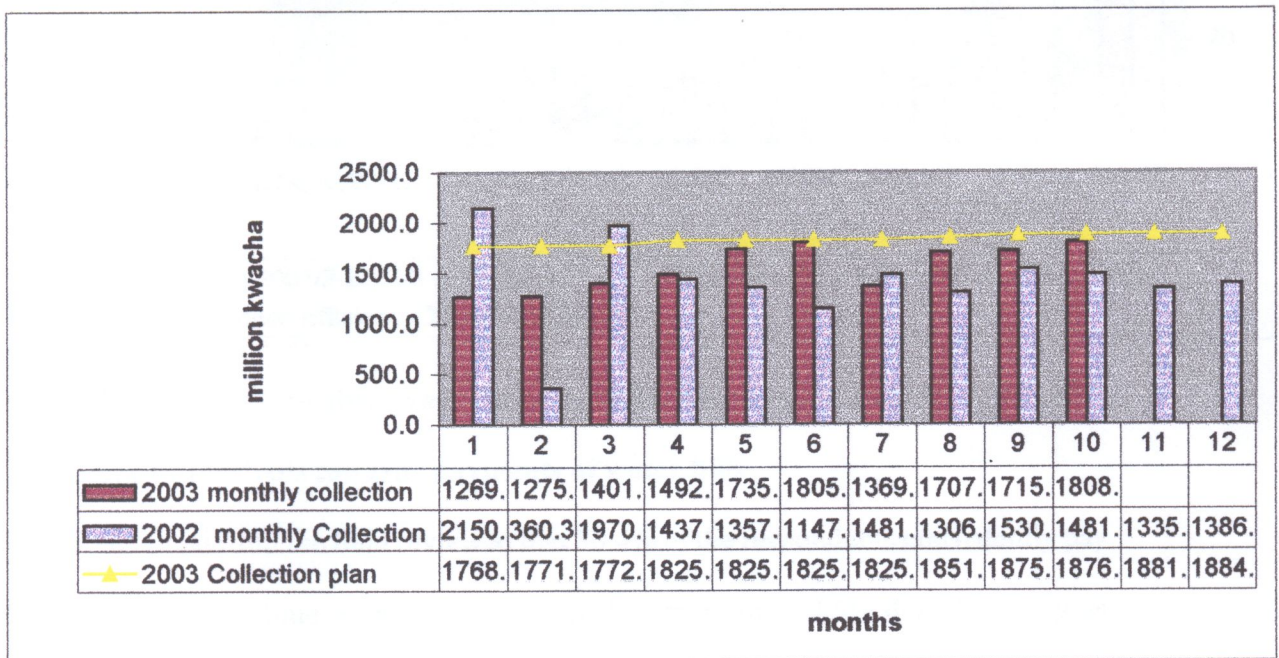
The revenue collection efficiency from water bills in Chibwe Township was 75% at the time of the study. The company has employed two methods of revenue collection from water bills. These are the direct and the payroll methods. The direct method is one whereby clients pay their water bills directly to the commercial utility company and the pay roll method is one whereby the clients have their water bills deducted from their salaries and the money is transferred to AHC-MMS's bank account. This method is only applicable to KCM employees who are the majority of the clients from Chibwe

Township. The payroll method of collecting revenue from the clients has helped to improve the revenue collection efficiency from Chibwe Township.

In all the towns on the Copperbelt where AHC-MMS is offering its services in the provision of domestic water, it has recorded a steady increase in revenue collection even though customers still need to be consistent in paying for the water bills to enable the company be sustainable and be able to provide quality services. The company is still owed money by the customers more especially those that pay using the direct method.

Figure 5.2 below outlines the revenue collection status for the year 2002/2003.

