

**UNIVERSITY OF NAIROBI
FACULTY OF ARTS
DEPARTMENT OF SOCIOLOGY AND SOCIAL WORK**

**FACTORS INFLUENCING SANITATION PRACTICES IN KIBERA
URBAN INFORMAL SETTLEMENTS IN NAIROBI- KENYA**

**BY:
MUHELE MILLICENT
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DECLARATION

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

Signed.....

Date.....

Millicent Muhele

C50/60545/2013

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

Signed.....

Date.....

Dr. Mutsotso

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DEDICATION

I dedicate this work to the residents of Kibera informal settlement Nairobi county Kenya, who have made this project a success.

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ABSTRACT

This study sought to assess the factors influencing sanitation practices in urban informal settlements with a focus on Kibera, Nairobi. The objectives of the study were to: Establish the common sanitation practices; Find out the levels of awareness on existing safe sanitation practices; Establish the factors that influence household choice on the type of sanitation practice; and Identify specific actions required to make safe sanitation practices effective. There is limited research which has been conducted to explore the influencers of sanitation practices in informal settlements. This study therefore examined the factors influencing sanitation practices in informal settlement, Kibera. The literature review on sanitation practices, specifically were; sanitation situation in Kenya, characteristics of informal settlements and common causes of unhygienic practices. This study was guided by the following theories; Theory of planned behaviour, Social Cognitive theory and People-centred theory of development. The target population for the study was household heads. The research selected a random sample size of 96 household heads. The study used quantitative and qualitative methods of data collection. The tools used were questionnaires key informant interview guide and an observation checklist. The study found out that majority of the resident's water supply was from the water vendors (57%).The findings showed that 41.3% of the residents used public latrine of which about 82.4% reported that they paid for the use of the latrines. It was also found out that only 2.1% of the respondents burnt their solid waste while 46.8% disposed in the open space. Majority of the respondents 60% did not wash their hands after visiting a toilet. The study revealed that the main source of information on sanitation to the residents was through the mass media (46.8%). This study recommends that Kibera residents should uphold community initiatives to ensure that they promote sanitation practices in the households, campaigns on sanitation practice to consider the different cultures and socioeconomic status of the residents. Further research to be conducted to establish partnerships for the government, community and other stakeholders to promote sanitation.

CHAPTER ONE: INTRODUCTION

1.1 Background

Sanitation is a human right and a key component of primary prevention to ensure better health (WHO, 2014). According to the report of WHO (2014), in the African Region, 45% of the population uses either shared or unimproved facilities, and an estimated 25% practice open defecation. The majority of those practicing open defecation live in rural areas or urban informal settlements. Lack of sanitation facilities forces people to defecate in the open, in rivers or near areas where children play or food is prepared. This increases the risk of transmitting diseases. Examples of diseases transmitted through water contaminated by human waste include diarrhea, cholera, dysentery, typhoid, tropical diseases and hepatitis A. In the same report, it is observed that in Africa, 115 people die every hour from diseases linked to poor sanitation, poor hygiene and contaminated water. The report suggests that hygiene education and promotion of hand washing are simple, cost-effective measures that can reduce diarrhea cases by up to 45%. Proper hygiene goes hand-in-hand with the use of improved facilities to prevent disease.

Globally, large numbers of people remain without access to basic levels of drinking-water supply and sanitation (WSS 2012). One of the UN Millennium Development Goal (MDG, 2000) targets is to half, by 2015, the proportion of people without sustainable access to safe drinking-water and basic sanitation, with 1990 as the baseline year. According to the JMP (2010), the rate of progress towards achieving this target is such that the target will not be reached in its entirety by 2015. While the drinking-water target was met in 2010, sanitation is still considerably off-track. Based on the most recent

estimates sanitation coverage must increase globally from 63% to 75% between 2010 and 2015. At the current rate of progress, sanitation coverage is predicted to be 67% in 2015, 580 million people short of the MDG target.

According to JMP report (2012/13), in the East Africa nation of Kenya, 48% of people lack access to adequate and safe water supply. However, 29% of the populations have access to improved sanitation, 26% shared sanitation, 31% Un-improved sanitation and 14% of the population still practice open defecation. According to Schmidtet (2009), Less than 25% of the population in Kenya practices hand-washing with soap. Whereas there is progress in reducing Open defecation in the sanitation sector, there are still huge service gaps between urban areas, 31% access improved sanitation facilities, 47% shared, 19% un-improved with 3% defecating in the open. In the rural areas 29% access improved sanitation, 19% shared, 35% un-improved and 17% open defecation (JPM 2012/13).

Therefore, the state of sanitation and hygiene practices in informal settlement and slums is wanting despite the fact that the government of Kenya, through Kenya's National Sanitation and Hygiene strategy and Action Plan has the overall goal of, Sanitation for all by 2020 has endeavored to provide water and sanitation facilities to urban and informal settlement so as to enable citizen in such areas to practice proper hygiene. The water and sanitation services of the informal settlements in Nairobi are a major public health and livelihood problem (NESSAP, 2010-2015).

The Constitution of Kenya 2010 recognizes access to safe water as a basic human right and assigns overall responsibility on water resources management to the National government while assigning the provision of water and sanitation services to the 47

counties. The Government is therefore committed to respect, protect and fulfill this right.

1.2 Statement of the Problem

Due to rural-urban migration, the number of slums in Kenya's capital Nairobi is increasing uncontrollably because of the population increase. Overpopulation in this area leads to few water supplies and due to the lack of water supplies, garbage collection, excreta disposal, drainage, and electricity supply. Thus the levels of sanitation in this area are reduced next to zero (Nordberg, Oganga, Kazibwe & Onyango, 1993).

The lack of sanitation facilities is considered a big problem by the residents in Kibera slums, but it is very difficult to improve the situation because of several related issues (UN Habitat, 2008). First, there is hardly any space for latrines; the compounds are built up to capacity and available empty spaces are becoming encroached. Secondly, latrines are considered the responsibility of the landlord in this area, and because the landlord usually does not live in the area, s/he is not interested in improving the latrine situation (Umande Trust, 2006).

Despite the Kenyan commitment towards ensuring sanitation for all, little progress has been made; therefore it's important to establish factors that account for poor sanitation practices especially in informal settlements (SWA-HLM Commitments 2014-2016). A rapid applied research pilot study to determine the level of hygiene awareness conducted in Korogocho slums of Nairobi in Kenya by NETWAS Kenya and the WSSCC in 2003 indicated that knowledge on the key hygiene behaviors and practices by the slum residents was very low and only 29% of the respondents had ever attended any form of hygiene training (Ghosh, Karanja, & WSSCC, 2003).

The study of Alam and Pattanayak (2009) revealed that the sanitation facilities were inadequate for overcrowded slums. Similarly, Duncker (2007) in South Africa found that there were health problems resulting from a lack of sanitation facilities but did not address the factors influencing implementation of hygiene practices. In a study in Namibia, Mundia (2013) discovered that knowledge and the practice of hygiene among the residents was insufficient. This research therefore seeks to fill this gap by providing comprehensive information on factors influencing implementation of sanitation practices in informal settlement a case study of Kibera, Nairobi.

1.3 Research Questions

- a) What are the common sanitation practices in Kibera, Nairobi?
- b) What are the factors considered by households in choosing the type of sanitation practice in Kibera, Nairobi?
- c) What are the sources of information existing on safe sanitation practices in Kibera, Nairobi
- d) How can the sanitation practices be made more effective?

1.4 Objectives of the Study

1.4.1 Main Objective

The main objective of this study is to assess the factors influencing Sanitation Practices in Urban Informal Settlement: Case of Kibera, Nairobi.

1.4.2 Specific Objectives

The specific objectives of this study are:-

- a) To establish the common sanitation practices.
- b) To find out the factors that influence household choice of the type of sanitation practice.
- c) To establish source of information on existing safe sanitation practices.
- d) To identify specific actions required to make safe sanitation practices effective.

1.5 Significance of the Study

Many people stay in informal settlement and population in slums is in rise so the issues of poor sanitation affects many people hence this study will be of essence in provided important information to the people in order to be able to control diseases like cholera and other infectious diseases.

The study will provide information to scholars and practitioners toward better understanding of sanitation problem.

It will help the policy makers in designing appropriate policies towards addressing the problem of poor sanitation in informal settlement.

1.6 The Scope and Limitations of the Study

The research study confined itself to the factors influencing hygiene practices in Kibera informal settlement which include levels of awareness on existing safe sanitation practices and socio-economic factors that influences the choice of the type of sanitation practice in the area. The study cannot be generalized to cover formal urban setting since

factors influencing implementation of hygiene practices in these settings may be significantly different. Because of time and financial constraints not the entire population of Kibera was studied but it is assumed that the result can be a good pointer to the entire population.

Limitation for the study was the difficulties of getting respondents understand questionnaires which were written in English hence need for translation to Kiswahili.

CHAPTER TWO: LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Introduction

This chapter reviews the selected literature that has been carried out by various writers and researchers in the area of water and sanitation. It also quoted from various studies and contributions that had relevance to the area of the study.

2.2 Sanitation Situation in Kenya Informal Settlements

Hygiene is very important to healthy living and survival of humanity. Despite the realization of the importance of observing good hygiene practices and the risk of poor hygiene practices, many informal settlements including Kibera in Kenya have not implemented good hygiene practices. Even though the rapid population growth due to rural urban migration is deemed to be the immediate cause, the situation could have been attributed to culmination of many years of neglect and mismanagement of sanitation systems in many informal settlement.

Between 60 and 93% of slum households are dependent on water vendors for their water supply (World Bank, 2006 & KDHS, 2010). Provision of water is well below Sphere Project recommendations. In Mathare slum, for example, there are 1,200 people per water point compared to Sphere Standards recommending a maximum of 500 people per hand pump based on a flow of 16.6 l/m (Grellety E and France MSF, 2008). Furthermore, the high cost of water generally 4-5 times the price per litre charged by Nairobi Water and

Sewerages Company, restricts the amount of water used by a household, increasing the risk of water borne diseases and poor hygiene standards (Umande Trust, 2006).

An estimated 24% of residents of informal settlements have access to household toilet facilities, 68% rely on shared facilities and 6% have no access to facilities at all and often resort to ‘flying toilets’ which pose a serious health hazard. Latrine emptying and sewerage removal are handled by small scale operators under unsanitary conditions. An economic study conducted for Kenya has shown that impacts resulting from poor sanitation and hygiene cost the economy of Kenya 27.4 Billion Kenyan Shillings (KSh) (US\$ 324 million) per year, or the equivalent of 0.9% of annual Gross Domestic Product (GDP). These figures reflect the; adverse health effects associated with poor sanitation and water supply, costs of treating these health problems, loss of productivity that results when individuals are sick and others have to care for them, and time spent to access service.

Kenya's National Sanitation and hygiene strategy has the overall goal of, Sanitation for all by 2020. In the health sector, (MTPII 2013-2017) stresses that, the National government in partnership with county governments, will continue to emphasize primary healthcare, access to clean water to households, and better management of communicable diseases.

There are 6 key objectives developed in the strategy towards attaining the goal; a) To eradicate open defecation (OD) in Kenya by 2015, b) To significantly improve hand washing practice to over 90% by 2015, c) To significantly improve the safe water at point of use for all households in Kenya by 2015, d) To ensure that all solid and liquid

waste is properly managed by 2020, e) To have an effective emergency preparedness and response mechanism for sanitation by 2015, and f) To strengthen coordination of sanitation hygiene systems and enabling framework on an ongoing basis.

