

UNIVERSITY OF NAIROBI
DEPARTMENT OF SOCIOLOGY AND SOCIAL WORK
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**IMPACT OF MICROFINANCE ON INCREASING ACCESS TO WATER
AND IMPROVED SANITATION OF HOUSEHOLDS OF SLUM
DWELLERS IN KENYA: A CASE STUDY OF KIBERA SLUM-NAIROBI
COUNTY.**

BY:

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DECLARATION

This research project is my original work and has not been presented for award of a degree in any other university.

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DEDICATION

To my beloved Dad Martin Kaloa Wachana who saw me through leaps and bounds during my entire academic life, to you this work I dedicate.

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This project would not have been possible without the guidance and the help of several individuals who in one way or another contributed and extended their valuable assistance in the preparation and completion of this project.

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ABBREVIATIONS AND ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
APHRC	African Population and Health Research Centre
ASALs	Arid and Semi-Arid Lands
CBOs	Community Based Organizations
CDF	Constituency Development Fund
GOK	Government of Kenya
HIV	Human Immune Virus
KMD	Kenya Meteorological Department
MDGs	Millennium Development Goals
NEMA	National Environment Management Authority
NGO	Non-Governmental Organization
NGOs	Non Governmental Organizations
PPPs	Public Private Parastatals
SPSS	Statistical Package for Social Sciences
UN	United Nations
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
WASH	Water and Sanitation for Health
WHO	World Health Organization
WSP	Water and Sanitary Program
EMCA	Environmental Management and control act
NWSC	Nairobi Water Sewerage Company

ABSTRACT

Providing adequate safe water and improved sanitation can enhance people's livelihood options by making significant additions to good health, clean environmental conditions and generate income. However, there exists no comprehensive study that has ever focused on documenting the impacts of microfinance support on increasing access to Water and improved sanitation projects on the livelihoods of slum dwellers in developing countries like Kenya. The study therefore, aimed to establish the implications of water and sanitation projects on the livelihoods of slum dwellers in Kenya where the focus was on Kibera residents.

The objectives of this study was to establish the influence of water pricing on the economic status of Kibera slum dwellers, to establish the extent to which microfinance has improved economic status of the households of Kibera slum dwellers, and to determine the effects of microfinance on access to supply of safe water among the households and finally, to establish the impacts of micro finance on health and sanitation through access to safe water supply among households in Kibera slum.

The research design adopted for this study was the descriptive survey. The targeted population for this study included registered groups benefiting from the Community Water Projects supported by Micro financing (Maji ni Maisha Programme) in Kibera. The study selected a sample of 90 respondents using simple random sampling. Primary data collected in this project comprised of both qualitative and quantitative data. Questionnaires were self-administered with help of research assistants. Quantitative data collected were analyzed by the use of descriptive statistics using SPSS while qualitative data were analyzed thematically. The results were presented in form of percentages and frequencies. The information was displayed by use of tables and in prose-form. The research found out that water and sanitation provision. The research project recommended that water and sanitation projects should be up-scaled in slums since they were felt to have significant implications on the livelihood of the residents. The study also recommended that Water and Sanitation Projects should be up scaled in slums since it has significant implications on the livelihood of Kibera people.

CHAPTER ONE: INTRODUCTION

1.1 Background of the study

Addressing the world's water and sanitation needs is one of the great human development challenges of our time. Globally, some 663 million people do not have access to improved drinking water sources, and approximately 2.4 billion people lack access to improved sanitation. Lack of access to clean water and basic sanitation facilities creates significant costs in terms of illness, lost time and productivity.

The provision of safe water and sanitation is one most critical challenges in any sustainable developments. Such development requires that people have access to safe water supply services Admassu M. et al, (2004). According to World Health Organization (2005) access to clean water is the single most important global crisis of the 21st century. At the beginning of 2000, 1.1 billion (17%) people of the world's population lacked water. The majority live in Asia and Africa. With 60% of the world's population, Asia faces tremendous challenges providing clean water to a rapidly growing population.

The increasing urban population creates unprecedented challenges, which provision for water and sanitation have been the most pressing when lacking. Consequently, there is an enormous need for water investment to supply and support water use in major metropolitan areas to treat water and provide filtration services.

Nyangena (2008: 119) accounts that, "Water is fundamental to all forms of life and that it must be protected as a common resource, public good and human right". This confirms that it's an asset for socio-economic growth and development, ranging from the individual to national. According to UNESCO (2009:80), water and sanitation is a key factor in health improvement, economic productivity and social well-being of population both as social and economic activities rely on quantity and quality of water. Access to water is an essential component to alleviate poverty (*Ibid.*). Yet, in "sub-Saharan Africa remains the area of greatest concern" WHO/UNICEF (2006: 3).

Between 1990 and 2011, people in this region with no access to water sources did not decrease; on the contrary, it increased with 24% WHO/UNICEF (2010). Moreover, the number of people underserved with safe water doubled (112%; *Ibid.*). Figures for Kenya show the same tendency, particularly in the urban areas, where the number of people lacking water and sanitation services grew more than fivefold during that period (*Ibid.*). Nowadays, there are various examples of cities in developing countries where the water and sanitation situation has indeed improved as a result of such partnerships.

However, in many (if not all) cases, one major challenge appears to remain: the low-income areas – or ‘informal settlements’, where the majority of the urban population lives – are not covered see e.g. Budds & McGranahan (2003); Bayliss (2003); Davis (2005); RTI 2(005); Prasad (2006). This is due partly to purely commercial considerations – low profitability, hence too great a financial risk Budds & McGranahan (2003) – and partly to local circumstances in terms of physical infrastructure and local politics. All over the world, attempts have been done to (locally) improve this situation, either by the local water provider or by the local community itself see e.g. Kariuki & Schwartz (2005).

In attempt to give water for productive uses which can enhance people’s livelihood options to improve food security and nutrition, good health and generate income was devised.. The provision water and basic sanitation contributes to sustainable improvements in peoples’ lives. The preconditions for productive employment as well as for the eradication of extreme hunger and the empowerment of women Hesselbarth, (2005). Similarly, Admassu M. et al, (2004) notes that water projects have positive change on people’s lives, which extend far beyond the expected improvements to health and reduction in time spent collecting water. Hesselbarth (2005) argues that, assuring adequate clean water supply to a given settlement enables the households to manage others income generating activities. Adequate clean water supply, does not only reduce water-related diseases but also improves positively on the households.

Many families in the developing world have the desire to pay for water and sanitation services, the high up-front costs of connecting to piped water supply or building a latrine is a challenge to many. While microfinance has helped hundreds of millions access financial services, many institutions prefer to focus on giving credit to business purposes, rather than offering consumer

loans. Among the challenges are provision of safe water supply – as well as adequate sanitation which is a priority. The quality is poor, leading to exposure to water-borne diseases. The Human Development Report 2006 stresses that the crisis in water and sanitation is above all a crisis for the poor. It further says that almost two in three people lacking access to water survive on less than US\$2 a day, with one in three living on less than US\$1 a day UNDP (2006). Moreover, “the less fortunate people not only get access to less water, less clean water, but also pay some of the world’s highest prices” (*Ibid*: 7). The latter applies particularly to the urban poor, mainly because they are often forced to buy water from private water vendors (see e.g. Kjellén & McGranahan (2006).

UN-Habitat (2007), the urban low income get their water by queuing for long hours to collect water from standpipes or illegal connections. Others buy their water from vendors who can charge up to twenty times more than the price paid by their wealthier neighbors. This makes the poor suffer financially; poor health from using unsafe water and poor sanitation facilities. It is estimated that “at any one time, half the population in Africa, Asia and Latin America suffer from one or more of the main diseases associated with inadequate water and sanitation” (*Ibid*: 6). A survey conducted in Nairobi’s informal settlements revealed that the prevalence of diarrhoea among children is 32%, while the infant and child mortality is 35%. The prevalence of diarrhoea was found to be double the rate for Nairobi and the national average APHRC (2002).

Improved access to water, has positive effect on people’s livelihood, directly or indirectly, in at least three ways UN-Habitat (2006: 28-29). First, it has a positive impact on health and, as a consequence, nutrition, which increases time and energy to invest in productive activities. Being close to water sources reduces the time necessary to fetch water. And women depended upon for looking after ill relatives, fetching water for the whole household. In a nut shell, improved access to water at the household level is likely (1) to reduce the time spent on fetching water, water-borne diseases, child morbidity, expenditure, and water-related conflicts; (2) to increase the girl-child’s school attendance; and (3) to improve family’s health conditions.

Access to credit facilities for household water and toilet facilities is still a relatively new concept, but has the potential to help address the global water crisis by allowing households to spread these high up-front costs over time. Emerging evidence from the World Bank Water Global Practice’s Water and Sanitation Program (WSP) and Water.org is finding that water and

sanitation credit can be one solution to increase access and reach hundreds of millions at the bottom of the economic pyramid. The UN Sustainable Development Goals (SDGs) call for access to clean water and sanitation for all by 2030. Achieving this goal is estimated to cost trillions of dollars. Current levels of funding from developing countries and donors are not sufficient to fill this gap, and at the current rate of growth will not meet the SDGs. Ensuring that all people have safe water and a toilet will require significantly higher levels of investment from new sources, including microfinance.

Several pioneering MFIs lend out specialized loans for water and sanitation, often working closely with local government and nongovernmental organization (NGO) programs to raise awareness and build demand for water and sanitation. While the upfront cost of a toilet or a piped water connection can easily equal a household's entire monthly income, many are willing to purchase this infrastructure if they can spread the cost over time by saving or borrowing.

Microfinance is the principle of giving small loans to the very poor to support them get an income of their own Wheat, (1997). Microcredit is broader and includes savings and insurances as well as credit. In the past, it has become an even broader concept. "Building inclusive financial systems for the poor" is increasingly used as the financial institutions that provide financial services to the poor become more diversified and cannot be described as Microfinance institutions (MFIs).

The idea of providing small loans to the poor was first explored in Bangladesh in 1976 when the Grameen Bank was set up by the economist Professor Muhammed Yunus. The strategy of the Grameen Bank was to make up for a lack of borrower collateral to access loans by creating social collateral through a group support. The essence of micro-banking was to replace sophisticated credit-methodology and collateral regulations with lower cost. The success of the microcredit approach in supporting small micro-enterprises in developing countries has led to it being considered in other areas of development. For example, the use of microfinance intermediaries to supply the credit needed to implement water and sanitation services has become a promising approach to improving service coverage in low income urban and rural communities.

Microcredit is the principle of giving small loans to the less fortunate to generate an income of their own Wheat, (1997). Its broader and incorporates savings and insurances as well as credit.

The generally very positive results from these projects have led to a high level of donor support for microfinance initiatives, and significant amounts of money have been pledged. However, the donor community has also brought with it expectations and requirements which may need clear and specified results in a short time period.

1.2 Problem Statement

The gloomy picture of people getting Water and Improved Sanitation in slums is a two-fold problem in Sub-Sahara Africa, especially Kenya. First (*ibid*) reports a rapid increase of population. The urban population more than doubled during the 1990-2011 period (*Ibid.*). The growth of the urban population is especially high in the urban slum areas. Finally, according to UNESCO (2012), this rapid and poorly managed growth in the slum area has overwhelmed most municipal water services” UNESCO (2012: 177), which constitutes the second major cause: the Unreliability of water utilities, especially those that serve the city areas. Many systems are characterized by high water losses, poor revenues to cover operating costs, dilapidated and poor functioning infrastructure, and lack of investments, low billing and collection efficiency, chronic water shortages, low demand, low coverage especially for the urban poor, and corruption, among others World Bank (2004). Results to enormous challenges in relation to functionable water and sanitation sector, governments in developing countries have increasingly entered into public-private partnerships to improve the situation.

