THE IMPACT OF WATER SECTOR REFORMS ON THE MANAGEMENT OF WATER IN KIKUYU TOWN, KIAMBU COUNTY

By

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DECLARATION

This Research Project Report is my original work and has not been presented for award of a degree at any University or any institution of higher learning.

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DEDICATION

This research work is dedicated to my loving wife Monica Wangari Ngwiri, my unborn daughter Renee Wairimu, parents Mr and Mrs Kihumba and my entire family. May God bless them always.

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ACRONYMS AND ABBREVIATIONS

AWSB	Athi Water Services Board
CBO	Community Based Organization
CBS	Central Bureau of Statistics
CDC	Constituency Development Committee
CDF	Constituency Development Fund
CWSB	Coast Water Services Board
DWD	Department of Water Development
FAO	Food Agricultural Organization
GoK	Government of Kenya
HH	House Holds
IEBC	Interim Electoral Boundaries Commission
IWRM	Integrated Water Resources Management
KHDS	Kenya Household Demographic Survey
KNBS	Kenya National Bureau of Statistics
M^3	Cubic Meter
MDG	Millennium Development Goal
MOA	Ministry of Agriculture
MOLF	Ministry of Livestock and Fisheries
MOLG	Ministry of Local Government
MWI	Ministry of Water and Irrigation
MWRMD	Ministry of Water Resources Management and Development
NCWSC	Nairobi City Water and Sewerage Company

NWCPC	National Water Conservation and Pipeline Corporation
SME	Small and Medium Enterprises
SPSS	Statistical Package for Social Sciences software
UN	United Nations
UNICEF	United Nations Children's Fund
WAB	Water Appeals Board
WASREB	Water Services Regulatory Board
WHO	World Health Organization
WRMA	Water Resources Management Authority
WRUA	Water Resource Users Associations
WSB	Water Services Boards
WSPs	Water Service Providers
WSTF	Water Services Trust Fund
WUA	Water Users Associations

ABSTRACT

In the world over water and its supply has a significant impact on people's lives. These impacts touch on almost all aspects of our lives from health to socio- economic. Even though water is a very important scarce commodity its quantity over the years has continually decreased with the increasing population and destructive environmental activities. This had been the case despite the fact that the Government kept increasing the budget allocated to the water sector . It was for this reasons under the Water Act of 2002 that the Government rolled out an ambitious program dubbed Water sector reform program to decentralise and bring in water stakeholders in the management of water. This therefore led to the need of undertaking a study to make of impact this program on the management of water in this nation.

The independent variables that were considered for the study were poverty alleviation, availability of enough water and water of good quality, conflict resolution and stakeholder/ community participation in the management of water. The study area identified was Kikuyu town in Kiambu County. The Town was selected because even though it was the source of water to the City of Nairobi, it remained water deficient. The town population was the target group and a simple random sampling was used to identify 350 respondents for the study. Questionnaires with closed ended questions were used to collect data as well as observation and interview methods. The findings from this study have shown good management of water is crucial for the effective water supply and achievement of Vision 2030. In the study it was noted that though there has been an improvement in the quality of the service by changing the main players from the government to the companies and the people, the program should also invest in new water sources as it was found that even though people had the necessary infrastructure, most got water barely once a week. The quality of water was applauded by most of the respondents as they commented that is was of high quality. The cost of the water was found to be on the higher side and a third of the respondents complained that they were unable to meet the cost of water per month as it was way above what they could comfortably afford. This was noted as one of the impediments of the effective utilisation of this program.

Conflicts which are mostly caused by lack of resources which in this case is water were found to have declined with time. This could have been directly attributed to the inclusion of the community in the management of water. It was noted by most of the respondents that most of the conflicts that they have witnessed had been solved by the community and they were of the opinion that the community is the best placed institution to solve these conflicts. This affirms the spirit of the Water Sector Reform Program which had the intention of including the stakeholders who are the community. On community involvement the study found that community involvement was high with a higher number of projects started by the community as compared with other organizations such as NGOs and the Government. It was also noted that the community was involved as key stakeholders in Government and NGO projects.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

According to the World Health Organisation (WHO) around 1.1 billion people globally do not have access to improved water supply sources. The most affected are the populations in developing countries, like Kenya living in extreme conditions of poverty, normally peri-urban dwellers or rural inhabitants. Kenya is water scarce country with renewable fresh water per capita of 647 m^3 against the UNs recommended per capita of 1000m^3. In addition the country is a signatory to the Millennium Development Goals and thus commits to achieve target 7c which aims to reduce by half the proportion of people without sustainable access to safe drinking water and basic sanitation by 2015 (UNDP, 2012).

The Kenya National Bureau of Statistics, Kenya Demographic and Health Survey 2008-2009 which included a survey of the source of drinking water, found out that three out of five households (63%) obtained drinking water from an improved source. However, disparities exist by residence, with a higher proportion of urban households (91%) having an improved source of drinking water compared with rural households (54%). In addition, more than one-third of Kenyan households get their drinking water from a non-improved source, mainly surface water from lakes, streams, and rivers (24 % of households). Although only 6 percent of urban households use non-improved sources for drinking water, the proportion is far higher for rural households (46 percent). (UN WATER). The area under study is Kikuyu town in the Central Province of Kenya. Kikuyu town is located 20 km northwest of Nairobi City. The town itself has an urban population of 4,100, but the surrounding densely populated rural territory brings the total population to 165,594 (CBS, 2002).

The town was chosen for this study because the area around the town is an important water resource providing both the residents of Nairobi with water as well as being the source of some

of its rivers. The area around Kikuyu Town is made up of the Ondiri wetland and the Kikuyu Springs. The Ondiri wetland is a major source of the Nairobi River as it forms the headwaters of Nairobi River within the Athi drainage basin. In addition according to the Nairobi Water and Sewerage Company, Kikuyu springs located in Magana, adjacent to Kikuyu Town produces about four million litres per day of water for the residents of Nairobi, twenty two kilometres away. This is ironical because even though the town is significant to the supply of water to Nairobi City and the it's environment, Kikuyu constituency and town has a constant water deficiency since the current water demand is $48,277M^3$ per day, against a current supply of $27,300M^3$ per day. The constituency and the town in particular are highly dependent on wells and borehole water and there is no sewerage system.

1.2 Statement of the Problem

The Government of Kenya has been coming up with strategies to improve the situation of water management in the country by formulating new laws that would enable the citizens of Kenya to be able to get potable water and sewerage services and at the same time conserve the waters within its borders. To achieving this, the Government and water sector stakeholders came up with the Water Act of 2002 which brought with it drastic reforms in the water sector a program dubbed Water Sector Reforms. This was aimed at bringing radical changes to the management of water in the country. The purpose of this study is to investigate if there has been an impact on the management of water to the study area Kikuyu Town. Kikuyu town forms a good study case because though it is in a unique geographical location where it is blessed with abundant water resources it is also the source of many rivers in Kenya and one of the key source of water for Nairobi city and has a challenge to provide its large population with adequate amounts of water . Hence it was the aim of the researcher to know if there has been a significant change in the management of water since the reforms started and if they had had an impact on its citizens.

1.3 Purpose of the Study

This research assesses the achievements of the Water Sector Reform Program on the intended stakeholders thereby answering the research question of whether there has been a change in the management of Water in Kikuyu Town since the inception of the Water Sector Reforms.

1.4 Objectives of the Study

The objectives of the study are:

1. To investigate if there is there adequate provision of water to the residence of Kikuyu Town.
2. To find out if the residents of Kikuyu Town are provided with good quality water.
3. To find out if there has been a reduction of conflicts due to water in Kikuyu Town.
4. If the water sector reforms has led to a reduction of poverty in the area.
5. To find out if the community has been involved in the management of their water resources since the onset of the water sector reforms.

1.5 Research Questions

1. Is there an adequate quantity of water being provided to the residents of Kikuyu Town?
2. Is the water being provided to the residents of Kikuyu Town of good quality?
3. Has there been a reduction in the conflicts that have arisen due to water in Kikuyu Town ever since the reforms began?
4. Has the Water sector reforms led to a reduction of poverty in the area?
5. Has the community been involved in the management of their water resources since the onset of the water sector reforms?

1.6 Significance of the Study

The Government of Kenya initiated these reforms as a response to its commitment to protect the dwindling natural water resources and to ensure that its citizenry are provided with adequate portable water as stated in the millennium development goals.

It is for this reason that Kikuyu Town was chosen for this study. The town in situated strategically at the North of the City of Nairobi. It is also the home of the Kikuyu springs which provide 4,000m^3 of water for the city of Nairobi and the Ondiri wetland is located within close proximity to Kikuyu town which happens to be the source of the River Ngong.

In contrast Kikuyu town and the constituency in general is water deficient. With the constituent's water demand being approximately 48,277M^3 per day, against a current supply of 27,300M^3 per day and the town and the whole constituency being highly dependent on wells and borehole water and there is no sewerage system. Therefore these challenges provide a good test case of whether the nationally implemented Water Sector Reforms is achieving its goals of achieving the MDG goals on the provision of clean water to the citizens.

1.7 The Scope of the Study

The research was limited to Kikuyu town which is located in Kikuyu constituency, Kiambu County. Kiambu County is one of the 47 counties in Kenya. According to the IEBC, Kikuyu constituency has a total population of 124, 402 people. It comprises of twelve sub locations namely Karai , Gikambura, Gitiba, Nachu, Renguti, Kari, Lusingetti , Kerwa , Sigona, Kikuyu , Thogoto and Kinoo sub-locations. The research targeted this particular town because of its unique administrative, natural and economic position. Kikuyu town hosts a town council and an administrative division in the Kiambu County. Many of the people who work here who were respondents are from the 12 sub-locations in Kikuyu constituency. The research targeted the population of the town which is estimated at 4,100 in a random survey. The town itself has an urban population of 4,100, but the surrounding densely populated rural territory brings the total population to 165,594 persons (CBS, 2002).This particular town was also chosen for this study because the area around the town is an important water resource providing both the residents of Nairobi with water as well as being the source of Nairobi River. The area around Kikuyu Town is made up of the Ondiri wetland and the Kikuyu Springs. The Ondiri wetland is a major source of the Nairobi River as it forms the headwaters of Nairobi River within the Athi drainage basin. In addition the Kikuyu springs located in Magana, adjacent to Kikuyu Town produces about four million litres per day of water for the residents of Nairobi, approximately twenty kilometres away. This is ironical because even though the town is significant to the supply of water to Nairobi City and its environs ,Kikuyu town is water deficient since the constituency's current water demand is 48,277M^3/ day, against a current supply of 27,300M^3/day. The town's residents are therefore highly dependent on wells and borehole water.

1.8 The Limitations of the Study

The limitations that were encountered during the study were among others:

1. Language barrier which hindered the effective implementation of the data research tools.
2. The researcher was limited by the size of the population and the eventual sample size.