Whereas there is progress in reducing open defecation in the sanitation sector, there are still huge service gaps between urban areas, 31% access improved sanitation facilities, 47% shared, 19% un-improved with 3% defecating in the open. In the rural areas 29% access improved sanitation, 19% shared, 35% un-improved and 17% open defecation. Further, within the urban setting there are inequities between formal settlements and Informal areas, including peri-urban settlements, which are home to 32% of Kenya's current projected population (Kenya SWA-HLM commitments, 2014-2016).

2.3 Characteristics of Informal Settlements from a Sociological Perspective

Fourie (1993) developed a social change model to explain how informal settlements come about. The major components of it are 1) the dialectical approach; 2) ongoing processes of fission and integration; and 3) transactional behavior. The dialectical approach holds that there is internal competition and inter-dependence between the various power levels and sub-groups within a community. Competition is manifested in struggles for land, resources and political power. Tension between subgroups develops as a result of local dynamics and factors external to the community (such as urbanization patterns, local authority policies, and local authority interventions). Hence the internal dialectic refers to the structural tension between groups within the community. The external dialectic is seen as the tension between external factors and the internal dialectic in the local area (Davies and Fourie, 1998). It follows that a community can be expected

to act in solidarity when dealing with external agencies, but the deals that arise from these actions also give rise to internal competition and conflict.

Fission and integration are two opposing processes. Fission, being a process of individualization and integration, tends to strengthen group identity. At the group or sub-group level, fission and integration have to do with the dynamics of group ties and coalition construction. The latter refers to the process of a faction severing ties with one sub-group (fission) and seeking alignment with another faction within a community (integration). With respect to land tenure practices, fission and integration are manifested as competition between notions of individual and group land tenure rights. Where there is a bias toward integration, group rights prevail over individual rights. For example, an individual may obtain a right for the exclusive use and enjoyment of a particular parcel of land (that is, tending towards fission), yet a community-based institution may insist on approving any person to whom this land right may be sold (tending towards integration). This approval may, for example, require the sponsorship by a person already residing in the settlement along with allegiance and affiliation to a particular faction within the settlement (Barry, 1999).

Transactional behavior, or entrepreneurial behavior, relates to the negotiations and deals associated with land and land tenure within a community. Land tenure rules are important and required by groups at settlement level for land administration operations, such as land allocation and dispute resolution. However, such rules are not static. They transform over time because they tend to be manipulated by sub-groups as they compete for land, resources and power. These transformations are a manifestation of the tension and

conflict both within the local system (internal dialectic), and between the local system and external factors (external dialectic) (Davies, 1998).

In essence, the above social change model is a pluralist conceptualization of urban informal settlements. Solidarity and schism continually arise, and they are intrinsic to the processes of coalition formation. Conflict is inherent and natural in the relationships between different individuals, groups and sub-groups within a settlement and between these entities and external agents. Furthermore, the conventional assumption that a simple hierarchical power structure determines social behavior within a polity, or group, is simplistic. Rather, within a group a range of different power levels exist, with competing sub-groups at each level. As circumstances change it is likely that the prevailing bias of the tenure system in different geographical and social sectors of a settlement may oscillate between individualization (fission) and overriding group rights (integration). The relevance of the above is that the concepts of social change in informal settlements need to be taken into account in the design and management of the processes of understanding an informal settlement (Allison & Larson, 2002).

2.4 Common Causes of Unhygienic Practices in Informal Settlements

Informal settlements communities overwhelmingly lack adequate arrangements for waste disposal. Wastewater from bathing and washing is typically spilled right outside shelters, where it may soak into the ground or form stagnant pools in poorly drained areas. Where sewers exist, they are virtually always open drainage canals. The ground by the side of the shelters or in alleyways serves as a frequent substitute for urinals. In general, residents have improvised sanitation systems in informal settlements areas to satisfy their

perceived needs (privacy and convenience, for example), and as materials and labor become available (APHRC, 2006).

Generally communities adopt unsafe hygiene practices as residents do not wash hands after changing babies' nappies, before handling food, before eating, after a visit to the toilet, after house cleaning and after work or rubbish disposal, due to irregular water supply. Others do not wash food before eating, especially fruits. Men do not wash their hands after urinating and they urinated in open spaces (such as behind the house, on the street, next to the car). There is poor disposal of children faeces and solid waste because of the lack of essential services for waste disposal. Most mothers who used disposable nappies threw them in the field. Water containers are sometimes left uncovered or half-covered so as to ensure that they capture rainwater. The communities shared water with animals because of lack of demarcation areas around households (Larson, Minten and Razafindralambo, 2006). They also drank untreated water from unprotected streams, due to lack of money to buy disinfectants. A number of communities used the “bush” for defecation due to the lack of toilets. This habit also stems from poor technical awareness in communities (such as seepage problems), lack of maintenance and cleaning of public toilets and facilities, cultural norms and beliefs regarding certain practices as well as poor designs in public facilities.

In informal settlements experiencing regular or even irregular water supplies, pour-flush toilets with soak-away or septic tanks may exist, relying either on household or community septic tanks. However, the septic tanks often are poorly maintained or undersized. The motivating factors for adoption of safe hygienic practices are varied and complex, but could generally be grouped into the following linked and overlapping

categories: educational/awareness factors, cultural factors, economic factors, environmental factors and psycho-social factors (Mundia, 2013).

Educational factors include training, advocacy, capacity building, social mobilization, access to information and information exchange. Unhygienic practices, certain cultural beliefs in relation to hygiene, fears and perceptions of hygienic practices have to be changed through raising awareness and education. Ineffective promotion and low public awareness, ignorance of people, lack of capacity building, lack of hygiene education and training, negligence of people are said to be de-motivating factors for adoption of safe hygienic practices (Nath, 2009).

The need for more sanitation programmes is unavoidable. Sanitation programmes change long-held beliefs through mentioning the unmentionable; equally address the needs, preferences and behaviours of children, women and men; adopt approaches which recognize and allow optimal use of valuable community attributes such as participatory approaches; focuses on behaviour and facilities together. Sanitation programmes and hygiene awareness workshop should address cleanliness, collection of waste, safe disposal of faeces, food storage, disease prevention, sanitation facilities and erection of toilets (Scott, Curtis & Garbrah, 2007).

Culture is the particular knowledge, beliefs, and understanding of art, law, morals, customs, and other skills and habits that a person acquires as a member of a given society. Beyond their individual differences, the members of a group or a society have particular ways of thinking and behaving, and will react to situations in similar ways. Culture is also an instrument; a tool by which we assign meaning to the reality around us

and to the events that happen to us. This constant building of meaning involves repetition, the reproduction of the ways of doing things and behaving which have been acquired; and renewal of the incorporation of new elements that add to or replace what has been acquired. Because of these processes of repetition and renewal, societal attitudes are not unchangeable and communities can choose to give up harmful practices, although there is a need to accept that this process may take some time (Allison & Larson, 2002).

According to Water Aid (2003), experience of CLTS in West Africa, it is clear that the total sanitation techniques need further strengthening and adaptation to local contexts in order to be more effective. Safe, acceptable and affordable sanitation technologies and flexible sanitation systems incorporate respect for community values, perceptions and practices. Further, introducing awareness programmes that take into consideration the values, culture and beliefs of communities and of indigenous knowledge and experience could lead to desired results. The programmes should also address the myths, attitudes, beliefs and distorted perceptions.

One of the DWAF officials mentioned that most communities do not perceive children's faeces as harmful. They touch children's stools giving the impression that children's stools are clean. Some people perceive safe hygienic practices as a rich people's affair and other people preferred to defecate in the bush because they are afraid to share toilets to avoid being bewitched. Availability of income is considered to be one of the key motivating factors for adoption of safe hygienic practices. Further, provision of affordable sanitation products and services, with more equitable distribution so as to reach the low-income groups and to enhance access to and demand for goods and

services is viewed as critical. Unemployment, low incomes, poor living conditions, low literacy levels and lack of recreational facilities are perceived as de-motivating factors towards the adoption of safe hygienic practices (Allison & Larson, 2002).

The high cost of water and sanitation to families of low income and the shortage of capital for investment are also cited as de-motivating factors. While even the lowest-income families can usually afford potable water as it is delivered, the provision of indoor connections close to the house can become unaffordable because of attendant costs that are not taken into account in sanitation project feasibility studies (Duncker, 2007).

Environmental factors which motivate people to adopt safe hygienic practices are cited as: infrastructural development (e.g. well-built houses with electricity); access to water supply sources (e.g. house connections; public stand pipes, bore-holes, protected springs); access to excreta disposal sources (e.g. connection to the sewer or septic tank and Vertical Improved Pits; care and maintenance of water sources (e.g. fencing, cut grass, soak-away, drains as well as existence of care takers for preventive maintenance) and excreta disposal sources and supportive and enabling environment (Duncker, 2007).

Inadequate and poorly used resources are said to be de-motivating factors. Properly maintained water sources and properly maintained excreta disposal sources are said to be motivating factors for adoption of safe hygienic practices. Sanitation technologies must maintain the integrity of the natural environment. It must not contribute to contamination of water resources or the creation of health hazard (Bhatia & Falkenmark, 2003).

Psycho-social factors that could motivate people to adopt safe hygienic practices include improvement of living standards, availability of basic needs, poverty alleviation and community participation in sanitation programmes (from conceptualization, design, implementation to evaluation). Political commitment from the top and at all levels is seen as one of the motivating factors for adoption of safe hygienic practices (Alcock, 2009).

Lack of enabling environment, the attitude that responsibility for sanitation lies somewhere, lack of political will, lack of local support for sanitation programmes, limited consideration of service sustainability and weak sector institutions, lack of monetary and social benefits, low prestige and recognition for sanitation are all regarded as demotivating factors towards the adoption of safe hygienic practices. Sanitation technologies should be consumer oriented, address the needs of the people. Sanitation technologies must support human dignity in all interventions because sanitation is not only about health. It is about improving morale and dignity of the people (Ajzen & Fishbein, 2005).

2.5 Theoretical Framework

This study was guided by the following theories; Theory of Planned Behavior and Social Cognitive Theory.

2.5.1 Theory of Planned Behavior

The theory of planned behavior (TPB) was developed by Ajzen in 1988. The theory proposes a model which can measure how human actions are guided (Armitage & Conner, 2001). It predicts the occurrence of a particular behavior, provided that behavior is intentional. The Theory of Planned Behavior (TPB) started as the Theory of Reasoned

Action in 1980 to predict an individual's intention to engage in a behavior at a specific time and place. The theory was intended to explain all behaviors over which people have the ability to exert self-control. The key component to this model is behavioral intent; behavioral intentions are influenced by the attitude about the likelihood that the behavior will have the expected outcome and the subjective evaluation of the risks and benefits of that outcome (Sniehotta, 2009).

The TPB has been used successfully to predict and explain a wide range of health behaviors and intentions including smoking, drinking, health services utilization, breastfeeding, and substance use, among others. The TPB states that behavioral achievement depends on both motivation (intention) and ability (behavioral control). It distinguishes between three types of beliefs - behavioral, normative, and control. The TPB is comprised of six constructs that collectively represent a person's actual control over the behavior (Ajzen & Fishbein, 2005).

