

**DETERMINANTS OF WATER AND SANITATION SERVICES IN KILIFI  
COUNTY, KENYA**

**BY:**

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## DECLARATION

### Declaration by the Student

I declare that this research project report is my original work and that it has not been presented in any other university or institution for academic credit.

Signature.....

Date.....

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**L50/82712/2012**

### Declaration by the Supervisor

This research project report has been submitted for examination with my approval as the University supervisor.

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## **DEDICATION**

This study is dedicated to my family and parents and workmates for their support and encouragement through the study.

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## LIST OF ABBREVIATIONS AND ACRONYMS

<b>AfDB</b>	African Development Bank
<b>AMCOW</b>	African Ministers Council on Water
<b>CBO:</b>	Community-Based Organization
<b>GAWASCO</b>	Garissa Water and Sewerage Company Ltd
<b>MAWASCO</b>	Malindi Water and Sewerage Company
<b>KIWASCO</b>	Kisumu Water and Sewerage Company
<b>GoK</b>	Government of Kenya
<b>IWM:</b>	Integrated Water Management
<b>KIHBS</b>	Kenya Integrated Household Budget Survey
<b>MoPHS</b>	Ministry of Public Health and Sanitation
<b>MDGs</b>	Millennium Development Goals
<b>MWI</b>	Ministry of Water and Irrigation
<b>NGO</b>	Non-Governmental organization
<b>NWC&amp;PC</b>	National Water Conservation and Pipeline Corporation
<b>NRW</b>	Non Revenue Water
<b>NWSB</b>	Northern Water Services Boards
<b>SIDA</b>	Swedish International Development Cooperation Agency
<b>SIM</b>	Sector Investment Model
<b>SIP</b>	Sector Investment Plan

<b>SWAp</b>	Sector Wide Approach
<b>UFW</b>	Unaccounted for water
<b>UNICEF</b>	United Nations Children’s Fund
<b>USH</b>	Urban sanitation and hygiene
<b>WARIS</b>	Water Regulatory Information System
<b>WASH</b>	Water, Sanitation and Hygiene
<b>WASREB</b>	Water Services Regulatory Board
<b>WHO</b>	World Health Organization
<b>WSB</b>	Water Services Board
<b>WSPs</b>	Water Services Providers
<b>WSTF</b>	Water Services Trust Fund
<b>LCDs</b>	Less Developed Countries
<b>OVCs</b>	Orphans and Vulnerable Children
<b>SIP</b>	Systems Investment Plan
<b>WSS</b>	Water and Sanitation Services
<b>TISDA</b>	Transparency and Integrity Service Delivery in Africa
<b>NWP</b>	National Water Policy
<b>PPP</b>	Private, Public partnership
<b>WASSIP</b>	Water and Sanitation Improvement Program

## **ABSTRACT**

The study investigated the factors influencing water and sanitation services provision in Kilifi County, Kenya. The purpose of this study was to carefully investigate the underlying factors that influence water and sanitation services provision in Kilifi County. The objectives of the study included: To examine the influence of infrastructure in the provision of water and sanitation services in Kilifi County, To find out the extent to which financial resources influence the provision of water and sanitation services in Kilifi County, To examine the extent to which poor urban planning and development strategies influence the provision of water and sanitation services in Kilifi County, and, To establish the extent to which low rate of returns on investments influence the provision of water and sanitation services in Kilifi County, Kenya.. The research design used was descriptive analysis. There were different sampling techniques used for the study due to the nature of the population studied and they include; cluster, random and purposive sampling. The study targeted all the resident of Kilifi County but five divisions were chosen by use of cluster sampling technique. To achieve the objectives, the study used primary data in the form of questionnaires, and secondary data from literatures, articles, books and internet sources. The data was primarily quantitative and therefore descriptive analysis was used.

## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background of the Study

Water and sanitation services form a vital part of human life. Water is among the key sectors emphasized under the social pillar of the Kenya's vision 2030 goals and forms part of the millennium development goals. MDGs, (2009). Estimates by the World Health Organisation indicate that only 59% of the world's population has access to adequate water and sanitation systems. WHO, (2010). A report by the WHO (2006), stated further that , in 2004, only 16% of people in the sub-Saharan Africa had access to drinking water through household connection ( an indoor tap or a yard tap) compared to 66% in the USA.

Looking at international statistics it becomes obvious, that most people without access to WSS live in developing countries and the burden falls especially on low-income households UN, (2010). However, UN-Habitat suggests that even more people in developing countries lack access to WSS than those captured by statistics WHO, (2003). There has been a global crisis in the provision of proper clean water and adequate sanitation due to the ever increasing world population, climate change and rural-urban migration UN-Habitat, (2009). However, checks and balances have been enhanced in developed countries that have seen their provision of water and sanitation services to the citizens be achieved at above 60%. A good example is that given by The Dutch community and government whereby, the Dutch have universal access to water supply and sanitation at very good quality, and enjoys a drinking water network which is in good shape ,with treated water that typically does not need further disinfection (chlorination) to prevent recontamination in the network. World Bank Report, (2010). 60% of Dutch drinking

water comes from groundwater, and the remaining 40% comes from surface water that is normally harvested during rainy seasons using modern technology and stored in modern tanks that can store clean water for up to 60 months.

Unlike in developing countries and LDCs where the dependence on urban water comes from municipal councils/governments, the average municipal water use in developed countries is among the lowest. In Dutch for example, a report done by the UNEP (2009) shows that only 98 litre/capita/day could be supplied by the municipal's networks in 2004. Some major challenges associated with the low use of municipal supplied water and services include those from the frequent unpredictability of the services offered by the councils, not limited to, water rationing, failure to cover some regions due to nature of the terrain, poor technology and poor management practices. UNEP, (2009). Therefore, 96% of water users are metered and a portion of their bill typically about one half is based on actual consumption. Responsibilities in the Dutch drinking water and sanitation sector are spread over a number of institutions at different levels of regional aggregation and with specific functions. At the national level, two Ministries share responsibility for the sector, and there is no autonomous regulatory agency as it is the case in England, states of the US or Portugal. GoK Report, (2012).

The World Bank report on Environmental Assessment (2012) shows that, in 1945 the Dutch water sector was highly fragmented with more than 200 water companies. Their number gradually declined to 10 five decades later in charge of drinking water supply and 27 water boards, which are in charge of wastewater treatment, among other tasks. At the local level, municipalities take charge of sewerage. One reason for the decline in numbers was the transition from groundwater to surface water as the government encouraged the use of surface water by

charging the groundwater abstraction levy, and the need to construct capital-intensive and relatively complex treatment plants which required the cooperation of many municipalities. Another reason was that the national government encouraged the creation of larger public limited companies through a law enacted in 1975. However, since the 1990s, consolidation has not been driven by the government, but rather by a desire of the water companies themselves to reach economies of scale and to be "competitive" in a more liberalized European market. An interesting and striking feature of the Dutch water sector is a performance benchmarking system for water companies first introduced in 1997, which has inspired similar efforts in other European countries. The Dutch parliament passed a law in 2004 banning private sector provision of water supply. However, while the water companies themselves remain publicly owned, they contract many services such as customer service and repairs out to the private sector. GoK Report, (2012).

The legal framework of the Dutch water sector is structurally organized in such a manner that it consists of the Water Supply Act of 2005 and a corresponding Decree on Water Supply, as well as the Water Boards Act of 1995. Within the government, two Ministries share responsibility for the sector. The ministry of Housing, Spatial Planning and Environment which is in charge of water supply and regulates public health and the Ministry of Transport, public Works and Water Management in charge of water resources management. Its Directorate-General for Public Works and Water Management is in charge of water resources policy and managing surface water, in cooperation with the Water Boards. The Ministry's Inspectorate for Transport, Public Works and Water Management is in charge of monitoring compliance with regulations. WHO, 2010; UNICEF, (2011). However, the achievements of water and sanitation provision has not been so

easy due to various constrains. For example, in the year 2011/12, the Dutch government was challenged by the natural calamities that came due to the result of too much precipitation. This was in the form of rainfall that was accompanied by hailstones/snow frost that made most of the water and sewage disposal pipes burst, too much flooding that broke/exposed the underground pipes/destroyed the laid down water enabling infrastructure like tanks and water reservoirs, the global economic crisis hit the bodies in charge of water and sanitation services provision; lowering their productivity and consequently lowering their rates of return accompanied by financial constrains, affected urban structures and settlement plans; as settlement tended to avoid the calamities prone area among others. These are some of the factors that forced the Dutch government and the WSS bodies to come up with structural practical plans that aimed at providing water and sanitation at the highest percentage level to all the urban and the upcountry dwellers. HABITAT, (2009); Bechky, B.A., (2010).

A report by the Global Water Supply and Sanitation Assessment (2000) highlighted the huge challenges faced in meeting the need for safe water supply and adequate sanitation services worldwide. According to the report, the percentage of people served with improved water supply in the years 1990 to 2000 rose from 79% (4.1 billion) to 82% (4.9 billion). Over the same period the proportion of the world's population with access to sanitation facilities increased from 55% (2.9 billion people served) to 60% (3.6 billion). At the beginning of 2000 one-sixth (1.1 billion people) of the world's population was without access to improved water supply and two-fifths (2.4 billion People) lacked access to improved sanitation. The majority of these people live in Asia and Africa, where less than one-half of all Asians have access to improved sanitation and two out of five Africans lack improved water supply. Moreover, rural services still lag far behind



urban services. Sanitation coverage in rural areas, for example, is less than half that in urban settings, even though 80% of those lacking adequate sanitation (2 billion people) live in rural areas, some 1.3 billion in China, India and South Africa alone. UNDF, (2013).

In Africa, South Africa is one of the few countries in the world that enshrines the basic right to sufficient water in its Constitution, stating that "Everyone has the right to have access to sufficient water". UNICEF, (2010). However, much remains to be done to fulfill that right. After the end of Apartheid in the year 1994, South Africa's newly elected government inherited huge services backlogs with respect to access to water supply and sanitation from the whites and Asian colonialists. Gutierrez, E., (2009). It is estimated that about 15 million people were without safe water supply and over 20 million without adequate sanitation services in 1990. These figures were even greater in the slums of Soweto where the population is great with very poor settlement planning owing to the fact that the region is a slum. However, the share of the population with access to an improved water source increased from 83% in 1990 to 91% in 2010 meaning that almost 15 million people gained access during that period. With respect to sanitation, progress has been slower. According to estimates by the WHO/UNICEF global Joint Monitoring Programme for Water Supply and Sanitation based on survey and census data, the share of South Africans with access to improved sanitation increased slowly from 71% in 1990 to 75% in 2000 and 79% in 2010. In 2010, an estimated 11 million South Africans still did not have access to improved sanitation. De Waal D., (2004-2010).

There are three bodies that perform different functions in the provision of clean water and better sanitation services in South Africa, that is;

- i. The national government, represented by the Department of Water Affairs (DWA), as a policy setter,
- ii. The Water Boards, which provide primarily bulk water, but also some retail services and operate some wastewater treatment plants, in addition to playing a role in water resources management, The Municipalities, which provide most retail services and also own some of the bulk supply infrastructure, and, Banks, the professional association WISA, the Water Research Commission and Civil society who also are important stakeholders in the sector. Mehta M. and Fugelsnes T. (2010).

Despite the fact that these bodies have constantly struggled to better the provision of WSS to the people, there are still giant problems that hinder their operations. In Soweto for example, 79% of the population lack clean water, proper sanitation/sewage disposal and other related services due to the high population, poor infrastructure like electricity construction and roads, poor urban settlements-Soweto being a slum and poor financial allocations by the central government towards the bodies in charge of WSS in the area.

These are among the many factors that have forced the south Africans live in dire need of clean water and sanitation despite the endless promises by the Mbeki and Zuma governments that have always claimed to have water as universal right to every citizen. UN, (2010).

As much as the South African government has ever self claimed to have a strong water industry with a track record in innovation and enjoys higher levels of water and sanitation services, the sector is still characterized by both achievements and challenges. Significant problems remain concerning the financial sustainability of service providers, leading to a lack of attention to maintenance. The uncertainty about the government's ability to sustain funding levels in the

sector is also a concern. Two distinctive features of the South African water sector are the policy of free basic water and the existence of water boards, which are bulk water supply agencies that operate pipelines and sell water from reservoirs to municipalities. Public access to water and sanitation services, is through payment of a fee which is guided by a legally established tariff structure, a problem of levy to the otherwise suffering citizens. However, the government of South Africa in 2001 introduced a policy to address the issue of equal basic water services to both the poor and the rich. Free basic water became a national policy through a revised tariff structure that included at least 6m<sup>3</sup>(cubic meters) of free water per month (40 litres/capita/day for a family of five or 25 litres/capita/day for a family of eight). The policy was being implemented gradually within the means of each municipality; a factor so far seen as a dream for the future generations at the expense of the suffering current citizens. Nyirenda, N., (2009); ODI, (2010).