1.9 The Assumptions of the Study

The study made the following assumptions:

1. The sample selected were representative of the target population
2. The respondents answered the questions truthfully.

1.10 Definition of Significant Terms as Used in the Study

The following terms have the explained meaning in this study:

Aquifer An underground impervious layer of rock and sand that contains water

Decentralisation Process of transferring funds from the Central Government to the regional levels of the government structure.

Gender An idiom used to express the roles of men and women and their socio-economic and cultural relationships in any community. The roles and relationships between men and women is a product of the social and cultural formation based on equality, but not a biological term based on the sex difference.

Gender Mainstreaming is defined as a process of assessing the implications of any planned action, including legislation, policies or programs in all areas and at all levels. It is a strategy for putting women as well as men concerns and experiences as integral dimension of the design, implementation, monitoring and evaluation of policies and programs in all whole fields, so that women and men can get equal benefits in addition to the involvement of women and men in all related processes of water development and management.

Ground Water This refers to water of underground streams, channels, artesian basins, reservoirs lakes and other bodies of water in the ground and includes water in interstices below the water table.

Improved sources Sources that is likely to provide water suitable for drinking

Potable Water This is a terms that refers to drinking Water.

Stakeholder Groups, organizations or individuals who have a stake or a role in the water resources.

Water scarce A country is classified as water scarce if renewable freshwater supplies are less than 1,000 cubic metres per capita.

Water stressed A country is classified as water stressed if its annual renewable freshwater supplies are between 1,000 and 1,700 cubic metres per capita.

Water Resource Means any lake, pond, swamp, marsh, stream, water course, estuary, aquifer, artesian basin or other body of flowing or standing water whether above or below ground.

Water Service Means any service of or incidental to the supply of water or the provision of sewerage.

Water Service Provider This refers to a company or a nongovernmental organization or other person or body providing water services under and in accordance with an agreement with the licensee within whose limits of supply the services are provided.

Wetland A low lying area of land that is saturated with moisture, especially when regarded as the natural habitat of wildlife. Marshes, swamps, and bogs are examples of wetlands.

Quacking bog It is made up of a layer of vegetation or shrubs that forms over water, floating over water and which shakes when walked upon.

1.11 Organisation of the Study

Chapter one gives a general introduction of the study. It presents the background of the study from the history of Water Governance to our current situation. The study's problem, purpose, research questions and objectives, justification, significance and scope are further demonstrated

here. It concludes with the limitations and delimitations of the study and the significant terms used.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Potable water or Drinking water services are a critical area in our lives. The services share many of the characteristics of private goods that are bought and sold in any private market. It is a commodity for which demand is normal stable and predictable. According to the KNBS Kenya Demographic and Health Survey 2008-2009, a survey of the source of drinking water of most Kenyans showed that three out of five households in Kenya (63 percent) get drinking water from an improved source. However, disparities exist by residence, with a higher proportion of urban households (91 percent) having an improved source of drinking water compared with rural households (54 percent). Among the improved sources, piped water into the plot accounts for the highest proportion (15 percent) of households, but mainly in urban areas (33 percent), while the most common improved category for rural households is a protected dug well (12 percent).

More than one-third of Kenyan households get their drinking water from a non-improved source, mainly surface water from lakes, streams and rivers (24 percent of households). Although only 6 percent of urban households use non-improved sources for drinking water, the proportion is far higher for rural households (46 percent) (UN WATER, 2012). However conceptions of water inscribed in international water agreements and national water governance strategies that focus on its economic value collide with constructions of water as a ''free'' good provided by nature, with traditional valuations of water as a religious/cultural symbol, and with constructions of water as a necessary part of the ecosystem whose needs also must be satisfied, equally with those of other "users'' (Katz and Sara, 2000).Kenya has throughout history been blessed with adequate water resources. Water has always been regarded as a free resource. The country has an abundance of rivers both perennial (mostly found in the Central, Western and Coastal areas of the country), and seasonal mainly found in semi-arid and arid areas and ground water. Ground water resources exist in deep aquifers up to over 300 metres. Though it has had a vast array of these water resources, the country suffers from an acute shortage of potable water due to the sudden population growth and depleted scarce resources such as forest and rivers which in-turn has made the country struggle to provide adequate water for its citizens. Kenya is now

classified as a water scarce country. But this has not always been the case. Over the last 30 years, Kenya's water per capita has decreased from a comfortable 1,853 cubic metres in 1969 to 704 cubic metres in 2000, to around 647 in 2007. Thereby earning the categorization of a water scarce country.

In comparison, Kenya's neighbours, Uganda and Tanzania have respective annual per capita renewable fresh water supplies of 2,940 and 2,696 cubic metres per capita a year respectively. Within the Arid and Semi-Arid Lands (ASAL) that form about 80% of Kenya, there is limited endowment of water resources. This situation has imposed a financial burden on the population compared with the citizens of other countries. The burden is even greater because of the country's vulnerability to rainfall variability (IEA, 2007).The current trends are alarming as the scarcity continues. Scholars argue that though nature is partly responsible for this crisis, the main cause of it has mainly been a crisis of governance (K'Akumu, 2007). The government though somewhat succeeding to provide water to the urban population has performed dismally in providing improved water sources to its rural population. Typically the people without access to reliable water services often represent the poorest and most marginalized of Kenyan people. (Mumma, 2007). The Government was faced with various challenges when undertaking this mandate which included; institutional weaknesses, lack of adequate funds to run the water operations and to develop new infrastructure, poor coordination and lack of community participation in the sector. Moreover the government became a signatory to the Millennium Development Goals which committed the Government to halving the proportion of people without sustainable access to safe drinking water and basic sanitation between 1990 and 2015. This together with future strategic plans such as Vision 2030 which stated that the economic pillar of the vision is tied to increasing agricultural production and value addition and an escalation of conflicts related to water, necessitated a change of policy for water management.

Table 2.1 Statistics of water in Kenya from the 2009 population census

PROVINCE	POND/ DAM/ LAKE	PIPED	STREAM	SPRING /WELL /BOREHOLE	RAIN HARVESTED	OTHER
KENYA (TOTAL)	5.1	30.0	21.6	35.4	1.1	6.8
NAIROBI	0.3	75.7	0.1	7.2	0.2	16.5
CENTRAL	1.6	39.8	26.0	25.1	2.6	5.0
COAST	8.2	46.3	7.1	25.4	0.6	12.3
EASTERN	4.1	28.5	28.8	31.1	0.7	6.7
NORTH EASTERN	16.3	11.6	5.1	51.5	2.5	13.0
NYANZA	12.8	8.5	29.9	45.3	0.9	2.5
RIFT VALLEY	4.7	22.8	29.3	36.3	1.2	5.5
WESTERN	1.2	7.0	16.8	73.8	0.4	0.8

2.2 The history of Water Management in Kenya

Kenya's first Act governing water was the Water Ordinance, 1929 which was then repealed by the Water Act Cap 372, published in May 1952. Under this the then Ministry of Water Resources Management and Development (MWRMD), National Water Corporation Pipeline Conservation, Ministry of Agriculture (MoA), Ministry of Local Government (MoLG) and Ministry of Livestock and Fisheries (MoLF) were all responsible for policy formulation, regulation and service provision(IAE , 2007). Until 1974, water was managed by the Department of Water Development (DWD) which was housed in various ministries including Public Works, Natural Resources and Agriculture. The Government then upgraded the Ministry of Agriculture's Department of Water Development into a Ministry of Water. This new Ministry embarked on an ambitious water supply development program. Unfortunately soon after in the 1980s, when the Government became overwhelmed with the water requirement of its citizens it published a national guideline on how to hand over rural water supply systems to communities (Ministry of Land Reclamation, Regional and Water Development, 1997).

The manual clarified that communities would only oversee the managing of the water supply schemes but they continued to belong to the Government. The criteria for handing over included : a community's capacity to take over , ability to pay ,capacity to operate and maintain the system ,involvement of women in management and ability and willingness of communities to constitute legal entities to manage the water schemes. The Government then developed a National Water Policy in 1999 which justified a management hand over, arguing that ownership of a water facility encouraged proper operation and maintenance (IEA, 2007).The Policy stated that the Government would hand over urban water systems to autonomous departments within local authorities, and the rural water supplies to communities. This therefore began the decentralization process which culminated in the review of the Water Act, Chapter372 granting service providers water facilities and introducing institution to provide and regulate the water industry. In 1988 the Government established the National Water Conservation and Pipeline Corporation NWCPC to take over the management of Government operated water supply systems that could be run on a commercial basis.

By 2000 the NWCPC was operating piped water supply systems in 21 urban centres serving a population of 2.3 million people and 14 large water supply systems in rural areas serving a population of 1.5 million people. The Department of Water Development (DWD) had also developed and was managing 73 piped urban water systems serving 1.4 million people, and 555 piped rural water supply systems serving 4.7 million people. Alongside the DWD and the NWCPC the large municipalities were licensed to supply water within their areas and by the year 2000, ten municipalities supplied 3.9 million urban dwellers. Additionally, about 2.3 million people were receiving some level of service from systems operated by self-help (community) groups who had built the systems, often with funding from donor organizations. Persons not served under any of the above arrangements did not have a systematic water service, and had to make do with such supply as they were able to provide for themselves, typically by directly collecting water from a watercourse or some other water source on a daily basis. (Mumma, 2007).

By the year 2000, less than half the rural population had access to potable water and in urban areas only two thirds of the population had access to potable and reliable water .It therefore

became necessary to repeal the current water act(Cap 372) and replace it with the Water Act of 2002 to provide the legal framework for the implementation of reforms in the water sector aimed at enhancing water resources management (WRM) and the provision of water supply and sanitation (WSS) services on a sustainable basis(M.W.I website, 2012) .After the successful implementation of the Water Act of 2002, Water sector reforms were introduced which mandated different institution to oversee the Water Sector. The Water sector under the water Sector Reforms was divided into three different levels. These were the National Level, the Regional Level and the local Level.

2.3 General overview of Water Act of 2002

The Water Act 2002 provided for three main aspects; (i) the management, conservation, use and control of water resources (ii) the acquisition and regulation of rights to use water, and (iii) the regulation and management of water supply and sewerage services. It created various institutions with separate functions and mandates and removed the Government from service provision (IEA, 2007).The functions of the MWI were reduced to policy making. More specifically, its functions were to develop and formulate policies. The Water Services Regulatory Board (WSRB) and Water Appeals Board (WAB) are independent institutions to regulate and deal with disputes respectively. The Act also provides for the Water Resources Management Authority (WRMA) to manage regulate and conserve water resources naturally including trans-boundary waters. At the Regional level water services were to be delivered through seven Water Services Boards. Six Catchment Area Advisory Committees (CAACs) were formed to carry out water resources management tasks. The boards in turn retained service provider(s) such as water companies, NGOs, institutions and community owned schemes, to provide day-to-day water services within their areas of responsibilities. At the Local level water is supplied by non-governmental water services providers (companies) whose main task is getting the end product to the consumer and maintaining the infrastructure under licence from the Water Service Board and WASREB (Mumma, 2007). The communities participated in formation of WRUAS. The Water Services Trust Fund was meant to finance micro-projects at the community level.