Attitudes - This refers to the degree to which a person has a favorable or unfavorable evaluation of the behavior of interest. It entails a consideration of the outcomes of performing the behavior.

Behavioral intention - This refers to the motivational factors that influence a given behavior where the stronger the intention to perform the behavior, the more likely the behavior will be performed.

Subjective norms - This refers to the belief about whether most people approve or disapprove of the behavior. It relates to a person's beliefs about whether peers and people of importance to the person think he or she should engage in the behavior.

Social norms - This refers to the customary codes of behavior in a group or people or larger cultural context. Social norms are considered normative, or standard, in a group of people.

Perceived power - This refers to the perceived presence of factors that may facilitate or impede performance of a behavior. Perceived power contributes to a person's perceived behavioral control over each of those factors.

Perceived behavioral control - This refers to a person's perception of the ease or difficulty of performing the behavior of interest. Perceived behavioral control varies across situations and actions, which results in a person having varying perceptions of behavioral control depending on the situation. This construct of the theory was added later, and created the shift from the Theory of Reasoned Action to the Theory of Planned Behavior.

There are several limitations of the TPB (Sniehotta, 2009). First, it assumes the person has acquired the opportunities and resources to be successful in performing the desired behavior, regardless of the intention. TPB does not account for other variables that factor into behavioral intention and motivation, such as fear, threat, mood, or past experience. While it does consider normative influences, it still does not take into account environmental or economic factors that may influence a person's intention to perform a behavior. TPB assumes that behavior is the result of a linear decision-making process, and does not consider that it can change over time. While the added construct of perceived behavioral control was an important addition to the theory, it doesn't say anything about actual control over behavior. The time frame between "intent" and "behavioral action" is not addressed by the theory (Ajzen & Fishbein, 2005).

The TPB has shown more utility in public health and sanitation than the other models, but it is still limiting in its inability to consider environmental and economic influences. Over the past several years, researchers have used some constructs of the TPB and added other components from behavioral theory to make it a more integrated model. This has been in response to some of the limitations of the TPB in addressing public health problems such as sanitation (Noar & Zimmerman, 2005).

2.5.2 Social Cognitive Theory

Social cognitive theory (SCT) is a learning theory based on the idea that people learn by observing others. These learned behaviors can be central to one's personality. While social psychologists agree that environment in which one grows up contributes to behavior, the individual person (and therefore cognition) is just as important. People learn by observing others, with the environment, behavior, and cognition all as the chief factors in influencing development in a reciprocal triadic relationship. The conceptual roots for social cognitive theory come from Edwin B. Holt and Harold Chapman Brown's 1931 book theorizing that all animal action is based on fulfilling the psychological needs of "feeling, emotion, and desire". The theory holds that portions of an individual's knowledge acquisition can be directly related to observing others within the context of social interactions, experiences, and outside media influences (Pajares, Prestin, Chen & Nabi, 2009).

Social cognitive theory states that when people observe a model performing a behavior and the consequences of that behavior, they remember the sequence of events and use this information to guide subsequent behaviors. Observing a model can also prompt the viewer to engage in behavior they already learned (Bandura, 2002). In other words,

people do not learn new behaviors solely by trying them and either succeeding or failing, but rather, the survival of humanity is dependent upon the replication of the actions of others. Depending on whether people are rewarded or punished for their behavior and the outcome of the behavior, the observer may choose to replicate behavior modeled. Media provides models for a vast array of people in many different environmental settings.

Each behavior witnessed can change a person's way of thinking (cognition). Similarly, the environment one is raised in may influence later behaviors, just as a father's mindset (also cognition) will determine the environment in which his children are raised. The core concepts of social cognitive theory can be summarized by Bandura's schematization of triadic reciprocal causation (Bandura, 2002). The schema shows how the reproduction of an observed behavior is influenced by the interaction of the following three determinants:

- 1) Personal: Whether the individual has high or low self-efficacy toward the behavior (i.e. Get the learner to believe in his or her personal abilities to correctly complete a behavior).
- 2) Behavioral: The response an individual receives after they perform a behavior (i.e. Provide chances for the learner to experience successful learning as a result of performing the behavior correctly).
- 3) Environmental: Aspects of the environment or setting that influence the individual's ability to successfully complete a behavior (i.e. Make environmental conditions conducive for improved self-efficacy by providing appropriate support and materials) (Bandura, 2011).

Social cognitive theory is applied today in many different areas such as public health and sanitation. Examples of the theory in application: The use of celebrities to endorse and introduce any number of products to certain demographics: one way in which social

cognitive theory encompasses all four of these domains. A study by Ahmed (2009) looked to see if there would be an increase in breastfeeding by mothers of preterm infants when exposed to a breastfeeding educational program guided by social cognitive theory. Sixty mothers were randomly assigned to either participate in the program or they were given routine care. The program consisted of SCT strategies that touched on all three SCT determinants: personal – showing models performing breastfeeding correctly to improve self-efficacy, behavioral – weekly check-ins for three months reinforced participants’ skills, environmental – mothers were given an observational checklist to make sure they successfully completed the behavior. The author found that mothers exposed to the program showed significant improvement in their breastfeeding skills, were more likely to exclusively breastfeed, and had fewer problems than the mothers who were not exposed to the educational program (Ahmed, 2009).

2.5.3 People-centered theory of development

This approach led to the emphasis on meeting the basic needs of the poor. Basic needs can include both material and non material needs and can include adequate food, shelter and clothing, accessible and safe drinking water, certain necessary household items, sanitation, health, access to information and opportunities and safety and security. This approach to development is very helpful because it focuses on the development of the people and specifically on the poor. However, approaches to development based on the basic needs theory that go no farther run the risk of becoming large charity programs that cannot be sustained without continuous involvement of outside organizations because

they help the poor meet their basic needs without identifying problems that caused the poverty and lack of basic needs in the first place,(Burkey 1993).

The recognition that people centered development must focus on more than just meeting the needs of the poor led to the theory of human development. Human development theorists believe that development must start with and come from the individual. “Unless motivation comes from within, efforts to promote change will not be sustainable by that individual.” Human development also called personal development, seeks to develop in the individual self respect, self reliance, and active participation in community’s development. This approach empowers the poor to come up with their own solutions and development plans and be the ones to implement them. (Burkey 1993)

There are many reasons why the poor should be involved in their own development. Firstly, the poor are the most knowledgeable about their condition and their needs because they are the ones experiencing them. Secondly, the poor need to feel empowered to change things themselves. Doing everything for the poor ignores their value and dignity as human beings and treats them as if they have no understanding of their own condition and no idea on how to change it (Chambers 1983).Development projects, therefore should stop simply giving things to the poor instead should focus on building up the capacity of the poor to do things for themselves (Eade 1997).This type of development is the only type that will last if/when outside aid ends. In this case Kibera residents should be involved in implementing sanitation projects for sustainability.

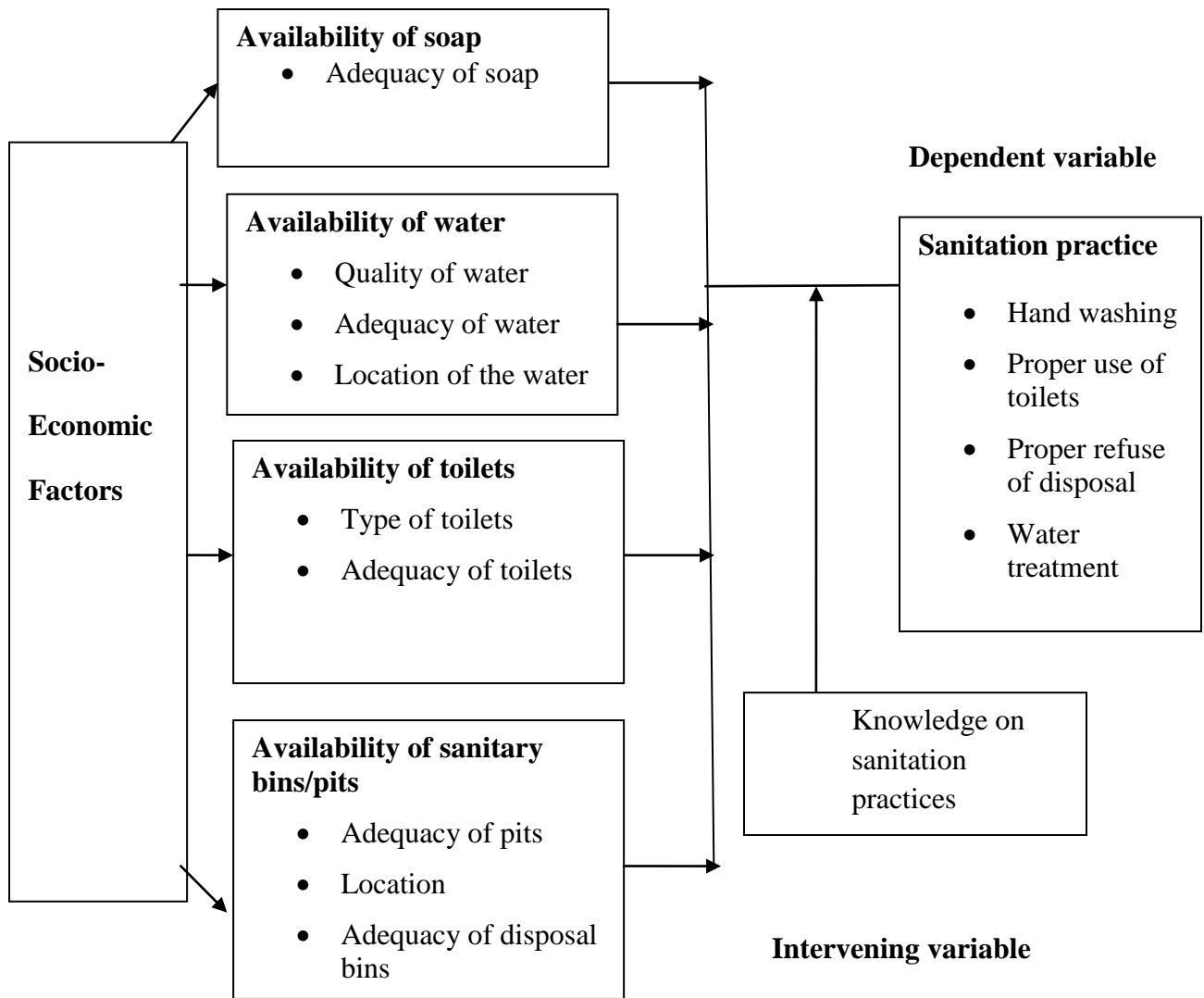
2.6 Conceptual Framework

The researcher based the study on the Hubley's BASNEF Model of health practices. The model was developed by Hubley in 1993 had desire to determine the reasons as to why people change their health behaviors. According to Hubley (1993), an individual will adopt a new practice when he believes that the practice has more benefits for his health. The person will then develop a positive attitude to the change. Subjective Norms, which may be other people's views, will also influence the person's decision to try the new practice. Skills and resources which in this model are referred to as Enabling Factors, will then determine if the practice is indeed taken up and sustained. The views advanced by Hubley seem to apply appropriately to this study because worldwide, hygiene is poorly practiced and this leads to diseases which is a major social evil that cripples any development in the society. The solution to this evil starts at home but a longer lasting solution will be offered at the community level where the community understand about hygiene practices.