For a long time, most of the East African states-Kenya included have had frequent cholera outbreak and other water borne diseases due to the poor sanitation and water provision services by the states. In Uganda for example, in 2011 alone, 45% of the patients who reported to clinics, health centres and national hospitals were suffering from water borne related diseases. The reports by WHO (2012) shows that during this year, the northern parts of Uganda reported about 57% of its deaths as a result of water relate problems. Major challenges quoted by the UNICEF report (2013) that have contributed to this include: Most of the northern parts of Uganda are semi-arid making it difficult for WSS infrastructure lay down a problem, The frequent long dry spells makes it difficult to access both underground water and surface water, The El-nino menace and frequent floods during rainy seasons break the pipes, roads and electrical poles making water pumping and navigation impossible, The poor farming practices of the Karamajong people like

overstocking/overgrazing makes soil loose thus easily carried down during the rainy seasons; silting the dams and lowering their storage capacities. Lack of sufficient funds to provide WSS to the people due to constrained national budget ,and, Low rates of returns due to the fact that the Karamajong people are nomad pastoralists who keep on moving from place to place. Poor urban planning in Uganda has given birth to a series of slums with poor settlements structures; making accessibility to interior parts a problem. This has made it difficult for the Ministry of Water and Sanitation to give piped water/lay proper WSS infrastructure leaving people with no option but to depend on un-protected boreholes that have contaminated water/water carried by donkeys and other local vender on Hand cats, poor sewage disposal leading to regular outbreak of diseases like cholera among other health related issues.

Kenya for a long time has experienced serious water scarcity thus the need to properly conserve and manage the few water towers available. According to the report published by the Government of the Republic of Kenya GoK, (2010), the GoK is charged with the mandate of implementing the Water Act 2002. The Water Act of 2002 focuses on the water resource, user's rights and how they have been mainstreamed in its National Water Policy (NWP) to envisage 100% access to safe water for the country's population by 2030. To achieve this target, the GoK has been implementing a far reaching sector reform program since 2002 aimed at harmonising the management of water resources and water supply and sanitation (WSS) throughout the country. This reform has been propelled by the Water Act (2002) which aims at harmonising the management of water resources and water supply and sanitation services. With the Constitution of Kenya 2010 and the Vision 2030 having kicked off, the National Water Policy needs to be aligned. The Policy's major aim should be at moving the sector to the next level of development

in order to contribute to the national goals. As stated in the WSSP 2010 – 2015, the critical role of water for national development cannot be over emphasized. Orgut, (2009).

According to the statement given by Hon. Charity Ngilu while serving as the Minister for Water in 2009, the country has only five water towers which are faced with severe degradation due to anthropogenic activities. Without their protection and conservation the ecosystem services and water security in the country would worsen having a negative effect on the economic development of Kenya and the living conditions of its population. The minister in a statement indicated that the urban slums like Korogocho, Kibira, Mathare phase 1 & 2, Mkuru kwa Njenga, Kianduti, Kisumu Ndogo in Mombasa, Nyamasaria slums in Kisumu among others faced 88% water shortage while sanitation was at a critical and questionable state. GoK, (2009). A joint study done by Water and Sanitation program and the UNICEF in 2011 found out that access to improved water supply in urban areas has dropped over the review period against a background of rapid urban growth, the trend of decline is from 91 percent in 1990 to 83 percent in 2008, while the definition of coverage, is below even this, at 59 percent .However, reaching the SIP target of 80 percent as outlined by Vision 2030 seems a distant prospect but both the 2009 Housing and Population Census and sector data from service providers reported by the regulator WASREB indicate that this negative long term trend may be reversed. WASREB, (2010).

According to the World Bank (2012), Kenya has almost forgotten its rural poor in terms of WSS provision and has concentrated on a few citizens living in big towns like Kisumu, Nakuru, Embu, Nairobi, and Mombasa among others. This has left the rural poor with 80% lack of proper WSS. In Kilifi, Kwale and Garissa for example, up to 89% of the local population has neither access to clean drinking water nor pit latrines. This has led to the frequent outbreaks of cholera, typhoid,

and dysentery among others in these areas. WHO, (2012). The major challenges cited by the GoK that have contributed to this include; Poor infrastructural development in these areas, Lack of financial resources due to the strained national budget, Low rates of returns to the government and other bodies in charge of WSS provision, Poor/un-coordinated physical planning making investments difficult. The report indicated that in places where water infrastructure is available, most of the times the taps went dry, some experienced low flow pressures, while others were totally vandalized by people who sell them as scrap metals. Waste management in areas around Kwale and Kilifi was cited to be at 32%; with almost 55% waste disposal ending up in few rivers since most people lacked just ordinary pit latrines, a case equated to that in the slums where people use flying toilets. UN., (2009), CBK., (2009).

## **1.2 Statement of the Problem**

One of the millennium development goals has been increasing accessibility to clean, safe and affordable water as well as providing proper and efficient sanitation services to all people in the world. Estimates by the World Health Organisation (WHO) indicate that only 59% of the world's population has access to adequate water and sanitation systems. Water being a vital commodity as well as an economic good, most nations in the world have taken up the responsibility of water and sanitation provision as one of its main government agenda. WHO, (2010); MDGs, (2012).

In Kenya, the government has always had a whole ministry in charge of water affairs ranging from protection of the few water towers, development of infrastructure to water and sanitation services provision. To help in service provision, the ministry of water formed several units in 1990s, one being the National Water Conservation and Pipeline Co-operation (NWC&PC) which had the mandate of development of water and sanitation infrastructure as well as provision of

water and sanitation services to the public in the whole country. This set up had several challenges in the management of services as it was more centralized and faced too much bureaucratic process in addressing significant issues of concern thus compromised on the service levels. This remained so until the year 1999, when the government reviewed its National Water Policy which subsequently gave birth to the Water Act 2002. MWI, (2009)

According to the Water Services Trust Fund (2009) report, the NWP (1999) and Water Act (2002), created a new institutional framework with several units which shared the responsibilities which were formally handled by NWC&PC and more so, the function of water and sanitation provision was decentralized to regional level. The water sector reforms created improved services for urban water supply through the establishment of commercial oriented WSPs, MAWASCO being one of them and regulation for consumer protection (socially responsible commercialization). However, although the sub-sector has recorded notable progress in the improved performance in urban service providers and increase of access for the poor, the WSPs still face some significant challenges in executing their mandates. According to the WASREB impact report (2012), MAWASCO for example still faces some challenges in its efforts to attain its performance targets which include raising its current water supply coverage of about 60% to 100%, the poor sanitation coverage of 20% to at least 70%, reduce its NRW from 30% to 25% and increase its hours of services from 20 hours to 24 hours.

Recent studies by USAID (2012), World Vision (2011) have shown that there are several factors which have led to poor performance in the WSS sector in Kenya. Studies carried out in 3 slums in major cities in Kenya (Kibira, Kondere and Kisumu-ndogo) and in areas with many OVC regions like Kisumu, Garissa, Kwale, Kilifi and Kangundo indicated that 70% of the population

has no direct access to clean water, proper sanitation and recommended waste disposal mechanisms. This was due to several challenges experienced by most WSPs in executing their mandates and they include the following; Lack of adequate infrastructure for service provision, Lack of adequate finances for capital projects investments to provide the WSS, Poor and un-coordinated urban planning and development strategies, High costs of operation and maintenance, and, Low rate of returns to investments Brautigam, D. (2009).

Due to this insurgence of problems and effects associated with water and sanitation projects in the country, the research intends to investigate the factors affecting water and sanitation services in Kenya, while focussing on the case of Malindi water and sewerage company in Kilifi county.

### **1.3 Purpose of the Study**

The main purpose of this study was to examine the factors affecting water and sanitation services in Kilifi County, Kenya, while focussing on Malindi Water and Sewerage Company.

### **1.4 Objectives of the Study**

The specific objectives included;

1. To examine the influence of infrastructure in the provision of water and sanitation services in Kilifi County.
2. To find out the extent to which financial resources influence the provision of water and sanitation services in Kilifi County.
3. To examine the extent to which urban planning and development strategies influence the provision of water and sanitation services in Kilifi County.
4. To establish the extent to which rate of returns on investments influence the provision of water and sanitation services in Kilifi County.



### **1.5 Research Questions**

The study was guided by the following research questions:

1. To what extent does Infrastructure influence the provision of water and sanitation services in Kilifi County?
2. To what extent do financial resources influence the provision of water and sanitation services in Kilifi County?
3. To what extent does urban planning and development strategies influence the provision of water and sanitation services in Kilifi County?
4. To what extent does Rate of returns on investments influence the provision of water and sanitation services in Kilifi County?

### **1.6 Research Hypothesis**

The study was guided by the following research hypothesis:

1. Infrastructure has a significant influence in the provision of water and sanitation services in Kilifi County.
2. Financial resources have a significant influence the provision of water and sanitation services in Kilifi County.
3. Urban planning and development strategies play a significant role the provision of water and sanitation services in Kilifi County.
4. Rate of returns on investments have a significant influence in the provision of water and sanitation services in Kilifi County.

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

The population census of 2009 showed that Kenyan population increased from about 38million to about 41million between 1999 and 2009. GoK, (2011).The strain on natural resource and water catchment areas like Mau forest was the order of the day during this period. This was accompanied by severe droughts in 2011/2012, deadly floods and other natural calamities that not only destroyed water tanks/reservoirs, destroyed infrastructure and even led to the breakage of sewage pipes-spreading diseases like cholera and dysentery. MoH, (2012).This research seek to investigate how these factors like infrastructure influence the provision of water and sanitation services in the country.

As a matter of fact, almost all WSPs country wide experience and share a common number of challenges in executing their mandate of water and sanitation services provision in their areas of jurisdiction. However, nothing much in form of studies has been done to identify and come up with standard procedures on how to address these challenges which have continued affecting the performance of these entities. Therefore, this study was of great importance not only to the WSPs but also to the national government as it provides information which would help in future on national policy formulation and any other reviews on legislation of the water sector. The findings provided the management and leadership of MAWASCO with information to help in decision making as well as help them appreciate the importance of focusing specific action plans on the identified factors as an effort to address their effects. This helped in improving the WSP's efficiency on water and sanitation service delivery, boost its customer satisfaction levels and improve on its overall performance. Other Water Services Providers will have a strong background based on the findings to measure their performance and factors that affect their water and sanitation services provision.

## **1.8 Basic Assumptions of the Research**

This study presumed that infrastructure played a central role in influencing the extent to which the provision of water and sanitation services was implemented in Kilifi County. It further presupposed that due to the decrease in financial resources allocation to water and sanitation services providers, the implementation of WSS in Kilifi County had been inefficient and non-effective. These WSS providers need proper management, reasonable rates of returns on their investments and proper planning both at the urban and rural areas for easy and efficient operations.

## **1.9 Limitations of the Study**

The study was limited by time due to the working hours in the work place and the distance factor to the various areas that were to be visited and that distance of linkage with the supervisor. However this was overcome by creating time during the weekends, evenings and at times travelling the long distance during lunch breaks to link with the supervisor and at times for information from the respondents. The recent security situation in Mombasa County and her environs was another limitation. Extracting information from some employees of Malindi Water and Sewerage Company was a major expected challenge; owing to fact that most of them are employed on contract and fear giving information freely as this could be in breach on contractual terms. The problems was addressed by the researcher linking directly with the permanent employees of the company and also having formal request from the University which clearly indicates the purposes of the study. In the case of data collection from the field involving the locals who rarely use English, a translator was used.

## **1.10 Delimitation of the Study**

The study delimited itself by concentrating on the factors affecting water and sanitation services in Kilifi County. The geographical scope was limited to selected areas covered by the Malindi Water and Sewerage Company in Malindi area of Kilifi County. The research targeted the management team of MAWASCO who are directly involved in the day to day services of the company, the staff working in this WSS providers and direct recipients of the services offered by the company.

The researcher used a consent form seeking the acceptance or rejection of the respondents to participate in the study and this assured the respondents of their voluntarism in participation in the research. The researcher was set to interview by administering questionnaires to the managers of MAWASCO, its senior officers with knowledge on the day to day operations of the company and this was to improve the integrity of the research in terms of quality. The researcher administered both questionnaire and key informant guide to the respondents in order to obtain both quantitative and qualitative information and this was to improve the research findings in terms of quality.

### **1.11 Definitions of significant Terms**

**Sanitation** Is the hygienic means of promoting health through prevention of human contact with the hazards of wastes as well as the treatment and proper disposal of sewerage wastewater. Hazards can be either physical, microbiological, biological or chemical agents of disease. Wastes that can cause health problems include human and animal feces, solid wastes, domestic wastewater (sewage, sludge, grey water), industrial wastes and

agricultural wastes. Hygienic means of prevention can be by using engineering solutions (e.g. sewage and wastewater treatment), simple technologies (e.g. latrines, septic tanks), or even by personal hygiene practices (e.g. simple hand washing with soap). (WHO, 2010).

**A Service** A set of actions or solutions that are put in place or are performed to provide a repeatable and consistent set of outcomes, deliverables, and performance for people, organizations, and systems that represent consumers or beneficiaries of such results. For example, providing clean water to the citizens is a form of a service. (Oxford Dictionary, 2013).