Figure 5.2: AHC-MMS Revenue Collection Record (Million Kwacha)



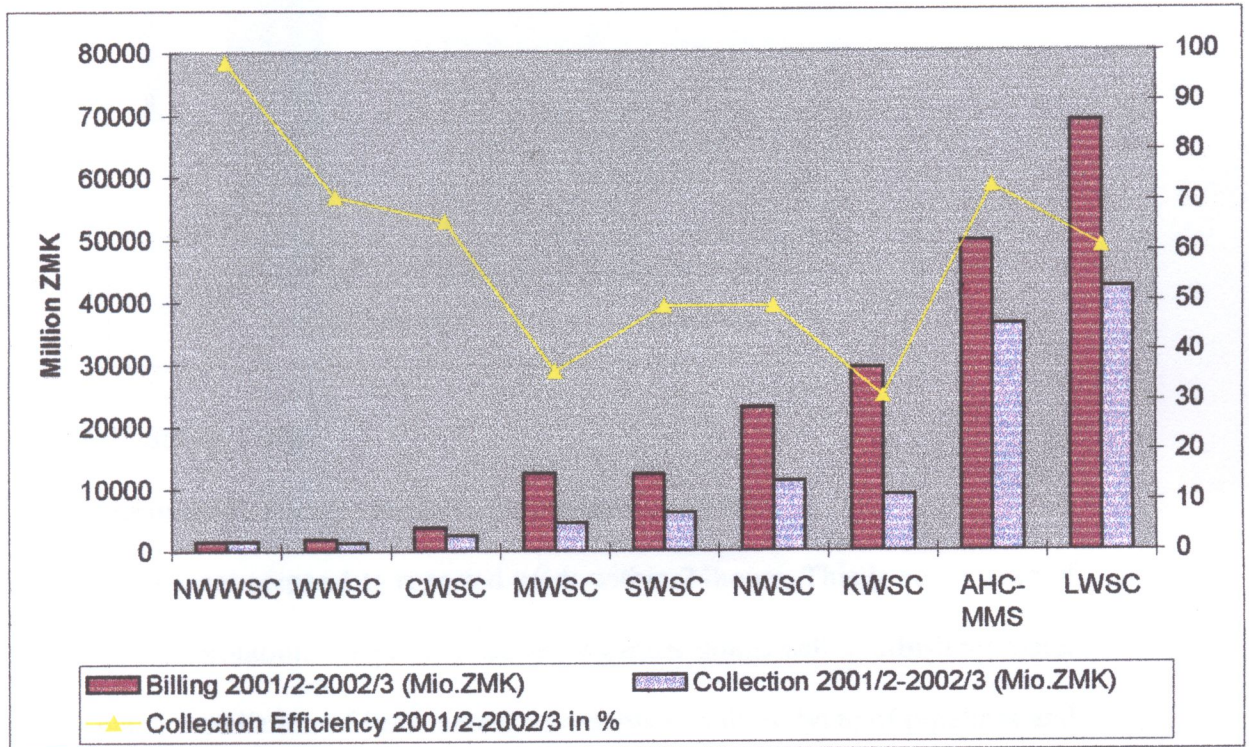
Source: AHC-MMS 2003: 2

On the comparative scale with other commercial utility companies operating in the country, AHC-MMS is above the country's average revenue collection efficiency of

56% for the years 2002/2003.

The diagram below shows the revenue collection efficiency for all the commercial utility companies operating in the country.

Figure 5.3: Collection Efficiency over two years 2002-2003

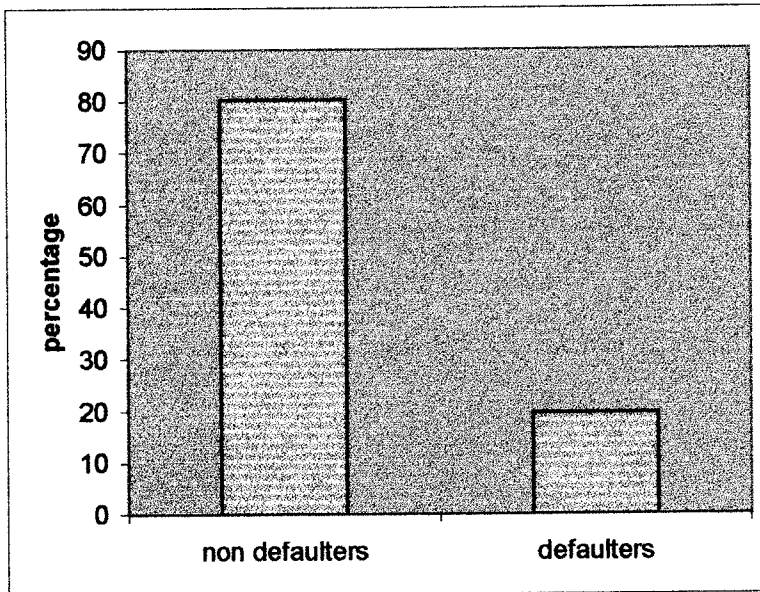


Source: Urban and Peri-Urban Water Supply and Sanitation sector Report 2002/3: 22

5.5 Attitude of residents towards payments of water bills

Results obtained from the field reviewed that 80.4% of the respondents consistently pay their water bills on time every month whilst the remaining 19.6% default paying as figure 5.4 illustrates.