Although, Kibera informal settlement has experienced implementation of various water supply and sanitation projects little is known about accessibility to the resource in terms of it being affordable and available to all. This is due to the fact that little in terms of assessment or evaluation of the projects has been done.

In another study among slum dwellers in Nairobi Kimani *et al.* (2007), it was found that water was provided mainly by private vendors. The prevalence of water-borne diseases appeared to be very high, while hygiene was compromised during water shortage periods. These people were found to be more vulnerable to morbidity and mortality as a consequence of lack of water and sanitation .

Poor people in low income areas, are entitled to reliable, affordable, well managed and sustainable water supply and related Services (UN-Habitat 2007). On a more positive note, UN-Habitat’s 2006

Global Report on Water and Sanitation in the World's Cities-Local Action for Global Goals notes that "Inadequate Water supply is not mainly due to lack of government funds.in many cities and smaller towns, it is possible to give better services for water in low-income settlements while charging their inhabitants less than they currently pay for inadequate provision(Ibid:6) .As a result, there exists no comprehensive study that has focused on documenting the effects of Microfinance credit on increasing access to Water and improved Sanitation on the lives of slum dwellers in developing countries like Kenya.Therefore,this proposed study sets out to particularly determine the level of accessibility of Water and sanitation projects on the households in Kibera Slum as a modest attempt to bridge this gap.

1.3 Research Questions

The research set out to address the problem:

- i. What is the influence of Microfinance on social status of Kibera slum households of the Nairobi City County?
- ii. To what extent has microfinance improved economic status of households in the Kibera Slum of the Nairobi City County?
- iii. What is the effect of microfinance on access to supply of safe water among households in Kibera Slum of Nairobi City County?
- iv. Has Microfinance improved Health and Sanitation practices through access to safe Water among households in Kibera slum?

1.4 Objectives of the Study

1.4.1 Main Objective:

The main objective of this study is to examine the impact of microfinance credit use in increasing access to water supply and improved sanitation on Nairobi's low income households living in Kibera slum.

1.4.2 Specific objectives:

The objectives of this study are:-

- i. To determine the influence of project water pricing or billing on access of Water of Kibera households in Nairobi City County.
- ii. To establish the extent to which microfinance has improved availability of Water and Sanitation of the households in Kibera Slum of Nairobi City County.
- iii. To determine the effects of microfinance on access to supply of safe water among households in Kibera Slum of Nairobi City County.
- iv. To establish the impact of micro finance on health and sanitation through access to safe water supply among households in Kibera Slum.

1.5 Justification

Kenya's Bill of Rights grants Every Kenyan right to good Standards of sanitation and to clean and safe drinking water in adequate quantities for every person .The new draft National Water Policy requires Water Service Providers to offer social connections in Low-income areas and recover costs through staggered payment or instalments.So as to scale up credit to households for connections.

Increased funding to urban water utilities due to limited public funding and rapid urban population growth which requires development of alternative sources of funding to enable the utilities meet their service coverage target in line with vision 2030.The proposed study will provide details of communities living in slums of the challenges they are facing to give solution to the problem of water and Improved Sanitation services.

1.6 Scope and Limitations of the Study

1.6.1 Scope

The study was limited to a component of Microfinance support of Maji ni Maisha Project implemented in Kibera Villages. The purpose of this Study was to determine the Impact of Microfinance support of Water and improved Sanitation on the lives of Kibera residents.

1.6.2 Limitations

The study was envisaged by the following limitations. A few respondents were people with low literacy levels; some of them unable to understand how water and sanitation projects has affected their economic livelihoods as well as their health condition. The researcher had research assistants who ethically explained in languages they could understand. In cases of non-response, requests to cooperate and support this academic research was given and in addition issues of confidentiality was strictly followed.

1.7 Significance of the Study

The research is important to both private and public stakeholders involved in the implementation of water projects in low income areas in Kenya. The information gained can be used to redesign, improve and eliminate projects or programs that are not well designed. In addition, such information will also be used to provide input to the appropriate design of future projects and programs.

The information obtained in this study is significant to the policy makers/ministry of water and Local authorities as it gives a rational evaluation of water supply and sanitation projects and how they affect the livelihoods of households in low income informal settlements. The study points the effects of water supply and sanitation projects initiated within informal settlements with the view of assisting policy and decision makers adopt long lasting strategies towards water projects in informal settlements; given that such projects receive better donor funding from various local and international organizations. The study seek to identify gaps and opportunities all geared towards successful water supply and sanitation projects that address the needs of the slum dwellers in all aspects and that ensure funds are utilized.

The findings highlight views and opinions of the community to understand their needs and improve their living standards. This is an important aspect of community participation in development projects where they are incorporated in the planning and execution of these projects with the aim of giving them ownership and collective responsibility.

The views collected in this study will give much valuable insight to the policy and decision makers even as they identify critical areas that may have been ignored and disseminate resources

proportionately for these projects. This was a need driven study on the insights of accessibility issue of water supply and improved sanitation projects of households in Kenya, where Kibera Slum residents were the focus.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter gives a view of literature that supports this study. The literature is mainly on water accessibility and improved sanitation in informal settlements and livelihoods of informal residents, economic effects of water projects and health implications of water supply and sanitation projects and conceptual framework.

2.2 Water Accessibility and Sanitation condition in Informal Settlements

The access to clean water is the single most important global crisis of the 21st century WHO, (2005). Water crisis is a term used to refer to the world's water resources relative to human demand. The major aspects of lack of water are allegedly overall scarcity of usable water and water pollution. Lawrence Smith, the president of the population institute, asserts that although an overwhelming majority of the planet is composed of water, 97% of this water mainly constitutes of salty water. The fresh water used to sustain humans is only 3% of the total amount of water on earth Hoewel (2005). Despite the vital role played by adequate safe drinking water in development, most towns and cities are still facing numerous water shortages. 27% of the town dwellers in the developing world do not get piped water at homes. In developing countries' towns and cities water shortage is highly attributed to high rate of urbanization. The fast pace of urbanization is clearly evident by change in percentage of urban population from 29% in 1950 to approximately 51% in 2010 and expected to rise to 60% by 2030.

According to the UNDP's Human Development Report, in 2000, the population's access to safe water in SSA was only 44%, while the average for countries in East Asia and the Pacific (EAP) stood at 67% and in Latin America and the Caribbean was reported to be 65%³. Furthermore, it is clear that the challenge populations getting basic water and sanitation persists as not much improvement has been made since the early 1990s. Even where water supply systems and sanitation facilities have been installed, they are still often inadequate and unsafe.

The high rate of urban growth in developing world, where cities gain an average of 5 million residents every month. The increasing urban population growth creates unprecedented challenges, like provision for water and sanitation have been the most pressing and painfully felt when

lacking. The speed of urbanization of middle-income nations is highest and that of developed nation is lowest Mazumdar, (1987). This increase of urban population has been at a rate that most municipal authorities are not able to provide enough housing, community facilities and other crucial infrastructural services to the rising population, resulting to formation of informal settlements.

The problem of adequate safe water provision is mostly felt in developing countries where many people have poor access to this important commodity. *Africa water and sanitation magazine (2008) edition* states that approximately, 1.2 billion people lack water and 2.2 billion lack sanitation with 280 million of these living in Africa. Poor access to adequate water and sanitation is a main reason to stagnant development for many regions in Sub-Saharan Africa. Most countries in which a large proportion of the urban population lives in informal settlements are unlikely to meet the water-related MDGs Dagdeviren and Robertson, (2009). The situation of water access is by day worsening in informal settlements since appropriate measures by relevant stakeholders such as local authorities and governments are not being put in place to address the existing and upcoming challenges. Although the number of slum-dwellers is predicted to reach over two billion by 2030, access to safe water in urban slums does not seem to be improving Limido, (2011).

It's Upon this that regulatory frameworks and institutions at national levels try to oversee water and sanitation services provision are essential to effect national policies, protect property rights, and generate equitable returns on private investments through efficient tariff structures and levels, service standards, and expansion needs. Mandated local bodies for provide services, and linkage between national and local authorities is essential and defined. Also, partnering with private sector promotes essential values, such as independence in legislation, accountability and transparency.

Water supply and sanitation needs a participatory approach which aims at strengthening collaboration among the three key stakeholders, namely: governments, private sector and communities, NGOs, research centres and professional associations. PPPs are seen in this context as an effective means to establish cooperation between three actors and to bundle their financial resources, know-how and expertise to meet the challenges facing service provision. While this approach promises several benefits, experience shows that involving private actors in the

provision of basic services needs to be carefully planned and monitored if the benefits of such a model are to be fully realized and the numerous potential drawbacks avoided.

Another way of to ensure this is through private public partnership (PPPs). PPPs in water supply and sanitation services imply the roles of a wide range of main actors and other stakeholders (consumers, regulators, governments, NGOs, unions, environmental groups, and independent providers etc.), who are involved as contracting parties. Successful PPPs require creating an enabling environment in which key roles and responsibilities are institutionally separated, clearly defined, and allocated among all actors.

In Kenya, the problem of water scarcity is usually amplified in informal settlements as compared to middle and high income residential areas. City growth, coupled with low employment opportunities is leading to increased poverty in town areas than in rural areas and city slum population continue to grow: 70 percent of all households in Addis Ababa, 66 percent in Dar es Salaam and 60 percent in Kampala and Nairobi can be considered slum households UN-Habitat, (2008).

2.3 Economic effects of Water Supply and Sanitation Projects

Water is an important resource for economic development of any given community. Fighting poverty is the main challenge for reaching equitable and sustainable development and water plays a vital role in relation to economic growth, Reba, (2003). He continues to argue that less fortunate do not get water which contributes to hunger and food insecurity.

According to Hesselbarth (2005), the providing of safe water and improved basic sanitation contributes to sustainable betterment of peoples' lives in relationship to health and education, the preconditions for productive employment as well as for the eradication of a cute hunger and the empowerment of women. Fox and Liebenthal (2006) argues that water, sanitation and hygiene are good for achieving the MDGs- and hence for alleviating global poverty. An investment in the water sector is a good indicator in all the MDGs. The impact of water sector investments directly targeted at poor consumers is anything but subtle UN-Water, (2009). Around the world poor people place a high priority on drinking water.

Table 2.1: Nairobi Water and Sewerage Tariffs

Customer Category	Consumption lock(m3)	CurrentTarriff (Kshs./m3)	Approved Tariff bill (Kshs./m3)
Domestic/Residential	0-10	12.00	18.71
Commercial/Industrial	11-30	18.00	28.07
Government institutions and schools	31-60 <60	27.50 34.50	42.89 53.80
Water Kiosks	0-10 11-30 31-60 >60	10.00	15.00
Bulk sale to WSPs for resale	0-10 11-30 31-60 >60	15.00	26.57

Source: Nairobi City County Water Company

Athi Water Services Board (AWSB), 2010 the disparities in water pricing that exist between different common water sources in Nairobi low-income settlements namely; piped water, water kiosks and water vendors can have significant implications on economic status of the residents. There is a huge difference in amount saved between buying water from water vendors which trades from 20 to 30 Kshs per 20 litres whereas the same amount of money in piped water can afford approximately 2000litres. The table above shows water tariff structure for Nairobi City County Water and Sewerage Company Limited (NCCWSC) which is the main water and sewerage provider in Nairobi City County.