According to Hubley (1993) the success of the implementation of these hygiene practices will largely depend on combined efforts of encouragement of proper hygiene practices and the construction of water and sanitation facilities. These will serve as enabling factors that will make the households and community to transform the newly acquired attitudes and beliefs into desirable hygiene practices. If properly addressed, these factors will lead to healthy community members who will learn better and become productive members of the society with the ability to share the benefits of basic hygiene practices in their own homes and communities.

Figure 2.1 Conceptual framework

Independent Variables



This representation brings out clearly the relationship between variables being studied.

The conceptual framework of this study diagrammatically shows the relationship between

the independent variables namely availability of water, soap, sanitary bins, and toilets as

the dependent variables. The independent variables as shown in the conceptual framework interact and eventually influence sanitation practices. Availability of water has indicators such as its availability, adequacy and location while the indicators for toilets include their types, condition, availability and adequacy. The indicators for sanitary disposal bins include their availability, condition and location while indicators for soap include their availability, type and adequacy. The indicators for sanitation practices include proper hand washing, proper use of toilets and disposal. Intervening variables in this study were social economic factors (gender, age, income, attitudes, beliefs, religion, customs and culture and education level) and awareness on availability of water, toilets, soap, sanitary bins which significantly influence implementation of sanitary practices.

2.7 Definitions of Concepts and Operationalization of Variables

Sanitation: This word has been used in this study to refer to any system that promotes proper disposal of sanitary towels, human waste, proper use of toilets and avoiding open space defecation

Water accessibility: Is the availability of at least 20 liters of drinking water per day within a distance of not more than 1km of the dwelling and a maximum of water fetching round trip of 30minutes

Hygiene practices: This word has been used in this document to include hand washing using soap, proper disposal of refuse, regular bathing and avoiding open defecation.

Implementation: It refers to the process of putting in place resources and strategies towards achieving the desired level of hygiene.

Sanitary disposal bins: Sanitary disposal bins has been used to refer to containers or pits in which households dispose of their refuse.

Refuse: This word has been used in this study to refer to the materials waste from human or household

A household: consists of one or more people who live in the same dwelling and also share at meals or living accommodation, and may consist of a single family or some other grouping of people.

Toilet: This word has been used to refer to a room used by people in case they want to go for a long or short call.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter discusses the research methodology for this study and provides a general framework. The chapter presents details of the research design, target population, sample and sampling procedures, method of data collection and study instrument, data analysis techniques and ethical issues for considerations while conducting the study.

3.2 Site Description and Site Selection

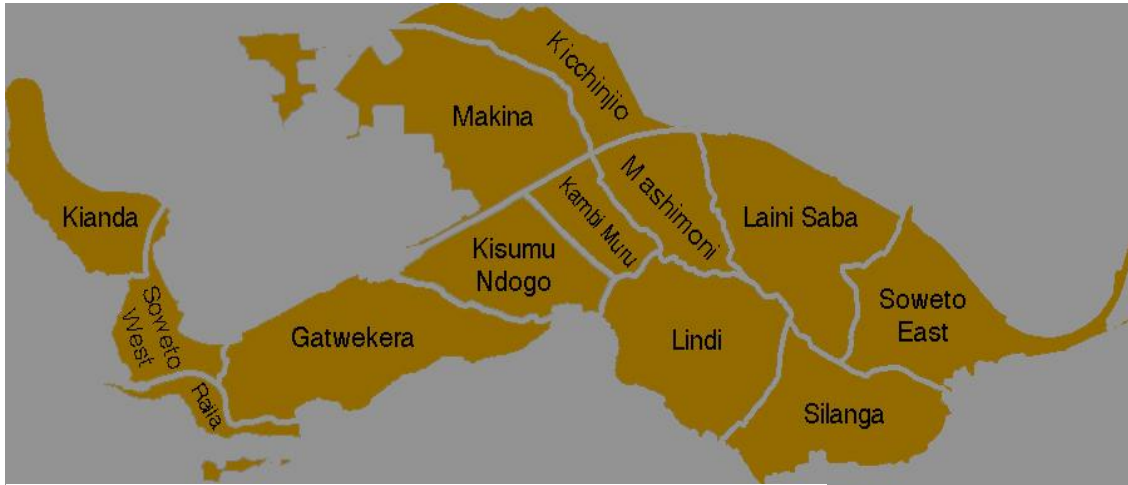
Covering 250 hectares and with a population estimated at 700,000, Kibera is home to about 50% of the urban poor. Kibera is situated in Nairobi's South Western peri-urban zone approximately seven kilometers from the Nairobi City Centre. The area as a whole is an informal settlement comprising of thirteen villages covering approximately 250 hectares of land. The villages are Lindi, Kisumu Ndogo, Kambimuru, Soweto East and West, Makina, Kianda, Raila, Mashimoni, Silanga, Gatwekera, Laini Saba, and Kichinjio (Umande Trust, Centre on Housing Rights and Evictions (COHRE) & Hakijamii, 2007).

The villages are the smallest administrative unit with populations ranging from 70,000 to 80,000. In Kibera the communities are not homogenous and vary in their social, economic, cultural and political make up. Interest groups aggregate around structure ownership and tenancy, religion, welfare groups, business and occupation, education, political interest, age and gender. In addition to specific interest groups present in the communities, during the past decade a number of civil society organizations, government authorities and utilities and international organizations have been identified as key stakeholders in Kibera. Kibera is extremely densely populated with about 1,250 persons

per hectare with an average 5 persons per household. Lack of secure land tenure is one of the major constraints in improving conditions in the area (Umande Trust, Centre on Housing Rights and Evictions (COHRE) & Hakijamii, 2007).

Kibera is characterized by lack of basic services and infrastructure such as adequate access to water, sanitation, solid waste management, roads and footpaths, storm drainage, electricity and public lighting etc. Housing units are semi permanent in nature, and often reflective of the high population densities. Security of tenure is not guaranteed and the threat of forced eviction remains real. Social amenities are inadequate, with facilities such as schools and hospitals unable to cope with the population demand. The unsanitary conditions in Kibera contribute to unmitigated increases in HIV and TB related illnesses. The lack of adequate basic healthcare facilities, access to clean water and sanitary means of human excreta disposal has serious repercussions for the affected populations in the settlement. Kibera was selected due to its accessibility to the researcher.

Figure 3.1: Map of Kibera slums showing the villages (Marras, 2012).



Scale 1cm = 25000cm on the ground

Source: KDHS (2010)

A research design is a plan that shows how the problem under investigation can be solved (Borg and Gall, 1989). This study used a descriptive survey research design. Descriptive survey design is a direct analysis and it enabled the researcher to get a broader result in terms of sample size. The design allowed researcher to analyze data without changing the environment. Survey design require questions that are more applicable, as well as with getting responses to survey. Also design provides answers to questions of who, what when, where and how associated with a particular research problem. Descriptive design provides information about natural occurring, health status, behavior, attitudes and characteristics of particular group. Descriptive surveys obtain information from large number of respondents by allowing participants to answer questions administered through interviews and questionnaire. Descriptive survey design enables researcher to gather information, summarize, present and interpret for clarification (Orodho, 2003).

3.4 Target Population

The target population for this study was 96 household heads who have lived in Kibera slum Nairobi.

3.5 Sample Size and Sampling Procedure

The research selected a sample size of 96 household heads (Gatwekera 42, Kianda 22 and Laini Saba 32) from the total 19,203 household heads which were selected purposively after consultations with the village elders based on the difficulty of access to water and sanitation facilities. Household heads who have lived in Kibera for at least three years are in a position to give insightful information on the area as they have been residents there long enough to know the area well.

The number of household heads in each village was calculated as the percentage (%) of the total on household heads in each village against the intended study's sample (96). This sample was selected using the proportionate random sampling method which is a method that involves selecting participants from a universe that is not equally distributed in terms of numbers. The formula below was used to obtain representation from each village.

Number in Cluster x Intended Sample

Total Cluster (Universe)

Table 3.1 Number of households in each village.

Number of village	Name of village	Number of household heads	Percentage f the total heads	Selected sample
1	Laini saba	6,642	34.6%	32
2	Gatwekera	8000	41.7%	42
3	Kianda	4560	23.7%	22
Total		19202	100.0	96

Source: KNBS, 2010

3.6 Unit of Analysis

The unit of analysis for this study was the factors influencing sanitation practices in kibera: Laini Saba, Gatwekera, and Kianda.

3.7 Units of Observation

The units of observation in this study were household heads from the three villages study area together with the key informants.

3.8 Methods of Data Collection

i. Household Survey

Survey method includes any measurement procedures that involve asking questions to the respondents. It consisted of both closed and open ended questionnaires mean to capture relevant and significant information.

ii. Key Informants

A key informant is someone that can offer specific specialized knowledge in a particular issue like in this study on factors influencing sanitation practices. They filled the information gaps that a researcher could have had with regards to the research area. Informants give a particular perspective or communicate specific challenges the particular group in community are facing. The key informants in this study were assistant chiefs, community public health officers and staff from NWSC. All key informants were 10 in number.

iii. Direct observation

An observation checklist was used to seek information on sanitation based on respondents' attitudes, behavioral intention, subjective norms, social norms, perceived power, perceived behavioral control, and environmental conditions. An observational checklist provides information that was gathered in the environment of the respondents during data collection.

3.9 Instruments of Data Collection

i. Questionnaire

Questionnaire is a tool consisting of series of questions and other prompt for purpose of gathering information from respondents. The questionnaires measures separate variables and with questions that are aggregated into index scale. The researcher administered questionnaires to the head of household on the spot. This was found suitable to enhance response rate and offer explanations and clarifications to the household heads where need arose. The questionnaire had five sections. The first section sought information on demographic information while the second section sought data on sanitation practices. The third section sought data on factors that influence the choice of sanitation practices while the fourth section sought data on the levels of awareness on existing safe sanitation practices. The fifth section of the questionnaire sought data on respondents' recommendations on how to promote sanitation practices.

ii. Key Informant Interview Guide

Key informant interview guide is a research tool administered on key informants to enable an in-depth discussion of the issues under investigation (Appendix II). There were series of questions for key informants in order to gather information. It enabled them to give their views and information about the study where researcher required more information.

iii. Observation Checklist

A checklist is a tool used for gathering data through observation. It enabled the researcher to gather more details about the environment of the respondents during data collection. It focused on the physical environment that can be observed during data collection.

3.10 Ethical Considerations

Ethics are norm or standards of behavior that guide moral choice about our behavior and relationship with others. According to Kothari (2004), the goals of ethics in research are to ensure that no one suffers adverse consequences from the research activities. Similarly, Mugenda (2011) encourages protection of the rights and welfare of participants. These include the right to life, protection from pain and injury.

The researcher sought approval from University department to collect data. The researcher also sought approval from the local administration in Kibera/ Nairobi County before conducting the study. The researcher maintained confidentiality in terms of disclosure of confidential information about the respondents.

The data collected was coded to conceal the identity of the respondents. The respondents were informed on the expectations of the study for them to give informed consent. No respondent were manipulated against their will to satisfy the needs of the study. They were allowed to respond to the items on the questionnaire that they are comfortable with. To do this well, Gatara (2010) encouraged that the purpose of the research is clarified to participants. Therefore, the researcher included a short paragraph on the questionnaires to explain who was doing the research and why this research was being done. Researcher also carried out the sampling and handled respondents without bias.