2.4 Necessity of the Water Reforms

Unfortunately poor governance of water has dominated the world. Poor governance is represented by systems characterized by lack of certain conditions such as inclusiveness, accountability, participation, transparency, predictability and responsiveness. These have led to increased political and social risk, institutional failure and rigidity among other things (K'Akumu, 2007).As the per capita availability of mobilizable water supplies decline and the marginal costs of securing additional supplies rise, water authorities in many countries are compelled to explore new approaches to improve the management of water resources (Diaoa and Roeb, 2003). Many of the countries facing this problem are also under pressures to engage in broader policy reforms, including those reforms that better integrate and link their economies to world markets. In Kenya, the unchecked use of water is leading to over extraction of water resources, while the degradation of water catchment areas through deforestation, drainage of wetlands and other factors is threatening the availability of water. The main reasons for these problems lie in mismanagement, corruption, an unresolved legal situation and the low level of poverty orientation (Ayieko, 2007).

2.4.1 Positive impacts since the implementation of the reforms

Efficiency in service delivery

In a review by the Governments of England and Wales of the provision of water and sewerage services (Cave and Wright, 2010) discovered that the water industry had become more efficient. Though there were challenges on infrastructure renewal, environmental improvement and higher customer expectations, the industry had become more efficient under the regulation. It also found that with climate change and increase in future populations would reduce the amount of water available to the populations. Therefore this increased demand and lower supply necessitated finding efficient ways of allocating and treating and using waste water. The reforms have had some far reaching consequences, namely : i) the Water Sector is now better organized with various institutions dedicated to their area of specialization, ii)there has been an increase in investment in poor and marginalised areas with donor institutions like the World bank giving a substantial amount to increase to fund water sector reforms . There has also been an increase in

the budget allocation to the water sector from Kshs. 2 Billion in the year 2002 to Kshs. 28 Billion in the year 2009)

2.4.2 Challenges in implementing the Water Sector Reforms

State ownership of the water resources

Part II of the Act deals with ownership and control of water. Section 3 vests "every water resource" in the State. "Water resource" is defined to mean "any lake, pond, swamp, marsh, stream, watercourse, estuary, aquifer, artesian basin or other body of flowing or standing water, whether above or below ground." The effect of this provision, therefore, is to vest ownership of all water resources in Kenya in the State.

Disadvantage to the landless people

Management of water resources and provision of water services to the rural poor is inhibited because they only have limited access to state based systems. Matters are compounded by the administrative, financial and technical constraints inhibiting the ability of the Kenyan state to implement the Water Act 2002 and to enable rural household to derive full benefits from its provisions. The permit system is state centric in orientation. In operation, it privatizes water rights to a small section of the community, essentially property owners who are able to acquire and use water resource permits. By the same token, it marginalizes from the formal statutory framework poor rural communities who are unable to meet the requirements for obtaining a permit, principally land ownership because according to the Act it is not possible, under the law, to obtain a permit which is not linked to particular land. The Act therefore marginalizes poor rural community groups in the acquisition and exercise of the right to use water resources. This undermines the ability of poor rural communities in Kenya effectively to utilize water resources in economically productive activities such as irrigation and commercial livestock rearing.

Inefficiency in water management

Cave and Wright, (2010) concludes that competition and innovation have an important role to play in addressing water issued but the water industry is essentially made up of monopolies as in

the case of Kenya where water service providers are given rights for a particular geographical area and therefore there is no real competition . The customers can not really choose their suppliers and the providers are often not large enough to innovate. Due to inefficiency it is argued that not all reforms are good. In a survey of data of 50 water supply enterprises from 29 countries of Asia and Africa in 1995 found that efficiency of water supply in the private sector is not significantly different from the state water sectors (Estache and Rossi, 2002).In their analysis of whether or not private sector management is related to a more efficient, sustainable, and accountable management of water variety of municipal and private management arrangement in four urban areas, Wilder and Lankao, 2006 in Mexico found out that it has not led to increase in efficiency. They also found that it did not result in greater equity, efficiency or sustainability of water use. They further argued that privatization is less an instrument aimed at improving efficiency than a channel for preferred treatment for capital accumulation by private entities as well as a legitimized way for the state to transfer the burden of water management to non-state institutions.

Corruption in management of water

There have been numerous challenges to the Reforms. Cases of corruption in water bodies and tales of water supply switched off because of electricity bills that have not been paid are many. Among the urban poor, cases of bribing to get legal connections are countless and many boardroom wars over the control of water and sewerage companies are being reported regularly. (The Standard, 2012). Another reason has been the creation of too many institutions to manage water which has lead to weaknesses in ministerial co-ordination. This has led to contradictory policies or turf wars between ministers and local authorities which distract the bodies from implementing their strategic plan.

2.5 Community Involvement in water management

In their article on the Constraints and potential for efficient inter-sectoral water allocations in Tanzania, Kashaigili et al, (2003) explored the major constraints and potential for achieving efficient systems of allocating water resources to different uses and users in Tanzania. They identified the constrains such as; the lack of active community involvement in management of

water resources, conflicting institutions and weak institutional capacities both in terms of regulations and protection of interests of the poor, the lack of data and information to inform policy and strategies for balanced water allocation, and inadequate funds for operation, maintenance and expansion of water supply systems.

They noted that due to increasing human population, water scarcity and conflicts over water resources were increasing. It is now the norm all over the world e.g. in South Africa and Zimbabwe to have a water users association to reduce conflicts due to water sources. The researchers went on to recommend reforms in water utilization to achieve equity and meet changing social and economic priorities, facilitate the development of effective local institutions, put in place the legal system that assigns rights to water resources and describes how those rights may be transferred, enforcing of the rights and punish infringements on those rights, and using cost-effective pricing systems to ensure that payment for water uses cover development, operational and management costs. In Kenya, there has been a lot of emphasis on public participation with regards to the issue of water management. Under section 14 of the Act it states that after the Water Resources Management Authority shall establish regional offices in or near each catchment area. Section 16 provides that the Authority shall appoint a committee of up to fifteen persons in respect of each catchment area to advise its officers at the appropriate regional office on matters concerning water resources management, including the grant and revocation of permits. This in effect transferred the role of management from the Government officials to the people.

2.5.1 Decentralization of authority

Decentralization is the devolution of authority and accountability from the Central to lower levels of Government. One dimension of decentralization is the extent to which users and other stakeholders participate in the decision-making process (World Bank, 1993). Water resources have been usually mismanaged by governments, leading to several social and economic problems, including degradation in its quality and reduction in the level of services they to mean the shift of decision-making responsibility to water users or governmental units at the ground. In his analysis on the decentralization, Dinar et al. 2007 found that contrary to common perception

that primarily emergency situations trigger reform, persistent water scarcity is found to be a major stimulus to reform. Similarly, financially well- endowed or -developed basins do not necessarily outperform poor and underdeveloped basins. Conditions improving decentralization performance include: existence of dispute resolution mechanisms; greater financial responsibility of users; and as opposed to traditional thinking, government financial support to basin budget.

Decentralization of Functions

The Water Act 2002 has introduced comprehensive and, in many instances, radical, changes to the legal framework for the management of the water sector in Kenya. These reforms revolve around the following four themes: the separation of the management of water resources from the provision of water services; the separation of policy making from day to day administration and regulation; decentralization of functions to lower level state organs; and the involvement of non-government entities in the management of water resources and in the provision of water services. (Mumma, 2007)

2.5.2 Water Users Associations

In their papers Sokile et al, (2003) and Garrick et al, (2009)argued that water management issue is both a question of developing stakeholders' participation and transferring state's competence to water user associations. Xinshen, (2003) explores the benefits of reducing the conflict caused how the creation of a market in water user rights can lower the resistance to reform under circumstances where water is administratively allocated to producers, and other policies distort the economy in Morocco. A study in Mongolia found that the formation of water user associations eliminated the competition by increasing the total amount of water available and assuring all households some voice in its allocation (Qiao et al, 2009).

In their examination of the viability of Water Users Association Sokile et al, (2003) write that the wider scholarly opinion seems to accentuate that WUAs are a long awaited solution to intersectoral water management. However, a closer observation reveals that irrigators, with little or no acknowledgement of other users, dominate WUAs. In the critical examination of WUAs

Sokile et al, (2003) in critically investigating whether WUAs meet the expectations of the poorest of the poor in the villages, to what extent, from whose agenda do the WUA arise and operate and who are the ultimate beneficiaries of WUAs. They realized that not many WUAs have brought together conflicting water users. They further recommended capacity building to local communities should be carried out to enable them identify their roles and obligations in water management and networking and collaboration among various stakeholders; government agencies, private sector, NGOs, CBOs and grassroots organizations should be encouraged. In response to pressing water management problems, many countries have adopted reform policies such as transferring rights and responsibilities of irrigation systems from government agencies to farmers' associations and other private institutions. In several countries, peasants' participation in water management has been encouraged in hopes of reducing government's financial burdens, optimizing the use of water resources, and increasing operational efficiency of hydraulic engineering facilities to solve water-shortage problems. (Qiao et al 2009).

Manzungu, (2002) looked at Stakeholders participation as the principle for reforms in water management and how the process and modalities of how new democratic water management institutions are being set up. He further went on to focus on the proposals and practice of ensuring strategic stakeholder representation in the catchment wide bodies, especially with regards to the formerly disadvantaged people. This would be by recognizing and promoting group identity of different water users as well as creating real political space for such groups to exist and operate and nurturing group interests and safeguarding them rather than emphasize vague notions of the common good (Manzungu, 2002). This was to ensure that local politicians and other interested groups don't hijack an otherwise noble idea. He however discovered that a vast majority of people were unaware of such community organizations and this further made the implementation harder.

2.6 Provision of water services

According to the Water Act section 51 allowed for the establishment of Water Services Boards whose area of service may encompass the area of jurisdiction of one or more local authorities. A water services board is responsible for the provision of water and sewerage services within its

area of coverage. Now since the water services board is prohibited by the Act from engaging in direct service provision. The board must identify another entity, a water service provider, to provide water services as its agent. The law allows water services boards, however, to provide water services directly in situations where it has not been able to identify a water services provider who is able and willing from the particular area to provide the water services. Under section 53(2) of the act it further states that water services shall only be provided by a water service provider, which is defined as "a company, non-governmental organization or other person providing water services under and in accordance with an agreement with a licensee [the water services board]." Community self-help groups providing water services may therefore qualify as water services providers. In the rural areas where private sector water service providers are likely to be few, the role of community self-help groups in the provision of water services is therefore significant.