The burden of water provision includes time spent in the fetching process. Over two thirds of households in the world fetch water from outside their homes: In terms of resources, various studies have shown that the search for water may take 2-3 hours daily, travelling distances of over 3 Kilometers and carrying load of between 20-25 Kilograms and technically the function of women and children Alaci (2004) and Alehegn (2009). The time and energy used in economic

activities is wasted. Thereby, the time saved can be utilized in other activities such either productive (economic), domestic such as looking after children, cooking and cleaning, personal (socializing), or development and management related e.g. attending meetings, carrying out group work and participating in community activities Alaci and Alehegn (2009). Therefore, giving populations a reliable water supply with the potential of increasing the income of households.

Sustainable development can only be achieved if we first succeed to get people out of poverty. Developed populations who lives in prosperous parts of the world rarely have to confront the consequences of water scarcity. For many people low earning have inadequate access to water, and this forms a central part of people's poverty, affecting their basic needs, health, food security and basic livelihoods. Improving connectivity of poor people to water has the potential to make a major contribution towards poverty alleviation, UNESCO, (2003). Water is a consumption need which must be paid for with revenue gained from economic activities (or in time spent collecting it), and is an asset which can produce certain types of income in contribution with other assets Clarke, (1998).

Many water project investments in the city of Nairobi have in one way or another improved on the economic status of many Nairobi dwellers who not only benefit from the supply of clean and safe water for drinking but also it becomes a source of employment and income to the same. An example of such project is "Maji na Ufanisi" working with locals of Kibera to provide them with clean and safe community water, as a community project way World Bank (2000).

The Kenya's Vision 2030 has also highlighted importance of adequate water and improved sanitation to give way to sustainable development. The projection for the water and sanitation sector is "to ensure water and improved sanitation availability and access to all by 2030". Kenya is a water-scarce country with renewable fresh water per capita at 647 m³ against the United Nations recommended minimum of 1,000 m³. This compares unfavorably with the neighboring countries of Uganda and Tanzania which have per capita levels of 2,940 m³ and 2,696 m³ respectively. Kenyans' access to water and sanitation is relatively poor and low compared to countries such as Malaysia. It is critical to note that Kenya's fresh water per capita has been declining due to effects of climate change and is projected to reach 235 m³ by 2025 unless effective measures to address the challenges. Water which is a natural resource should be well managed if the MDGs have to be achieved, Fox and liebenthal, (2006). Additional supply

and more efficient management of Kenya's and commercial enterprises will therefore be necessary to achieve the economic, social and political priority projects suggested by vision 2030.

2.4 Water impact on health and improved Sanitation

Water for domestic use is a need which has focused on the achievement of health benefits through constant supply, based on the premise that more and safer water can help to improve the health of individuals. This approach has been consistent with the provision of improved supplies by governments and other agencies as part of a strategy of meeting the basic needs of the poor. Poor health or eruptions of water borne diseases caused by poor water supply quality, insufficient sanitation and unsafe hygiene behavior was regarded as both a symptom and cause of poverty. At the global policy level, safe water supply, access and sanitation have been closely linked to better health whilst at the household level, establishing these links has proven far harder.

The economic burden from unsafe water, sanitation and hygiene (WSH) is estimated at the global level taking into account various disease outcomes, principally diarrhoeal diseases. The risk factor is defined as including multiple factors, namely drinking of unsafe water, lack of water linked to inadequate hygiene, poor personal and domestic hygiene and agricultural practices, contact with unsafe water, and lack of proper management of water resources or water systems. In the less developed countries, 3000 young children still die every day from the consequences of diarrhoeal diseases, and yet this suffering is largely preventable in view of the estimate by the World Health Organization WHO, (2005) that 89% of all diarrhea cases are caused by unsafe water supplies, inadequate sanitation and insufficient hygiene practices.

Well organized water supply with better sanitation (Which includes disposal of effluents and excreta) is one of the best effect to better human health. It is estimated that 80% of all communicable diseases are water-related and hence a major cause of health care expenditure. Benefits of improved water services and sanitation therefore include averted health related costs, which is again to the economy as a whole (G.O.K, 2005).

Insufficient water supply and sanitation leads to many different diseases. Hesselbarth (2005) noted the following diseases to be as a result of insufficient water supply and sanitation; Arsenic contamination in drinking water has been recognized as an important health risk, in

particular in Bangladesh. Increased levels of salt in the drinking water, in some cases associated with salination of soil and water resources, can lead to kidney problems. Eliminating stagnant, standing water around the households and water points can contribute to less incidence of malaria, in dry areas with few natural mosquito breeding places. Again, reduction in incidence of water-borne, water-washed and water-based diseases through improved services and hygiene behaviors will have good effects on reducing the susceptibility to other illness. For people living with HIV/AIDS, water, sanitation and hygiene is extremely important in reducing the incidences of opportunistic infections.

People living in overcrowded town environments with inadequate safe water provision face more diarrhoeal diseases in comparison to areas with adequate safe water provision. Studies by African Population and Health Research Centre APHRC, (2002) show that the prevalence of diarrhea among children below the age of 3 is around 40% in Kibera, whereas it is much lower in Nairobi as a whole (13%) and at national level in Kenya (17%). This study also points out water projects in informal settlements whether they cause any positive health effects to the targeted population.

2.5 Impacts of Safe Water Supply and Sanitation Projects on the Environment

Lack of water supply and sanitation is associated with an ineffective exploitation of natural resources. Relative water management systems including pollution control and water conservation is important factor in preserving ecosystem. Good treatment and disposal of excreta and both household and industrial wastewater results to less pressure on freshwater resources. Furthermore, improved sanitation reduces flows of human stool into waterways and reducing the respective health risks to the populations.

In most slum areas lack of water leads to inadequate sanitation facilities hence poor human waste disposal methods. These less fortunate suffer the more especially on environmental pollution and other epidemic due to inadequate water supply, sewerage and drainage, sanitary toilets, solid waste disposal facilities Hardoy et al. (1997). Lack of water services in informal settlements prevents good hygiene practices, which that compromises the quality of environment in these neighborhoods. Many people living in poor areas experience that they practice personal hygiene such as brushing teeth, bathing the body although not as frequent as it is desired. Lack of

resources, such as water, results in poor hygiene levels; toilets cannot be washed and there is not enough water to shower Mahasneh and Sawsa (2001).

The poor housing conditions under which slum-dwellers live exert a heavy disease burden on residents, specifically children, since they are vulnerable to infectious diseases (African Population and Health Research Centre, (2002); Timaeus and Lush, (1995). For example, the prevalence of diarrhoea in children aged under three years in Nairobi slums (31%) was more than double that of Nairobi as a whole (14%), and higher than the rates for other urban areas (19%) and rural areas (17%). The United Nation Habitat (2006) have explained that hygiene challenges in slums is poor basic services which results in lack of access to clean facilities or clean water sources. Results due to lack of waste collection services, a poor drainage system and weak infrastructure.

In Kenya, the National Environment Management Authority (NEMA), through Environmental Management and Co-ordination Act, 1999 was mandated with the responsibility of ensuring a clean and healthy environment. The Act prohibits the discharge of any poison, toxic, noxious or obstructing matter, radioactive waste or other pollutants or dumping into the aquatic environment. Despite this legal act many slums in Nairobi discharge human and solid waste into nearby rivers. This has worsened the state of pollution making the water unhygienic and inhabitable environment. The resultant is a health hazard to natural water leading to bacterial contamination in surface water resources.

With emergence of water projects in various slum areas within Nairobi, eco-toilets have been established thereby solving problems associated with human waste disposal. Given that the eco-toilet technologies require little water, they are best placed to provide alternative option of proper human disposal especially in informal settlements where water may be scarce.

2.6 Theoretical Framework

2.6.1 Community Participatory Approach

Community participatory is whereby a community achieves socio- economic goal by selectively identifying its problems and finding a way forward to those problems. Experts are needed, but only as facilitators. Nonetheless, people do not participate in something which is not their own

creation. Strategies prepared by incoming experts, irrespective of their technical soundness, do not qualify to participate in the projects.

The concept participation was defined by Baertz as referring to “how community members of a community is assured the opportunity of participate their fullest knowhow and in ways most meaningful to them in creation of a community’s goods and services.

Baertz added that as community of people actively participated in making of decisions governing their developments, avenues for full self-realization were opened and a sense of independence and spirit of community would be created.

Chekky (1979) meanwhile defined participation as referring to “situations where people gain power and are able to manage affairs of their communities and to control institutions that serve them” Similarly, Biddle and Biddle (1965) expressed the view that “people could be encountering a better world for themselves, that is, they could improve themselves. These conceptions of the participatory perspective emphasize:

- Mobilization of members of communities
- Helping them to identify their problems and plan their solution
- Assisting people to form groups or organization as means of helping them work together to meet their diverse interests
- Identify and build local leadership;
- Networking and collaboration of communities with others and development agencies

The following Paulo Freire’s contributions according to Popple;(1995:62-64) the practice of this participatory approach entails: Reflection ,Action and Reflection .Many members of a community work together for a goal they have identified and agreed upon .In the context of increasing access to water and improved Sanitation of households, this participatory approach would help in mobilizing members of communities living in Kibera slums, involve them in finding ways to unite ,plan ,pull resources and work together to solve problems facing them.

The conventional method of planning for water services was highly planned process of written rules and procedures with a top-down planning flow with narrow participation profiles and budgetary focuses Pyburn, (1983).The priority needs and necessary service levels were determined by officials based on their own perceptions of what was needed for the “target beneficiaries “The people often had little say in the matter Eawag, (2005).Rural Participatory planning approaches (RPA) are interactive and often visual methods, which encourage and facilitate the participation of individuals in a group learning and action planning process. A Participatory planning approaches (PPA) generates constructive collaboration among stakeholders who may not be used to unity together, often come from different backgrounds, and may have different values and interests Simpson-Herbertetal,(1997).This participatory approach have in many cases shown a great deal of success in water supply and sanitation programs.

2.6.2 Grameen Microfinance Model

The success of the micro credit method in supporting informal micro-enterprises in developing countries has led to it being considered in other areas of improvement. For example, the use of microcredit intermediaries to give the credit needed to implement water and sanitation services has become a positive approach to improving service coverage in low income areas and rural communities. This study examines the progress being made to develop micro credit mechanisms to support access to water and improved sanitation initiatives. Microcredit is the principle of giving small loans to the very poor to help them generate an income of their own Wheat, (1997). Microfinance is broader and incorporates savings and insurances as well as credit.

The idea of making small loans to the very poor was first explored in Bangladesh in 1976 when the Grameen Bank was set up by the economist Professor Muhammed Yunus. The strategy this Grameen Bank was to make up for a lack of borrower collateral to secure loans by creating social support through peer pressure. The essence of micro-banking is to replace sophisticated credit-evaluation techniques and collateral regulations with lower cost procedures.

A joined group of five members would agree and mutually guarantee each other's loans. This deterred loan defaults and repayment rates stand at greater than 80 per cent. This initiative showed that the poor need not be bad debtors. Today, microfinance is seen as a crucial poverty alleviation strategy. In 2000, there were 1,580 Micro Finance Initiatives reported worldwide, serving over 30 million people including more than 19 million of the poorest Daley-Harris, (2002). Not all use the Grameen Bank method, other approaches to evaluate future borrowers include individual references, personal guarantees and rotating savings credit associations (ROSCA's) where loans are provided from a communal savings pot.

The final results from these projects have led to a high level of donor support for microcredit initiatives, and good amounts of money had been agreed upon. However, the donor community has also brought with it expectations and requirements which may need clear and specified results in a short time.

The success of this scheme can be related to the wide range of options in terms of the type of improvement made, the loan period and the quality of the improvement offered by lenders. Borrowers could make their loans to their individual needs and hence the initiative avoided the 'one size fits all' approach. It was discovered that households were often prepared to choose the high cost option if the incremental increase in property value was considered to be high.