3.11 Data Analysis

The study used quantitative and qualitative method of data analysis. The data from questionnaires responses was organized entered and analyzed using Statistical Package for Social Sciences (SPSS) version 20. The quantitative data was presented using

descriptive statistics which included frequency distribution tables and pie chart figures to illustrate the findings of the study. These tools helped to reduce information into understandable form. Thereafter, there was interpretation and discussion of the findings. The qualitative data was presented through description that is, through explaining the findings in a narrative way as it was stated or explained by the respondents.

CHAPTER FOUR: DATA ANALYSIS, PRESENTATION AND INTERPRETATION

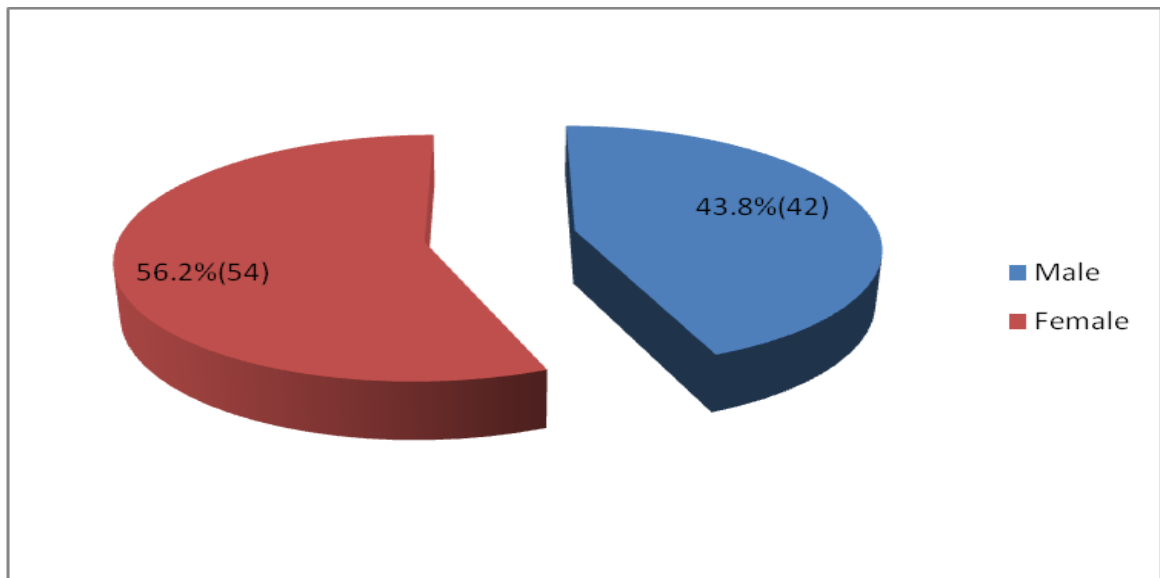
4.1 Introduction

This chapter presents the data analysis and interpretation of the study findings. It covers findings on demographic information of the respondents, common sanitation practices, levels of awareness on existing safe sanitation practices, the factors that influence household choice the choice of the type of sanitation practice and specific actions required to make safe sanitation practices effective.

4.1.1 Respondents' Distribution by Gender

Majority of the respondents (56.3%) were female as compared to 43.8% who were male. Figure 4.1 shows the results on respondents' distribution by gender.

Figure 4.1: Respondents' Distribution by Gender



4.1.1.1 Respondents' Distribution by Age

Majority of the respondents (41.7%) were aged 31-40 years while (31.3) 41-50 years and the rest were 51 and above. This shows that most of Kibera residents are young and middle aged people. Table 4.1 shows these results.

Table 4.1: Respondents' Distribution by Age

Age distribution	Frequency (n)	Percent%
18-30 years	12	12.5
31-40 years	40	41.7
41-50 years	30	31.3
51+ years	14	14.5
Total	96	100

4.1.1.2 Respondents' distribution by religion

Majority (95.8%) of the respondents were Christians while 4.2% indicated their religion as African traditional.

4.1.1.3 Level of Education

Respondents with primary education were 36.2% while those with secondary education were 38.3%. Only 6.4% of the respondents had diploma or tertiary level of education while 8.5% had undergraduate level of education. Respondents with postgraduate level of education were 4.3% while 6.4% of the respondents indicated their highest level of education as other. Table 4.2 shows the results on respondents' highest level of education.

Table 4.2: Respondents' Highest Level of Education

	Frequency (n)	Percent%
Primary school	35	36.2
Secondary school	37	38.3
Diploma/tertiary	6	6.4
Undergraduate	8	8.5
Postgraduate	4	4.3
Other	6	6.4
Total	96	100.0

4.1.1.4 Size of the Household

Respondents whose household had 4-7 family members were 47.9% while 31.3% of the household had 1-3 family members. Households with over 7 family members were 20.8%. According the survey done by UN-HABITAT in collaboration with Research International in Kibera, the average household size is 5 persons (Research International, 2005). The results of size of the household are shown in table 4.3.

Table 4.3: Size of the Household

	Frequency (n)	Percent %
1-3 family members	30	31.3
4-7 family members	46	47.9
Over 7 family members	20	20.8
Total	96	100.0

4.1.1.5 Level of Income

The results show that income distribution was concentrated at the bottom with 35.4%, 33.3% and 14.6% of the respondents reporting income level of 0-9999, 10000-19999, and 20000-29999 Kenya shillings respectively. Respondents with an income level of 30000-39999 were 13.6% while those with an income level of 40000-49999 and over 50000 Kenya shillings were 2.3% each. This results shows that many people have low income which makes them unable to adopt the safe sanitation practices as they are expensive for them. Poverty is prevalent in Kenya. In 2003, 56 % of the population was below the poverty line, and it is expected to become 65.9% by 2015 (Government of Kenya, 2005). Table 4.4 shows the results on respondents' level of income.

Table 4.4: Respondents' Level of Income

	Frequency (n)	Percent %
0-9999	34	35.4
10000-19999	32	33.3
20000-29999	14	14.6
30000-39999	13	13.6
40000-49999	2	2.3
Above 50000	2	2.3
Total	96	100.0

4.2 Household Sanitation Facilities and Practices

4.2.1 Toilet

Respondents who indicated that they used public latrine were 41.3% while those that indicated shared private latrine were 28.3%. Respondents who indicated that they used public flush toilet were 6.2% while those that indicated that they used plastic bag or

flying toilet were 11.4% and public flush toilet were 6.2% each. Only 2.2% of the respondents indicated that they used personal latrines, majority and were mainly the landlords or the care takers of plots. These results confirm that there are still huge services gaps in the informal settlement areas in access improved sanitation. Some people chose to use plastic bags and threw them away because of the risk of going out at night; others chose to defecate in the open because of the fee charged a fee of KSh 5 to use the toilet. Most of the public latrine was largely made from removable materials such as timber and iron roofing sheets due to the unsecure land tenure. Some toilets had falling mud walls, big holes, and unsanitary floors with flowing urine on the floor. There is hardly any space for latrines; the compounds are built up to capacity and available empty spaces are becoming encroached. Secondly, latrines are considered the responsibility of the landlord in this area, and because the landlord usually does not live in the area, s/he is not interested in improving the latrine situation.

According to a study conducted between January and June 1999 in Langas an urban slum in Eldoret Municipality Kenya, majority of respondents (98%) said that adults used pit latrines, whereas the rest said adults defecated indiscriminately. Similarly, a majority of respondents (70%) said that children used pit latrines, whereas 30% said children used open field/defecated indiscriminately. Most of the pit latrines (95%) in the community were traditional, whereas the rest were ventilated improved pit latrines (VIP latrines) (Kimani-Murage & Ngindu, 2007).

A study commissioned by the World Bank concluded that up to 68% of the residents in informal settlement rely on the shared public toilets (World Bank, 2006). Table 4.5 shows the results on the kind of toilet used at respondents' home.

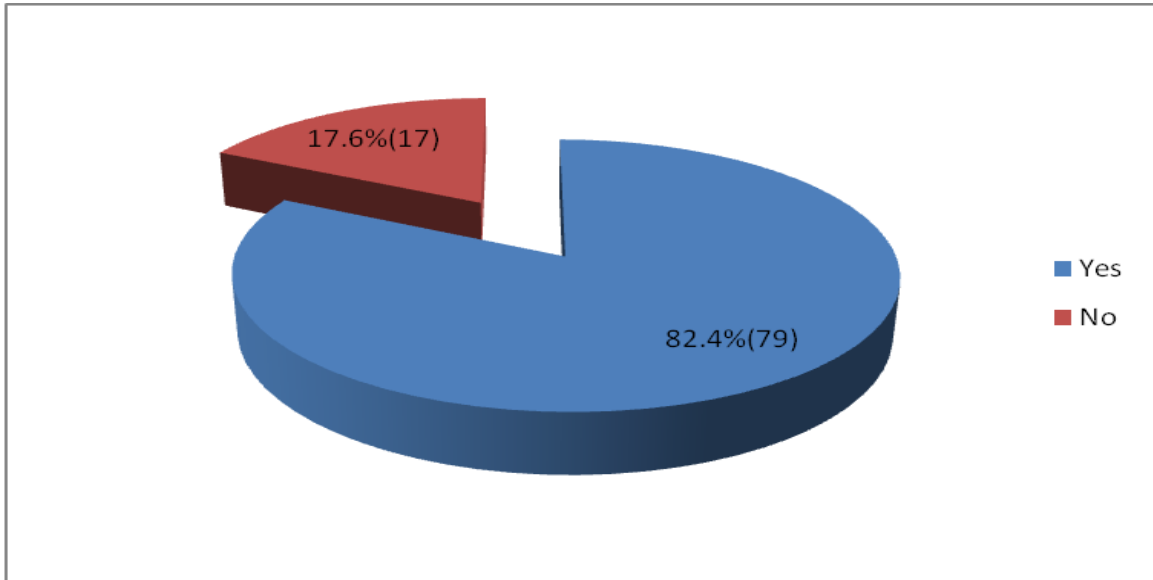
Table 4.5: Type of Toilet used at Respondents' Home

	Frequency (n)	Percent%
Plastic bag/flying toilet	11	11.4
Shared private latrine	27	28.1
Personal latrine	2	2.2
Public latrine	40	41.3
Public flush toilet	6	6.2
Open air space	10	10.4
Total	96	100.0

4.2.2 Pay for use Public Toilets

The respondents who indicated that they paid for the public toilets were (82.4%) while 17.6% of the respondents indicated that they did not pay for use of public toilets. Private toilets were constructed by people who own houses, micro entrepreneurs, or individuals wishing to make some profit. One toilet serves 10 to 20 households with an average of six people, so an average of 60 to 200 people uses each toilet. Average price for using a toilet is Khs 5 per person per use. Some residents pay ksh100 per month for plot based latrines. The owner of the establishment stands at the door to collect the fee. Toilets run by micro entrepreneurs are padlocked when not in use. Some latrines are managed by CBOs on a commercial or volunteer basis whereby volunteers receive some compensation in terms of money. Figure 4.3 shows the results of respondents who paid for use of public toilets.