The Act requires the appointment of private individuals to the boards of both the Authority and the Regulatory Board and further goes to state that in the qualification of these persons that, in making appointments, regard shall be among other factors, the degree to which water users are represented on the board. More specifically subsection 3 of section 16 states that the members of the catchment advisory committee shall be chosen from among, inter alia, representatives of farmers, pastoralists, the business community, non-governmental organizations as well as other competent persons. Similarly, membership on the board of the water services boards may include private persons. Most significantly however, the Act provides a role for community groups, organized as water resources users associations, in the management of water resources. Section 15(5) states that these associations will act as an aid to conflict resolution and cooperative management of water resources.

2.6.1 Privatization of water management

According to Casarin et al, (2007) in failures in water reform, for the last two decades, countries worldwide have made pioneering efforts in the design and implementation of reform plans in infrastructure services. These have involved restructuring, privatization and deregulation in the telecommunications, energy, water, and transport industries. Private sector participation has been

accomplished in a variety of forms, ranging from management contracts to concessions and full privatization. These reforms have led to a reallocation of the conflicting roles of governments as owners, operators, and regulators, with private firms and regulators undertaking important roles in these functions. They further note that evidence shows that privatized enterprises have on average delivered superior performance across a wide range of performance indicators. They also discovered that reforms have proved successful in defining suitable environments attracting private and mostly foreign investment. A reason they attribute to this improved performance is that privatization makes it difficult for government and politicians to intervene in the operation of firms and to behave opportunistically. On the down side weak institutional environments may allow private operators to behave opportunistically where powerful firms take advantage and increased tariffs, lower service standards or coverage levels. The inefficiencies of public ownership have had adverse effects on the water supply sectors performance (Wang et al, 2011).

Hence many countries seek through privatization to increase service coverage and investment and reduce the financial burden on government budgets. By 2000 more than 93 countries had introduced private sector participation in the urban water supply industry (Brubaker, 2001) Fundamental to the optimal use and conservation of water is an active partnership with all concerned stakeholders so as to be able to achieve an equitable provision of adequate quantities and qualities of water for all sectors of users at an acceptable cost and assurance of supply. (Marimbe and Mazungu, 2003).

2.6.2 Role of the State in water management

The creation of new forms of water institutions requires not the retrenchment of the state but rather its involvement to ensure accountability, transparency, equity, and sustainability (Wilder and Lankao, 2006).

2.7 Conflicts due to water

In their study of Conflicts in Zambia, Funder et al, (2010) noted that conflicts arise in situations in which two or more parties seek access to the same water resource. At times such conflict or

cooperation is latent, while at other times, it is expressed as water events where one or more parties seek access to water by: challenging other parties' access or confirming own or other parties' access; or collaborating with other parties to secure access". The event becomes conflictive when one or more parties challenge other parties' access to a particular water resource. Many local water conflict events are indeed very local – i.e. they tend especially to take place within individual communities and only to a lesser extent across a number of communities and/or administrative boundaries.

A study by Lomar et al, (2003) found that a water user association formed in 1995 in Hubei province led to reduced conflicts between upstream and downstream users. In addition, irrigation services improved and became better coordinated, allowing the entire area to be irrigated in 4 days as compared to 2 weeks before the formation of a water user association. This allowed the group to increase their irrigated area by more than 50%.

2.8 Poverty alleviation through efficient water management

Inadequate water services have a particularly adverse impact on the poor, facilitating the spread of disease, especially in crowded low-income areas. Thus, special efforts will be directed to meeting the water needs of the poor. Moreover, the health benefits of better hygiene and clean water should be emphasized so that the advantages of having an improved water supply can be fully realized. Where public finance is scarce, significant additional resources can often be mobilized within local communities. Efforts should be made to determine the level of services actually wanted by the poor. Research and experience suggest that the poor are willing to pay for reliable service. Indeed, in the face of unreliable service, the poor often pay more for less water, which they typically receive from street vendors. Water entities that have a financial stake in serving the poor are more likely to provide them with better, more sustainable services. "Social fees," whereby the better-off cross subsidize the poor, as well as budgetary transfers to subsidize connections can be used. (World Bank, 1993)

2.8.1 Water borne diseases brought on by poor water management

One could argue that diseases brought on by water may cause people to be considerably poor as most of their resources are spent treating them. An important fraction of the burden of water-related diseases (in particular: water-related vector-borne diseases) is attributable to the way water resources are developed and managed. In many parts of the world the adverse health impacts of water pollution, dam construction, irrigation development and flood control cause significant preventable disease(WHO,2012) . It can therefore be noted that there is a correlation between preventing water borne diseases and reducing poverty.

2.9 The gender role in water management

The relation between water and gender can be seen in the millennium development goals have stressed the importance of the gender equity and women empowerment. In 2006, the Human Development Report revealed that countries with the lowest gender-related development indices (Sierra Leone, Niger, Burkina Faso and Mali) had high poverty rates and little access to water, health and education. Water is essential to human beings and all forms of life. But pollution and lack of access to clean water is proliferating the cycle of poverty, water-borne diseases, and gender inequities .Water is an entry point for sustainable development, poverty eradication, reproductive and maternal health, combating diseases. Poverty is deepening worldwide, and the most vulnerable groups are women and children. Women experience poverty differently than men, as they are generally treated unequally. It is estimated that, of the 1.3 billion people living in poverty around the world, about 70% of them are women. (Zoughbi, 2008)

Households headed by women are often more exposed to economic shocks due to the income irregularity or sustainability. Women are more vulnerable than men to chronic poverty due to gender inequality in various social, economic and political institutions. This can be found in the uneven distribution of income, control over property or income. If water resources are located far away from residence, women and girls have to walk further to bring water, thus reducing available time for more productive works. (UN Millennium Task Force on Water and Sanitation, 2005). In nearly half of Kenyan households (49 percent), adult women are responsible for water

collection. In rural households, adult women are six times more likely than adult men to be the ones to fetch water (58 percent of households compared with 9 percent, respectively). Even in urban households, women are more than twice as likely as men to collect water (22 and 10 percent of households). Furthermore when there is competition for water resources, women and the vulnerable often lose their entitlements.

2.10 The study area

The area under study is Kikuyu Town It is located in Kikuyu constituency. Kikuyu constituency is located in Kiambu County. According to the IEBC it has a total population of 124, 402 people. It comprises of twelve sub locations namely: Gikambura , Gitiba, Karai, Kari, Kerwa, Kikuyu , Kinoo, Lusingetti, Nachu, Renguti, Sigona and Thogoto. Kikuyu Town is located in Kikuyu sub location. It is approximately 20 km northwest of Nairobi City. Kikuyu hosts a town council and an administrative division in the Kiambu County. The town itself has an urban population of 4,100, but the surrounding densely populated rural territory brings the total population to 165,594 persons (CBS, 2002).This particular town was chosen for this study because the area around the town is an important water resource providing both the residents of Nairobi with water as well as being the source of Nairobi River. The area around Kikuyu Town is made up of the Ondiri wetland and the Kikuyu Springs. The Ondiri wetland is a major source of the Nairobi River as it forms the headwaters of Nairobi River within the Athi drainage basin. In addition the Kikuyu springs located in Magana, adjacent to Kikuyu Town produces about four million litres per day of water for the residents of Nairobi, approximately twenty kilometres away. This is ironical because even though the town is significant to the supply of water to Nairobi City and its environs ,Kikuyu town is water deficient since the current water demand is 48,277M3/ day, against a current supply of 27,300M3/day. The town's residents are therefore highly dependent on wells and borehole water.

Ondiri swamp

Ondiri Swamp is a breather of Lake Naivasha. It is located in the outskirts of Nairobi about 18 km on the south west of Kikuyu Town. It lies about 2000m above sea level, 10m below the area

topography. It is a major source of Nairobi River. The Ondiri wetland is oval in shape and local legend has it that it used to be an open lake in the early part of the last century and indeed the name itself is a corruption of the word old lake (Ondiri) by the locals. However as deforestation and subsequent erosion accelerated, the lake came to be covered with floating reeds on peat such that now it has an extensive reed mat that covers more than 95 percent of the wetland to form a quacking bog, the only one in the country .The wetland covers an area of approximately 30 hectares with a perimeter of slightly over 3km. Hydrologists say the water sits on a valley of about 10kms. To the north of the wetland, a large area on which sits Kikuyu town, slopes southwards towards the wetland. The wetland's vegetation comprises of reeds and water grass. The swamp is fed by rainfall and overland flow from the surrounding areas. During the rainy season, most floodwaters in this area drain into the wetland. The surrounding areas are characterized by valleys and rocks and because of this there are several small streams and springs sprout from the joints and faults in the area. The main direction of outflow of the wetland is to the south and east where several small streams join downstream to form larger streams that make the headwaters of Nairobi River. The water body is linked to Kikuyu Springs, which lies to its east through a subterranean passage. The spring is a major source of Nairobi's water throughout the year. Ondiri is a unique and an important wetland. As noted earlier, Ondiri is Kenya's only quaking bog and the second deepest wetland in Africa after Doula in Cameroon. Local people also use it intermittently as a recreation site.

Nairobi River

Nairobi River is a river flowing through the Kenyan capital Nairobi. It is the main river of the Nairobi river basin, a complex of several parallel streams flowing eastwards. All of the Nairobi Basin Rivers join east of Nairobi and meet the Athi River, eventually flowing to the Indian Ocean.