We generally follow Mehta's (2008) categorization of microfinance activities in the WS&S sector. The first category encompasses "retail" loans to households. These can be provided as individual loans or through the group lending approach pioneered by Grameen Bank in Bangladesh. Group lending approaches typically require no collateral because each borrower in the group guarantees the loans of the others. [Group *savings* approaches leverage the accumulated savings of a group and do not require external funding: each member is required to contribute some amount of savings on a regular basis, and one member borrows money from the groups' savings pool. As this loan is repaid, another member can use the groups' savings. These are known as Rotating Savings and Credit Associations (ROSCAs) in Kenya, or colloquially as "merry-go-rounds". The group-lending approach is most commonly targeted to women's groups. These "retail" loans have typically been used for income-generating activities like purchasing

equipment for a business, buying animals, etc., although we found several respondents in Kenya who were borrowing money to pay for school fees or for home repairs. The second category of lending in WS&S is loans to “small and medium enterprises” (SMEs) for water supply. These “small and medium enterprises” would include water vendors (who might borrow money to purchase water tanker trucks or carts, water kiosks) or private sanitation service providers (public shared toilet operators, manual latrine cleaners, suction trucks for emptying latrines and septic tanks). The definition would also include lending to small private water supply companies.

Small private water supply companies or communities might borrow to build new water systems as well as expand, rehabilitate, or simply maintain their existing water supply systems. Loans would be typically used for boreholes, spring protection projects, pumps, storage tanks, piped distribution networks, meters, etc. We limit our scope here to rural systems, small towns, and urban slums.

Mehta (2008) uses a third category of “urban services upgrading and shared facilities”. She describes a handful of studies so far where microfinance has been used to fund shared public toilets in Kenya and India, and slum upgrading in India, Peru and Guatemala. These programs used both household retail loans, group savings mobilization, and SME loans. As such, we prefer to focus on the former two categories of lending activities.

This type of support has been common in the WS&S sector for many years as bilateral or multilateral aid (i.e. loans with subsidized interest rates) or as financing at market rates. Precisely because water is necessary for life, by definition everyone has access to some type of water source. A community’s or a household’s willingness to pay or borrow to improve the water supply or sanitation situation will be strongly dependent on their *status quo* condition as well the improvement being offered.

K-Rep Banks Maji ni Maisha loan program provides finance for the development of water related infrastructure in community settlements where consumers are willing to pay for clean and safe

water. Activities financed under this programme include: development or rehabilitation of small piped water systems; development of abstraction resources such as boreholes, springs or rivers and installation of related equipment; construction of water purification and storage facilities and installation of metering, billing, technical and financial management systems to improve the supply of water and improved hygiene.

Some NGO's like Pamoja Trust "centers on developing a consensus among the inhabitants of informal settlements [in urban and peri-urban areas] around issues of land and structure entitlements, and building community capacity to address these, before negotiating with government for land and infrastructure." Weru (2004). Although the group has implicitly dealt with infrastructure problems in the past, it is new to thinking specifically about water and sanitation issues. They are working in two cities in Kenya on WS&S projects: Kisumu and Nairobi. Communities first form an "oversight committee" to apply for water connections. The public water company deals with the oversight committee rather than a single individual. The committee then decides how to set rates, hires an operator for kiosks (on a renewable contract basis), decides operating hours, and hires someone to keep facilities clean and deal with breakages, etc. The committee reports at the Annual General Meeting of the settlement to describe progress and problems.

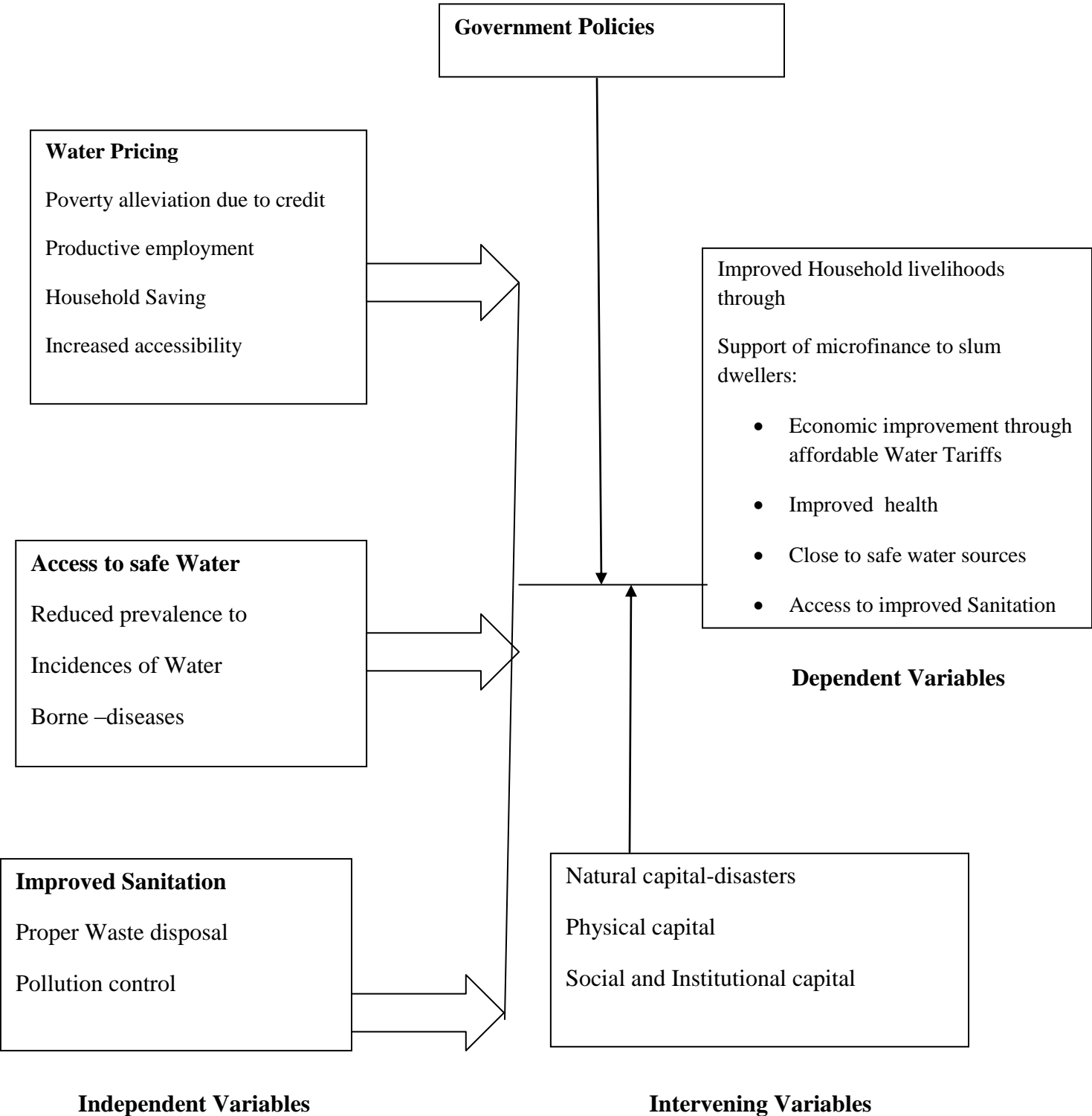
2.7 Conceptual Framework

This study will adopt the conceptual framework proposed by Mugenda (2008) to concisely describe the phenomenon under study accompanied by visual depiction of the variables under study. The independent variables in this study include economic, health impacts, and supply of safe water, while the dependent variable is livelihoods of slum dwellers involved in this study.

When adjusting to shocks, households use their assets in different combinations to try to meet livelihood goals Bharwani et al., (2008); Moench, (2005). The idea of water as an 'economic' good has been the driving force behind this change. Water availability is affected by natural water availability (natural capital) and water infrastructure (physical capital), as well as social capital. It is also influenced by institutions, as discussed below. Water use is affected by water infrastructure and other physical capital, as well as financial, natural, and human capital. The capitals then

mediate between production and livelihood outcomes. The extent to which production is converted to livelihood outcomes depends in part on the assets available to households and the strategies they employ. From the foregoing, the effect of water access and sanitation projects on the livelihoods of slum dwellers in Kenya can be investigated by assessing the economic effects, health implications, and affordable water tariffs.

Figure 2.1: Conceptual Framework



CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the methods and techniques that the researcher will employ in the study. In particular, the chapter will describe the research design, study area, sampling size and sampling techniques as well as the data collection tools and methods used. Data analysis and tools of presentation will also be examined in the chapter.

3.2 Site Description

Kibera is the largest informal settlement in Kenya and Africa as a whole. It is located to the South East of Nairobi, 7 Kilometers from the city Centre. The settlement covers an area of about 262.5 hectares (Orwa 2009) in Langata Ward (administratively) and Langata Sub county (Politically). It is bordered by the Royal Golf course, Ngumo and Magiwa estates to the North, Muituni River to the South, Ayany and Fort Jesus estates to the West and Nairobi Dam estate to the East, Jurgan (2002); Orwa (2009). The Kenya-Uganda Railway passes through the settlement, splitting it into two - The old and new Kibera. Kibera lies at an altitude of 1680 Meters above sea level with an average annual rainfall of 855mm. Flash floods are common in the area due to its sloping terrain, causing intense erosion, especially along the River banks. Most of the original vegetation has disappeared due to the densification of the area. Jurgan (2002)

The population of Kibera is estimated to be between 800,000 and 1,000,000 people with a population density of 2000 people per hectare although some villages are more crowded than others. The villages are Lindi, Kisumu Ndogo, Soweto, Makina, Kianda, Mashimoni, Siranga, Gatuikira, Laini Saba and Raila village.

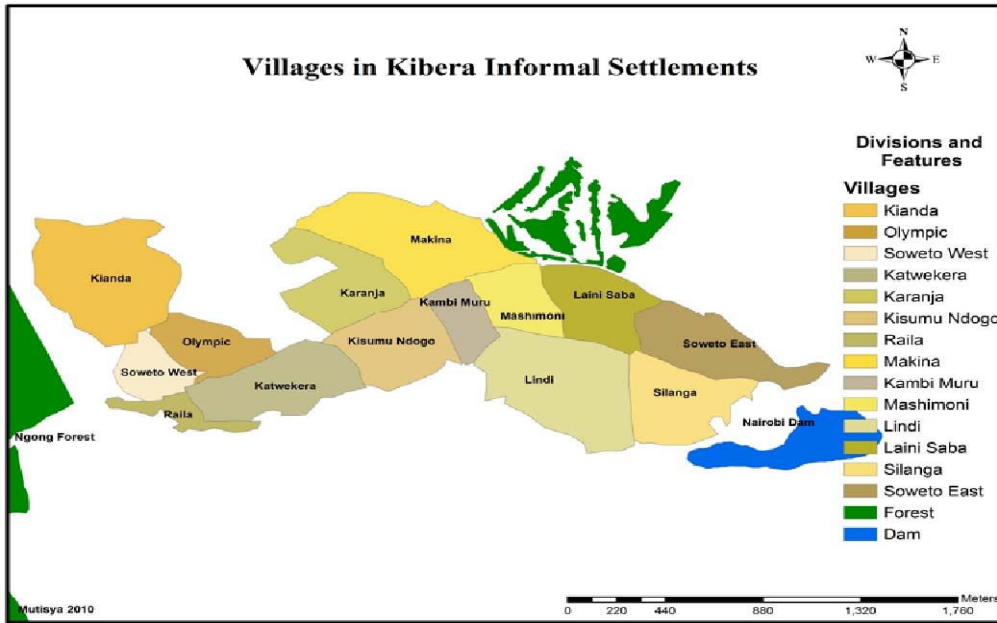


Figure 2.2: A map of villages in Kibera informal settlements

Although many interventions have been carried out, there still persists the problem of Water scarcity, access and also lack of improved Sanitation services in Kibera thus informed as my area of study. From community needs assessment done in 2002 by KWAHO, excreta disposal and water supply was the highest priority. Issues associated with water include, its source, cost, availability and distribution. Access and availability of water is limited. Up to 85% of the households draw water from kiosks (private and community owned) at an average of Ksh 2/= per 20 litre jerrican. The average distance to the nearest Kiosk is 40 metres and consumption ranges from 16-20 liters per person per day. Frequent shortages contribute to an increase in prices, distance walked and time spent. Within Kibera the quality of water decreases significantly hence it is contaminated by infiltration of liquid waste into burst pipes. Therefore, there is always high risk of waterborne diseases.