Figure 5.4 Attitudes of Residents towards Payment Of Water Bills



Source: Field Survey 2004

5.6 The company's response towards maintenance works.

AHC-MMS does not respond to reported work within 24hours. This is so because of the on-going rehabilitation, the project that among other things will refurbish the water treatment plant, installation of flow meters, and network valves, lying of pipelines and installation of new taps. Many workers are assigned to do rehabilitation works leaving behind a skeleton workforce to attend to general maintenance work. This has caused reported repair works to remain unattended to for a long period of more than one month. According to the company's operations engineer based in Chingola, a lot of emphasis has been put on the rehabilitation work because once this is completed; the provision of water to Chibwe Township would improve for the better.

5.7 Residents' views over the companies response towards maintenance work

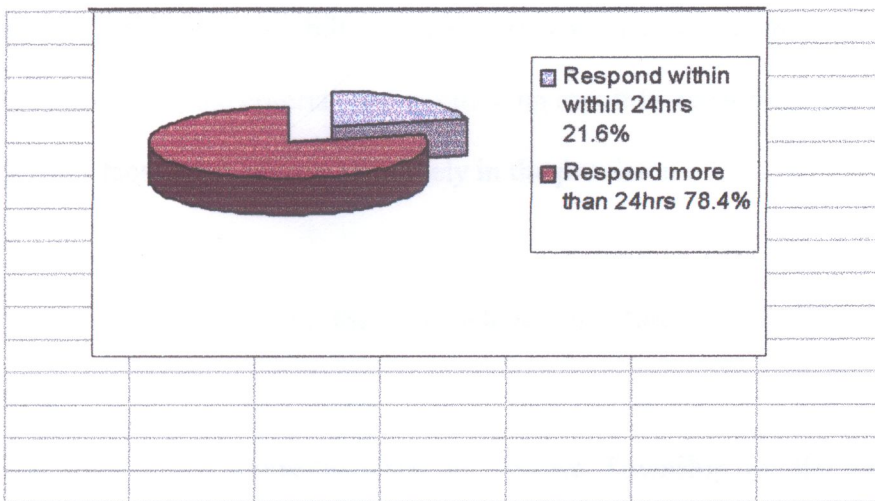
The results that were obtained during the research reviewed that 78.4% do not have their reported repair works attended to within 24 hours after being reported and 21.6%

have faults attended to within 24 hours after being reported.

This information corresponds to the one obtained from the company's representative who was interviewed.

Figures 5.5 illustrate the period AHC-MMS take to respond to maintenance works

Figure 5.5: Residents view over the company response towards maintenance works



Source: Field Survey 2004

5.8 Criteria AHC-MMS uses to charge monthly water bills in Chibwe Township

All houses in Chibwe Township do not have flow meters because they were not installed right from the beginning. Instead the commercial utility company has one flow meter that measures the amount of domestic water provided to the entire township. A fixed charge is slapped on all the consumers in the township regardless of their consumption levels. The cost is the average and not the actual consumption. AHC-MMS uses the fixed monthly bills as a way of charging domestic water supply.

CHAPTER SIX

DISCUSSION

6.0 Introduction

The chapter discusses the finding of the research. The discussion is based on the consistency of domestic water supply by AHC-MMS to Chibwe Township, the revenue collection from the water bills by the commercial utility company, response towards maintenance work, the criteria used in charging monthly water bills and the challenges that AHC-MMS faces in operating effectively in the provision of domestic water supply.

6.1 AHC-MMS view on the Consistency of Domestic water supply in Chibwe Township

AHC-MMS supplies domestic water to Chibwe Township on the average number of sixteen hours per day. This situation is not healthy in that the time interval for which the commercial utility company provides water supply varies from time to time and differs in sections within the same township. There is inconsistency in the provision of domestic water supply in Chibwe Township and the major contributing factor is the old infrastructure that the company is using in the provision of this commodity. It is for this reason that the company has embarked on a rehabilitation project that could be completed by the year 2005. It is hoped that once the project is completed it will improve the duration of water supply and the consistence.