**Rate of Return** A profit on an investment over a period of time, expressed as a proportion of the original investment. The time period is typically a year, in which case the rate of return is referred to as *annual return*. Returns, and rate of return, are commonly presented as a percentage. (UN, 2010).

**Financial Resources** The money available to a business for spending in the form of cash, liquid securities and credit lines. Before going into business, an entrepreneur needs to secure sufficient financial resources in order to be able to operate efficiently and sufficiently well to promote success.

### **1.12 Organization of the Study**

This research proposal is organized in three chapters. Chapter one is the introduction which includes the background of the study, statement of the problem, purpose of the study, objectives of the study, research questions, statement of the problem, purpose of the study, objectives of the

study, research questions, research hypothesis, significance of the study, delimitations of the study, basic assumptions and the definition of significant terms. Chapter two of the study consists of the literature review with information from other articles which are relevant to the researcher. Chapter three entails the methodology to be used in the research.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This section summarized the literature that was already in existence regarding factors affecting water and sanitation services in Kenya and their relationship. It presented an overview of previous work on related topics that provide the necessary background for the purpose of this research.

#### **2.2 The Influence of Infrastructure in the Provision of Water and Sanitation Services**

A report published by the UN and UNICEF on the rate of sanitation, water provision and the health situation of the people of India in 2012 highlighted some pertinent issues that had to be looked into for general good of all the citizens in relation to water provision, sanitation and solid/liquid waste management. Among the major cited issue in the provision of water and sanitation services was the infrastructure. UNICEF, (2013). Infrastructure in India was found to be a problem in providing water and sanitation services to its population that had grown into millions of people by the year 2000. According to the report published by the WHO (2009) about the state of health and sanitation in the country, infrastructure was rated as the major determinant of sanitation, waste management and water services provision to the people of India. The infrastructure here included electricity, passable ways like roads and hard infrastructure like water tanks, reservoirs, dams, built waste pit disposals among others. UN, (2009).

The UNICEF, UN and WHO wrote a report that touched on major Asian countries like Sri Lanka, Bangladesh, Malaysia and others in 2008 on the state of water and sanitation services in

reference to the MDGs. According to UNICEF (2010), The Millennium Declaration and the Millennium Development Goals (MDG), that have raised an international commitment to reduce poverty over the next decade, also highlight upon the aspects of safe drinking water supply and improved sanitation were the major areas of concern as per the population influx that was being experienced in these Asian countries in relation to the new millennium. The Target 10 of MDG 7 specifically calls for reducing by half the proportion of people without access to safe drinking water and improved sanitation by 2015. To meet the MDG drinking water target, another 1.1 billion need to gain access to safe drinking water from 2005 to 2015, and 1.6 billion need to gain access to improved sources of sanitation meet the sanitation targets. The Joint Monitoring Programme (JMP) of Water and Sanitation by WHO/UNICEF estimates that it will require roughly a doubling of efforts of the past 15 years to reach the MDG sanitation target, and one-third increase in efforts to meet the MDG drinking water targets, which corresponds to providing improved sanitation services to an additional 45 thousand people a day, and safe drinking water services to an additional 300 thousand people a day from 2005 to 2015. WHO/UNICEF, (2006). Achieving the target would not only require building the infrastructure for people without access, but it would also require action to prevent existing and future infrastructure from falling into disrepair as a result of inadequate institutional arrangements, insufficient cost-recovery, poor operation and maintenance and sound management practices. In other words, it requires accelerating the whole cycle of service delivery, comprising policy-making, mobilisation of resources, planning and design, construction, operation and maintenance, with a focus on poor and underserved people. IEG, (2010).



Provision of safe water supply and improved sanitation to the rural areas has formed a major challenge to the national governments in the world and more particularly in the developing areas. Most of these developing countries are those found in Africa and the sub-Saharan Africa in particular whereby infrastructure is poor, to some countries lacking due to destruction of major infrastructural facilities as a result of civil wars, natural calamities like floods among others. WSP, (2011). A report by the USAID (2010) shows that with the exemption of only five African countries that are in line with the Target 10 of MDG 7, the rest of the African countries are not at par with the MDG 7, and this is attributed to several challenges; the major of them being the infrastructure like electricity, passable roads, pipes, built tanks and even laid down reservoirs. The major functions of the African Ministers' Council On Water (AMCOW) is to ensure provision of water and better sanitation services to the citizens as per the MDGs, though, the council has cited among the most challenges faced in the provision of WSS being infrastructure. MDG, (2009).

In Nigeria for example, poor infrastructure has made the supply of water and sanitation difficult in the Kano areas. This is caused by: Poor road network to see tanks deliver clean water/transport solid waste to the designated areas, Frequent power cut outs that leave the taps dry, Regular breakage of water taps and water dams among others due to civil wars and natural calamities like floods. USAID, (2009). This has made the USAID to try and address the WSS situation in Africa; a factor that has seen it pioneer several models of innovative financing for water related infrastructure in developing African countries including Nigeria, South Africa, Malawi, Mozambique, central African republic, Uganda, Kenya and many more. USAID, (2011). The Agency is engaged in the world market for private debt financing, working closely with overseas

missions in an effort to identify bankable WSS infrastructural projects and risk-sharing partners in the water sector. USAID's Development Credit Authority (DCA) is one proven and effective tool that permits USAID to issue partial loan guarantees to private lenders to achieve economic development objectives. DCA partial guarantees help mobilize local capital and put it to work in creditworthy but underserved markets. The Agency also promotes other models such as "pooled" financing that allows municipalities to group infrastructure projects together and use government grants, credit enhancements or future revenues as collateral to tap local private capital. UNDP, (2012). All these are efforts aimed at addressing infrastructure; that has been found to be a major challenge to provision of WSS to the black continent people.

Kenya has been rated among the many African countries that have achieved only 32% in providing WSS to its people besides being one of the many LDCs that are too far from achieving and implementing the Target 10 of MDG 7 that touches on WSS. KIHBS, (2010). According to the report published by the World Bank (2010) about the history of water and sanitation in Kenya and gave the report below: Kenya is limited by an annual renewable fresh water supply of only 647 cubic meters per capita and is classified as a water scarce country, Momanyi, Quyen Le, (2005; 2009). Only 57 percent of the rural population has access to an improved drinking water source, and the time-intensive pursuit of water collection often prevents women from taking up income generating activities or in the case of girls, prevents them from attending school, Ministry of Water and Irrigation Strategic Plan (2009-2012). In 2007, findings from the National Water Services Strategy indicated that the water sanitation situation is poor with only 57% of households using water from sources that are considered safe. Sustainable access to safe water is around 60% in the urban setting and drops to as low as 20% in the settlements of the urban poor where half of the urban population lives, KIHBS (2005/2006/ 7).

Over 50% of Kenya's households do not have access to safe drinking water and the proportion is higher for the poor. In urban areas, large populations living in informal settlements within the towns and cities have no access to safe water. In rural areas, there are large disparities between geographic areas where in North Eastern and Eastern Provinces less than 30% of the poor have access to safe water compared to some 60% in Western Province. (Social Policy in Kenya Report, 2012).

One of the major reasons cited by a report done by the World Bank on such variant situations in the provision of WSS in Kenya is that that touches on infrastructure. World Bank, (2012). The north eastern parts of Kenya for example are poorly connected and covered with infrastructure with most areas being almost inaccessible, poorly covered by electricity, poor laid down water dams and reservoir structures among others that have made it almost difficult to provide the WSS. Kenyan Demographics Profile (2012). A recent study conducted by the African Research Institute in two constituencies in 2009 (Embakasi and Lang'ata) within Nairobi County established that water still continues to be the thematic area that citizens demand right for. According to this study, 13.5% of the respondents had at one time demanded a right, the highest number of citizens 23.9% demanding rights on water related issues. With 71.6% of the citizens stating that they encountered a problem while trying to access their rights. This indicates there is need for a range of actors to work together to improve access to water policy makers, development practitioners, citizens and producer associations, community leaders and other civil society actors and discusses practical ways to take account of water access and programmers' contribution to the development of water and sanitation issues. Later on, a study plan was conducted by the Nairobi Water and Sewerage Company and found out that one of the troubling

issues in Lang'ata was poor infrastructure coverage; owing to the fact that Kibira slums lies in the constituency and it is poorly connected with infrastructure.

A case study conducted in Kangemi area by TISDA (Transparency and Integrity Service Delivery in Africa) revealed that many families in informal settlements such as Kangemi suffer acute shortages of water because some areas are poorly covered with the relevant infrastructure. Taps are almost not laid down or have been vandalized by some second hand metal vendors. Some few areas covered with relevant infrastructure and electricity saw landlords determine when their tenants get water, how much water they get, and how much money they pay for the water. This they have made certain by locking the yard taps which is the main source of water for their tenants. TISDA, (2011). Due to this realization of the influence of infrastructure in the provision of WSS, many districts have been spending sleepless nights in addressing the issue. In the recent years for example, there has been enormous investments in Malindi water supply (consisting of source works, treatment facilities, bulky transmission pipelines and balancing storage).The existing infrastructure is adequate to supply Malindi with water beyond the year 2030 design horizon. The town has adequate bulk capacity to ensure that it will continue to receive an adequate supply of water in the near future up to 2017. Malindi area is, therefore, the only part of the coastal regional water system (and one of only a few water projects in Kenya) with an adequate water production, transmission and storage capacity that meets current and future demands, and where water shortages should not occur. TISDA Kenya, (2012). However recent studies have indicated that there is about 56% poor provision of WSS in the larger Malindi district( i.e. Malindi and Magarini Districts), owing to the fact of poor WSS infrastructure especially in the rural areas of Magarini whereby the network is almost at a full stop state or approaching the full stop state. The rural poor of Malindi not only lack tapped water but in the

few areas they use the locally dug underground water sources like wells have water that is mostly contaminated during the rainy seasons; spreading waterborne diseases. About 77% of the rural poor in Kilifi County have no laid down pipe connection, piped water or modern ways of sanitation. GoK, (2012).

### **2.3 Financial Resources' Influence in the Provision of Water and Sanitation Services**

In 2012 after the deadly earthquakes that were experienced in Haiti, the World Bank published a report on the post situational analysis of Haiti and its recovery strategies. The report had a section that showed the outbreak of cholera, the number of deaths from cholera in Haiti and the major suspected causes of such a deadly disease. World Bank, (2013). The report found out that ,besides, the destroyed infrastructure like pipes and laid down pipeline by the earthquakes and the presence of the cholera virus that was infiltrated by the UN soldiers, the availability of financial resources for the provision of WSS played a central role. For the provision of proper water and sanitation services, the Haiti government, the well-wishers and donors needed finances to hire helicopters, buy clean water/purify the available water or import clean and safe drinking- having had almost 98% percent of the taps being broken. UN, (2012). The report continues to outline how many lives were lost due to a simple disease that could be treated and controlled were it that there were available funds to give emergency of WSS that were needed at hand.

According to the USAID (2012), most countries below the Target 10 of MDG 7 are those from Asia and Africa especially the LDCs that have little and constrained financial resources and therefore aren't in the position of acquiring the required WSS infrastructure (pipes, passable water ways and electricity to pump the water), sanitized water tanks, right reservoirs, proper sanitation disposal latrines among others. Financial resources have been quoted as the major

determinant of WSS provision with some governments going into PPPs so as to increase the capital base for the services. In South Africa for example, the MDGs are too far from being realized due to the fact of constrained budget. According to the report published by the WHO (2010) showed that in Soweto, there has been more than 30 companies providing WSS or WSS related services although the slum has been experiencing 78% water shortage. The major cause of poor WSS provision in Soweto is due to the fact of the poverty levels of the people and the private/public companies providing WSS in the area having constrained resources, Booth, D. (2011). DFID (2009) had a report that showed some issues in the South African water systems. The report showed that 56% of the financial resources allocated to water and sewerage companies in South Africa go to planning, management and administration areas whereby only 32% goes to real water provision. This leaves most companies constrained with finances in providing essential WSS structures like infrastructure thus limiting their levels of operations; owing to the fact that money is needed to acquire decent water pipes, tanks, dig modern pit latrines among others.

While some states have created strong enabling environments like in Nigeria, other states are yet to start the reform process in WSS provision especially in resources mobilization, aimed at meeting the required funds to buy materials like pipes, lay down infrastructure for WSS and acquire relevant personnel for the WSS provision. GoN, (2010). A report by the Nigerian Government (GoN) showed that for a real Nigerian economy, there must be sourced funds to fund the otherwise troubled water sector starting from the Kano area to the Abuja state. The Nigeria MDG Office estimates that US\$2.5 billion is required annually to meet the water supply and sanitation targets between 2007 and 2015 an average US\$15 per capita, Duncan, A. and G.