2.11 Conceptual Framework

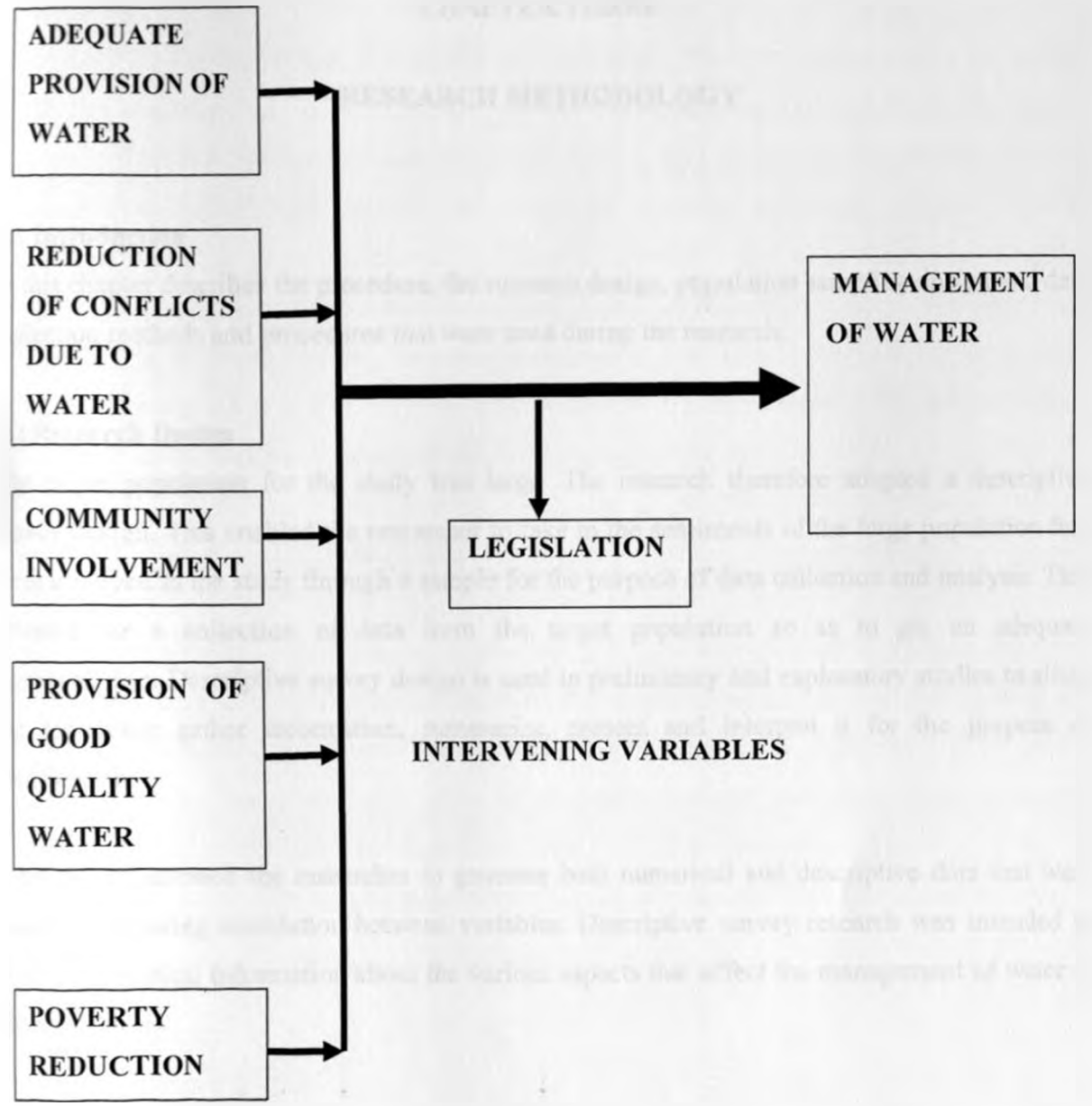

Figure 1 Conceptual Framework

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

In this chapter describes the procedure, the research design, population sampling design and data collection methods and procedures that were used during the research.

3.2 Research Design

The target population for the study was large .The research therefore adopted a descriptive survey design. This enabled the researcher to take in the sentiments of the large population that were involved in the study through a sample for the purpose of data collection and analysis. This allowed for a collection of data from the target population so as to get an adequate representation. Descriptive survey design is used in preliminary and exploratory studies to allow the researcher gather information, summarize, present and interpret it for the purpose of clarification.

This design allowed the researcher to generate both numerical and descriptive data that were used in measuring correlation between variables. Descriptive survey research was intended to produce statistical information about the various aspects that affect the management of water in Kikuyu Town.

3.3 Target Population

Mugenda and Mugenda (2003) define a population as an entire group of individuals, events or objects having a common observable characteristic. The universe or the target population for this study was Kikuyu Town in Kikuyu Constituency, Kiambu District in the Central Province of Kenya. The researcher targeted the population of the town which is estimated at 4,100 according to the 2009 population census (CBS, 2002).

3.4 Sampling Procedure

Mugenda and Mugenda (2003) define sampling as the process of selecting a number of individuals for a study in such a way that the individuals selected represented the group from which they were selected. Kikuyu constituency has twelve sub-locations under the constituency. The researcher chose Kikuyu town as the respondents of the survey were representatives of all these sub locations because the people who work in this town live in these sub-location. Because of the nature of the target population the research carried out a simple random sampling. Mugenda and Mugenda (2003) define it as giving a number to every subject or member of the accessible population and picking the number at random. At Kikuyu town the researcher used simple random sampling and the respondents were chosen randomly since all the respondents are stakeholders as consumers of water and the population was very large.

3.4.1 Sample Selection and Sample Size

According to the IEBC which put the population of Kikuyu constituency in Kiambu county as 125, 402. The area is 175.70 square kilometres. The constituency has 12 sub locations and one administrative centre Kikuyu town. The population of Kikuyu town is estimated to be around 4,100 people. The survey tried to focus on the town residents and was limited to the population within the town. The sample size was determined to be 350 respondents. This was arrived at using Krejcie and Morgan's method of determination of a sample for a given population size which is:

$$s = X\,2NP\,(1-P) \div d\,2\,(N-1) + X\,2P\,(1-P).$$

Where

s = required sample size.

$X2$ = the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841).

N = the population size.

P = the population proportion (assumed to be .50 since this would provide the maximum Sample size).

d = the degree of accuracy expressed as a proportion (.05).

The population of Kikuyu town is 4100 and the eventual sample size is 350.

3.5 Data Collection Method

Survey Method was used for data collection. The sampled individuals were requested to respond to a questionnaire and the responses recorded for analysis. This method was chosen because it is very economical and accurate.

3.5.1 Data Collection Instruments

The study used quantitative instruments due to the nature of the research questions. The quantitative data are those that can be quantified usually on the ordinal and ratio scales where as the qualitative data cannot be expressed fully as numbers and therefore may be expressed on nominal scales .

Quantitative data was collected through the use of questionnaires. Here the researchers employed two methods namely:

1. Self administered questionnaire: Here the respondents completed the questionnaire by themselves. This is because a majority of the respondents are literate.
2. Researcher administered questionnaire: This was done to respondents who had difficulties in understanding the questions.

3.6 Validity and Reliability of the instrument

3.6.1Validity of the Instruments

Mugenda and Mugenda, 1999 define validity as the accuracy and meaningfulness of inferences which are based on the research results; it's the degree to which results obtained from analysis of the data actually represent the phenomenon under study. In order to improve validity the researcher ensured that the research instruments were accurate by making the necessary adjustments after conducting a pilot study and ensuring the questions were getting the right responses to measure what was intended. Five water experts were chosen for this and their response was used to improve the research instrument.

3.6.1Reliability of the Instruments

Mugenda and Mugenda, (1999) further define reliability as a measure of the degree to which a research instrument yields consistent results or data after repeated trials. Reliability enables the researcher to identify misunderstandings, ambiguities, and inadequate items in the research instruments and make the necessary adjustments so that data collected can have more reliability. Reliability of the research instrument was ensured by using the test and retest method prior to the commencement of the work where five of the actual respondents were given the same research instrument to ensure that they produced the same results. Three of the respondents produced the exact results after retest while two had a deviation which showed that the instruments were 67 percent reliable.

3.7 Data analysis method

After the end of the research all the questionnaire and other tools of data collection were fed into the statistical package for Social Sciences program, where the data was analysed using descriptive statistics.

3.8 Operational Definition of Variables

Table 3.1: Operational Definition of Variables

Research Objectives	Indicators	Scale
1. Is there an adequate quantity of water being provided to the residents of Kikuyu Town.	• Where the water is consumed.	Nominal
	• Source of water.	Nominal
	• Quantity of water provided	Nominal
	• How easy is it .to access water?	Nominal
	• For piped water how many days do you get water in a week.	Ordinal
2. Is the water being provided to the residents of Kikuyu Town of good quality.	• Rating of the flavour and taste of the water you consumed.	Ordinal
	• Confident in drinking water without boiling it or using chlorine.	Nominal
	• Opinion on the smell of the water provided.	Ordinal
	• Opinion on the colour of water provided.	Ordinal
3. Has there been a reduction in the conflicts that have arisen due to water in Kikuyu Town ever since the reforms began.	• Water related conflict in the last five years.	Nominal
	• Water related conflict resolution.	Nominal
	• Opinion on water conflicts increase or reduction in the past five years.	Ordinal
	• In case of water related conflicts, the opinion on who is the best person to	Nominal

	address it.	
4. Has the Water sector reforms led to a reduction of poverty in the area?	• The cost of water per 1000 litres.	Ratio
	• Opinion on the cost of water.	Ordinal
	• Difficulty in meeting monthly water payments.	Nominal
	• Water borne disease prevalence this year.	Nominal
	• Willingness to pay more for water for improved service.	Nominal
5. Has the community been involved in the management of their water resources since the onset of the water sector reforms?	• Existence of a water project in your area.	Nominal
	• Initiator of the water project.	Nominal
	• Participation in the starting of a water project in your area.	Nominal
	• Role in the community water project.	Nominal
	• Period of involvement in the community water project.	Ordinal
	• Ownership of the water supply.	Nominal
	• Membership to a Water Resource Users Association (WRUA).	Nominal

3.9 Methods of Data Analysis

The data collected was analyzed using descriptive statistics. After collection the data was pre-processed to eliminate unwanted and unusable data which could have been contradictory or ambiguous. The researcher organized the data ensuring that the raw data had been edited to free it from inconsistencies and incompleteness. This involved the scrutiny of the completed

instruments in order to detect and reduce as much as possible, errors, incompleteness, misclassification and gaps in the information obtained from the respondents. Then the data was coded to establish how possible answers would be treated by assigning to them numerical values. The data was stored both in electronic and paper formats. Qualitative data generated from questions was organized into categories and patterns pertinent to the study. This helped identify information that was relevant to the research questions and objectives. The software Statistical Package of Social Sciences was used to analyze the data which was presented using frequency tables.

3.10 Ethical Issues

The researcher in his undertaking maintained confidentiality about the respondents. All the respondents were encouraged to participate voluntarily to the study and assured that their opinions would be kept confidential.

CHAPTER FOUR:

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter presents the findings of the data collected from the sampled community in Kikuyu Town, Kiambu District on the impact of water sector reforms on the management of water .Out of the 350 respondents that the study targeted there were 288 respondents that took part in the study. This represented 82.2% of the target of the sample population. The data was interpreted according to the research questions. Analysis was done using descriptive statistics and findings of the study were presented in form of tables. The discussion of the outcomes is based on the outputs from Statistical Package for Social Sciences software.

4.2 Results and Discussion

This section gives the results of the findings and data analysis of the study. The discussion is linked to the questions of the study and research objectives in accessing the impact of water sector reforms on the management of water in Kikuyu Town, Kiambu district.

4.2.1 Background

4.2.1.1 Response rate

Out of 350 questionnaires that were issued by the researcher, there were 288 respondents who successfully participated in this study while 62 chose not to participate or were late in returning their questionnaires. The response rate was 82.2 percent. It was further noted that questionnaires that were self administered had a lower response rates as compared to researcher administered questionnaires as shown in the table below.