The company has spent a sum total of Five billion and five hundred million Zambian kwacha (ZMK5. 500 000 000) to purchase pipes taps and valves to replace the old ones.

Therefore, there is need for the company to complete the rehabilitation work to enhance consistency in their quest to serve the community diligently. Besides, once there is consistency in the provision of domestic water supply, this could encourage water bills defaulters to settle their bill on time thus improving the revenue collection of the company.

6.2 Residents' views on the consistency of domestic water supply

Most of the residents in Chibwe Township do not have consistent water supply for 24hours. There is erratic supply of water in this township because most of the water pipes leading to the residential area are damaged. On several occasions the pipes leak and cause discontinuous flow of water to the township or water flow at a low pressure. Besides AHC-MMS does not respond within 24 hours unless the fault is every urgent and affect the entire township due to having a skeleton workforce. This is posing a danger to the health of the residents as the houses are flitted with water borne toilets Diarrhoea. This makes the residents to be come more vulnerable to Diarrhoea related diseases such as dysently and cholera could break out if the AHC-MMS does not change its altitude toward matainance work.

6.3 AHC-MMS view over the tariff of domestic water

Any commercial utility company needs money to run its operations effectively and efficiently. It is for this reason that AHC-MMS introduced tariffs for domestic water supply. The tariffs enable the commercial utility company to carry out its operations in the supply of domestic water to the residents in the mine Township. The money collected from water bills is used among other things for acquiring chemicals needed in the treatment of

water, payment of employers and buy new equipments needed in the supply of domestic water to mention just a few. However the tariffs are not adequate as it is just a twenty five thousand kwacha (ZMK25, 000.00) slapped on all the consumers regardless of the consumption. In an ideal situation the company is supposed to realize sixteen million five hundred thousand kwacha (ZMK16 500 000.00) from the 660 households. This is not so as some consumers' default payment of water bills. Out of the money raised from water tariffs, some money goes towards payment of wages other than just the replacement of the infrastructure.

6.4 Revenue collection efficiency from water bills

The commercial utility company AHC-MMS have recorded an increase of thirteen million six hundred and ninety eight thousand Zambia kwacha (ZMK13, 698,000) from the financial year 2001/2 to 2002/3 in its revenue collection (Urban and Peri-urban Water Supply and Sanitation 2002/3).

The major contributing factor to this improvement is the company's methods of revenue collection especially that of payroll and the action that AHC-MMS takes that of disconnection of water supply on those who fail to settle their water bills. The two methods employed have worked very well as the clients strive to pay for fear of being denied water. This has contributed greatly to the consistency of paying the water bills by the customers as well as to revenue collection efficiency.

6.5 Attitudes of residents towards payment of water bills.

The attitude of the of Chibwe Township residents towards payment of water bills is beyond the country 's projected figure of 56%. This is a clear indication that that there is consistency and efficiency in the payment of water bills in this township despite of the fact that the water supply is not consistent. With this situation at hand there is urgent need for the company (AHC-MMS) to improve its operations in addressing the problem of inconsistency or else they risk losing the in flow of money as it is likely to affect the positive altitude Chibwe township residents have toward payment of water bills .If this situation is left unattended to AHC-MMS stand a chance of losing out in that the residents may stop paying water bills thus reducing revenue collection

6.6 Response towards maintenance work

The company needs an urgent improvement in this area if it is to serve its clients effectively. The company's response towards maintenance work is poor and in some instances reported work is not attended for more than six months. As much as the commercial utility company tries to rehabilitate the old infrastructure, they should also consider maintaining the existing one. They should also consider maintaining old infrastructures while pending rehabilitation works. Many clients in Chibwe Township complained that the company is very slow in responding to the reported maintenance work. If the company can provide work force for disconnections, then there is no reason for their non-response towards maintenance work. This situation if left unchecked will lead to AHC-MMS losing huge sums of money in that its customers would default payments of water bills. Therefore, there is an urgent need for AHC-MMS to increase the rate at which it

responds to maintenance repair requests. This can be done either by assigning a larger workforce to maintenance work or increasing the number of staff by recruiting more.