3.3 Research Design

Orodho (2003) defines a research design as the scheme, outline or plan that used to generate answers to research problems. Such designs provides an operational framework within which the facts are placed, processed and valuable output produced. Further Donald (2006), notes that a research design is the structure of the research, it is the “glue ” that holds all the elements in a research project together.

The research design used for this study was the descriptive survey design. The research was characterized by a mixed strategy of both qualitative and quantitative methods. The phenomenon under investigation was impact of microfinance use on access of water and improved sanitation on households in Kibera slum. This method concerns the intense investigation of problem solving situations which are relevant to the research problem.

The underlining concept selected several targeted cases where analysis to identify possible alternatives for solving the research questions on the basis of the existing solution applied in the selected case study. The study attempts to describe or define a subject, often by creating a profile of group of problems Cooper and Schindler, (2003). Thus, selected villages within the wider Kibera informal settlement in Nairobi City County was the focus of the study which provided a natural setting on which data was collected.

3.4 Unit of Analysis and Units of Observation

The unit of analysis is the major entity that is being studied. The interview will target households who are members of selected women groups benefiting from the Microfinance support in accessing water and improved sanitation in Kibera slums. Units of observation will be the group members from which the sample will be derived along with Key informants in relevant villages. These included the Maji ni Maisha officials, Kibera integrated water, Sanitation and Waste Management programme officials, Chiefs, Community Health Officers, Community Development Officers and officials of community Water projects. The in-depth information formed a base of qualitative data

3.5 Target Population

According to Ngechu (2004), a population is a well defined or set of people, services, elements, events, group of things or households that are being investigated. The targeted population for this study constituted of 30 community water groups, with active membership of 30 members in each distributed in 10 villages according to Maji ni Maisha program. The target population included both males and females who have been in the settlement before and after the water projects were funded as they were well placed to relate both situation before and after improvement of the water development projects.

3.6 Sample size and Sampling Procedure

3.6.1 Sample Size

Kibera has an estimated population of half a million people with a resultant density of 2,222 people per hectare of which approximately 95 percent of households live below the poverty line Government of Kenya, (2002). Kibera neighbourhoods is distinctly divided into two parts; the upper area which is the original Nubian settlement of Makina and the lower area that has been densely settled during the last two decades and include the villages of Lindi, Kisumu Ndogo, Soweto East, Soweto West, Makina, Kianda, Kambi Muru, Mashimoni, Gatwekera, Silanga, Laini Saba and the newly founded Raila Village.

Table 3.6.1. Showing number of villages

No.	Name of Villages	No. of Community Water Groups	No. of registered members	No. of respondents(after random selection of 15 groups out of 30)
1	Lindi	3	90	9
2	Kisumu Ndogo	3	90	9
3	Soweto	4	120	12
5	Laini Saba	4	120	12
6	Makina	3	90	9
7	Kianda	3	90	9
8	Mashimoni	3	90	9
9	Gatwekera	4	120	12
10	Silanga	3	90	9
		30	900	90

Mugenda and Mugenda (1999) recommend that if there is no estimate available of the proportion of the target population assumed to have the characteristic of interest, 10 per cent should be used.

3.6.2 Sampling Procedure

The study was carried out in 15 community waters groups of Kibera slum where Maji ni Maisha project is being implemented. A workable random Sample of 90 households was selected for interviews. Even with a mathematical formula, there is no universal laws about the sample size, Mugenda & Mugenda (1999). However, guiding principle do exists. The sample size in these villages were informed carefully by selecting 15 groups from the total of 30 on a lottery basis. Further to this, a proportionate sample was drawn from a total membership of 900 registered members, 10% of this sample was selected and therefore interviewed 6 households per village (in 15 villages), to achieve the overall meaning of the study. The selection of members was randomized, a group register was used for a systematic random selection from the first name and every fifth person thereafter was picked for interview at the household level.

3.7 Methods of Data Collection

According to Ngechu (2004) there are many methods of data collection. The choice of a tool and instrument depends mainly on the attributes of the subjects, research topic, problem question, objectives, design, expected data and results. This is because each tool and instrument collects specific data. Also, Best and Kahn (2004) suggest that data may be collected by a wide variety of methods. Primary data was gathered directly from respondents by use of questionnaires. Secondary data was gathered for purposes of enriching primary data, Secondary data entailed the collection and analysis of information from other relevant sources such as annual reports, past reports in Libraries, published journals etc.

3.7.1 Collection of Quantitative Data.

The research used primary questionnaires sampled to the targetted population. The questionnaire will had both open and close-ended questions. The open-ended questions provided additional information not captured in the close-ended questions. Cooper and Schindler (2003) further explain that secondary data was a useful quantitative method for bringing out public opinion on reports.. This implies that incorporation of reliable statistical data in the study. The researcher will also rely on the supervisor's approval of the questionnaire to ensure instrument reliability was realized

3.7.2 Collection of Qualitative Data

The study also relied on focus group discussion as one of methods in collection of qualitative data. An interview schedule was therefore be designed to guide the survey. A sample of 8-10 registered members and beneficiaries of the community Water projects were used. The key informants such as the chiefs, community development officers, chair persons of the water groups and health workers, representatives of the NGOs working in the neighborhood, and special group leaders and the youths.

3.8 Ethical Considerations

Before the field study, permission was sought by getting a letter from the University of Nairobi, Department of Sociology and Social work addition to the authorities in the study area in order to follow principles. The five principles were be observed, from scientific merit, equitable selection of subjects, seeking informed consent, confidentiality and avoidance of coercion. Prior to collecting information from the respondents, the researcher will explain to the respondents the objectives of the study.

3.7 Data Analysis Techniques

According to Mugenda and Mugenda (2012), She defined data analysis as the process of cleaning and summarizing data so that it becomes information that can easily be interpreted and used to support decision making. Before processing the responses, completed questionnaires were edited for completeness and consistency. Quantitative data collected was analyzed by the use of descriptive statistics using SPSS and collated percentages and frequencies. The data was displayed frequencies and tables. Content analysis was used to test data that is qualitative in nature or aspect of the data collected from the open ended questions. According to Baulcomb, (2003), content analysis uses a set of collation for valid and replicable inferences from data to their context. The data was broken down into the different aspects of impacts of micro finance use on water projects on slum dwellers such as economic effects and health. This offered quantitative and qualitative base of the objectives of the study.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter outlines findings of the data collected from Kibera slum, Nairobi County, on the Impacts of Micro finance credit on increasing access to Water and Improved sanitation of households of Slum dwellers in Kenya.

The outcome are shown based on the objectives of this research. The analysis was done through descriptive methods and the findings of the study were tabulated and presented as frequency tables and percentages.

4.2 Socio-demographic data

The following section describes the demographic pattern of those who participated in this study. The researcher investigated the following demographic characteristics: age, household size, gender, occupation, and level education.

Table 4.1 below, majority of the respondents were of between age 24-28 (44.4%) followed by age 32-36 (22.2%). Those within the age of 18-23 were (13%). This implies majority of people living in the slum are in youthful stage. This age group is also important for creating ready work force

Table 4.1: Age groups of the respondents

Age group (Years)	Frequency	Percentages (%)
18-23	12	13.3
24-28	40	44.4
32-36	20	22.2
40-44	10	11.1
45-49>	8	9.0
Total	90	100.0

4.3.3 Number of people living in the household

Nearly 28% of households surveyed had between 1 and 3 persons living in the household. Those with persons ranging between 4 - 6 had the greatest proportion with 45 (50 %) of the respondents falling in this category. The study revealed that 15 respondents accounting for 16.6% had household number ranging between 7 and 9 people, while 5.7% accounted for 10 and more. This high number of people suggests that there is high demand in water usage and need for better sanitation facilities for the households.

Table 4.2: Number of people living in the household

No. of people	Frequency	Percentage (%)
1-3	25	27.7
4-6	45	50.0
7-9	15	16.6
Above 10	5	5.7
Total	90	100.0

4.3.3 Gender distribution of respondents

Table 4.3 below shows that women were more than men by 20%. This was perhaps the interview was conducted during the day when men who are mainly perceived as bread winners in many families were out of the settlement for jobs. This also indicates that the availability of women during daytime, suggest that they used more water than men since they do most of the household chores.

Table 4.3: Gender among respondents

Gender	Frequency	Percentage (%)
Male	35	38.9
Female	55	61.1
Total	90	100.0

4.3.4 Community Level of education

Table shows 4.4 shows 5% of the respondents did not have any formal education. 61% of those interviewed had at least achieved primary education. This implies that most of the respondents were able to understand how microfinance support for water and improving sanitation on their livelihoods. It also indicates that literacy levels were moderate for mobilization and sensitization of the beneficiaries.

Table 4.4: Level of education of respondents

Level	Frequency	Percentage (%)
None	5	5.6
Primary	55	61.1
Secondary	20	22.2
Tertiary	10	11.1
Total	90	100.0

4.3.5 Marital status of the respondents.

According to table 4.5 below, those interviewed indicated that 87.5% were married and 12.5% were not married. This signifies that most of the respondents in the settlement had family responsibilities. This large family size indicates that there is high water demand and need for sanitation facilities for their households.

Table 4.5: Marital status of the respondents

Marital Status	Frequency	Percentage (%)
Yes	70	87.5
No	10	12.5
Total	80	100.0

4.3.6 Occupation of the respondents

Table 4.6 below states that 10% of those surveyed depended on salaried employment as their main source of livelihood. Others depended on either casual (55%) or self-employment (25%). This implies that most of respondents were low income earners depending on temporary jobs and small scale businesses. According to one key informant, he noted that *“most of the residents in the village depended on small jobs to earn a living like washing clothes, shoe shinning and repair, garbage collection, selling vegetables, selling water, hair dressing to selling illicit brews among others”*

Table 4.6: Occupation of the respondents

Type of employment	Frequency	Percentage (%)
Salaried	10	11.1
Casual	55	61.1
Self-employed	25	27.8
Total	90	100.0

4.3.7 Main source of water for the household

As indicated in table No.4.7, most of respondents (55.6%) accessed piped water, followed closely by 39.9 who relied on water kiosks. Those who depended on water vendors are represented with 5%. Although some families had different water sources depending on the activities. Most of those who use piped water noted that the water was available unless there is a problem which is tackled after a while, again the rates were affordable compared to the time they had not formed community water groups

Table 4.7: Household’s Main source of water

Source	Frequency	Percentage (%)
Piped Water	35	55.6
Water Kiosk	50	39.9
Water Vendors	5	5.5
	90	100.0

4.3.8 Distance to the main source of water after improvement of water projects

Table 4.8 implies that after implementation of water projects 16.7% of the households are able to access water in less than 50 meters from their houses, whereas the rest (6%) access their main source of domestic water within 51-100 meters. Compared to the distance travelled to access water before the projects there was significant reduction of distance travelled. Currently every family is able to tap water within a distance of less than 100 meters.