Williams ,(2010). The investment cost is almost equally split between water supply and sanitation. The report conceded some of the challenges in estimating the investment requirements, such as the non-availability of comprehensive data; and, the difficulty in quantifying or assigning percentages with regard to infrastructural decay. The CSO2 costing model was introduced in the country and later used to provide alternative estimates of required investment, utilizing input data including coverage from the JMP (2010) report, along with population and the mix, unit costs, and lifespan of technologies derived from the MDG Office. According to the CSO2 model annual financing required to achieve the MDG targets for Nigeria is estimated at US\$1.7 billion for water supply and US\$2.3 billion for sanitation. The financing requirements can be further disaggregated into rural water supply (RWS) (US\$604 million per year), urban water supply (UWS) (US\$1.1 billion per year), rural sanitation (US\$1.1 billion per year) and urban sanitation (\$1.2 billion per year). The CSO2 costing model also compares required investment with anticipated investment from government, donors including non-governmental organizations (NGOs) and users, to derive the expected annual finance gap. It has been difficult to establish the extent of the financing gap given the weak reporting of sector spending at various levels of government. An analysis of the sector investments in selected states indicates an average annual state level spend of some US\$15 million from which an annual national spending of around US\$550 million can be inferred. A higher figure of US\$700 million per year has been applied in the costing. A little over US\$200 million per year is expected from donors and NGOs, mainly for the water supply sub-sector. From the model therefore, it is evident that the provision of WSS in Nigeria strongly hangs on the amount of financial investments available for infrastructure, labour and WSS materials acquisition, World Bank, (2013); WHO, (2012).

In Uganda, although official policy is to promote tariffs that cover all costs, the NWSC tariff that was introduced in 2006 actually only covers operation and maintenance costs that were seen to be the centre stage actors in WSS providers. This was after the realization of the importance of finances in the provision of WSS to the Uganda people. The second performance contract between the Government of Uganda and NWSC provides for a tariff policy which in the long term covers operation, maintenance, and a part of the future investments. Although the current tariff structure does recover operation and maintenance costs, the tariffs are not high enough to finance system expansion, leaving system improvement and extension investments to the national government and international donors. According to UN-Water (2010), full cost recovery tariffs including investments would require a significant rise of tariffs. According to the MWE (2012), the total budget for Ugandan water supply and sanitation was 149 billion Uganda Shilling or US\$90 million in fiscal year 2006-2007, of which US\$73 million were actually spent. This corresponds to US\$2.37 per inhabitant. The NWSC received a budget of US\$56 million. Out of the remaining funding of US\$34 million, 54% was allocated to rural water and 29% to urban water. In addition, NGOs and Community-based organizations (CBOs) reported investments of US\$5 million in 2006, and NGO and CBO members of the UNICEF-supported Water, Sanitation and Hygiene (WASH) cluster, which provide emergency water supply and sanitation in Northern Uganda, reported investments of US\$15 million from January 2005 to August 2006. Total sector investments in 2006 thus can be estimated at roughly US\$85 million.(Williams, 2010). However, a report published by the UNICEF(2010), shows that Uganda has achieved only 42% in its provision of WSS due to constrained budgets. The major areas affected by budgets are those of acquiring qualified personnel, right infrastructural facilities like water taps, paying repairing costs among others. According to the UNICEF's



WASH initiative, financial resources ranked the highest hindrance in the provision WSS to the Ugandans especially those in north Uganda, particularly the Karamojongs'.

In the Kenyan case as per the Vision 2030, the country requires Kshs. 1.7 trillion to ensure accessibility of WSS to all its citizens. However, the GoK can only raise about Kshs. 600 billion for both water and sanitation investments, leaving a funding gap of over Kshs, 1.1 trillion. According to the World Bank (2011), for water supply, financial allocations to the main sector ministry have increased six-fold since 2003/04, while development partner contributions have almost quadrupled since 2006/07. Estimates for required and anticipated capital investment suggest that urban water supply has sufficient funds for water supply infrastructure, but additional funding needs for urgent water storage and bulk transfer schemes will require consideration. Anticipated capital investment for rural water supply falls short of requirements and is highly fragmented, making it difficult to manage and report on. For sanitation, though anticipated capital investments are close to requirements, this assumes households will meet a substantial share of costs, especially in rural areas. However, there is currently no clear policy on promotion and marketing to encourage households to invest in sanitation. USAID's Fiscal Year (FY) 2006 water and sanitation activities in Sub-Saharan Africa highlighted the need of funding in the provision of WSS in major Sub Saharan Africa countries that had acute and frequent water shortages and related waterborne diseases outbreaks. The programs highlighted in grey Kenya, Somalia and West Africa as part of a new set of Bureau for Africa water and sanitation activities, with urgent need to be addressed, USAID, (2010)

According to the Kenyan government budget speech read by Hon. Uhuru Kenyatta during (2009), the funding that was effectively available to the water sector in FY 2008–2009 was Kshs

18.5 billion (equivalent to US\$ 240 million). Of these, MWI handed over Kshs 16.8 billion to subordinate water sector institutions. The main sources of funding for Kenyan water institutions were three: government funds which constituted 58% of sector funding in 2008–2009, internally generated funds that amounted to 11% and donor contributions that made up 31% of the funds available. One third of the contributions by development partners are channeled through government budget, while the remaining two thirds are disbursed for specific projects. Of the estimated donor funding for 2008–2009, 70% was in the form of loans, whereas grants represented 30%. Only 58% of the grant money committed by donors was actually disbursed in 2008–2009. Budget Speech, (2009). Funding for measures aimed at improving access to water and sanitation in areas without adequate services especially areas inhabited by the poor was provided by the Water Services Trust Fund (WSTF). The WSTF received funds from the Government of Kenya and from donor agencies and directed them to the 362 poorest locations throughout the country identified in collaboration with Water Services Boards. There were significant variations in the ability of water supply and sanitation institutions to finance their operations. In FY 2008–2009 WASREB was the most independent as it generated 72% of funds internally. The Water Services Trust Fund, by its nature, had very limited self-generated funds and was supported by 2/3 by the government and by 1/3 by donor agencies. The financing of Water Services Boards, as already mentioned, showed great variations. None of the Boards managed to generate more than 20% of their funds. Donor agencies provided the majority of funds for Rift Valley WSB, Lake Victoria North WSB and Northern WSB, while the remaining WSBs received more funds from the government. GoK, (2010).

From the report, the financial allocations and the relevant financial resources play a central role in the provision of WSS in the country. However, a study report in Kiambu in 2008 showed that the district had an acute water shortage despite the fact that the major dam in the area supplies water to Nairobi and its environs. The central hindrance cited to the acute shortages was 70% lack of sufficient funds to pay expert water engineers to do the water lay-down strategies, repairs and expansion of the colonial laid down infrastructure. MWI, (2009).

The government has moved to other sources for funds due to their importance in WSS provision. For example, The French Development Agency (AFD) supports the Kenyan water and sanitation sector through projects in Nairobi, Kisumu and Mombasa. In 2008 the total financing for on-going projects was €105 million, including a €40 million loan for Mombasa approved in 2008. In 2009 AFD approved a new €51 million loan for water supply and sanitation in Nairobi and Kisumu. In the past, the agency also financed projects in Kandara, Kahuti, Litein and Siaya. Citizens Report Card, (2010), AFD, (2010).

In her financial statements for the period between 2008-2013, MAWASCO broke down the role of financial resources played in her services provision between 2009 to 2013 to the people of Malindi and the surroundings. The results gave a constant increase in financial spending/gross expenditure in infrastructure, human resource development, marketing, customer services and many more. The company indicated an increase in funding from internal sources, donors mostly WSTF and World Bank through the WaSSIP program. This led to the increase in its services delivery having being ranked as one of the companies giving above 56% effective service delivery in coast region and her neighboring areas. (Ministry of Water and Irrigation, 2011). A study by the WHO, MWI and USAID (2012) shows that finances have been the central point of

WSS provision due to the fact that the Kenyan economic crisis has led to the increase in the cost of both plastic/metallic pipes, repair and maintenance costs have doubled due to the procedures and processes involved in both contractual agreements and taxes for firms undertaking such contracts, salaries for the workers have not been left behind too just like the skyrocketing costs of marketing and services delivery. This has been found to push many WSS providers in the coast and about 60% of them are at an extreme hangs ;leaving them to run up and down just to mobilize resources aimed at funding their operations. AMCOW, (2010). As other many WSS providers, having realized the constrains in its budgets, MAWASCO came up with plans of getting extra cash for its operations mainly to invest in infrastructural development through: Partnerships with Coast Water Services Board, the Water Services Trust Fund, Community Organizations, Constituency development fund(CDF) and the Local Authority Funds and now the County Government of Kilifi

Here, MAWASCO came in with the aim of establishing formal relationship with a range of community organizations in order to provide quality water and sanitation services to the under-served communities throughout its area of operations. This will be achieved through encouraging communities to contribute towards provision of water and sanitation services in their areas. This contribution may be through materials/finances used in water and sewerage infrastructure, beneficiaries' contribution or contribution in kind e.g. offering labour or offering security services to the water infrastructures etc. MAWASCO will also tap into the resources availed to the constituency development fund to ensure that water and sanitation projects are funded from this basket. MAWASCO Strategic Plan, (2013). MAWASCO has plans that will seek donor support, especially for development of Water and Sewerage infrastructures in areas with no

adequate water services through grants and concessional loans; a factor aimed at bettering its services and relevance in its activities. DFID, (2009).

#### **2.4 Role of Urban Planning in the Provision of Water and Sanitation Services**

Development of structures like settlement houses/schemes, roads, waste disposal centres, cities, industrial towns/points, markets among others has been an issue of contention among most developing and LDCs especially those in the Asian and African continents. This is the 21<sup>st</sup> century issue owing to the fact that there is a constant worldwide population increase with about 6.3 billion people living on earth and the majority of these people being born daily in the DCs and LDCs and these population ever needs places to live, some food to eat, water to drink and many more. WFO, (2010). This population increase has pushed many people to settle in the otherwise areas that were not initially meant for settlement like the water catchment areas. Another problem that has been brought by this population is the rural-urban migration that has seen the number of people living in urban areas ever increasing daily; the consequence of which is the development of poorly planned urban centres/informal settlements commonly referred to 'slums'. Urban planning plays a central role in the provision of WSS in the world especially among the urban poor/slum dwellers. The urban poor are the most hit by the planning problem. Most of the houses in these areas are poorly drained, poorly constructed, people are poorly connected to WSS infrastructure like piped water/proper waste disposal toilets (pit latrines), poor technology involved in emptying waste collecting buckets, poor waste disposal (flying toilets), poor stakeholders involvement, poor media/awareness creation for sanitation demand, infrastructure vandalism, illegal water connections among many more problems that have been associated with the urban poor. WSUP, (2012).

In Bangalore (India) just like in Naivasha (Kenya) there is often no planning culture at a municipal level. The public health section of the municipality is mandated to enforce the regulations that require people to have latrines and at times access to clean drinking water. However, they lack the capacity to do so as there is a poor working link between the urban planning departments and the public health departments. This results to failure of developers to adhere to the approved designs, or construction without approvals due to corruption. It then becomes very difficult for public health officers to enforce latrine construction and water related structures in an already inhabited area. There is also no engagement with the issue of dealing with the sludge. World Bank, (2012). According to UN HABITAT (2010), In most developing countries whereby India was taken as a case study, the number of people living in towns and cities is growing rapidly, both as a result of natural urban growth and because of migration into towns and cities from rural areas. This will add significantly to the number of people living without clean drinking water or adequate sanitation in urban areas. It will also cause more unemployment and poverty, widening the gap between the urban rich and the urban poor who lack access to a whole range of basic services besides clean water and sanitation.

According to the report by the World Vision (2010), the rapid urbanization has in many places resulted in an increase in slums. According to the UN-HABITAT, the definition of a 'slum' household is one that lacks one or more of the following; i.e. Water, Sanitation, Durable Housing, a living area with a maximum of two people per room, and, secure tenure. It is estimated that more than 920 million people lived in slums in 2001, that is about one-third of the world's total urban population. By the year 2020, as much as half the world's total urban

population, which include those who live in the peri-urban areas surrounding city centres, could be living in poverty. UNDP (2006; 2011).

Poverty is one reason that the number of slums is growing; other factors like poor urban planning have accelerated the growth of these slums in many LDCs like Nigeria, Guinea, Uganda, Kenya and many more. However, slums are not the only urban areas without adequate access to water and sanitation. It is a fact that in many cities the necessary infrastructure simply cannot be built quickly enough to keep up with growing urban populations. For example, the urban population served with improved drinking water sources increased nearly 36% from 1990 to 2004. Despite this effort the number of urban people un-served is increasing over time. If efforts to provide sanitation coverage in urban areas are to continue at the current pace, coverage rates will increase from 80% in 2004 to only 82% in 2015 because of expected population increases. In absolute terms, this small increase means that 692 million people will be living without basic sanitation in urban areas in 2015, 81 million more than in 2004. Cities and towns account for a large share of the non-renewable resources that are consumed, producing large amounts of waste and serious air and water pollution in the process. This makes good water and wastewater management, as well as provision of adequate sanitation, essential in order to limit pollution and minimize health risks. In fact, most cities today are environmentally unsustainable due to poor town planning and overburdened population. With a substantial percentage of their residents living in areas without adequate shelter and basic services, many cities in the developing world are also socially unsustainable. Decision makers therefore need to view sustainable urbanization as a crucial issue for the future of humanity. In so doing, they must recognize that the proper handling of water

supplies and sanitation are fundamental dimensions of such sustainability. WHO/UNICEF, (2006; 2012).