6.7 Criteria used for consumer monthly water bills

The fixed charge criteria used for customer monthly water bills is arrived at in consultation with all the stakeholders that include AHC-MMS, Mine Workers Union of Zambia (MUZ), KCM and representatives from the community. However, whenever, there is an increase the clients question the legitimacy of the representation. There is need for AHC-MMS to inform its clients on how the company comes up with monthly fixed charges for domestic water. Even though the clients have representatives on the Seating committee that looks into the tariff adjustments, many residents of Chibwe Township don't know how the utility company comes up with the monthly bills. This in a way has discouraged its clients to trust the company in its tariff system. Besides the criterion used is not fair both to the residents and the company in that some residents pay more than the amount of water used or less than the value of water used. Through its Customer Relation's Assistants, AHC-MMS should broaden the already existing bridge between its customers and the company. Clients need to be informed in all the channels that are involved in monthly fixed charges. If this is not done, customers will continue to feel neglected in the running of the company. The company should intensify workshops so that they address these issues to their clients. If this is not done, there is fear that customers may stop paying water bills and engage in illegal connections thus revenue could be lot in this way

6.8 Rehabilitation Projects

Many residents of Chibwe Township have welcomed the rehabilitation work of the entire water supply system that the company has embarked on. The rehabilitation work involved the installation of flow meters, replacement of old valves, water pipes and taps. Hence it should speed up the progress for it to continue receiving the support. If this project is completed, many queries that have come up because of dilapidated infrastructures could be avoided. This project will improve the operations of the company on the following aspects:

a) Through the installation of flow meters, customers' costs will be justified as each one will pay according to consumption.

b) Through the installation of computer networks, AHC-MMS shall interact with customers in a unique way creating an improved atmosphere of customer-oriented services, improved internal efficiencies and increased inter-organizational efficiencies as it (AHC-MMS) will keep good track of its clients. Sustainability will be enhanced.

c) Through the replacement of new equipment will improve the consistency of water supply to the residents.

6.9 Challenges that AHC-MMS faced in operating effectively in the supply of domestic water to Chibwe Township

AHC-MMS faces a number of challenges towards its efforts to improve the service to its customers. The major ones are illegal reconnections, vandalism, theft and uneven land surface.

6.9.1 Illegal Reconnection

AHC-MMS is losing millions of kwacha because of connections and reconnections by some customers who default payments of water bills and have their services terminated by the company. Despite of the sensitization through the company 's Customer Relation Assistants the practice has continued. Therefore, the commercial utility company needs to go beyond the customer relation assistants. The solution to this problem should directly involve the customers within the community. This can help out because the task force comprises few people who cannot go round the entire township. People who are involved in this practice leave within the community and can be identified by the community members. Hence the company should come up with incentives that could encourage community members report all those who are involved in this illegal activity. Incentives such as awarding those who report cases of illegal connections could encourage active participation that can enable these cases to be brought under control. If this situation is left the way it is, the company will continue to lose money through this activity.

6.9.2 Vandalism and Theft

The problem of vandalism and theft of essential public infrastructure such water pipes, taps, and valves are retarding the consistency in supply of domestic water. Through these evil practices the company has lost huge sums of money spent on repeatedly buying these parts for replacement. Therefore, AHC-MMS should embark on serious sensitization activities in the community aimed at curbing these vices.

6.9.3 Uneven Land surface

The land surface of Chibwe Township is undulating. This situation has had an effect on the pressure of water in this residential area. Houses situated on the lower surface, especially those on the southern end of Nchanga open pit mine receive high water pressures, while those situated on the northern end receive water at lower pressure and for short periods of time. This has contributed to the inconsistency of water supply. Therefore, there is urgent need for the company to maintain at the same pressure to enable even distribution of water to all the houses in Chibwe Township. AHC-MMS needs a booster pump to the benefit of those households on the upland.

CHAPTER SEVEN

CONCLUSIONS AND RECOMMENDATIONS

7.0 Introduction

This chapter discusses the conclusions of the major findings of the research and the Recommendations on how best the commercial utility company AHC-MMS can serve its customers in Chibwe Township.