Table 4.1 Response Rate of respondents

Data collection method	Questionnaires issued	Questionnaires returned	Response rate as per questionnaire issued
Self Administered Questionnaires	250	188	75.2%
Researcher Administered Questionnaires	100	100	100%
TOTAL	350	288	82.2%

4.2.1.2 Gender Composition

On the gender ratio, the respondents were slightly in favour of men as 178 men as compared to 110 women agreed to take part in the survey. Though the study affects both genders almost equally the researcher noted that women were a bit more shy from participating in the survey as they came from a society that is largely patriarchal with most of the leadership being male dominated. This is illustrated in table 4.2.

Table 4.2 The Gender Composition of the respondents

Gender	Frequency	Percent
Male	178	61.8
Female	110	38.2
Total	288	100

4.2.1.3 Age of the respondents

The age of the respondents was restricted by the time the survey took place. Most of the respondents were between 21-40 years as younger respondents were in school. Table 4.3 reveals that, 74% of the respondents were between 21- 40 years. This represented the working

population of the town. In total the 83% of the respondents were between 21 and 60 years. 17 percent of the respondents were less than 20 years. There were no people under over the age of 60 who participated in the survey. The researcher concluded that being an urban area most of the residents and workers at the town are below sixty years old as the research was confined to that particular town.

Table 4.3: Age of Respondents

Age	Frequency	Percentage
1-20	48	17.0
21-40	213	74
41-60	25	9
61-80	0	0
Total	288	100

4.2.1.4 Occupation of the respondents

The research area was targeting the town's population. From table 4.4 the researcher established that 41.2 percent of the respondents were business people running their own businesses while slightly fewer than 34 percent were employed. 25 percent of the respondents were unemployed with a majority being college going youth who resided with a relative. Therefore the respondents in this age group had difficulty in answering questions about water bills

Table 4.4: Occupation of the Respondents

Occupation	Frequency	Percentage
Business Person	117	41.2
Employed	96	33.8
Not Employed	71	25.0
Total	284	100.0

4.2.1.5 Education levels

The researcher was interested in establishing the respondents formal education level. He noted that slightly over 70% of the respondents had tertiary education and over 98.6 percent of the respondents had some level of formal education therefore the anticipated barrier of lack of education did not arise as much during the research. Table 4.5 above shows that, majority of the respondents had formal education with 70.3 % of them having tertiary education while 25 percent had up to secondary education. This showed that the respondents understood quite well the intent of the research.

Table 4.5: The Education levels of the Respondents

Education Level	Frequency	Percent
Non Formal	4	1.4
Primary	9	3.3
Secondary	68	25.0
Tertiary	192	70.3
	273	100.0

4.2.1.6 Consumption of Water

On the consumption of water, 60% of the respondents stated that their comments were based on water they consumed in their homes while 17.7 percent stated that their opinions were on water that they consumed in their businesses. There were a very low percentage of people who consumed water in schools 0.4 percent. This is because the study was done when children who fall under this bracket had gone to school

Table 4.6: Place of water consumption

Place of water consumption	Frequency	Percent	Valid Percent	Cumulative Percent
In a School	1	0.3	0.4	0.4
At Home	210	60.0	73.9	74.3
In a Farm	11	3.1	3.9	78.2
In a Business	62	17.7	21.8	100.0
Total	284	81.1	100.0	
System	66	18.9		
	350	100		

4.2.1.7 Source of Water Consumed

Most of the respondents who took part in the research 75% of them had their water supplied by the water company. While 91.5 % of the total respondents had their water supplied by the water company or from a borehole/well. This showed that over 91 percent of the people surveyed got their water from an improved source.

Table 4.7: The source of water consumed

	Source of Water Consumed	Frequency	Percent	Valid Percentage	Cumulative Percentage
Valid	Water Company (piped)	213	60.9	75.0	75.0
	A Borehole/Well	47	13.4	16.5	91.5
	Water Vendors	24	6.9	8.5	100.0
	Total	284	81.1	100.0	
Missing	System	66	18.9		
Total		350	100.0		

4.3 Adequate quantity of water

While investigating this objective to find out if the residents of this area are getting adequate quantities of water the researcher looked at various aspects such as Frequency of piped water supplied , water pressure and how many days the water was supplied.

4.3.1 The Frequency of piped water supply to the respondent

The researcher noted that barely 14 percent of the respondents were getting water throughout while 68.8% of the respondents were getting water at least once in three days and 96% got water at least once in a week. Though this is low compared the UN standards, the researcher noted that this condition was brought about by inadequate quantities of water hence the water company was forced to ration the water for all to get.

Table 4.8: Frequency of water supplied

Frequency of piped water supplied	Frequency	Percent	Valid Percent	Cumulative Percent
Once in two weeks	10	2.9	3.9	3.9
Once in a week	70	20.0	27.2	31.1
1-3 days in a week	106	30.3	41.2	72.4
3-6 days in a week	35	10.0	13.6	86.0
Throughout the week	36	10.3	14.0	100.0
Total	257	73.4	100.0	

4.3.2 The Water Pressure

Water pressure was also a factor considered when the researcher looked at the quantities of water supplied to the residents. It was noted that slightly over half the respondents were not satisfied with the water pressure. This could have been caused by inadequate quantities of water to supply to the residents.

Table 4.9 the level of satisfaction of the pressure of piped water supplied

	Opinion on satisfaction of the pressure of the respondent's piped water	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	126	36.0	48.3	48.3
	No	135	38.6	51.7	100.0
	Total	261	74.6	100.0	
Missing	System	89	25.4		
Total		350	100.0		

4.3.3 Ease of Access to water

Another indicator that was considered was ease of access to this water supplied. It was noted that 46.2 % of the respondents stated that it was relatively easy to access this water while 38.8 of the respondents stated that it was relatively hard.

Table 4.10: Opinion on the respondent's ease of access to water

	Opinion on the respondent's ease of access to water	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very easy	51	14.6	18.5	18.5
	Relatively easy	76	21.7	27.6	46.2
	A bit hard	108	30.9	39.3	85.5
	Relatively hard	40	11.4	14.5	100.0
	Total	275	78.6	100.0	
Missing	System	75	21.4		
Total		350	100.0		

The researcher noted that though the water company had done a good job in connecting over 75 percent of the targeted population, water could still not be easily accessible by the target population. One of the factors contributing to this could be that there is an inadequate supply of water in the area.

4.3.4 Quantity of Water provided

Here the researcher noted that slightly over half 57.5 % of the target population were satisfied with the quantity of water provided with 42.5 % being dissatisfied as the water is too little for their needs. This the researcher noted was one of the weaknesses of this program as though the service delivery had improved the water company had not increased the sources of water hence as the population had increased the water supply remained constant and therefore as more and more people got connected to the water system, they got less and less amounts of this water.

Table 4.11: The respondent's opinion on the quantity of water provided

	Respondent's opinion on the quantity of water provided	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	It is more than I need	9	2.6	3.3	3.3
	It is enough	149	42.6	54.2	57.5
	It is too little	117	33.4	42.5	100.0
	Total	275	78.6	100.0	
Missing	System	75	21.4		
Total		350	100.0		

4.4 Poverty Reduction

In investigating if the objective of poverty reduction had been achieved had been achieved by the water sector reform program the following indicators were considered.

4.4.1 The respondent's cost of Water per 1000 litres

The researcher sought to know how much the residents pay for the water that they consume per 1000 litres. The researcher discovered that 56.8% of the respondents stated that they paid between 100-500 shs per thousand litres. The median pay rate is ksh.100 per 1000 litters of water. It was also noted that though the water company which is the source of most of the water consumed by the respondents charged an affordable rate of Ksh 60, landlords and middlemen charged their tenants and clients exorbitantly. 33.5 % of the respondents were either college students or employees who were not in the know of how much their water costs.

Table 4.12: The respondent's cost of water per 1000 litres

	Cost of Water per 1000 litres	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1000shs	9	2.6	3.5	3.5
	500shs	49	14.0	19.1	22.6
	100shs	88	25.1	34.2	56.8
	50shs	14	4.0	5.4	62.3
	20shs	8	2.3	3.1	65.4
	0.1shs	3	.9	1.2	66.5
	I don't know	86	24.6	33.5	100.0
	Total	257	73.4	100.0	
Missing	System	93	26.6		
Total		350	100.0		

4.4.2 Respondents' opinion on the cost of water

On their opinion on the cost of water 51.1% of the respondents' said that the cost of water was very high and complained that even though it was a basic need they spent a big proportion of their income on buying water.

Table 4.13: The respondent's opinion on the Cost of Water

	Respondents' opinion on the cost of water	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	It is expensive	116	33.1	51.1	51.1
	It is fair	111	31.7	48.9	100.0
	Total	227	64.9	100.0	
Missing	System	123	35.1		
Total		350	100.0		

4.4.3 The respondent's opinion on difficulty in paying for water

Cost of basic commodities like water do contribute to poverty especially for low income earners who pay a higher percentage of their salaries on paying water as compared to other income groups. 38% of the people interviewed expressed difficulty in paying for their water due to the exorbitant cost of water.

Table 4.14: Difficulty in meeting monthly water payments

	Difficulty in meeting monthly water payments	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	93	26.6	38.0	38.0
	No	152	43.4	62.0	100.0
	Total	245	70.0	100.0	
Missing	System	105	30.0		
Total		350	100.0		

4.4.4 Willingness to pay more for improved services

With water costing between (100 – 500) Ksh most of the respondents were against the idea of paying more for water. 73.9 % of the respondents said they were unwilling to pay more for water even if it would result in better water services. They argued that they are already overpaying for the current water that they get and argued that economic constraints would not allow them to increase their budgetary allocations to water.

Table 4.15: Respondent's willingness to pay more for improved water services

	Respondent's opinion on their willingness to pay more for improved water services	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	63	18.0	26.1	26.1
	No	178	50.9	73.9	100.0
	Total	241	68.9	100.0	
Missing	System	109	31.1		
Total		350	100.0		

4.5 Provision of good quality water

Provision of good quality of water is one of the main goals of the Millennium Development goals and also an important factor in the management of water. The water is supposed to be clear, with no foul smell and taste. All the respondents said that they get good quality water. On the indicator of water borne diseases 16.7 % said that they had suffered from a water borne disease. Though this could be an indicator of overall health and sanitation which is affected by water.

Table 4.16: Response on water borne disease prevalence

	Respondent's response on whether they had suffered from a water borne disease	Frequency	Percent	Valid Percentage	Cumulative Percent
Valid	Yes	43	12.3	16.7	16.7
	No	215	61.4	83.3	100.0
	Total	258	73.7	100.0	
Missing	System	92	26.3		
Total		350	100.0		

Therefore the water is relatively clean as few water borne diseases have been reported from the survey results

4.6 Community Involvement

Community involvement and participation is a key component for any successful program or project and the Water Sector Reform program envisioned involving the community and society in the management of the project. The researcher aimed to investigate this by studying these indicators.