A study carried out by the World Bank (2009) in Lusaka Zambia indicated that despite the development of informal settlement plans by the town governments, an influx of people due to natural population increase or rural-urban migration, has rendered the WSS providers to the urban poor almost impossible due to the fact of poor urban structures, settlements and even policies set by illegal gangs who control and manage the otherwise laid down WSS colonial structures. A report by the USAID (2010), shows that in urban Lusaka, there are small community WSS providers who are being used due to inaccessibility of some areas since taps and tanks cannot be built in already illegally housed places. There are illegal connections because the ghetto people easily find illegal connections easily since the WSS companies cannot easily reach the poorly settled interior slums.

In Kenya, planning has been having a major leakage, starting from the congested slums like Mathare I, Mukuru kwa Njenga, Nyalenda, Kianduti, Kibira and Kariobangi to Peri-urban areas like Dandora, Umoja I and Likoni that face a unique set of water- and sanitation-related challenges which can only be tackled by good planning. Peri-urban areas include open spaces, for example, that are easy to access from built-up urban areas like Likoni and parts of settled Malindi town. As a result, they are often used as dumping grounds for urban waste which has a severe impact on the areas' ecosystems and the people living there. So, it is important to consider the peri-urban zone as an extension of the city rather than as an entirely separate area, and to plan the services provided accordingly.



Such planning must also take into account the wide range of variety found in a peri-urban area, however. The outer zone, for example, will contain rural settlements with urban characteristics which neither rural water and sanitation programs nor urban utilities will be able to serve effectively. The peri-urban interface will also contain slum areas and informal settlements that lack essential services like water and sanitation. The problem of sanitation in such areas is both critical and complex, because within them many people live in sustained poverty in cramped conditions without infrastructure, or any form of secure tenure, and at the mercy of those more powerful than them. Equity is also a crucial issue, as neighboring communities may have different levels of access to water and sanitation. Ezekiel N., and Kenneth S., (2012).

A report by the World watch Institute (2007) shows that Kibera slum in Kenya is the largest in Africa and the world at large having had the Soweto slums in South Africa being upgraded. This means that about 79% of people in Kibera lack access to clean water as outlined by the MDGs 7 and 81% lack proper sanitation to the extent of up to an average of 20minutes being lost daily on average to line up in a pit latrine/common bathing room. The report further indicates that the slum dwellers were forced to use polythene plastic bags to dispose their raw waste; posing a health hazard. As stated previously, overcoming these issues will require good urban planning, which should be used to properly coordinate land-use, infrastructure, urban functions and the provision of green areas. Good urban planning also involves coordinating the social and economic aspects of the development of new or improved infrastructure. It is a process that aims to coordinate the different institutional systems needed to properly provide and manage urban and peri-urban services. Mugabi et al. (2007). A report by the FAO (2013) showed that most of the three cities in Kenya; Kisumu, Nairobi and Mombasa are ever experiencing continuous

demolition of illegal structures. This is due to the fact that most people have been hit by hard economic situations in the country and are moving to the urban areas to settle there and look for jobs. This has forced a large population to settle in cheaper places like slums that have not been formerly planned-both structurally and socially-leading to difficulties in providing WSS by various companies and local water vendors.

In Kisumu Ndogo slums in Mombasa for example, everyone has the right-according to the habitants, to put a structure anywhere so long as you have the capability. This has made it difficult for the Mombasa Municipality to plan the WSS for the area. There have been frequent water tap bursts, illegal water connections, poor waste disposal whereby manual latrine emptying services are still widely used. In the region, manual emptying services are often the only means by which a latrine can be emptied when limited access makes it impossible for exhauster services and affordability makes other options unreachable for a large number of low-income households. Few technological options exist between manual and conventional emptying services. NGOs Council, (2010).

According to UN-HABITAT (2009), there has been acute water shortages among the urban poor frequently, compared to that of the urban wealth. For example, a comparison between water and sanitation in the two adjacent estates of Nyali and Kisumu Ndogo in Mombasa found out that, in Kisumu Ndogo, 57% people depended on water from dug boreholes, 43% water supplied by vendors on donkeys and hand cats , 61% illegally connected salty water from the ocean, 45% frequent water tap bursting, 42% dry taps and many more while in the Nyali estate, frequent water cuts were reported at only 25%,illegal water connections at 11%, while untreated water vending was at 17% .The major cause of such disparities was the poor urban planning in the

Kisumu Ndogo slums, which has made it difficult for WSS providers in the area from accessing the region well compared to the above average planned Nyali estate. UN-HABITAT (2009; 2011).

A similar case is found in Malindi as well which has about Seven (7no.) recognized informal settlements on its environs. These are Kisumu-ndogo, Maweni, Muyeye, Kibokoni, Mtangani, Furunzi and Kwa-Chocha all bordering the main town with total population of 61,288 people(Census report 2009). All these settlements are characterized by poor planned and constructed houses, lack of well defined road networks, poor drainage and lack of proper solid waste management not forgetting that almost 97% of its population are the low income earning people and only about 20% can access WSS. These areas have been experience serious unreliable WSS issues as the existing infrastructure has been overburdened by the very high population hence need improvement. MAWASCO in partnership with other development partners like the World Bank, WSTF and KISIP has really tried to put a lot of efforts to improve the services levels in these areas but the progress has been too slow as most projects earmarked in these areas attract so much of RAP issues thus making them very expensive to finance and to some other extent, the financiers shy away from financing such projects.

According to UNDP (2010), Kenyan slums and growing towns experience rampant corruption whereby municipal councils and county officers allocate land and commission structures illegally leading to poor urban planning. The overall effect is the difficulties in the provision of WSS and the frequent poor social and structural correspondence to proper sanitation and waste disposal.

## **2.5 Influence of Rate of Returns on Investments in the Provision of Water and Sanitation Services**

The traditional economic analysis theory depicts firms as rational economic units whose primary objective lies in profit maximization. Joseph O., (2002). The theory looks at the inputs in a project while focusing and being keen on the gains/outputs. WSS is an investment as much as it was initially being taken as the responsibility of the government to provide safe, clean water and proper sanitation to her citizens up to the 1990s before the introduction of the water act in 2002 when the decentralization of water was introduced by the Ministry of Water and Irrigation in Kenya. This decentralization saw the entry of private firms besides the government in the provision of WSS. The country was then divided into five drainage basins. The Lake Victoria Basin Drainage area system in Western Kenya is part of the Nile River Basin. The closed Rift Valley Inland Drainage system includes a number of rivers and lakes, including large freshwater lakes such as Lake Turkana, Lake Baringo and Lake Naivasha rivers such as the Kerio River [http://en.wikipedia.org/wiki/Kerio\\_River](http://en.wikipedia.org/wiki/Kerio_River), as well as a number of salt lakes. The Athi Drainage system, the Tana Drainage system and the Ewaso Ng'iro North Drainage system all flow towards the Indian Ocean. The water distribution in the basins is highly uneven with the highest water availability in the Lake Victoria Basin (more than 50%) and the lowest in the Athi Drainage system. Only the Tana and Lake Victoria Basins, have surplus water resources while the three other basins face deficits. The capital city of Nairobi receives its water resources from two drainage systems: The oldest sources, the Kikuyu Springs (used since 1906) and the Ruiru Dam (since 1938) are located in the Athi River Basin. The Sasumua Dam, the Ndakaini-Thika Dam (since 1996) and Chania-B Dam supply Nairobi through inter-basin transfer from the Tana River drainage area. About 20% of the supply is from ground water resources which correspond to around 60,000 to 70,000 m<sup>3</sup> per day. Mombasa, Kenya's second largest city, serves its water demand through the Marere Water Works in the south-west, the Baricho Intake at the lower Athi

River and from Mzima Springs, upper Athi River, through a 220 km pipeline to the city. Meeks R., (2012).

In providing their services, the firms operating in these basins experienced expenses which they had to device methods of recovering at the end of the day. The costs incurred when providing the WSS include: cost of WSS infrastructure maintenance like replacement of pipes and other appurtenances, staff wages and salaries, legal licenses fees, Water abstraction levies, cost of treatment, huge power/pumping bills and many more. Moraa, H.,Atieno, J. and Salim. A., (2012). This makes most firms dig deep into their plans before providing their services because the rate of returns on their investments should be capable of taking care of the costs incurred in the water production process, delivery and disposal as they operate on regulated tariffs which are NOT full cost recovery. According to UNICEF (2012), Kenya just like India is at 51% Economic efficiency disadvantaged. This means that about 51% losses occur in Kenya due to either water losses, non-billed water, stolen water or unpaid billed and many more. The report continues to say that, despite the fact that countries like Bangladesh, India, Pakistan, etc. having formulated policies and programs aiming ensuring all the people with access to safe water and sanitation services at an affordable cost, the poor population of this countries in the peri-urban has no capability of effectively paying for the services rendered; leaving most firms with no option except that of withdrawing their services. According to Najjar, K. (2011), in the year 2010, about 53 families among the 95 families interviewed in the peri-urban Bangladesh lacked access to proper WSS due to the fact that they could not pay for the services; forcing the 56% firms to withdraw their services leaving the people to the hands of the local water venders and waste collectors.

The economic performance of Kenyan Water and Sanitation Service Providers is closely monitored by WASREB and made available in the Impact Report to encourage competition and spread best practices. Important indicators of economic efficiency are: Collection efficiency, the level of non-revenue water, metering ratios and labour productivity. However, most Kenyan WSS Providers do not meet the benchmarks in these dimensions. WASREB ,(2009). For example, in the year 2006–2007 most Kenyan WSSPs recorded a fairly satisfactory revenue collection efficiencies: the average collection rate of water bills was at approximately 76% against a sector benchmark of 95%. However, there were worst hit WSSPs providers which recovered too much low beyond their investments and expectations. The worst performing utility was Garissa with 45% of the billed amount being collected by the WSSP. On average, almost half (47%) of the supplied water in Kenya was not billed in 2006–2007, either due to leakage or water theft. Two Water and Sanitation Services Providers met the benchmark set by the Ministry of Water and Irrigation with levels of NRW of 25% i.e. Malindi and Nyeri. In Nairobi NRW levels were about 40%. Based on the unit cost of production (18 Kenyan shillings/m<sup>3</sup> or US\$0.2), the nationwide losses due to non-revenue water in 2006–2007 were about 2.43 billion Kshs, equivalent to US\$31.5 million). (White Paper, 2013). The other major loss that is frequently swallowed by most WSS providers is the Metering ratio. The metering ratio of Kenyan water utilities in 2006–2007 was 82%. 13 WSPs report 100% metering ratio (Mombasa, Nyeri, Kisumu, Eldoret, Malindi, Kericho, Tavevo, Embu, Lamu, Kitui, Yatta, Makindu and Tarda-Kiambere. There is however uncertainty about whether the installed water meters are in fact functioning. In the analyzed period, the metering ratio in Nairobi rose to almost 99% thanks to a programme for the restoration of the existing water infrastructure. Though in the slums like

Mathare and Kibira there was about 75% metering ratio. This means that about 25% losses of water were experienced due to water that was not counted in.

The government and ministry of water and irrigation made big strides towards water-pricing policy that has undergone significant evolution. The goal of current water pricing in all the urban areas in Kenya is to achieve cost-recovery. This requires that costs incurred in making water available at source include some or all of the following elements: The costs of operation and maintenance; Capital costs, comprising a return on paid-up assets, the repayment of loans; Overheads such as the administration and support required to operate such schemes; An allowance to provide for depreciation, replacement or refurbishment. The major problems arising from the current water pricing policy in Kenya can be broadly classified into: those related to financial sustainability of urban water schemes and those related to water use efficiency and conservation. The focus of the current policy debate in Kenya continues to be on the cost-recovery rather than on making water prices an instrument for water use efficiency. This has led to most WSS providers like those operating in Nyalenda, Kangundo, Kwale's Likoni area and Kibira being at the hang balance because out of the 99% input of their expenditure, they only recover about 45%; a factor that has forced most them run into a negatively skewed balance sheet year after year. Therefore, the amount that WSS providers are getting on their investments greatly determines when, where, how, what amount and which way to offer their services. Water Partnership Program report, (2012); Moraa, H., Atieno, J. and Salim. A., (2012).