7.1 Conclusion

The effectiveness of AHC-MMS in its quest to serve the residents of Chibwe Township in the provision of domestic water lies on the successful completion of the on-going rehabilitation work that the commercial utility company has embarked on. Once the project is completed, there would be improvements in the consistency of domestic water supply, revenue collection efficiency, and response to maintenance work. Consistency would improve in that break down that come about as a result of worn out pipes, valves and taps could be avoided. The 75% revenue collection efficiency that was recorded by company could improve further in that once flow meters are installed residents would be charge accordingly and queries that come about as a result of the criteria used could be the thing of the past. Response to maintenance work, which was very poor at the time of the study, would improve in that most of the old equipments used in the supply of water could be replaced. Thus few breaks down would come by. The

rehabilitation works of the water treatment plant, replacement of new pipes, taps, valves and the installation of flow meters, which was initiated by the company, would greatly improve its operations. Inconsistency of water supply that the residents of Chibwe Township are facing could be avoided once the rehabilitation work is successfully completed. However, there is an urgent need for AHC-MMS to speed up the process of rehabilitation to the benefit of both the company and the residents. On the attitude of Chibwe residents towards payments of water bills and the criteria used in coming up with the monthly fixed charges, the company should explain to its customers in order to win their confidence. This can be done through intensification of the already existing sensitization programs such as workshops, seminars and, group discussion meetings. Sensitization programs should also be used to educate AHC-MMS customers on the importance of paying water bills and the disadvantages of involving themselves in illegal activities such as theft, vandalism and illegal water service reconnections.

7.1 Recommendations

In view of the major findings of the research, the following recommendations are made

a) Community participation

AHC-MMS should encourage community participation in its activities to enable community members to feel that they are the major stakeholders, as this would help boost efficiency and co-operation. If this is achieved, ignorance that comes

about because of non-participation of community members could be avoided and improve the operations of the service providers.

b) Provision of information

AHC-MMS should provide reliable, up to date and accurate information by using educational awareness and sensitization programs such as seminars, workshops, and focus group discussions with community members.

c) Staff efficiencies

The commercial utility company should increase the number of employees assigned to Maintenance Work Section to enable quick responses to reported repair works.

d) Illegal Practices

AHC-MMS should reinforce the already existing taskforce by involving community members to act as watch groups to curb illegal reconnections, vandalism, and theft

e) Rehabilitation Works

AHC-MMS should speed up the project works rehabilitation project to avoid loss of revenue that comes about as a result of loss of water from broken pipes, valves and tap.

REFERENCES

- Bennete .E. (1998). Services (water and waste) PPPU Background paper.
UNDP/YALE.
- Brook.C.P. (1999) Lessons from the Guinea water lease in Private Sector.
Washington. D.C. The World Bank.
- Chanda. O.M. Urban and Peri-Urban Water Supply and Sanitation Sector
Report 2001/2002.
- Chanda. O.M. Urban and Peri-Urban Water Supply and Sanitation Sector
Report 2002/2003.
- Chibwe .A., Kambole M. and Nyambe I.A (2000) Water Demand
Management in Zambia: Towards promotion and adoption. Final Draft
Report
- Classon L.S. (1995) Private sector participation in municipal solid waste
services in developing countries. urban management programme discussion
paper. Washington D.C.: World Bank.
- Central Statistic Office (2000) Census of Population and Housing. Top desk
publishing, Lusaka.
- Hart.C. (2001) Mixed Capital Public-Private Partnership conditions for
success. YALE/UNDP
- James.S. (1998) Creative Inter-Sectoral Partnering in Developing countries.
YALE/UNDP PPP.
- Mikunga. G.S. (2003) Customers Information Newsletter. Public Relations
Department, AHS-MMS Limited Head Office, Kitwe.
- Moyo.S.and Nyoni .M. (2001) Global water partnership Southern Africa.
Integrated water resource management (IWRM). Harare, Zimbabwe.

Muchimba.P. (2000) Activities in integrated water resource management (IWRM). Unpublished document.

Parker. J.S. (1995) Water and sanitation for all: A World priority.
Internation water sanitation center (IRC). The Hague, The Netherlands.

Pottinger. A. (2001), Prospects for Climate Change in P.E Wagoner ed,
Climate Change and U.S Water Resource, John Wiley, New York. 1990 pp.
41-73.

Website,<http://www.zambia.water.org/information>.

World Bank, (1994) Partipation Source Book IRBD Washington. D.C.