Figure 4.2: Respondents who paid for use of Public Toilets



4.2.3 Management of Human Waste

According to the table below, 66.7% of the respondents indicated contracted as the main way of waste management while 28.9% opted for manual emptying. A paltry 4.4% of the respondents indicated that human waste or refuse from their latrine or septic tank was not removed. They reported that emptying services were provided by the City Council however, most of the pit latrines cannot be accessed by the council tracks. Another limitation was that the city council services were inconsistent resulting in the residents going for other alternatives.

The 28.9% of the respondents who opted for manual emptying mentioned that there were small groups that came together occasionally to empty the pit latrines using buckets at a fee of between Ksh. 1,500 to 2,000 per unit. Those who preferred this option cited the inconsistency of the city council services and the inaccessibility of some areas by tracks.

Table 4.6 shows the results on who removed human waste or refuse from respondents' latrine or septic tank.

Table 4.6: Removal of Human Waste or Refuse from Latrine or Septic Tank

	Frequency (n)	Percent%
Contracted	64	66.7
Manual Emptying	28	28.9
Not removed	4	4.4
Total	96	100.0

The research also sought to find out the frequency of waste removal from the pit latrines. 41.3% indicated that they did not have an idea how frequent the waste was removed while 21.7% of the respondents indicated a monthly removal. 32.7% indicated that the waste was never removed. An insignificant 2.2% indicated that the waste was removed daily and weekly respectively.

Table 4.7 shows the results on how often waste was removed from latrine.

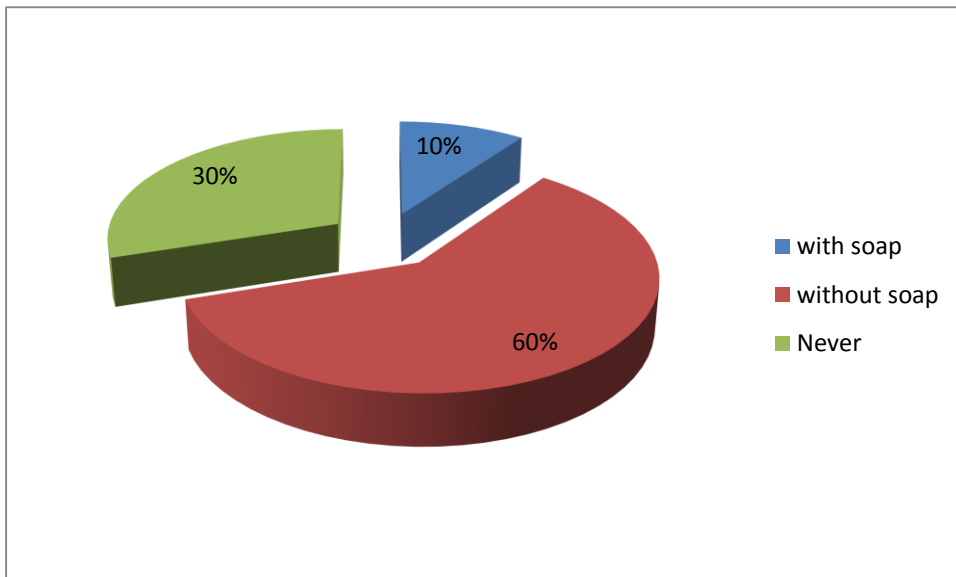
Table 4.7: Frequencies of removal of waste from Latrine

	Frequency (n)	Percent%
Daily	2	2.2
Weekly	2	2.2
Monthly	31	21.7
Don't know	40	41.3
Never	31	32.6
Total	96	100.0

4.2.4 Household Hygiene Practice

According to the findings, (60%) respondents indicated that they never washed their hands after visiting the toilet while 30% indicated that they washed their hands without soap while 10% indicated that they washed hands with soap. Figure 4.3 shows results on proportion of respondents who washed their hands with soap after visiting toilet.

Figure 4.3: Washed their hands with soap after visiting toilet



Many of them cited lack of soap while others indicated that they did not have sufficient water to wash their hands. The lack of these basics was underpinned by a respondent who indicated that *'I cannot borrow food and afford to buy soap'*.

The results suggest that soap is available in few of the households; however the soap is used mainly for laundry, dish and body washing, and much more rarely for hand washing. The soap that was most present in most settings was laundry bar soap. Perfumed toilet soaps tended to be seen as a luxury, to be used on special occasions and kept

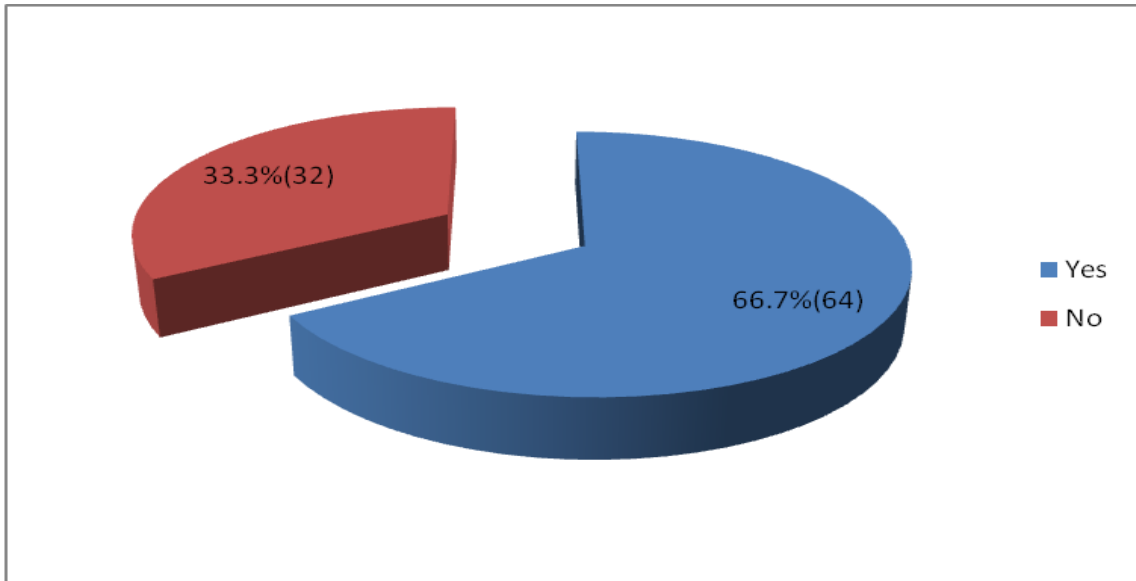
carefully, often by the mother for her own bathing, so it would not be wasted. On the whole, access to water was not a major constraint for hand washing, except for a small number of people. Some reported that it was a waste of time washing hands while others stated that they forgot to wash their hands.

The 2000 UNICEF survey (UNICEF 2002) has reported information about hand washing (UNICEF, April 2010) practices. The Baseline Survey of Awareness of 'Facts for Life' showed that two-thirds of the people interviewed, for example, are aware that after defecation hands should be washed with water and soap. Unfortunately, in reality, only about 9% actually do so. (UNICEF, April 2010)

4.2.5 Separation of solid from non-solid waste

To begin determining the number of households who separated solid waste from non-solid, the respondents were asked whether they separated or not. Majority of the respondents (68.1%) indicated they do separate while 31.9% indicated that they did not. Figure 4.4 shows results on whether respondents separated water from solid garbage before disposing.

Figure 4.4: Separate water from solid garbage before disposing



4.2.6 Waste water disposal

From the findings below, (76.6%) of the respondents indicated that they disposed their household water in trenches while 14.9% of the respondents indicated they disposed waste water from their household in open place. Respondents who indicated that they disposed their waste water in septic tank and other were 4.3% of the respondents each. The responded indicated that there was no suitable place for them to pour the waste water.

The Right to Water and Sanitation in Kibera, Nairobi, Kenya study conducted in 2007 indicated that, 71 % of households dispose of 'grey water', which includes bath water and dish water, by pouring it into a drain. Drains are also used as dumping points for solid waste and serve as open channels for emptying wastewater from latrines. Existing footpaths also act as open drainage channels and in many instances carry open sewage to

the rivers. It is estimated that 54% of the households do not have bathing facilities. (Umande Trust, Centre on Housing Rights and Evictions and Hakijamii Trust, 2007)

Table 4.8: Dispose Waste Water from Household

	Frequency (n)	Percent %
Trenches	74	76.6
Septic tank	4	4.3
Open place	14	14.9
Any other	4	4.3
Total	96	100.0

4.2.7 Disposal of Solid Garbage Waste

Respondents who indicated that they disposed the solid garbage waste from their house in disposal plastic bags and later threw it in the open space were 46.8% .they reported that this was the only option because the dumpsite was far away from their house, which was also to disposal the waste during late hours in the night. Those that disposed their solid waste at a community dumpsite were 17% of the respondents. Only 2.1% of the respondents indicated that they burnt their solid garbage waste. They reported that some small groups organize themselves and dug the pits in which they burnt the waste. 10.6% of the respondents indicated that they disposed their solid waste in open place because they dint have time to reach the dumpsite. Those who chose other means of disposing were 23.4%.

The Right to Water and Sanitation, Action Research Report (the Kibera Report) initiated by Umande Trust, Centre on Housing Rights and Evictions (COHRE) and Hakijamii. According to the findings, an estimated 2,400 tons of waste is generated per day in Nairobi. The NCC collects only 10% of total generated solid waste in the city (JICA 1997). Less than one in a 100 households (0.9 percent) is served by a public garbage collection system. 78% of households dispose of their waste by dumping it in their own neighborhoods. Another 10% burn or bury their waste in their own compound. 10% utilize organized private collection system and of these, the majority (78% pay for the service). Most private garbage collection groups charge a minimum of Kshs 10 per collection with the maximum being Kshs 100 per calendar month with bi-weekly collection. (Umande Trust, Centre on Housing Rights and Evictions and Hakijamii Trust, 2007) Table 4.9 shows results on disposal of solid garbage waste

Table 4. 9: Disposal of Solid Garbage Waste

	Frequency (n)	Percent%
Burn	2	2.1
Disposal plastic bag	45	46.8
Open place	10	10.6
At a community dumpsite	16	17.0
Any other	23	23.4
Total	96	100.0

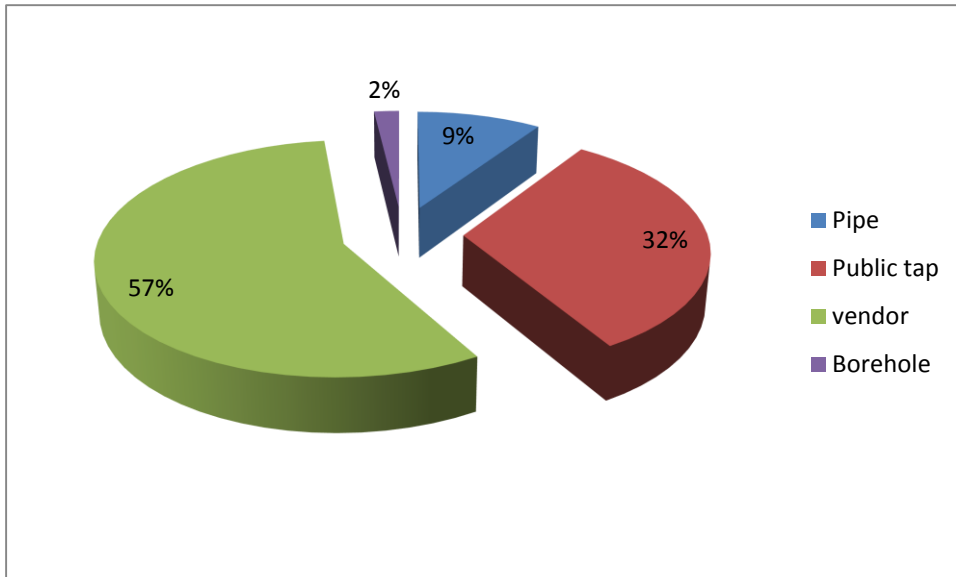
4.2.8 Main source of Water Supply for Households