## **2. 6 Conceptual Framework**

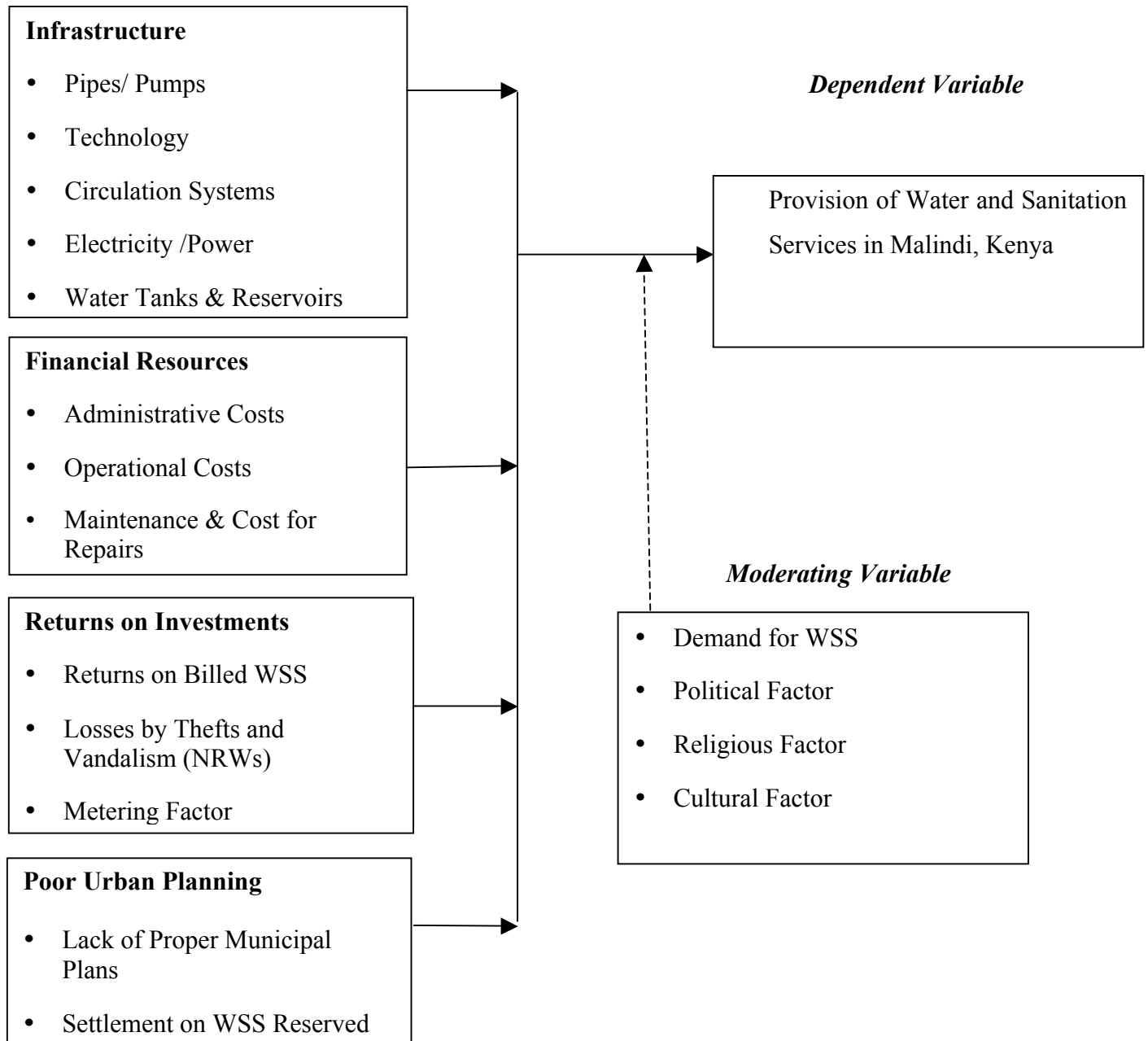
The above conceptual framework shows the relationship between the independent and dependent variable. Infrastructure like, Pipes/ Pumps, Technology, Circulation Systems, Electricity /Power, Water Tanks and Reservoirs play a major role in influencing how the WSS providers give their services. Availability/absence of financial resources has a direct positive or negative influence in the provision of WSS to people. Poor urban planning has led to illegal structures and this has brought up the problem of slums and the end result is, most WSS providers aren't able to execute their mandates well.

The gross and net rates of returns have been cited as one of the factors that have been having both negative and positive influence in the provision of WSS. Areas with high rates of returns have been found to attract many WSS providers while those areas with low returns have been neglected. There are intervening factors that also influence the provision of water and sanitation services, chief among them are the political, cultural, demand as well as the religious factor.



**Fig 1. Conceptual Framework**

***Independent Variables***



## **2.7 Summary of Literature Review**

Literature has revealed that the developed countries have made remarkable investment on WSS as well as adopting the MDGs 7 that insists on the provision of WSS to her people. On the other hand the developing countries, Kenya included are rapidly and heavily investing in WSS despite the other challenges they face for instance drought and famine. WHO, (2012). Despite these efforts, these countries still have low water connectivity and supply, inadequate power supply and pipes connection especially in the rural areas and urban poor areas where most settlements of the poor are located coupled with regular power interruptions, low levels of piped water connections, poor urban planning, limited finances among many other challenges.

These challenges have created a big gap between the developed and the developing countries and thus the developing countries miss out on the benefits of WSS in almost all aspects including in health and education sectors which are the cornerstone of the economy and an avenue to break the poverty cycles on the developing countries. UNESCO, (2010).The study will be done to assess the factors influencing the provision of water and sanitation services in Kilifi County by the Malindi Water and Sewerage Company.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **h3.1 Introduction**

This chapter dealt with the specific methodology of the study. It started by stating the design of the data and the target population. The chapter then described the sampling procedure and the research instruments that were used in the study, including their validity and reliability. Finally, the chapter explained how data was analyzed and presented.

#### **3.2 Research Design**

The study design that was be used was descriptive survey analysis. Ng'ang'a, Kosgey and Gathuthi (2009) described descriptive survey analysis as a method that involves measuring a variable or a set of variables as they exist naturally. It was suited for this study because it was not concerned with the relationship between variables but rather a description of individual variables. The aim was to describe a single variable or obtain a separate description for each variable when several are involved. The respondents were asked questions about a particular issue. The study employed descriptive survey analysis to establish opinions and knowledge about the factors influencing water and sanitation service provision in Kilifi County by the Malindi Water and Sewerage Company.

#### **3.3. Target Population**

The target population for this study was the residence of Kilifi County who were served directly by MAWASCO. Five areas namely; Matsangoni, Watamu, Malindi town and its environs, Mambui and Kakuyuni were selected to participate. 16 households will be selected, 7 schools, 7 Health Facilities, 8 CBOs and 12 water vendors(kiosk operators) were selected also. A larger

total population of 50 was targeted for this study. The household heads/school heads/hospital heads and water pump heads were the ones who participated in the study.

**Table 3.1. The number of respondents sample in selected population**

<b>Targeted Population</b>	<b>Heads</b>	<b>Total</b>
Water Kiosk Vendor	12	12
CBO Representative	8	8
Hospital Representative	7	7
School Representative	7	7
Household Representative	16	16
<b>Total</b>	<b>50</b>	<b>50</b>

### **3.4. Sample Size and Sampling Techniques**

Sample design is a definite plan determined before any data are actually collected for obtaining a sample from a given population. The statement about the sample should be true in relation to the population, Orodho, (2009). According to Mugenda and Mugenda (1999), for descriptive study, 10% of accessible population is enough. Given that the targeted population was heterogeneous due to the nature of the schools in the region, hospitals, households, CBOs and Water vendors in the area, stratified random sampling was used to allow full participation of the schools.

16 households, 7 schools, 12 water vendors, 8 CBOs and 7 hospitals were expected to make up the sample size representing 48% of the total population. There were public primary school, private primary schools, public secondary schools and private. From each category, 7 were picked. Malindi hospital was picked, 2 private hospitals and 4 clinics. Random 12 water vendors, 8 CBOs and random 16 households were picked. This added up to 50 respondents.

### **3.5. Research Instruments**

These are tools that were used by the researcher to collect data from the sampled respondents in a study, Kombo and Tromp, (2006). The questionnaires were self-administered to collect data from the Schools and Hospitals while for, the water vendors, household heads and CBOs operators, questions from the questionnaires were asked as a way of assistance for those who were illiterate or semi-illiterate. Observation was expected to help to gather crucial information that could not be obtained through questionnaires. The questionnaires were used to collect bio-data as well as background information of the school teachers/ hospital heads/household heads, CBO operators, Water vendors so as to gather information on the situation of WSS in the areas.

### **3.6. Piloting**

This is exposing the instruments to a small number of respondents to test the validity and reliability. The instruments were piloted in two schools, 5 household and one hospital, and, the procedure repeated in two weeks. Piloting helped the researcher to eliminate any ambiguity in the research instruments to ensure they generate valid results of the research. The schools/hospital and households where piloting was to take place were part of the study sample to avoid bias results of the study.

#### **3.6.1. Validity of the Instruments**

The questionnaires were given to three lectures from the department of Extra Murals for validation. The responses were checked to verify whether the questions answered what they were intended to answer in order to ensure instruments validity. Based on the analysis of the lecturers, the researcher was able to make corrections, adjustments and additions to the research instruments.

### 3.6.2. Reliability of the Instruments

In the study, reliability was assessed through the results of piloting, which was done using test-retest technique. The research instrument was administered to the same group of subjects twice in the pilot study. A two week lapse between the first and the second test was allowed.

The scores from both tests were correlated to get the coefficient of reliability using Pearson's product moment formulae as follows: Pearson's coefficient of correlation

$$r_{xy} = \frac{N\sum xy - (\sum x)(\sum y)}{\sqrt{[N\sum x^2 - (\sum x)^2][N\sum y^2 - (\sum y)^2]}}$$

Where;

N-number of respondents, X-scores from the first test , Y-scores from the second test. The value of r lies between  $\pm 1$ , the closer the value will be to +1 the stronger the congruence.

### 3.7. Data Collection Procedure

After approval of the research by the University supervisor, a research permit which was to authorize the researcher to carry out the study was obtained from the National Council of Science and Research at Utalii House, Nairobi. The questionnaires were drop and pick type, so the respondents were given one week to fill them. After one week the questionnaires' were collected. Due to the vastness of the study area to be sampled the researcher was assisted by research assistants whose duty was mainly to follow up the questionnaires.

### 3.8. Data Analysis and Presentation

The data that was collected from questionnaires was analyzed by the use of descriptive statistics (frequencies and percentages). The descriptive analysis was appropriate for this study because it involves the description, analysis and interpretation of circumstances prevailing at the time of study. Descriptive statistical techniques was used to analyze various items of the questionnaire.

These included averages, percentages, frequencies and totals. This study used frequencies and percentages because they easily communicate the research findings to majority of readers, Gay, (1992). Frequencies easily show the number of subjects in a given category. A number of Tables were used to present data findings. Coding was done where the response was transferred into summary sheets by tabulating. They were tallied to establish frequencies. The frequencies were determined by converting similar responses into percentages to illustrate related levels of opinion. The questionnaires were analyzed separately in Five categories; from household heads, hospital/ school officers, from the local water vendors and CBOs representatives.

### 3.9 Logistical and Ethical Issues

Consent of the participants was sought whereby they were requested to agree to participate in the study through voluntary informed consent without threat or undue inducement. In addition the respondents were assured that the information they gave was to be kept confidential and used only for the purpose of research. For anonymity the respondents were requested not to write their identities in the questionnaire section while the appropriate chain of command was followed before the commencement of the data collection process.

### 3.10 Operational Definition of Variables

**Table 3.2: Operationalization of Variables**

<b>Objective</b>	<b>Variable</b>	<b>Indicators</b>	<b>Measurement scale</b>	<b>Types of analysis</b>
To examine the influence of infrastructure in the provision of water and sanitation services in	Infrastructure	Storage tanks  Pipes networks	Nominal	Descriptive

Kilifi County		Billing systems	Ordinal	
To find out the extent to which financial resources influence the provision of water and sanitation services in Kilifi County	Finance	Operational Costs Maintenance & Cost for Repairs Administrative Costs	Nominal  Ordinal	Descriptive
To examine the extent to which poor urban planning and development strategies influence the provision of water and sanitation services in Kilifi County	Urban planning	Lack of Proper Municipal Plans Settlement on WSS Reserved points	Nominal  Ordinal	
To establish the extent to which low rate of returns on investments influence the provision of water and sanitation services in Kilifi County	Rate of returns	Returns on Billed WSS Metering Factor Losses by Thefts and Vandalism		



## CHAPTER FOUR

### DATA ANALYSIS, PRESENTATION AND INTERPRETATION

#### 4.1 Introduction.

This chapter presents findings which had been analyzed, interpreted and presented under the following thematic areas: response rate, demographic characteristics of respondents and data analysis per each factor that affect the provision of Water and sanitation services in Kilifi County.

#### 4.2 Response rate.

The researcher administered 50 questionnaires to residents of Malindi in Kilifi county who were served by MAWASCO. A total of 43 questionnaires were filled and returned while only 3 out of 5 interviews planned were successful.

##### 4.2.1 Response rate to questionnaires

Table 4.1 overall response rate

Questionnaires	Frequency	proportion
Filled and returned	43	86%
Unreturned	7	14%
Total	50	100%

Table 4.2 Response rate to interviews

Interviews:	Sought	Done	Not done
Frequency	5	3	2
Proportion	100%	60%	40%

#### 4.2.2 Response rate as per the sample population

For the purpose of this study, the researcher collected data from 43 residents of Malindi in Kilifi county who are served by MAWASCO. The response rate per each department was as shown below in table 4.3. This was done through a prepared questionnaire some cases of face to face interviews with the director of each department.