Before the water projects in the settlement longer distances were traveled by the residents in order to access domestic water as compared to the current situation. This was due to inadequate provision close to their houses.

Table 4.8: Current distance from residence to source of water

Distance(Metres)	Frequency	Percentage (%)
<50	15	16.7
51-100	58	64.4
101-150	10	11.1
>151	7	7.8
Total	90	100.0

4.4 Economic effects of water and improved sanitation projects on the livelihood of slum dwellers

Among the objectives of the research was to address the extent to which microfinance has improved economic status Kibera slum residents.

4.4.1 Reliability of the main source of water

In order to determine whether respondents' main water supply was reliable, the respondents were asked to state whether there was a constant supply of water from their main source of water or not. Results in table 4.9 indicates that over 77.8% of the respondents felt that water supply in the settlement was reliable, 33.2% felt that it was not reliable. This is attributed to the support from the Maji ni Maisha programme which supported the initiative through Nairobi Water and Sewerage Company.

Table 4.9: Reliability of the main source of water

Reliability	Frequency	Percentage (%)
Yes	70	77.8
No	20	22.2
Total	90	100.0

4.4.2 Water Quantity spent in each household per day

According to table 4.10, respondents noted that the average quantity of water every family spent daily was high. Majority (72.2%) of the households were spending between 30-40liters, given that the average

Household number ranged between 3-4 persons the water spent per person per day was still below the recommended universal standards by WHO (i.e. 50 liters-100liters). This clearly shows that the most households do not have access to water as perceived, due to reasons that some live below poverty line and can hardly afford one jericcan of water for their daily needs nor better sanitation services.

Table 4.10: Water quantity spent in each household each day

Quantity of Water (20 litres)	Frequency	Percentage (%)
20 litres<1	5	5.6
20-30	65	72.2
40-50	15	16.6
60>	5	5.6
Total	90	100.0

4.4.3 Influence of Water pricing on the economic status of Kibera residents

Table 4.11 below, the study sought wanted to know whether residents were paying to get water or not. 91.1% of the respondents paid for water which is normal for urban population. The remaining 8.9% were not. As per the findings of this household study, these households spend an average of about Kshs.500 on water related expenses every month. The cost of water (largely from the water kiosks) ranged between Kshs.1-4 for a 20litre container. However, of the households use less than

Kshs.15 per day buying water. The respondents said that they were willing to pay more as long as the water is reliable

Table 4.11: Water utility Payments

Response	Frequency	Percentage (%)
Yes	82	91.1
No	8	8.9
Total	90	100.0

4.4.4 Cost of water

Referring to table 4.12 below, study found out that 13% of the respondents were buying water at 5 shillings, these were people getting water from vendors. 20% of the respondents bought water at water at 3 shillings, these included water from Kiosks and individual neighbors connected to Nairobi water and Sewerage Company. The large group representing 66.7% accessed water at less than Kshs. 2 per every 20 litre Container. This group of people enjoys cheaper water tariffs since they are connected to Nairobi water and Sewerage Company and are beneficiaries of Maji ni Maisha programme.

Table 4.12: Cost of water

Cost of Water in 20 litre container	Frequency	Percentage (%)
5	12	13.3
3	18	20
<2	60	66.7
Total	90	100.0

4.4.5 Time taken to fetch water per day after implementation of water projects

In table 4.13, the study found out that after the water and sanitation projects were established nearly (56%) of the respondents accessed household water in less than 2 minutes. 33.3% of the respondents were taking 3-4 minutes. Numerous water points enabled all the respondents to access water in less than 7minutes meaning no much time was lost to access water.

Table 4.13: Time taken to fetch water per day after implementation of water projects

Time	Frequency	Percentage (%)
>2	50	55.6
3-4	30	33.3
5-6	10	11.2
	90	100.0

4.4.7 Time taken to fetch water per day before implementation of water projects

According to table4.14, study established that before Maji ni Maisha projects were established, nearly 8.9% of the respondents accessed water in 6-10 minutes. A large number of respondents accessed water in more than 10 minutes (55.6%) showing a lot of time was spent in accessing water probably since there were long queues for them to access water. This was attested by an officer from Maji ni Maisha project who noted that *“The distance to the water kiosks ranged from a radius of about 5 -100 metres. The person responsible for fetching water was mainly the females. However, in some part or all of the household members were involved, including the male spouse, worker and sometimes visitors”*

Table 4.14: Time taken to fetch water per day before implementation of water projects

Time	Frequency	Percentage (%)
<5	10	11.1
6-10	8	8.9
11-15	50	55.6
16-20	22	24.4
Total	90	100.0

4.4.8 Impacts of Micro finance in accessing supply of safe water and improved Sanitation.

Table 4.15 shows that a few households paid for water transport to get domestic water after the establishment of the water projects. This means that less cost was incurred by the households to access domestic water. After the water projects were put in place only 6.7% of the respondents paid high to have domestic water transported from water point to their houses. At the same time 44.4% of the respondents paid less or fetched water on their own since they were close to the water points.

Table 4.15: Payment for water transport from the source to house after execution of water projects

Water Transport /Day	Frequency	Percentage (%)
1-10	40	44.4
11-20	30	33.3
21-30	14	15.6
31-40	6	6.7
Total	90	100.0

4.4.9 Water projects and their relation to economic benefits to Kibera residents

Almost all the respondents (97%) acknowledged economic relieve associating it to introduction of micro finance support for sanitation projects in the slum areas. Fox with Liebenthal (2006) argues that water, sanitation and hygiene are essential for achieving the MDGs- and hence for alleviating global poverty. The remaining 3% did not to realize any economic benefits from these projects saying that their economic status had not been changed in any way. The main reasons that the residents felt water projects had contributed were reduced water buying price and extra-time for economic activities.

Perception of respondents on economic benefits of water and Sanitation projects

The study established in table 4.16 that the respondents had various reasons why they felt water and sanitation projects were of economic importance.96.7% agreed to have greatly benefited from the water and sanitation projects while 3.3% did not agree citing no tangible benefits. One of the key informant a chairman of community water project noted that ” *most economic activities that required water included, cooking, washing fresh produce eg. Vegetables before selling, washing utensils, toilets, hair and equipment in salons and barber shops. The unavailability of water affects these sources of livelihoods through loss of income, reduced sales and spending more time and money looking for water.*”

Table 4.16: Perception of the respondents on economic benefits of water & sanitation projects

Response	Frequency	Percentage (%)
Yes	87	96.7
No	3	3.3
Total	90	100.0

Reasons for economic benefits attributed to water & sanitation projects in Kibera

The table 4.17 below indicates that 56% of those interviewed acknowledged economic benefits from the water projects pointed out reduced water tariffs as the main reason why they felt the projects had helped them economically. The residents were able to save money to start small scale businesses hence improving their source of income. 17% mentioned water transport relieve as reason to why they felt the water and improved sanitation were of economic importance compared to the period the projects were not there. Another section of respondents (11%) considered reduced toilet tariffs as the key aspect through which the residents were able realize economic benefits from the said projects.

Table 4.17: Reasons for economic benefits attributed to water & sanitation projects in Kibera

	Frequency	Percentage (%)
Reduced Water buying price	50	55.6
Water Transport cost reduced	15	16.7
Extra time for other economic activities	15	16.7
Cost of toilet reduced	10	11.1
Total	90	100.0

4.5 Impact of micro finance support on health and hygiene projects

The Water quality and better hygiene in any given settlement determines the residents’ health condition. The researcher established the influence of safe water access and improved sanitation on prevalence and incidences of water related diseases to Kibera residents. This was done by comparing number and frequency of water related diseases suffered by the residents before and after establishment of water and sanitation projects in the settlement.

4.5.1 Incidences of water and sanitation related diseases before and after water and sanitation projects

Table 4.18 and 4.19 below shows a comparison of water related disease incidences before and after the projects of Maji ni Maisha proximity to safe water and better hygiene practices has tremendous reduction on incidences of water and sanitation related diseases suffered by the residents. Whereas 83% had suffered water related diseases before the projects. Only 27% of the respondents suffered water related diseases after the Maji ni Maisha projects. This change can be attributed to better roles in providing clean water and hygienic services to the community.

Table 4.18: Incidences of water related diseases before the water projects among the respondents.

Incidences	Frequency	Percentage (%)
Yes	75	83.3
No	15	16.7
Total	90	100.0

Table 4.19: Incidences of water related diseases after water the projects among the respondents.

Incidences	Frequency	Percentage (%)
Yes	25	27.8
No	65	72.2
Total	90	100.0

4.5.2 Prevalence of unsafe environment and sanitation related diseases

Lack of safe water and poor hygiene contribute to a range of diseases. The respondents were asked to state most prevalent diseases related access to unclean water and poor hygiene suffered by family members before and after the water and sanitation projects were established. The most pronounced diseases related to unclean water suffered before the water and sanitation projects are presented in table 4.20 below.

The most prevalent diseases related to unclean water and environment suffered by family members before water and sanitation projects were Diarrhoea and Typhoid diseases representing 38% and 26% respectively. The two diseases rated high before the projects perhaps due to high contamination of domestic water and human waste. Malaria and Cholera represented 17% and 10% respectively. Amoeba and intestinal worms were the least diseases attributed to unclean water and poor hygiene in the settlement with 4% and 3% respectively.

Table 4.20: Prevalent diseases suffered in the settlement before water & sanitation were established

Prevalent Diseases	Frequency	Percentage (%)
Typhoid	23	25.5
Diarrhea	34	37.8
Amoeba	3	3.3
Malaria	15	16.8
Intestinal worms/Skin diseases	5	5.5
Cholera	10	11.1
Total	90	100.0

Prevalent diseases suffered in the settlement after water & sanitation projects were established

After implementation of water and sanitation projects in the settlement five diseases associated to unsafe surrounding were mentioned. Malaria combined with Intestinal worms were the most common diseases with 50% and 20% majority because of heavy rains experienced during data collection time and drainage systems had blocked. Followed by typhoid at 16.7% and diarrhea at 11.1% respectively. The study also noted significant reduction in frequencies for all said diseases in comparison to the situation before water and sanitation projects were financed and supported. This drop in disease prevalence among the residents is therefore directly proportional to supply of such important component of clean water.

Table 4.21: Prevalent diseases suffered in the settlement after water & sanitation projects were established

Prevalent Diseases	Frequency	Percentage (%)
Typhoid	15	16.7
Diarrhea	10	11.1
Amoeba	2	2.2
Malaria	45	50
Intestinal worms/Skin Diseases	18	20
Total	90	100.0

4.5.3 Water and sanitation projects' contribution to improved health condition of the households

As illustrated in table 4.22, 78% of the respondents associated improved health conditions of their families to improved environmental management at community level. The 22% of the respondents who did not correlate health condition of their families to the established water and sanitation projects explained that the health condition of their families did not change primarily because their health condition were not related to water and sanitation.

Table 4.22 Opinion on whether water and sanitation projects have influence on health condition of the people in the settlement.

Opinion	Frequency	Percentage (%)
Yes	70	78
No	20	22
Total	90	100.0

Reasons why water & sanitation projects in Kibera settlement contributed to improved health condition of the residents.

Majority of respondents (61.1%) felt that families trust and continuous dependency to safe water had contributed to better health conditions to their families. This was mainly because of reliability

on safe water had reduced the risk of contaminating water borne diseases.11.1% respondents related improved health condition of their households due to proper drainage and good garbage disposal projects was the availability of clean environment clean-up.