4.6.1 The respondent's response on the existence of a Water Project in their area

The main aim of this question in the questionnaire was to be able to know the number of people who had a water project in their area. Some of the respondents were not residents of the area and in their location the local water company was not able to provide water. Hence these residences rely on community water projects as well as other ways to get their water. Of the respondents sampled 115 or 47 percent of the respondents had a community water project in their area.

Table 4.17: The Respondent's response on the existence of a Water project in their area

	Is there a Water Project in your area	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	115	32.9	46.9	46.9
	No	130	37.1	53.1	100.0
	Total	245	70.0	100.0	
Missing	System	105	30.0		
Total		350	100.0		

4.6.2 Initiators of community water project

It is generally accepted by the Government and other funding organizations that community initiated project and programs are normally more sustainable. The research revealed that 45% of the current water projects were initiated by the community which is a reflection of the spirit of the Water Sector Reform program. Though the water company and the Government also have a big percentage which was 32.5% it was noted that the Government also tries to include the residents who are the stakeholders in projects that they start and fund.

Table 4.18: Respondent's response on the initiators of community water projects

	Respondent's response on the initiators of community water projects	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	The Community	49	14.0	45.0	45.0
	The Water Company	30	8.6	27.5	72.5
	The Government	6	1.7	5.5	78.0
	Others	24	6.9	22.0	100.0
	Total	109	31.1	100.0	
Missing	System	241	68.9		
Total		350	100.0		

4.6.3 Participation in starting of community water project

The researcher wanted to find out how involved the public was in community water project with this research project and more specifically to know to what extent the community was involved during the starting of the project.

Table 4.19: Respondent's response on their participation in the starting of a community project

	Respondent's response to the question of if they participated in the starting of a community project.	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	36	10.3	24.0	24.0
	No	114	32.6	76.0	100.0
	Total	150	42.9	100.0	
Missing	System	200	57.1		
Total		350	100.0		

When asked if they were involved in the starting of a water project 36 respondents out of the 150 answered yes which was 24 percent of the respondents , while 114 said no or 76 percent of the respondents.

4.6.4 Role of the community in the water project

In this question the researcher tried to find out the role that the community is playing in community water project. Though most community members come into these projects as water consumers, quite a number of respondents stated that they had major roles to play in these water projects such as leaders or workers at these community water projects.

Table 4.20: Respondent's response on their role in their respective community water projects

	Role of the community in the water project	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Water Consumer	27	7.7	58.7	58.7
	Others(specify)	19	5.4	41.3	100.0
	Total	46	13.1	100.0	
Missing	System	304	86.9		
Total		350	100.0		

4.6.5 The respondents' response on the period when the community got involved in the water project

It is important in all projects that involve the community that they should be involved wholly for the project to be sustainable. In this section, the researcher tried to find out when they were involved in the project and found out that 49.2 percent of the respondents got involved at the beginning of the project which is consistent with the current policies of the Government and nongovernmental organisation where they actively seek for a public participation. But the level of participation drops drastically as the project progresses.

Table 4.21: Respondent's response on the period when the community got involved in the water project

	Period when the community got involved in the water project	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	From the beginning	29	8.3	49.2	49.2
	Joined Midway	19	5.4	32.2	81.4
	At the end of the project	11	3.1	18.6	100.0
	Total	59	16.9	100.0	
Missing	System	291	83.1		
Total		350	100.0		

4.6.6 Ownership of the water project

For effective community participation the community need to feel involved in the process and that they own the whole process.

Table 4.22: Community water project ownership

	Respondent's response on who owns the Water project	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	The Community	41	11.7	22.9	22.9
	The Local Government	71	20.3	39.7	62.6
	The National Government	23	6.6	12.8	75.4
	Others	6	1.7	3.4	78.8
	I don't know	38	10.9	21.2	100.0
	Total	179	51.1	100.0	
Missing	System	171	48.9		
Total		350	100.0		

The researcher aimed to seek the respondents view on ownership of the community water project. 23% of the respondents felt it belonged to the community while 40 % felt it belonged to the local government. 21 % did not know who it belonged to. This may be an impediment to effective community participation as over 77% of the respondents feel that the project belong to others and not the community.

4.6.7 Water users association membership

The researcher noted that most of the respondents did not belong to a water users association and only 6% of the respondents belonged to one.

Table 4.23: Respondent's response on Water Resource Users Association membership

	Membership to a Water Users Association	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	13	3.7	6.0	6.0
	No	202	57.7	94.0	100.0
	Total	215	61.4	100.0	
Missing	System	135	38.6		
Total		350	100.0		

4.7 Reduction of conflicts due to water

Most of the conflicts between people are due to resources such as land and water. Water is the most common form of conflict and the aim of effective management of water is to reduce and if possible eliminate conflicts due to water. To research this researcher observed the following:

4.7.1 Respondent's response on if they had experienced any water related conflict in the last five years

Basically the researcher wanted to find out the occurrence of water related conflicts due to water allocation. Because of the nature of the businesses of some of the respondents such as hotels,

carwashes etc conflicts related to water are inevitable. The researcher found that only 37.7% of people had experienced conflicts within the last five years

Table 4.24: Respondent's response on their experience on water related conflict in the last five years

	Respondent's response on if they had experienced any water related conflict in the last five years	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	86	24.6	37.7	37.7
	No	142	40.6	62.3	100.0
	Total	228	65.1	100.0	
Missing	System	122	34.9		
Total		350	100.0		

4.7.2 How the water related conflicts were resolved

The researcher found out that most of the water related conflicts were solved by the community. In fact 53.6 percent of the respondents who had experienced water related conflicts in the last five years said that the conflicts were solved by the community.

Table 4.25: Respondent's response on how the conflicts were resolved

	How the conflicts were resolved	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	The Water Company	15	4.3	15.5	15.5
	The Local WRUA	20	5.7	20.6	36.1
	The Local Government	10	2.9	10.3	46.4
	The Community	52	14.9	53.6	100.0
	Total	97	27.7	100.0	
Missing	System	253	72.3		
Total		350	100.0		

4.7.3 Respondent's response on the trend in water related conflicts in the last five years

Most of the respondents were of the opinion that water related conflicts had reduced in the last five years. 64.5% of the respondents had the opinion that water related conflicts had reduced. This may have been due to community participation in upcoming water project which have helped reduce the tension in the community.

Table 4.26: Respondent's response on the trend in water related conflicts in the last five years

	Respondent's response on the trend in water related conflicts in the last five years	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes they have increased	68	19.4	41.0	41.0
	No they have reduced	39	11.1	23.5	64.5
	Same as five years ago	4	1.1	2.4	66.9
	No Idea	55	15.7	33.1	100.0
	Total	166	47.4	100.0	
Missing	System	184	52.6		
Total		350	100.0		

4.7.4 Respondent's response on who is the best person to resolve water related conflict

On water related conflicts opinions were divided on who is best placed to resolve these conflicts but a majority of the respondents 27.1% stated that the community is the best placed to mediate between two conflicting parties in water related conflicts.

Table 4.27: Respondent's response on who is the best person to resolve water related conflict

	Respondent's response on who is the best person to resolve water related conflict	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	The water company	37	10.6	18.0	18.0
	The local WRUA	37	10.6	18.0	36.1
	The local Government	36	10.3	17.6	53.7
	The community	95	27.1	46.3	100.0
	Total	205	58.6	100.0	
Missing	System	145	41.4		
Total		350	100.0		

CHAPTER FIVE

SUMMARY OF FINDINGS, DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter discusses the summary of the findings, reached and then gives the summary as per the responses from the respondents. This is in relation to the impact of water sector reforms on the management of water in Kikuyu town. The chapter also discusses the findings and comes to a conclusion and recommendations as deduced from the study findings. Finally the chapter points out the areas the researcher thought would require further research in related fields.

5.2 Summary of findings

Provision of adequate water and community participation have been identified as the most crucial factors towards good management of water. Though the study was on the impact that the Water Sector Reform program has had on the management of water, these two issues have been noted as those that require attention to improve the management of water. The Conclusion and recommendations have also been arrived at derived from the results of the study and it is hoped that they will make useful contributions in informing other program and projects.

5.2.1 Adequate quantity of water

The study revealed that slightly above 60 percent of the respondents had piped water. Though this is very good when compared to the national average, it is much lower compared to the UN standards. Even though most of the respondents had the water infrastructure only 14 % of the respondents stated that they had water piped to their homes or premises throughout the week. 96% got water at least once in a week at low pressure. The study also revealed that more than half had trouble getting the water and therefore researcher concluded that was caused by inadequate quantities of water hence the water company was forced to ration the water for all to get. This was collaborated with the findings that found out that almost half 42.5 % of the target

population were dissatisfied with the quantity of water provided as the water is too little for their needs. This the researcher noted was one of the weaknesses of this program because even though the service delivery had improved, the water company had not increased the sources of water hence as the population increased the water supply remained constant and therefore as more and more people got connected to the water system, they got less and less amounts of this water.

5.2.2 Poverty Reduction

Cost of basic commodities like water has been found to significantly contribute to poverty in an area especially for low income earners. The study found that 56.8% of the respondents stated that they paid between 100-500 kHz per thousand litres with the medium pay rate being ksh.100 per 1000 litters of water. It was also noted that though the water company which is the source of most of the water consumed by the respondents charged an affordable rate of Ksh 60, landlords and middlemen charged their tenants and clients exorbitantly. Most of the respondents stated that the cost of water was very high and complained that though it was a basic need they spent a big proportion of their income on buying the water with slightly over a third of the respondents expressing that they had had difficulty in paying for their water due to the exorbitant cost of water. Most of the respondents said they were unwilling to pay more for water even if it would result in better water services. They argued that they are already overpaying for the current water that they get and argued that economic constraints would not allow them to increase their budgetary allocations to water.

5.2.3 Provision of good quality water

Provision of good quality water is one of the main goals of the Millennium Development goals and also an important factor in the management of water. Almost all the respondents said that they get good quality water and only about seventeen percent said that they had suffered from a water borne disease. Therefore on this indicator the reforms seemed to have achieved top marks in management of water as most people considered their water as of good quality.

5.2.4 Community involvement

Community involvement and participation is key for any successful program or project and the Water Sector Reform program had envisioned involving the community and society in the management of the project. The study revealed that almost half of the respondents who had a water project in their community said that they were initiated by the community which is a reflection of the spirit of the Water Sector Reform program which was higher than the water company and the Government initiated projects that were at 32.5 percent. The study noted the effort in involving the community as it was noted that the community was involved in the running of the projects initiated by the Government and NGOs as stakeholders. The study also revealed that there was need for the program to encourage the community to own the projects as only twenty three percent or slightly less than a quarter of the respondents felt it belonged to the community while 40 % felt it belonged to the local government. This may be an impediment to effective community participation as over 77% of the respondents feel that the project belong to others and not the community.