*Table 4.3 showing the distribution of sample population and how they responded to the questionnaires and interviews.*

S/no	area	Sample Population	questionnaires returned	proportion
1	Water Kiosks	12	11	91.7%
2	CBO representative	8	7	87.5%
3	Hospital Representative	7	6	87.5%
4	Schools	7	5	71.43%
5	Households	16	14	87.5%
	<b>Total</b>	<b>50</b>	<b>43</b>	<b>85.13%</b>

### 4.3 Demographic characteristics of respondents

#### 4.3.1 Gender

There were more male respondents than women making 69.76% of the population.

Table 4.4 Gender of respondents

Gender	Frequency	proportion
Male	30	69.76%
Female	13	30.23%
Total	43	100%

#### 4.3.2 Age of respondents

The sample population was composed of mainly people in the age class of 36-46 years. This was the modal class making a proportion of 69.77% comprised of the most productive age and experienced as shown in table 4.5 below. This was followed by the age class of 25-35 years and composed of newly young people making 13.95% while age class of 47 -57 years composed of 9.30%.

Table 4.5 Age of respondents

Age class	Frequency	proportion	cumulative percent
24 yrs and below	1	2.33%	2.33%
25-35 yrs	6	13.95%	16.28%
36 -46yrs	30	69.77%	86.05%
47-57yrs	4	9.30%	95.35%
58yrs and above	2	4.65%	100.00%
Total	43	100%	

### 4.3.3 Education background

The respondents were mainly literate people since all of them had attained post primary education. None of them had ended at primary education, 46.51% were of secondary school level while the remaining 53.49% were of tertiary and university education level as shown in table 4.6 below.

Table 4.6 Education background of respondents

Age	Frequency	proportion	cumulative percent
Primary school	0	0.00%	0.00%
Secondary school	20	46.51%	46.51%
Tertiary college	18	41.86%	88.37%
University	5	11.63%	100%
Total	43	100%	

### 4.3.4 Respondents experience and involvement in Water and Sanitation services

Most of the respondents had between 6-10 years of involvement experience in water and sanitation services making 55.81% of the sample population. This was followed by a group of respondents who had 11-15 years of experience. Both groups of respondents had at one time been involved in at least one project of water and sanitation in Kilifi County.

Table 4.7 Industrial Experience of respondents

Age	Frequency	proportion	cumulative percent
5 yrs and below	3	6.98%	6.98%
6-10 yrs	24	55.81%	62.79%
11 -15yrs	8	18.60%	81.39%
16-20yrs	6	13.95%	95.35%
21yrs and above	2	4.65%	100%
Total	43	100%	

Majority of the respondents were involved in water and sanitation representing 46.51% while 25.59% were involved in hospital, 18.60% involved in housing and office and 9.30% of the respondents were from households as shown in table 4.8 below.

Table 4.8 Projects respondents were involved in.

Projects	Frequency	proportion	cumulative percent
Hospital	11	25.59%	25.59%
Water and sanitation	20	46.51%	72.10%
Housing and office	8	18.60%	90.70%
School and Education	4	9.30%	100.00%
Total	43	100%	

#### 4.4 Contribution of infrastructure in the provision of water and sanitation services in Kilifi County

All respondents agreed that, the availability of infrastructure was key in the provision of reliable water and sanitation services in Kilifi County. However the extent to which the availability of such infrastructure determines the provision of water and sanitation services varied for different respondents as shown in table 4.9 below.

Table 4.9 showing extent of availability of necessary infrastructure in determining implementation of water and sanitation development projects.

<i>Likert scale</i>	(x)	frequency (f)	<i>fx</i>
'Lesser extent'	1	0	0
	2	0	0
	3	4	12
	4	18	72
'Greater extent'	5	21	105
Total		43	189

$$\text{Mean} = \sum fx/n: 189/43=4.395$$

#### 4.5 Contribution of urban planning in the provision of water and sanitation services in Kilifi County

All respondents agreed that urban planning was a key factor in determining the levels of water and sanitation services provided in Kilifi County as it informed the way infrastructure network

was developed. However the extent to which this factor contributes in provision of water and sanitation services varied for different respondents as shown in table 4.9 below.

Table 4.10 showing extent of availability of urban planning in determining implementation of water and sanitation development projects.

<i>Likert scale</i>	( <i>x</i> )	frequency ( <i>f</i> )	<i>fx</i>
'Lesser extent	1	0	0
	2	0	0
	3	11	33
	4	10	40
'Greater extent'	5	22	110
Total		43	183

$$\text{Mean} = \sum fx/n: 183/43=4.256$$

#### **4.6 Contribution of availability of financial resources in provision of water and sanitation services in Kilifi County**

All respondents agreed that availability of adequate financial resources actual played a significant role in the provision of reliable water and sanitation services in Kilifi County. This was because development of adequate infrastructure network required some huge capital investments which was a challenge to obtain.

Table 4.11 showing extent of availability of adequate financial in determining the levels of water and sanitation services in Kilifi County.

<i>Likert scale</i>	( <i>x</i> )	frequency ( <i>f</i> )	<i>fx</i>
'Lesser extent'	1	0	0
	2	0	0

	3	12	36
	4	8	32
'Greater extent'	5	23	115
Total		43	183

$$\text{Mean} = \sum fx/n: 183/43=4.256$$

#### 4.6 Contribution of Rate of return on investments in provision of water and sanitation services in Kilifi County

All respondents agreed that the Rate of return on investments contributed highly to the levels of provision of water and sanitation services in Kilifi County, 12 out of the 43 respondents rated it at 3, while 7 respondents rated it 4 and 24 respondents rated it at 5 on the *likert* scale as shown in table 4.12 below.

Table 4.12 showing extent of rate of return on investments in determining provision of water and sanitation services in Kilifi County.

<i>Likert</i> scale	(x)	frequency (f)	fx
'Lesser extent'	1	0	0
	2	0	0
	3	11	33
	4	12	48
'Greater extent'	5	20	100
Total		43	181

$$\text{Mean} = \sum fx/n: 181/43=4.209$$



## 4.8 Testing of hypothesis using Chi-Square

In this study the researcher tested only the alternative hypothesis for each dependent variable as shown below.

### 4.8.1 First hypothesis on contribution of infrastructure in water and sanitation services management,

(i)H<sub>1</sub>; There was a significant relationship between the availability of infrastructure, and successful implementation and provision of water and sanitation services in Kilifi County.

Table 4.13 Showing observed and expected responses on extent of the availability of infrastructure, and successful implementation and provision of water and sanitation services in Kilifi County.

Likert scale	1	2	3	4	5
Observed (O)	0	0	4	18	21
Expected (E)	8.6	8.6	8.6	8.6	8.6

Table 4.14 showing Chi-Square testing for the first hypothesis

O	E	(O-E)	(O-E) <sup>2</sup>	(O-E) <sup>2</sup> /E
0	8.6	-8.6	73.96	8.6
0	8.6	-8.6	73.96	8.6
4	8.6	-4.6	21.16	2.46
18	8.6	9.4	88.36	10.27
21	8.6	12.4	153.76	17.88
				$\sum (O-E)^2/E = 47.81$

$$\chi^2_c = 47.81 > \chi^2_{\alpha, 0.05} = 9.488 \text{ at 4 degrees of freedom and 5\% level of confidence.}$$

Since the calculated chi-square value of 47.81 was greater than the critical chi-square value at 5% level of confidence, we accepted the alternative hypothesis in that there was a significant relationship between the effect of infrastructure, and successful implementation and provision of water and sanitation services in Kilifi County

#### 4.8.2 Second hypothesis on efficient urban planning process.

H<sub>1</sub>; There was a significant relationship between a transparent and efficient urban planning processes, and successful implementation and provision of water and sanitation services in Kilifi County.

Table 4.15: Showing observed and expected responses on extent of transparent and efficient urban planning processes, and successful implementation and provision of water and sanitation services in Kilifi County.

Likert scale	1	2	3	4	5
Observed (O)	0	0	11	10	22
Expected (E)	8.6	8.6	8.6	8.6	8.6

Table 4.16 showing Chi-Square testing for the second hypothesis.

O	E	(O-E)	(O-E) <sup>2</sup>	(O-E) <sup>2</sup> /E
0	8.6	-8.6	73.96	8.6
0	8.6	-8.6	73.96	8.6
11	8.6	2.4	5.76	0.67
10	8.6	1.4	1.96	0.23
22	8.6	13.4	179.56	20.88

$$\sum (O-E)^2/E = 38.98$$

$\chi^2_c = 38.98 > \chi^2_{0.05} = 9.488$  at 4 degrees of freedom and 5% level of confidence.

Since the calculated chi-square value of 38.96 was greater than the critical chi-square value at 5% level of confidence, we accepted the alternative hypothesis in that there was a significant relationship between a transparent and efficient urban planning process, and successful implementation and provision of water and sanitation services in Kilifi County.

#### 4.8.3 Third hypothesis on adequate financial resources in the provision of water and sanitation services.

H<sub>1</sub>; There was a significant relationship between availability of adequate financial resources, and successful implementation and provision of water and sanitation services in Kilifi County.

Table 4.17: Showing observed and expected responses on extent of availability of adequate financial resources and successful implementation and provision of water and sanitation services in Kilifi County.

Likert scale	1	2	3	4	5
Observed (O)	0	0	12	8	23
Expected (E)	8.6	8.6	8.6	8.6	8.6

Table 4.18 showing Chi-Square testing for the third hypothesis.

O	E	(O-E)	(O-E) <sup>2</sup>	(O-E) <sup>2</sup> /E
0	8.6	-8.6	73.96	8.6
0	8.6	-8.6	73.96	8.6
12	8.6	3.4	11.56	1.34
8	8.6	-0.6	0.36	0.04

23                      8.6                      14.4                      207.36                      24.11

---


$$\sum (O-E)^2/E = 42.69$$


---

$\chi^2_c = 42.69 > \chi^2_{0.05} = 9.488$  at 4 degrees of freedom and 5% level of confidence.

Since the calculated chi-square value of 42.69 was greater than the critical chi-square value at 5% level of confidence, we accepted the alternative hypothesis in that there was a significant relationship between availability of adequate financial resources and successful implementation and provision of water and sanitation services in Kilifi County.

#### 4.8.4 Fourth hypothesis on the rate of return on investments

H<sub>1</sub>; There was a significant relationship between the rate of return on investments and successful implementation and provision of water and sanitation services in Kilifi County.

Table 4.19: Showing observed and expected responses on extent of sound rate of returns on investments and successful implementation and provision of water and sanitation services in Kilifi County.

Likert scale	1	2	3	4	5
Observed (O)	0	0	11	12	20
Expected (E)	8.6	8.6	8.6	8.6	8.6

Table 4.20 showing Chi-Square testing for the fourth hypothesis.

O	E	(O-E)	(O-E) <sup>2</sup>	(O-E) <sup>2</sup> /E
0	8.6	-8.6	73.96	8.6
0	8.6	-8.6	73.96	8.6
11	8.6	2.4	5.76	0.67
12	8.6	3.4	11.56	1.34
20	8.6	11.4	129.96	15.11
				$\sum (O-E)^2/E = 34.32$

$\chi^2_c = 34.32 > \chi^2_{\alpha, 0.05} = 9.488$  at 4 degrees of freedom and 5% level of confidence.

Since the calculated chi-square value of 34.32 was greater than the critical chi-square value at 5% level of confidence, we accepted the alternative hypothesis in that there was a significant relationship between the rate of return on investments and successful implementation urban planning processes, and successful implementation and provision of water and sanitation services in Kilifi County.

## **CHAPTER FIVE**

### **SUMMARY OF FINDINGS, DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 Introduction**

This chapter presents the summary of the study findings, discussions, conclusions and recommendation of the research. The chapter also contains suggestions of related studies that may be carried out in the future.

#### **5.2 Summary of Findings**

The research aimed at finding out the factors that affect Water and sanitation services in Kilifi County. From an analysis and review of the research data and additional data gathered through the respondents and informants, a number of issues became apparent.

The first objective of the study was to examine the influence of infrastructure in the provision of water and sanitation services in Kilifi County. Data analysis, interpretation of interview responses and questionnaire responses from the respondents of the study revealed that infrastructure played a major role in the provision of water and sanitation services in Kilifi County. In the study for example, 39 out of 43 respondents, (90.7%) showed that the availability of infrastructure had a greater influence on the provision of water and sanitation services. This indicated that, with adequate infrastructure network in place, a greater number of people could be able to access water and sanitation services through ease and affordable connectivity.

On the second objective that sought to establish the extent to which financial resources influence the provision of water and sanitation services in Kilifi County. The respondents had the view that for the County to have a well established water and sanitation infrastructure network, a huge capital investment which required adequate financial resources was of great need . This was with 31 out of the 43 (72.1%) respondents. Proper water and sanitation services requires huge investments on the infrastructure development which ranges from water sources, development of both sewer and water treatment works as well as the laying of both sewer and water pipeline networks enough to cover the entire county.