Table 4.23: Reasons why water & sanitation projects in Kibera settlement contributed to improved health condition of the residents

Reasons	Frequency	Percentage (%)
Access to safe drinking Water	55	61.1
Improved human waste disposal	22	27.8
Adequate safe water facilities and environmental cleanup	10	11.1
Total	90	100.0

4.6.1 Toilet ownership

Table 4.24 implies that after implementation of water and sanitation projects, study found out that 77.8% of respondents owned private toilets. This increment was due to more people getting the supported services through credit to the community. The rest (22.2%) relied on communal toilets that were faced with a challenge in cleanliness thereby leaving the residents prone to water borne and sanitation related diseases.

Table 4.24: Households with private toilets after establishment of water and sanitation projects

Response	Frequency	Percentage (%)
Yes	70	77.8
No	20	22.2
Total	90	100.0

4.6.2 Common types of toilets in the settlement

The findings in table 4.25 shows that a large number of respondents rely on modern latrine and eco-toilets which were represented by 44.4% and 39% respectively. These toilets were established through micro finance support. Although a good number of 17% own flash toilets, which were also shared among the household and were more secure and convenient to use. It was observed that the use of this cash support to water and hygiene had a positive impact on the residents of Kiera Slum. The project uplifted health status of the residents through provision of a clean environment where they live with less threat of waterborne diseases that are caused by lack of proper management of human waste.

Table 4.25: Common types of toilets after establishment of water and sanitation projects

Type of toilets	Frequency	Percentage (%)
Latrine	40	44.4
Flash Toilet	15	16.6
Eco-toilet	35	39
Toilets	90	100.00

CHAPTER FIVE
SUMMARY OF FINDINGS, DISCUSSIONS, CONCLUSIONS AND
RECOMMENDATIONS

5.1 Introduction

This chapter talks about the summary of the works gathered from the fields; conclusions reached and then relate the recommendations according to the outcomes.

This is in relation to the Impact of Microfinance on increasing access to Water and Improved sanitation of households of slum dwellers in Kenya. This is in relation to the impact of micro crediting on increasing access to affordable water and hygienic services households of slum dwellers in Kenya.

Maji ni Maisha micro finance programme provides finance for development of water related infrastructure in communities where poor people live and where consumers are willing to pay reasonably low rates for clean water and improved sanitation services. Examples of activities financed under this include; development or rehabilitation of small piped water systems, water kiosks; development of abstraction resources such as boreholes, springs or rivers and installation of related equipment; construction of water purification and storage facilities and installation of metering, billing, technical and financial management systems to improve the efficiency of access to water and sanitation services.

The water Service Board then issues CWP with a service provision Agreement that permits it to supply water within a demarcated area, monitors and enforces the terms and conditions of the agreement-rep bank now Sidian bank is the financier that will provide micro finance support for upfront construction of relevant infrastructure to qualified applicants following its due diligence process. In addition to its principal banker for the CWP during the term of the loan. There is also a contractor contracted by the CWP to carry out construction works on the project.

5.2 Summary of findings

5.2.1 Influence of water pricing on economic status of slum dwellers

Most of the respondents acknowledged economic relieve associating it to introduction of water and sanitation projects in the settlement. The economic improvement of the residents attributed to lower water pricing of water and improved sanitation projects was realized both directly and indirectly. Those who cited economic benefits from water projects supported by microfinance pointed out reduced water tariffs as the main reason the projects had helped them economically. They particularly argued out that reduced water prices had enabled them to save money so as to perform other obligations of economic nature.

A few respondents mentioned water transport relieve as reason to why they felt the water and sanitation were of economic importance to their households since before the projects were established they could incur extra cost of transporting the water besides buying it at higher price comparatively. Most of them noted they had enough time to attend to other matters of economic value due to affordable water and better sanitation as a major economic score compared to the period the projects were not established since such saved time is now used to perform other activities of economic value.

Others noted reduced toilet tariffs as the key aspect through which the residents were able realize economic benefits from affordable water tariffs of the said projects.

5.2.2 Impact of safe water provision on the health of slum dwellers

The study found out that safe water availability as a good has great impact on Kibera slum dwellers. Since inception of the water and sanitation projects believed to provide safe water, incidences of water related diseases have reduced.

They associated improved health conditions to provision of safe water and improved sanitation in their settlement. A good number argued that access to safe drinking water reduced risk of contaminated water. They noted that water provision before establishment of the water and sanitation projects in the settlement was highly contaminated with human waste due to water breakages and illegal tapping leading to unhygienic conditions.

They acknowledged on the improved human waste disposal which has resulted to reduced incidences of water related diseases since less water contamination with human waste was greatly

reduced. The improved human waste facilities and services which contributed adequate water provision in the settlement. The study also found out that adequate safe water provision had enabled clean environment inside and outside the houses thereby reducing risk of suffering from unhygienic environment.

5.2.3 Impact of microfinance support on access to supply of safe water among the households of Kibera slum

The study found out that improved access to constant supply of water and sanitation provision in slum areas contributed towards improved livelihoods. Respondents attested that establishment of water and sanitation projects had contributed to improved healthy lives.

Number of those interviewed argued that the newly constructed sewerage systems had helped to solve the problem of improper human waste disposal leading to environmental pollution and believed that affordable toilets increased toilet accessibility to have led to reduced environmental pollution. They explained that affordable human waste disposal facilities had greatly reduced fly toilet cases thereby reducing foul smell in the settlement. Some mentioned adequate supply of water in the settlement led to clean toilets to be the greatest reason why they considered water and sanitation projects to have contributed to improved lives.

5.3 Discussion of findings

The study found out that upon introduction of micro financing to water and improved sanitation projects in the slum, economic improvement of their livelihood to the services provided by the projects. This findings complement study by Fox and Liebenthal (2006) which concluded that clean water and hygiene are important component in achieving the MDGs now Sustainable Development Goals and hence for alleviating global poverty.

Besides creating jobs for many local people in the settlement most of the respondents acknowledging economic benefits from water projects pointed out reduced water tariffs as the main reason why they felt the projects had helped them. Reduced water tariffs enabled more savings thereby creating wealth mostly to start small businesses. While others had time to do other jobs or performed other activities of economic value.

Before the projects support through micro finance, water supply was not constant and reliable. During water shortages the residents used to fetch water or buy water at hiked prices from water vendors or outside the slum. These sources were characterized by long queues leading to time wastage. Fetching water is an opportunity cost in number of man-hours, which would have been used in gainful employment. Similarly, before the water and sanitation facilities were human waste disposal facilities in the slum were few and inconvenient.

5.4 Conclusion of the study

The purpose of the research was to find out the level of microcredit boost to increase awareness on water use for households of slum dwellers in Kenya. Water and sanitation projects in slums have contributed positively towards improved lives and health of the common man and woman through safe water access, reduced water pricing and improved sanitation provision. The quality and sustainability of the projects established is however wanting, some of the aspects of the projects are temporary. e.g. Plastic sewer lines connected to toilets are vulnerable to breakages. Those interviewed and had low education level could not comprehend how water and sanitation projects contributed towards their improved livelihoods due to inadequate knowledge of the project's objectives and purpose.

5.5 Recommendations of the study

Based on findings from this study, it was concluded that;

- i) Proposed Water projects need to be up-scaled in slums and more microfinancing to support technical and management levels. From the study it was noted that sanitation projects in slums are significant on the lives of community
- iii) Personnel involved in such magnitude of projects need to be trained on proper project management practices. They should be motivated through incentives. Similarly, create awareness creation for the community members about the benefits and proper practices of water and sanitation projects.
- iv) Women participation especially in such projects should be increased to ensure sustainability of water and sanitation projects thus enhancing continued livelihood improvement.

5.6 Suggestion for further research

This study has encountered other areas which would require further research. These are;

1. The effects of collective participation on water and sanitation as a common want in slum areas ,
2. Challenges facing the successful water and sanitation infrastructural projects in slum are

REFERENCES

- Abrams, (1998). Understanding sustainability of local water services. Retrieved on 7th May 2012.
<http://www.africanwater.org/sustainability.htm> .
- Admassu,M., Kumie A., and Fantahun M., (2004). Sustainability of drinking water supply projects in rural of north Gondar, Ethiopia. Retrieved on 19th June 2012.
<http://www.ejh.uib.no/ejhdv17-no3/92mengesha%20Admassu.pdf>.
- Adomako, T. (1998). Community financing, challenges to community management-paper presented at 24th WEDC conference, Islamabad
- Alaci, D. S. A., & Alehegn, E. (2009). Experiences from Ethiopia and Nigeria: Infrastructure Provision and the Attainment of Millennium Development Goals (MDG) in Decentralized Systems of Africa, Paper presented at the Conference on the Role of the Sub-National Jurisdictions in Efforts to achieve the MDGs, 7-9 May 2009, Abuja, Nigeria.
- Antonio Estache, 2006. "[PPI divorces vs. PPI partnerships in Infrastructure](#) ," [ULB Institutional Repository](#) 2013/43914, ULB -- Universite Libre de Bruxelles.
- AWWA (2001). *Reinvesting in drinking water structure: dawn of the replacement era.* , Denver, CO: American Water Works Association.
- Baker, J.L (2000). Evaluating the impact of development projects on poverty: A handbook for practitioners. Washington, DC: The World Bank
- Baulcomb, S.J (2003). Management of change through force field analysis. *Journal of nursing management.* 11(4) 275-280. Retrieved on 10th March 2012.
<http://www.onlinelibrary.wiley.com>

Best, J.W. and Kahn, J.V. (2004), *Research in Education*, New Delhi, Prentice Hall of India.

Bharwani, S., Downing, T., Haase, D., Pahl-Wostl, C., Taylor, A., Shale, M., *et al.* (2008). *Dynamic Vulnerability: Learning from NeWater Case Studies* (NeWater Deliverable No. D 2.1.2). Oxford: Stockholm Environment Institute.

Borg, W. R., & Gall, M. D. (1989). *Educational Research*. Longman: New York.

Carter, R.C., Tyrrel, S.F. and Howsam, P. (1999). Impact and Sustainability of Community Water Supply and Sanitation Programmes in Developing Countries. *Journal of the Chartered Institute of Water and Environmental Management*, 13, 292-296, August 1999

Chambers, R. (1997), *Whose Reality Counts?*, London, ITDG.

Clarke, P. (1998) 'Water, food security and livelihoods', in Nicol, A. 'Water Projects and Livelihoods – Poverty Impact in a Drought-prone Environment', SCF Workshop Report 18, London: Save the Children Fund.

Constituency Development Fund Act 2003. Government Printers: Nairobi

Cooper, D.R and Schindler, P.S (2003). *Business research method* (8th ed.). New Delhi: Tata McGraw-Hill.

Cooper, Donald R. and Pamela S. Schindler. (2006). *Business research methods*. 9th ed. HD 30.4 E47 2006

Environmental Management & Co-ordination Act no. 8 of 1999. Government Printers: Nairobi

Esrey, S. A., Potash, J. B., Roberts, L. & Shiff, C. (1991). Effects of improved water supply and sanitation on ascariasis, diarrhoea, dracunculiasis, hookworm infection, schistosomiasis, and trachoma. *Bull World Health Organ*, 69(5), 609–621.

Fewtrell, L. & Colford, J. (2004). *Water, sanitation, and hygiene: interventions and diarrhoea - A systematic review and meta-analysis*. Health, Nutrition and Population Discussion Papers.

The International Bank for Reconstruction and Development/ The World Bank, Washington, DC.

Gleick, P. H. (2003). Global freshwater resources: Soft-path solutions for the 21st century. *Science*, 302(5650), 1524–1528.

Hardoy L. (2008). *Environmental problems in the third world cities*. London: Earthscan Publication Ltd.