5.2.5 Reduction of conflicts due to water

Most of the conflicts between people are due to resources such as land and water. Water is the most common cause of conflict and the aim of effective management of water is to reduce and if possible eliminate conflicts due to water. The study found that only 37.7% of the respondents had experienced conflicts within the last five years most of the water related conflicts were solved by the community. In fact 53.6 percent of the respondents who had experienced water related conflicts in the last five years said that the conflicts were solved by the community.
Most of the respondents were of the opinion that water related conflicts had reduced in the last five years and this may be as a direct result of community participation in upcoming water projects have helped reduce the tension in the community. The respondents also concurred that the community was the best placed institution to mediate between two conflicting parties in water related conflicts.

5.3 Discussion of Findings

For the country to fully implement vision 2030, adequate provision of water is one of the key factors. Therefore good management of water is crucial for the effective water supply. The main aim of the water sector reforms was to provide good water supply and to transfer the management of water from government to stakeholders who are the public and water institution. Therefore the aim of this study was to analyse the impact this has had on the management of water in the country.

In the study it was noted that though there has been an improvement in the quality of the service by changing the main players from the government to the companies and the people, the program should also invest in new water sources as it was found that though people had the needed infrastructure, most got water barely once a week. The quality of water was applauded by most of the respondents as they commented that is was of high quality. The cost of the water was found to be on the higher side and a third of the respondents complained that they were unable to meet the cost of water per month as it was way above what they could comfortably afford. This was noted as one of the impediments of the effective utilisation of this program.

Conflicts which are mostly caused by resources were found to have declined with time. This could have been directly attributed to the inclusion of the community in the management of water. It was noted by most of the respondents that most of the conflicts that they have witnessed had been solved by the community and they were of the opinion that the community is the best placed institution to solve these conflicts. This affirms the spirit of the Water Sector Reform Program which had the intention of including the stakeholders who are the community. On community involvement the study found out that community involvement was high with a higher number of projects started by the community as compared with other organizations such as NGOs and the Government. It was also noted that the community was involved as key stakeholders in Government and NGO projects.

5.4 Conclusion

These conclusions are based on the findings and analysis from the data gathered on the topic. It has been noted that the implementation of water sector reform program is a crucial all inclusive program that needs to be fully implemented. Though some shortcomings were noted such as there is a need to increase the amount of water supplied as the populations increased there is a strain on current water supply. This was noted had a huge impact on other factors that ensured the success of this program. It was noted on the provision of adequate water to the people that this has been achieved and the results were higher than was recorded in the 2009 population census. But even with the increase in water connection and the high user penetration lack of adequate quantities of water was eroding the gains made by the stakeholders. It was also noted that the quality of water was applauded by most of the respondents as they commented that is was of high quality.

It was also noted from the response that community participation was high in project initiation and running of community water project. This was very encouraging as it was a step in the right direction for the Water Sector Reform program and is one of the intended impacts. It is widely accepted that community participation for projects is essential for its long term sustainability. Though it was noted that to be sustainable in the long run and to encourage the community to participate in the whole project or program cycle and not just in the beginning. This also has the effect of reducing and elimination of conflicts before they occur as seen in the study that most respondents prefer the community to solve water related conflicts and is already doing so on the ground.

5.5 Recommendation

Even though the Water sector reform program has had an impact on the management of water in Kikuyu town there were some shortcomings noted that need improvement. Some of the noted ones are; the researcher concluded that most of the problems that impeded the successful implementation of the Water Sector Reform Program which was providing adequate water for all to the citizens were the lack of adequate quantities of water and new water supply sources.

This factor had been noted even with a very efficient system the lack of enough water undermined the gains that this program had achieved. Hence the water company was forced to ration the water for all to get resulting in water coming a few times per week of very low pressure and citizens having to travel or go out of their way to access the water. This the researcher noted was one of the weaknesses of this program as though the service delivery had improved the water company had not increased the sources of water hence as the population had increased the water supply remained constant and therefore as more and more people got connected to the water system, they got less and less amounts of this water therefore there is a need to increase the amount of water supplied as the populations increase to reduce the strain on current water supply.

In addition there is a need for the Government to increase its investment on water infrastructure to reduce the cost of water infrastructure to the citizens as they shoulder most of these costs. This has led to an increase in the poverty on the ordinary water consumers are the only ones left to bear the cost of procuring this water infrastructure therefore in the end the cost of water have become very high. It was also noted that middlemen had caused an increase in the cost of water which they sold for a profit. Therefore if there was an increase in investment in these areas then the eventual cost of purchasing would reduce and this would have a huge impact on poverty in the area which may be extreme to their budgets. It was also noted that there is a need to encourage more community ownership for projects to be sustainable in the long run and to encourage the community to participate in the whole project or program cycle and not just in the beginning. This would also include inclusion of gender issues in the management of water. The researcher would also like to recommend that the community should be used as the avenue for reducing and avoiding conflict and conflict situations. These have been noted as being both effective and efficient.

5.6 Areas for further research

The researcher would like to recommend three further areas for investigation which would help to assess the impact of reforms on the management of water to further the research. These areas are:

To analyse the role of gender in the water sector and how this can be mainstreamed into the water sector program.

Also to investigate how communities benefits from programs that they fully participate in.

There is need to investigate the community capacities to sustain their water development projects.

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LIST OF APPENDICES

Appendix I: Introduction Letter

Joram Njuguna Kihumba

P.O. Box 26281 00100

Nairobi

20/06/2012

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

RE: A QUESTIONNAIRE ON THE IMPACT OF WATER SECTOR REFORMS ON THE MANAGEMENT OF WATER IN KIKUYU TOWN

I am Joram Kihumba, a postgraduate student at the University of Nairobi. I am conducting research on the impact of water sector reforms in the management of water in Kikuyu Town. The main reason for this study is to find out if there has been a significant change in the management, supply, quality and quantity of water supplied to the residents of Kikuyu Town and if there has been involvement of all stakeholders in the provision of water to the residents of Kikuyu Town. The information gathered here will provide valuable insight into the extent to which water sector reforms have improved the sector as well as the area that may need to be changed or improved.

In this regard I have attached a questionnaire for you to fill in. Some of the questions in this questionnaire will be a bit personal but the information given will only be used for statistical purposes. This is confidential data that will only be used for research purposes only.

Yours faithfully

Joram Kihumba

Appendix II: Water Consumer Questionnaire

Instructions Put a tick (√) against the most appropriate answer where the choices are given and any other appropriate information in the space provided.

Part A: Background of the respondent

	Questions and filters	**Coding Categories**
1	Gender	Male……☐ Female……☐
2	How old are you	1-20……☐ 21-40……☐ 41-60……☐ 61-80……☐
3	Occupation	Business person……☐ Employed……☐ Not Employed……☐
4	Education level	Non formal……☐ Primary……☐ Secondary……☐ Tertiary……☐
5	Marital Status	Married ……☐ Separated ……☐ Widowed ……☐ Single……☐

Part B: Provision of Water

	Questions and filters	Coding Categories	Skip
1	Where do you consume this water?	In a School ☐ At home ☐ In a Farm ☐ In a business ☐	
2a)	What is the source of your water?	Water Company (Piped) ☐ A borehole/well ☐ Water Vendors ☐ Others ☐	
b)	If the source is piped, how many days do you get water in a week?	Once in two weeks ☐ Once in a week ☐ 1-3 days in a week ☐ 3-6 days in a week ☐ Throughout the week ☐	
c)	Are you satisfied with your water pressure?	Yes ☐ No ☐	
3	How easy is it to access water?	Very easy ☐ Relatively easy ☐ A bit hard ☐ Relatively hard ☐	
4	Are you satisfied with the quantity of water provided?	It is more than I need ☐ It is enough ☐ It is too little ☐	

Part C: The Quality of Water

No.	Questions and filters	Coding Categories	Skip
1	How do you rate the flavour and taste of the water you consume?	Good .....☐ Fair .....☐ Poor .....☐	
2	What is your opinion of the colour of water provided?	Good .....☐ Fair .....☐ Poor .....☐	
4	What is your opinion of the smell of the water provided?	Good .....☐ Fair .....☐ Poor .....☐	
5	Do you feel confident to drink the water without boiling it or using chlorine?	Yes .....☐ No .....☐ Indifferent.....☐	

Part D: Cost of the Water to the consumer

No.	Questions and filters	Coding Categories
1	How much do you pay for your water per 1000 litres?	1000 shs .....☐ 500 shs .....☐ 100shs .....☐ 50 shs.....☐ 20 shs .....☐ 10 shs .....☐ 1 shs .....☐ 0.1 shs .....☐ I don't know.....☐
2	What is your opinion on the cost of water?	It is expensive.....☐ It is Fair.....☐

		It is cheap.....☐	
3	Have you had difficulty in meeting your monthly water payments?	Yes.....☐ No.....☐	
4	Are you willing to pay more than what you pay now for improved service?	Yes.....☐ No.....☐	
5	Have you suffered from water borne disease this year?	Yes.....☐ No.....☐	

Part E: Community Participation in coming up with Water projects in your area

No.	Questions and filters	Coding Categories	
1 a)	Is there a water project in your area?	Yes.....☐ No.....☐	
b)	If yes, who started the water project?	The community.....☐ Water Company.....☐ The Government.....☐ Others.....☐	
c)	Did you participate in the starting of a water project in your area?	Yes.....☐ No.....☐	
d)	If yes to the above question. What is your role in the project?	Water Consumer.....☐ Water Company Employee.....☐ Government Employee.....☐ An Expert.....☐ Other (specify).....☐	
e)	When did you get involved with the project?	From the beginning.....☐ Joined Midway.....☐ At the end of the project.....☐	

6	Who in your view is the owner of your water supply	The Community.....☐ The Local Govt .....☐ The National Govt.....☐ Others .....☐ I don't know .....☐	
7.	Do you belong to a Water Resource Users Association (WRUA)	Yes.....☐ No.....☐	

Part F: Water related conflict

No.	Questions and filters	Coding Categories	Skip
1 a)	Have you experienced any water related conflict in the last five years?	Yes.....☐ No .....☐	
b)	If so how was it resolved	The water company.....☐ The local WRUA.....☐ The local Government. .....☐ The community .....☐	
c)	In your opinion has water conflicts increased or reduced in the past five years?	Yes they have increased.....☐ No they have reduced.....☐ Same as five years ago. .....☐ No idea.....☐	
2	In case of a water related conflict who do you think is the best person to address it.	The water company.....☐ The local WRUA.....☐ The local Government... .....☐ The community .....☐	

Thank you for taking part in this study.