The third objective was to examine the extent to which urban planning and development strategies influence the provision of water and sanitation services in Kilifi County. The study found out that existence of proper urban plans inform of proper housing plans, availability of clear and un-encroached road networks with clear way-leaves within urban areas assist in proper planning and designing for water and sanitation infrastructure development. This was evident in Kilifi County as there were pockets of areas mostly in the informal settlements where water and sanitation service levels were poor. Despite several efforts by the water utility to improve the infrastructure network in these areas, the major challenge had been on where such infrastructure was to be developed simply because a bigger percentage of the areas set aside as way-leave for laying infrastructure was not accessible due to people encroachment.

On the fourth objective that sought to establish the extent to which rate of returns on investments influence the provision of water and sanitation services in Kilifi County, it was found that the major funding for water and sanitation services infrastructure came from foreign donors, with the government budget taking a small share. Most of these donors expect that these projects once

developed to be self sustainable but this was not the case. Owing to the fact that access to water and sanitation services had been recognised as a basic human right by the constitution and due to high poverty levels, most of the consumers cannot afford to pay for these services, the government, most of the times was required to chip in and subsidise for these services. The water utilities in the County had been experiencing some financial challenges and constrains thus didn't attract commercial financiers due to their un-pleasant financial statements and in this way, miss out opportunities to invest more in infrastructure networks and thus low service levels.

### **5.3 Discussion of Findings**

Provision of safe water supply and improved sanitation to both urban and rural areas had formed a major challenge to the national governments in the world and more particularly in the developing areas. Most of these developing countries were those found in Africa and the sub-Saharan Africa in particular whereby infrastructure was poor, to some countries lacking due to destruction of major infrastructural facilities as a result of civil wars, natural calamities like floods among others.

According to the report published by the WHO (2009) about the state of health and sanitation in the country, infrastructure was rated as the major determinant of sanitation, waste management and water services provision to the people of India. The infrastructure here included electricity, passable ways like roads and hard infrastructure like water tanks, reservoirs, dams, built waste pit disposals among others. UN, |(2009).

Likewise, issues of availability of financial resources were key in ensuring provision of reliable and affordable water and sanitation services. The study established that in the case of MAWASCO, the indicator on coverage suggested that it was only able to provide services to



52% of the entire population within its area of mandate. Water sources in the county were adequate and still had more potential to be explored. The major challenge had been actual development of conveyance infrastructure which were capital intensive and the financial gap as indicated in the National water master plan was too huge to cover up. For the county to be able to cover up for the uncovered 48%, more and more resources was to be mobilised so as to finance infrastructure development . The case of Haiti in 2012 after the deadly earthquakes proved that availability of financial resources played a key role in water and sanitation services provision. The World Bank published a report on the post situational analysis of Haiti and its recovery strategies. The report had a section that showed the outbreak of cholera, the number of deaths from cholera in Haiti and the major suspected causes of such a deadly disease. World Bank, (2013). The report found out that ,besides, the destroyed infrastructure like pipes and laid down pipeline by the earthquakes and the presence of the cholera virus that was infiltrated by the UN soldiers, the availability of financial resources for the provision of WSS played a central role. For the provision of proper water and sanitation services, the Haiti government, the well-wishers and donors needed finances to hire helicopters, buy clean water/purify the available water or import clean and safe drinking-water having had almost 98% percent of the taps being broken. UN, (2012). The report continued to outline how many lives were lost due to a simple disease that could be treated and controlled were it that there were available funds to give emergency of WSS that were needed at hand.

Development of structures like settlement houses/schemes, roads, waste disposal centres, cities, industrial towns/points, markets among others had been an issue of contention among most developing and LDCs especially those in the Asian and African continents. This was the 21<sup>st</sup> century issue owing to the fact that there was a constant worldwide population increase with

about 6.3 billion people living on earth and the majority of these people being born daily in the LDCs and these population ever needed places to live, some food to eat, water to drink and many more. WFO, (2010). This population increase had pushed many people to settle in the otherwise areas that were not initially meant for settlement like the water catchment areas. Another problem that had been brought by this population was the rural-urban migration that had seen the number of people living in urban areas ever increasing daily; the consequence of which was the development of poorly planned urban centres/informal settlements commonly referred to 'slums'. Urban planning played a central role in the provision of WSS in the world especially among the urban poor/slum dwellers. The urban poor were the most hit by the planning problem. Most of the houses in these areas were poorly drained, poorly constructed, people were poorly connected to WSS infrastructure like piped water/proper waste disposal toilets, poor technology involved in emptying waste collecting buckets, poor waste disposal, poor stakeholders involvement, poor media/awareness creation for sanitation demand, infrastructure vandalism, illegal water connections among many more problems that had been associated with the urban poor. WSUP, (2012).

The government and ministry of water and irrigation made big strides towards water-pricing policy that had undergone significant evolution. The goal of current water pricing in all the urban areas in Kenya was to achieve cost-recovery. This required that, costs incurred in making water available at source include some or all of the following elements: The costs of operation and maintenance; Capital costs, comprising a return on paid-up assets, the repayment of loans; Overheads such as the administration and support required to operate such schemes; An allowance to provide for depreciation, replacement or refurbishment. The major problems

arising from the current water pricing policy in Kenya could be broadly classified into: those related to financial sustainability of urban water schemes and those related to water use efficiency and conservation.

#### **5.4 Conclusion**

The study shows the relationship between the independent and dependent variable. Infrastructure like, Pipes/ Pumps, Technology, Circulation Systems, Electricity /Power, Water Tanks and Reservoirs play a major role in influencing how the WSS providers give their services. Availability/absence of financial resources has a direct positive or negative influence in the provision of WSS to people. Poor urban planning has led to illegal structures and this has brought up the problem of slums and the end result is, most WSS providers aren't able to execute their mandates well.

The study also concludes that water management such as the use of information management, providing accountability, enhanced meaningful communications and implementing a comprehensive recognition program affects the financial sustainability of the region. The study also deduced that participation in income generating activities such as business activities, corporate alliances, trust or endowment fund and unrestricted income generating activities affect the financial sustainability of the organization and region at large.

#### **5.5 Recommendations**

The study recommends that since income diversification strategies enhance financial sustainability at the organisations to a great extent, the water management should increase the water and sanitation services. It further recommends that the County government should invest more resources in the provision of safe water supply and improved sanitation to the rural areas.

#### **5.6 Areas of Further Research**

The study recommends that further research should be done on the level of water provision in the entire coast region so as to allow for generalisation.

## **APPENDICES**

### **APPENDIX I:**

#### **LETTER OF TRANSMITTAL**

**University of Nairobi**

**School of Continuing and Distance Education**

**P.O. Box 30197**

**Nairobi.**

**July, 2014**

Dear Respondent,

I am a post graduate student at the University of Nairobi, School of Continuing and Distance education. In order to fulfill the degree requirement, I am undertaking a research study on Factors Affecting Water and Sanitation Services in Kilifi County.

This is to inform you that you have been selected to form part of the study and to kindly request you to fill in the attached Questionnaires which is to be collected later.

The information collected will be exclusively be used for academic purposes and will be treated with strict confidentiality. At no time shall your name appear in the report.

The findings of the research can be availed to you upon request. Thank you in advance for your co-operation.

Yours faithfully,

Isaac Chibule

### RESEARCH QUESTIONNAIRE

This questionnaire is intended to establish factors affecting Water and Sanitation services provision in Kilifi County. The information you provide will be treated with a lot of confidentiality and be used for the purpose of this survey only.

Kindly respond to all questions as honest as possible. Please tick (✓) where applicable.

#### Section A: Demographics

1. Indicate your Gender:      Male ( )      Female ( )
2. Indicate your age (in years) in the appropriate box  
(a) 21- 30 ( )      (b) 31 – 40 ( )      (c) 41 –50 ( )      (d) 51 – 60 ( )
3. What is your highest Academic level?  
(a) Certificate ( )      (b) Diploma ( )      (c) Degree ( ) (d) Others (specify) .....
4. Respondents area of residence .....
5. Indicate the category of the respondent  
(a) Mawasco staff ( )      (b) CBO operator ( )      (c) Water Kiosk Vendor ( )  
(d) Hospital Rep ( )      (e) School Rep ( )      (f) Household Rep ( )

#### Section B: Influence of Financial Resources

6. In your opinion, do you think financial resources allocation on infrastructure development influence water and sanitation service provision in your area?      Yes ( )      No ( )
7. If Yes, in question 6, please explain.....  
.....
8. Are the financial resources available sufficient to covers the existing needs for water and sanitation services provision      Yes ( )      No ( )

9. Below are reasons as to why the finances for the provision of water and sanitation services are not met. Using the scale in given, Please tick to show the most common factor in Kilifi County;

**Strongly Agree (SA). Agree (A). No Response (NO). Disagree (D). Strongly Disagree (SD).**

Please indicate by ticking the statements that you agree or disagree are applicable in your area

<b>Reasons as to why finances for WSS are not met</b>	SA	A	NO	D	SD
Allocation from the Government is too little					
There is No allocation from the government					
Corruption and mismanagement of the available funds					
Ghost companies that run away with the money					
No support from the NGOs and other partners					
Water tariffs are Low (Not cost effective)					
Political, religious and demand influences in funds providence					

NB; Any other comments on issues of financial resources in WSS.....

.....

.....

### **Section C: Items on Urban Planning**

10. Please tick all relevant.

Tick the area you are living.

- a). Bossy urban ( )                      b). Peri-urban ( )                      c).Informal Settlement/Slum ( )

11. In your own opinion, do you think that issues to do with urban planning play any role in provision of WSS in Kilifi County?

- a). Yes ( )                      b) No ( )                      c) Not Sure ( )

12. Give a reason for your answer above.....  
.....

13. Do you think the Municipality/ County Government is doing enough in urban planning for WSS?

- a).Yes ( )                      b). No ( )                      c). Not sure ( )

14. Give a reason for your answer above.....  
.....

15. Do you support the idea that the Municipality/ County Government should come up with a plan aimed at structuring urban settlement a fresh?

- a).Yes ( )      b) No ( )      c) Not immediately ( )      d) Not sure ( )

16. Give a reason for your answer above.....  
.....

NB; Any other comments on issues of Urban planning in WSS.....  
.....  
.....

**Section D: Items on Rate of Returns**

17. In your own opinion, do you think that issues to do with rate of returns on investment play any role in provision of WSS in Kilifi County?

- a). Yes ( )      b) No ( )      c) Not Sure ( )

18. Give a reason for your answer above.....  
.....

19. Do the tariffs charged on WSS provision in Kilifi County sustain the operational requirements of the service provider?

- a). Yes ( )    b) No ( )    c) Not Sure ( )

20. Give a reason for your answer above.....  
.....

21. In your own opinion, what should be done by the Water and sanitation services provider to realize good rate of returns on investments which could further improve on WSS provision in Kilifi

County?.....  
.....  
.....

NB; Any other comments on issues of rate of returns on investments in WSS.....  
.....  
.....

**Section E: Items on infrastructure**

22. How does water infrastructure development influence water and sanitation service provision?

- a) Very highly ( )    b) highly ( )    c) averagely ( )    d) Very little ( )

23. The water distribution network for water in your area is mainly operated as;

- a) Continuous (24hrs) ( )    b) Intermittent ( )

24. How would you rate the existing water supply infrastructure in Kilifi?



a) Excellent ( )      b) Very good ( )      c) Good ( )      d) Bad ( )

25. Below are obstacles to fighting water losses. Which one applies in your area? Please tick

a) Political situation ( )    b) Lack of financial means ( )    c) Lack of appropriate technologies ( )

d) Maintenance system ( )    e) Personnel capacities ( )    f) Personnel awareness ( )

g) Public acceptance / awareness ( )

26. What do you consider to be the best solution to improve your water infrastructure supply situation?

a) Development & exploitation of new resources ( )    b) Water loss reduction ( )

c) Rehabilitation ( )    d) Reducing wastage of water (customer awareness) ( )

27. Which of the following aspects of your water supply needs improvement in the future?

a) Quality ( )    b) Pressure ( )      c) Rate Reliability ( )    d) Maintenance ( )    e) Others ( )

28. If others in 22 above, name them:

i. ....

ii. ....

iii. ....

iv. ....

NB; Any other comments on issues of infrastructure in

WSS.....

.....

.....

.....

### APPENDIX III

#### PROPOSED BUDGET

Serial No	Item Description	Unit	Quantity	Rate	Amount	Remarks
<b>1</b>	STATIONERY					
	Printing Cost			LS	4,000	
	Foolscaps			LS	200	
	Pencils	Pcs	5	20	100	
	Rubber	Pcs	5	10	50	
	Pens	Pcs	5	20	100	
	Binding	Pcs	8	50	400	
	Notebooks	Pcs	5	70	350	
<b>2</b>	Allowance for 5 staff at Kshs. 300	Days	30	1,500	45,000	
<b>3</b>	Contingencies			10,000	10,000	
<b>TOTAL</b>					<b>60,200</b>	

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