From the results shown in the table below, (57%) of the respondents indicated that they get water from water vendors, 32% reported that they have public tap water from Nairobi Water Company (NWC) while 9% cited that they get water from water pipes. An

insignificant 2% of the respondents indicated that they got their water from borehole citing that it was not safe for consumption because of the contamination caused by seepage of sewage into the water. It was indicated that, average distance to the nearest water kiosk is about 40 meters and consumption ranges from 16 to 20 liters per capita per day. There are only approximately 25 kilometers of piped network in the entire settlement, and much of this network receives little or no water due to limited capacity of the pumping station on the mains feeding this part of the city, and the tendency to divert available water to neighboring high income areas. It was observed that residents rely on small-scale water providers mostly absentee structure owners who not only own and control housing units but also yard taps. The majority of the residents pay between Kshs 2-3 per a 20 litre container as presently charged by the water kiosks and handcart vendors. These prices arbitrarily increase to between Kshs 10-20 in times of shortages, which on average occur four times a month. The high cost charged by water kiosks is partially due to the high costs of operation (construction of a kiosk (Kshs 75,000 approximately); and the fact that vendors often choose the option of registering for domestic connections where they are charged higher rates due to many requirements for registering as bulk consumers. Kiosk operators charge as much as 10 times the price charged by the NCWSC which has established a flat rate of Kshs 10 per cubic meter for bulk supply to water kiosks serving informal settlements. Most households depend on water vendors though they are believed to be delivering unsafe water.

The size of the household is important to the sanitation practices as studies have shown that between 60% and 93% of the slum households are dependent on water vendors for their water supply (World Bank, 2006& KDHS, 2010).

Figure 4.5: Main source of Water for Households



The researcher sought to know how available water was to the residents, (87.5%) indicated that water was available in the household on regular basis while 8.3% of the respondents indicated water was available weekly. Only 4.2% of the respondents indicated other. It was indicated that many water mains have water only for restricted hours per day while the Nairobi Water and Sewerage Company supplied water three times a week. A World Bank survey (2005, pg. 7), for instance, showed that two-thirds of the water sold in Kibera over a seven day period came from 29% of all kiosks.

Table 4.10: How often Water was Available in the Household

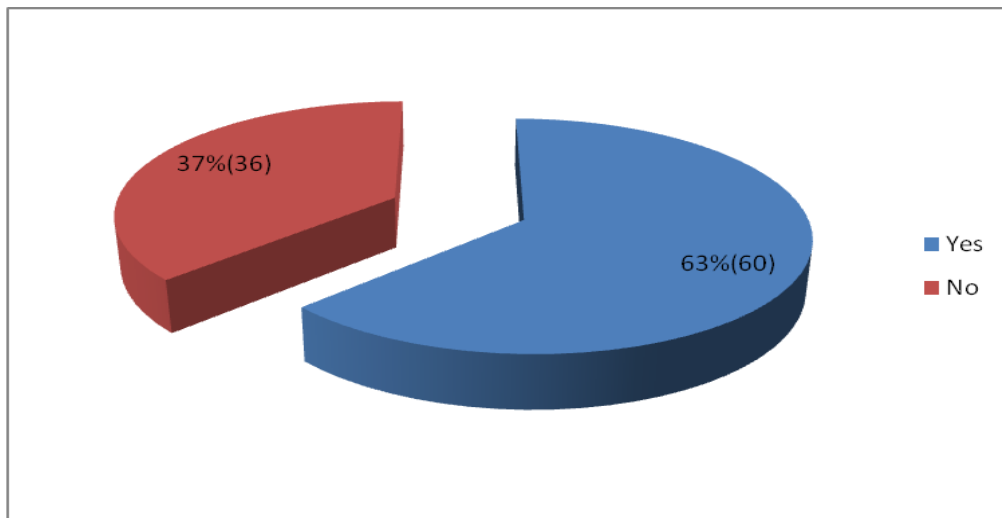
	Frequency (n)	Percent%
Regular	84	87.5
Weekly	8	8.3
Any other	4	4.2
Total	96	100.0

4.2.9 Treatment of Water

Treatment of water was a main concern as this was the main cause of water borne diseases observed. Out of the respondents who were asked if they treated the water, respondents (63%) indicated that they did not treat water used in their household because they assumed that the water was already treated through chlorination while 37% of the respondents indicated that they did treat their water for hygiene purpose.

Most water pipes in Kibera run above ground and are made of plastic (due to issues with theft of steel pipes), which are highly fragile and easily manipulated. These pipes will often crack or break (either accidentally due to traffic or intentionally by competitors), allowing sewage to seep into drinking water. This is reflected in public health data— infant mortality rates and bloody diarrhea infection rates in Kibera are more than three times the average of Nairobi as a whole (UNDP 2006). Figure 4.6 shows the results on whether respondents treated water used in their household.

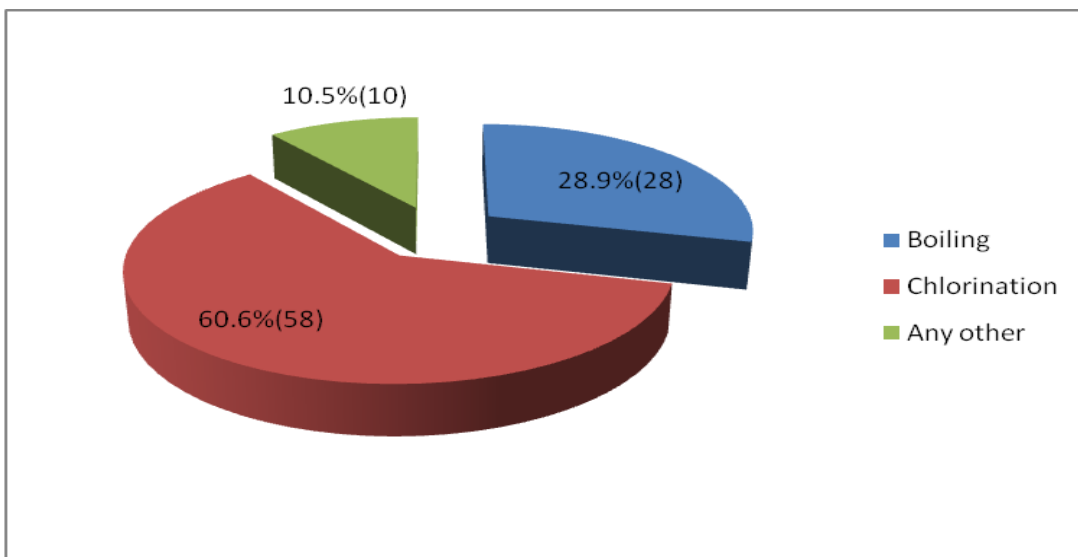
Figure 4.6: Treated Water used in their Household



Some of the respondents cited the reasons for treating water as to make it safe for drinking, avoid water borne diseases, kill diseases causing germs and purifying it for home use while others indicated that they assume that tap water was dirty mainly because the taps carrying the water could be dirty and the water is pumped through plastic pipes alongside sewage trenches hence contaminating the water. To be safe, respondents indicated that they treat water for home use because of their families' hygiene.

Majority of the respondents (60.6%) indicated that water was treated by chlorination by using water guard which is easily affordable costing about ksh 30 per bottle and serves up to 2500 litres. Only 28.9% of the respondents indicated that water was treated by boiling as it was the most appropriate to them as they dint have money to buy water guard for treatment. Few of the respondents 10.5% indicated other means. Figure 4.7 shows the results on how water was treated.

Figure 4.7: How Water was treated



From the findings below, 61.1% of the of those who treat water reported that treated water was used for drinking while 33.3% of the respondents indicated that it was used for general house use. A minority 5.6% stated that treated water was used for other purposes in the household.

Table 4.11 shows the results on how treated water was used in the household.

Table 4.11: How treated water was used in the Household

	Frequency (n)	Percent%
Drinking	59	61.1
General house use	32	33.3
Any other	5	5.6
Total	96	100.0

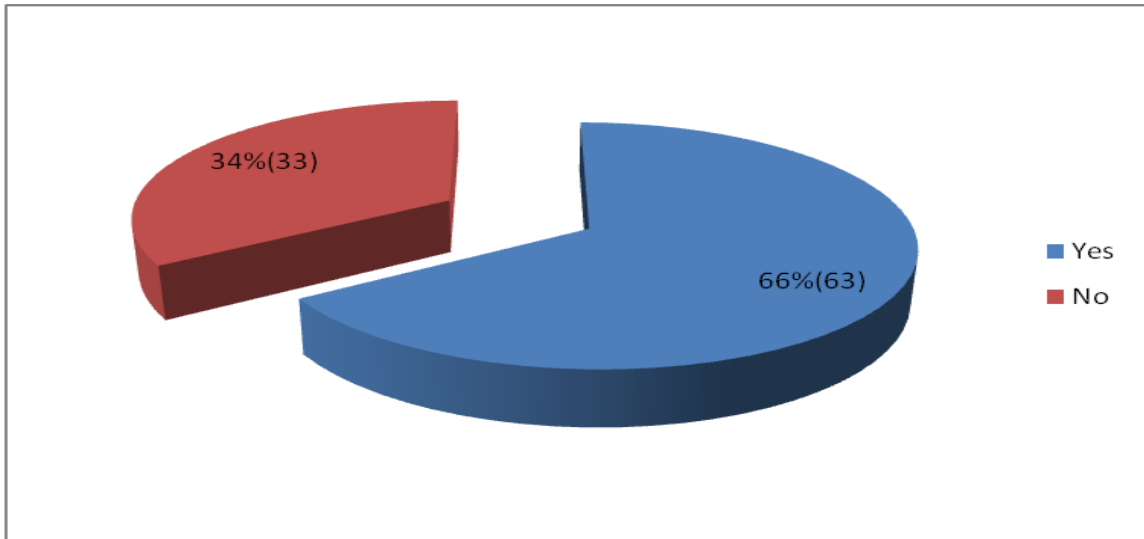
From the findings above, the respondents stated they believed that the water is safe from the source while others indicated that they did not have the time and resources to treat water. With lack of essential hygienic disposal of human faeces, adequate supply of safe drinking water, and good food hygiene, cholera eradication is next to impossible in Kibera (WHO, 2000)

4.3 Source of Information on existing Safe Sanitation Practices

4.3.1 Knowledge about public promotion campaign on sanitation

As noted in the figure below, 66% respondents stated they have heard about public promotion campaign on sanitation while 34% indicated that they have not heard about public promotion campaign on sanitation. Figure 4.8 shows the results.

Figure 4.8: Have heard about public promotion campaign on sanitation



The results show that 40.5% of the respondents did not remember the last time that they heard about public promotion campaign on sanitation while 21.6% of the respondents indicated that the last time that they heard about public promotion campaign on sanitation was that week. Respondents who indicated that the last time that they heard about public promotion campaign on sanitation was 2-4 weeks ago and more than 4 weeks ago were 18.9% each. Table 4.12 presents results on the last time that the respondents heard about public promotion campaign on sanitation.