World bank (1997) Toolkits for Private Sector Participation IRBD
Washington. D.C.

APPENDIX 1

THE UNIVERSITY OF ZAMBIA

SCHOOL OF NATURAL SCIENCES

DEPARTMENT OF GEOGRAPHY

QUESTIONNAIRE TO ACCESS INFORMATION ON THE EFFECTIVENESS OF
AHC-MMS ON THE PROVISION OF DOMESTIC WATER SUPPLY TO CHIBWE
TOWNSHIP IN CHINGOLA

Dear Respondent,

I am a four-year student of the university of Zambia, carrying out a research on the topic mentioned above. You have been randomly selected to be part of my sample. This questionnaire is intended to gather Chibwe townships' views on the topic above. This research is purely academic; therefore feel free to answer all the questions given without prejudice. I would like to assure you that all your response would be treated with strictest confidence. Your cooperation will be highly appreciated

INSTRUCTIONS

PLEASE TICK the appropriate response in the space () provided or fill in the blanks()

SECTION A

for
official
use only

Background Information

1. Age _____ Years (e.g. 20, 23, etc) ()
2. What is your sex?
Male () Female () ()
3. What is your marital status?
Married () Divorced () ()
Widowed () Not Married ()
Separated ()
4. What highest level of education have you attended?
None () Primary () ()
Secondary () College/University ()
5. Are you currently in employment?
Yes () No () ()
6. If the answer to question 5 is yes, which organization do you work for?

()

SECTION B

7. Which company is responsible for the provision of water in Chibwe?

()
8. When did this company start the provision of water in your area?

()
9. What do you think could be the reason why this company is providing water in your area?

()
10. Does the company provide water for 24 hours a day?
Yes () No () ()
11. If the answer to question 10 is No, for how many hours a day does the company provide water supply?

()

12. Does the company repair broken pipes within 24 hours after they have been reported?
Yes () No () for
official
Use only
()
13. If the answer to question 12 is No, how many hours does it take the company to repair the broken pipes and taps?
----- ()

SECTION C

14. Has the company introduced any changes in the provision of water supply in your area?
Yes () No () ()
15. If the answer to question 14 is yes, briefly state the changes.
----- ()

16. If the answer to question 14 is yes, have these changes improved the Provision of water supply?
Yes () No () ()
17. If the answer to question 16 is yes, what improvements have the changes Brought? Explain briefly.
----- ()

SECTION D

18. Does the company charge you for the provision of water?
Yes () No () ()
19. If it does, how much is the charge on monthly basis?
----- ()
20. Do you always pay your water bills on time?
Yes () No () ()

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21. If the answer to question 20 is No, explain why.
----- ()

22. What action does the company take against those who default payment of the bills?
----- ()

23. If there is any water problem, is it easy to approach your service provider.
Yes () No () ()

24. How quick do they respond to your problem?
Fast () Very fast () ()
Slow () Very Slow ()

25. Are you happy with the service provided by this public private company?
Yes () No () ()

26. If the answer to question 25 is no, what do you feel should be done by your service providers to help improve their service?
----- ()

27. Which system of water provision is better; that of ZCCM or that of the new public private company?
ZCCM () Public private Company () ()

28. Briefly explain why the answer you have given in question 27 is better than the other.
----- ()

Thank you for your time.

Appendix 2

Non scheduled interviews with AHC Management

1. How effective is AHC-MMS in the provision of domestic water supply to Chibwe Township?
2. How many hours does your company provide domestic water supply to Chibwe Township?
3. Is your company financially viable? If so what are the sources of funds?
4. When did you start providing your services to your customers?
5. Has your company made any changes in the provision of water in the former ZCCM residential areas? If so what are these changes?
6. How have your clients responded to the-changes that you have introduced?
7. What could be the reasons for the answers in question 6?
8. Have you ever been approached by your clients to launch their complaints? If so how frequent and how have you responded to these complaints?
9. What criteria do you use to charge monthly water bills?
10. How have your clients responded to the billing system?
11. What action does the company take to those who default payment of water bills?
12. Do you have any representatives from the community in your meetings? If so, how many?
13. How frequently do you receive complaints from your clients over the breakage of water pipes and taps?
14. How have you responded to the complaints from clients?

15. What are your futures plans regarding your company in the provision of water and sanitation?