Hesselbarth, S. (2005). Socio-Economic Impacts of water supply and sanitation projects. Retrieved from www.kfw-entwicklungsbank.de/ebank/DE_Home/Sektoren/ .

Hoevel, A. (2008), “Overpopulation could be people, planet problem” CNN. <http://www.CNN.Com/2007/tech/science/09/25/overpopulation.overview/index.html>

Howard, G. & Bartram, J. (2003). *Domestic water quantity: service level and health*. World Health Organization, Geneva, Switzerland.

Hulya Dagdeviren & Simon A. Robertson, 2009. "Access to Water in the Slums of the Developing World ," Working Papers 57, International Policy Centre for Inclusive Growth

Hunter, P. R., Chalmers, R. M., Hughes, S. & Syed, Q. (2005). Self reported diarrhea in a control group: a strong association with reporting of low-pressure events in tap water. *Clin Infect Dis* 40(4), e32–e34.

Hutton, G. & Haller, L. (2004). *Evaluation of the costs and benefits of water and sanitation improvements at the global level*. World Health Organization, Geneva, Switzerland.

Jaglin, S. (2002). The right to water versus cost recovery: participation, urban water supply and the poor in sub-Saharan Africa. *Environment and Urbanisation*, 14(1), 231-245.

Kazuhiro Yuki (2006). Urbanization, informal sector and development. *Journal of development*

economics 84 (2007) 76-103. Retrieved on 25th August. <http://www.elsevier.com/locate/econbase>

Kazungu, D.N (ed). Africa water and sanitation magazine. In search of solutions to Africa's development problems and strengthening capacities. November-December 2008. Vol 3 No. 3. Nairobi. Transworld publishers limited

Kenya Vision 2030. The popular version government of Kenya, 2007

Thorndike, R.L., & Hagen Elizabeth, (1961). Measurement and Evaluation in Psychology and Education, John Wiley and Sons, Inc

LeChevallier, M., Gullick, R., Karim, M., Friedman, M. & Funk, J. (2003). The potential for health risks from intrusion of contaminants into the distribution system from pressure transients. *J Water Health* 1, 3–14.

Lee, S. H., Levy, D. A., Craun, G. F., Beach, M. J. & Calderon, R. L. (2002). Surveillance for waterborne-disease outbreaks in the United States, 1999–2002. *Morbidity and mortality weekly report* 51(SS-8), 1–49.

Lockwood H. (2004). *Scaling up community management of rural water supply*. Thematic Overview Paper, IRC: Delft, the Netherlands.

Marcotullio, P.J and McGranahan G., (eds.) (2007). *Scaling urban environmental challenges: from local to global and back*. London: Earthscan

Ministry of population and national development (2005). Annual progress report: 2003/2004. Invest progress for economic recovery strategy for wealth to employment creation 2003-2007. Government Printers: Nairobi

- Mugenda, O.M and Mugenda (2008). *Research methods: quantitative and qualitative approaches*. Nairobi: Acts Press.
- Mugenda, O.M and Mugenda, A.G (2012). *Research methods dictionary* Nairobi: Acts Press.
- Nangulu-Ayuku, A. (2000). Politics, urban planning, and population settlement: Nairobi, 1912-1916. *Journal of Third World Studies* 17(2).
- Ngechu. M. (2004), *Understanding the research process and methods: an introduction to research methods*. Nairobi: Acts Press.
- Nicol, A. (1997) Global Action Plan for SCF Water Projects – Water Review Trip Reports, unpublished. London: Save the Children Fund.
- Okafor, C. 2005. “CDD: Concepts and Procedure.” Paper delivered at the LEEMP workshop in Kainji National Park, New Bussa, Pp. 2-10.
- Olmstead, S. M. (2003). Water supply and poor communities: What’s price got to do with it? *Environment* 45(10), 22–35.
- Orodho AJ (2003) *Essentials of Educational and Social Science Research Method*. Masole Publishers
- Pamoja trust (2007), *inventory report*: Nairobi Kenya.
- Payment, P. (1999). Poor efficacy of residual chlorine disinfectant in drinking water to inactivate waterborne pathogens in distribution systems. *Canadian Journal of Microbiology* 45(8), 709–715.
- Reba, P., (2003) *Sectoral Trends in the Water Sector (Technology, Policy and Poverty) in South Asia, Paper presented at South Asia Conference on Technologies for Poverty Reduction, New Delhi, 10 -11 October, 2003, cited on 26th June*

- Rockstrom, J. et al (2003). A watershed approach to upgrade rainfed Africa in water scarce regions through water systems innovations: An integrated research initiative for water and rural livelihoods in balance with ecosystem function. *Physics and chemistry of the earth* 29 (2004) 1109-1118. Retrieved on 4th July 2012. <http://www.sciencedirect.com>
- Seckler, D., Amarasinghe, D., Molden, D., deSilva, R. & Barker, R. (1998). *World water demand and supply, 1990–2025: Scenarios and issues*. International Water Management Institute Report 19. International Water Management Institute, Colombo, Sri Lanka.
- Semenza, J. C., Roberts, L., Henderson, A., Bogan, J. & Rubin, C. H. (1998). Water distribution system and diarrheal disease transmission: a case study in Uzbekistan. *Am J Trop Med Hyg* 59(6), 941–946.
- Stanley, B. 2003. *Sustainability through Participation*. Minna: Dele Publishers, p. 211.
- UN Department of Economic and Social Affairs, P. D. (2004). *World Urbanization Prospects: The 2003 Revision*. Retrieved on 26th April 2012. <http://www.unpopulation.org> .
- UN HABITAT (2011). *Cities and climate change global report on human settlements*. London; Earthscan. Retrieved on 14 March 2012. <http://www.unhabita.org/grhs/2011>
- UN Millennium Project (2005). *Health, dignity, and development: what will it take?* Earthscan/James & James, London, UK.
- UNCHS(Habitat) (2003)-*The challenges of Slums, Global Report on Human Settlements*, Earth Scan Publications Ltd, London.
- UNDP (2000). *HDR 2000*. New York: UNDP
- UNEP (2002). *Vital Water Graphics*. United Nations Environment Programme, Geneva, Retrieved on 10th June 2012. <http://www.unep.org/vitalwater/21.html> .

- UN-HABITAT (2003). *The challenge of slums; Global report on human settlements*. London: Earthscan. Retrieved on 10th June 2012. <http://www.unhabitat.org> .
- UN-HABITAT (2008). *State of world cities 2008-2009*. UN-HABITAT: Earthscan:London
- UNICEF & WHO (2004). *Meeting the MDG drinking water and sanitation target: a mid-term assessment of progress*. UNICEF/WHO, Geneva, Switzerland.
- USEPA (2002). *The clean water and drinking water infrastructure gap analysis*. United States Environmental Protection Agency, Office of Water, Washington, DC.
- Water Act No. 8 of 2002. Government Printers: Nairobi Water and sanitation program. 2005. *Improving lives through better water and sanitation services*. Annual report 2005. Washington, DC: WSP. Retrieved on 18th June 2012. <http://www.wsp.org>
- Water for sustainable urban human settlements (2010). Retrieved on 11th May 2012 <http://www.unwater.org/downloads/WWAP.urban-settlements-web-version.pdf> .
- WHO (2005). *Water for life: making it happen*. WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation, Geneva.
- WSP (2005). *Rogues no more? Water kiosk operators achieve credibility in Kibera*. Field Note. Nairobi: WSP-Africa.

APPENDICES

Appendix 1: Request for Participation

This questionnaire is prepared to facilitate in the collection of relevant data for an academic research whose aim is to study the **impact of microfinance on increasing access to water and improved sanitation of households of slum dwellers in Kenya: a case study of kibera slum, Nairobi County**. The information gathered will only be used for the study and shall not be used to victimize any one and the respondents will remain anonymous and their names shall not be revealed to anyone.

Appendix 2: Household Questionnaire

SECTION 1 – GENERAL DATA OF THE RESPONSES

1. Name of the respondent.....
2. Gender? 1.Male 2.Female
3. Age.....
4. Marital Status?
 1. Married
 2. Single
 3. Widowed
 4. Separated/Divorced
 5. Others (Specify)
- 5.What is your level of education?
 1. None
 2. Primary
 3. Secondary
 4. Tertiary
 5. Others Specify
- 6.What is your main sources of water for this household?
 1. Piped water
 2. Water kiosk
 3. Water vendors

4. Borehole
5. Rain Water
6. River
7. Others Specify

7.What is the distance in Kilometers from your house to the main source of water?

1. 0-2kms
2. 3-5 kms
3. Over 6 kms

8.Before the established of the water projects being supported by micro financing in Kibera,how far from your house didi you access main source of water (IN kms)

1. 0-2Kms
2. 3-5 Kms
3. Over 6 Kms

SECTION 2: Economic impacts of access to water and improved sanitation on households

9.What is your main source of income?

1. Salaried employment
2. Casual employment
3. Small scale business
4. Self employed
5. Others specify

10. What is the average amount of water does your household spent in a day? (In 20 litres container) Tick appropriately.

- 1. 1-2
- 2. 3-4
- 3. 4-5
- 4. 6 and above

11. Do you pay for water in your village?

- 1. Yes
- 2. No

12. If yes, how much in Kshs. per 20 litre jerrican?.....

13. How much were you paying before the “Maji ni Maisha” project was introduced?

.....

14.a) Do you pay to transport water to your household?

- 1. Yes
- 2. No

b). If yes, how much?.....

15.a) Has this water project helped you economically in any way?

- 1. Yes
- 2. No

b) Give reasons for your answer in the question above.....

.....

16. What factors would discourage you from supporting such water and sanitation initiative?

.....
.....

SECTION 3: Impacts of health status to access to water and improved sanitation

17a) Is the piped /Kiosk water reliable?

1. Yes

2. No

b) If the water source is not reliable, what do you do to ensure that you have water all the times?

.....
...

18. Have you ever experienced interruptions in accessing water?

1. Yes

2. No

19. Has anyone of your family members suffered from water related diseases (In the last six months)

1. Yes

2. No

20. Mention the most prevalent diseases that your household had suffered starting from the most common to the least after establishment of the water project.

.....
...

.....

21. In your own opinion, do you think this water project improved health conditions of your household?

- 1. Yes
- 2. No

22. Explain your answer above.....

.....

SECTION 4: Impact of water accessibility and improved sanitation practices

23. Does this household own a toilet?

- 1. Yes
- 2. No

24. The type of toilet before the water and sanitation project?

- 1. Pit latrine
- 2. Flash toilet
- 3. Eco-toilet
- 4. Others Specify

25. Type of toilet after the water project?

- 1. Pit latrine
- 2. Flash toilet
- 3. Eco-toilet

4. Others specify

26. How convenient was the human waste disposal before the water project?

- 1. Very convenient
- 2. Fairly convenient
- 3. Poor/Not convenient

27. Before the Water and sanitation projects, where was your main source of human waste disposal?.....

...

28. Do you think water and sanitation project (Maji ni Maisha) has attained improved sanitation in Kibera?

- 1. Yes
- 2. No

29. Explain your answer above.....

Thank you for your time.

Appendix 3: Focus Group Discussion Guide

1. Are you aware of any water and improved sanitation projects being supported by microfinance your settlement? (Give details of the project)

2. For how long has the projects above been supported?

3. In what ways were you involved in implementation of the projects above?

4. Did the projects help you to improve your livelihood in the following aspects?
 - a. Socio-economic
 - b. Hygiene and sanitation
 - c. Environment

5. Describe how the projects helped your settlement economically

6. Describe how the projects helped your settlement in health aspect

Thank you for your time