Table 4.12: Last time heard about public promotion campaign on sanitation

	Frequency (n)	Percent %	Cumulative Percent
This week	21	21.6	21.6
2-4 weeks ago	18	18.9	40.5
More than 4 weeks ago	18	18.9	59.5
Don't remember	39	40.5	100.0
Total	96	100.0	

The findings show that 46.8% of the respondents stated that they get sanitation information through mass media while 19.4% of the respondents indicated that they get the information through the public meetings campaigns. Respondents who reported door to door campaigns conducted through door to door conducted by CBOs were 16.7% while 16.7% indicated other sources. The findings tells us that mass media continues to be the most common source of sanitation information and this resource should be used by providers to talk about and explain how to practice safe hygiene. These results are presented in table 4.13.

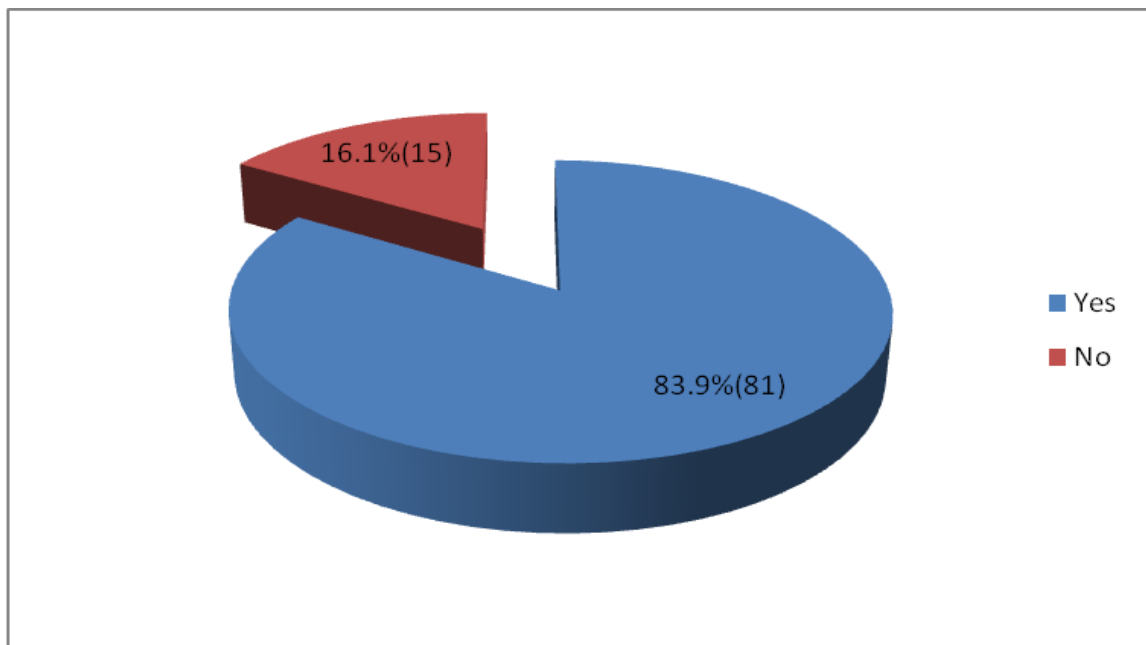
Table 4.13: Sources of Sanitation Information

	Frequency (n)	Percent%
Mass media	45	46.8
Door to door	16	16.6
Chief/public meeting	19	19.4
Others	16	16.6
Total	96	100.0

Appropriate measures to be taken for hygiene, diseases, clean environment, garbage collection, clean water, water contamination and how to avoid water borne diseases such as cholera were cited by the respondents. Respondents also indicated that importance of washing hands with soap after visiting toilet was emphasized as well as water treatment through the campaigns.

Majority of the respondents (83.9%) indicated that their behavior was changed due to sensitization campaigns while 16.1% of the respondents indicated that their behavior did not change due to sensitization campaigns. Figure 4.9 shows these results.

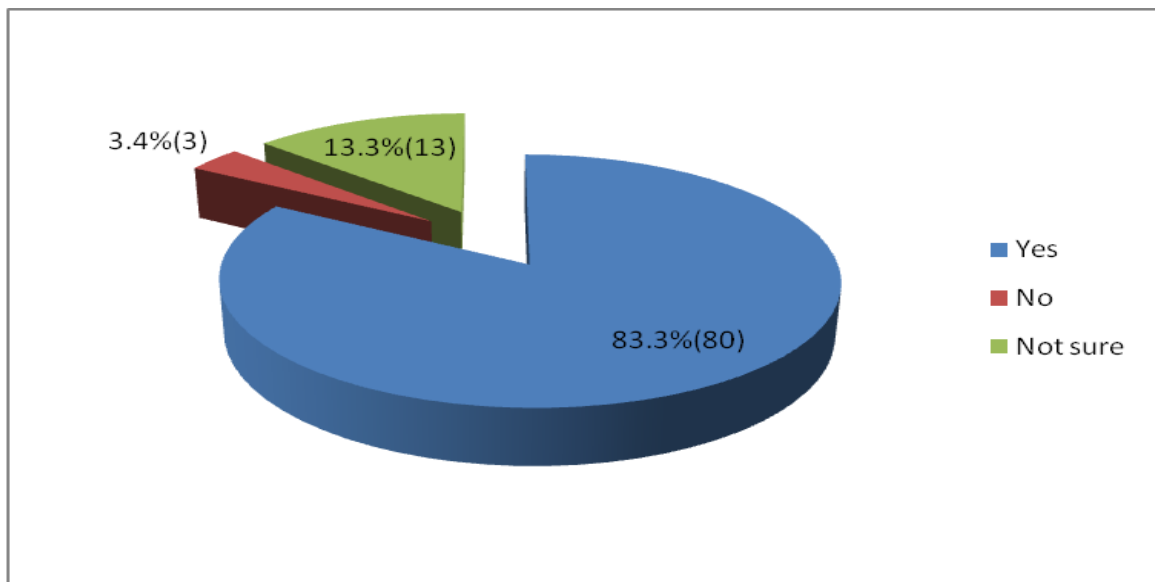
Figure 4.9: Behavior changed due to sensitization campaigns



Respondents also reported that they were afraid of diseases, hence need to keep their environment clean, and while others indicated that they got important information on sanitation that made their behavior to change. Other respondents indicated that sensitization made them learn many things that helped them change for hygienic lifestyles.

The researcher wanted to know whether the respondents considered discussion topics appropriate for sanitation awareness campaign. Majority of the respondents (83.3%) indicated yes while 13.3% cited that they were not sure and 3.4% indicated no. Figure 4.10 shows these results.

Figure 4.10: Discussion topics appropriate for sanitation awareness campaign



In an interview with one Public Health Officer based in Kibera, it was established that there is lack of consistency in content that is delivered by organizations conducting campaigns and what they actually undertake on the ground. According to the key informant, what is promoted in the campaigns is not what is normally done which could affect the whole programme. She also cited lack of motivation, promotional materials, gifts and prizes in the campaign. According to her,

“In the campaign providing of cleaning materials or necessary equipments for hygiene as well as provision of soaps and chlorine for water treatment are not there.” Indepth interview with Public Health Officer, Kibera

4.4 Actions to Promote Sanitation Practices

When asked about what they would suggest in order to promote sanitation practices, one Assistant Chief in Kibera, mentioned the need to have adequate water available, the need to build toilets and creating awareness to each member through sensitization. According to the Assistant Chief, due to poor security situations in slum areas, many households opt to use flying toilets at night rather than going to the public latrines that are located some distance from the households. In his view,

“There is need to have security as we will be able to use toilet at night...The county government and other stakeholders should open trenches and empty sewerages to ensure good sanitation practices are upheld in this area. But they rarely do that.” Indepth interview with Assistant Chief, Kibera

During an interview with staff of Nairobi Water and Sewerage Company, a manager indicated that provision of clean water and dustbins as well as provision of water storage facilities are good to improve sanitation practices in households. In order to reduce diarrheal diseases, the manager recommended that the government should develop a strategy of employing youths to help in collection of garbage.

The researcher wanted to know the community initiatives promoting sanitation practices. In an interview with the Public Health Officer, it was noted that several organizations are currently working improving sanitation,

“We have built public toilets and have participated in cleaning residential areas. We have also taken part in collection of garbage and cleaning of trenches around.” Indepth interview with Public Health Officer, Kibera

One Assistant Chief indicated that communities have come together to dig more pit latrines and more trenches as well as providing water for use. He further indicated that there are organized youth groups who work together so as to improve the environment.

The Assistant Chief was asked to indicate the government initiatives promoting sanitation practices. He also indicated that the government has employed youths to assist in cleaning and the government through NYS have been making improvements in ensuring toilets are available to all as well as creating awareness through mass media.

“We as government have initiatives in arranging programs about sanitation campaigns and building public toilets. The introduction of National Youth Service (NYS) ensures that the informal settlement environment is clean enough.” Indepth interview with Assistant Chief, Kibera

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the study and its key findings based on set objectives. The chapter also presents conclusions of the study from the findings as well as the recommendations of the study.

5.2 Summary of Findings

This study sought to assess the factors influencing sanitation practices in urban informal settlement with a focus on Kibera, Nairobi. Four specific objectives guided this study. They included: to establish the common sanitation practices; to find out the factors that influence household choice of the type of sanitation practice; to establish sources of information on existing safe sanitation practices; and to identify specific actions required to make safe sanitation practices effective.

The study revealed that public latrines are used by many households in Kibera which they paid for KSh5 per use. The study's findings show that removal of human waste from residents' latrines or septic tanks was managed by city contractors and small groups of youths. It was evident that many residents did not know how often waste was removed from latrines. Hand washing practice with soap after visiting the toilet was not a common to the residents except for few who could afford the soap. Majority of Kibera residents separated water from solid garbage before disposing while a few did not though they disposed in trenches and open space with only few using the community dumpsite. From the findings, most residents get water from the water vendors while an insignificant

number of residents get their water from boreholes which were hardly available. Water was available to the residents on regular basis while a few of the residents have water on weekly basis. Majority of Kibera residents did not treat water used in their household while a few did. Most residents treated water using water guard while a few treated water by boiling.

In relation to the factors influencing the choice of sanitation type practice, results show that most available public toilet use was paid for khs 5 per use which was expensive for most residents hence opting to use plastic bags or in hidden space. The results show that a significant part of the residents did not wash hands after visiting toilet because soap and water was not freely available while others had no time to wash their hands. Waste management from the households is disposed in the open space and trenches by most people due to either unavailability of the disposal facilities or the long distance to the dumping site.

Majority of Kibera residents have heard about public promotion campaign on sanitation while a few others have not. The results show that a large part of the residents got sanitation information through mass media as compared to those who got it from public meetings or door to door campaigns. Majority of Kibera residents changed their behavior due to sensitization campaigns; they also considered the discussion topics appropriate for sanitation awareness campaign while a few did not change their behavior on sanitation practices.

Residents recommended that to promote sanitation practices there is need for provision of adequate clean water, the need to build more toilets with no payments for the use of the toilets, soap to be provided at the public toilets, providing dustbins in each unit, providing more dumping site areas and creating awareness to each member through sensitization. The residents also recommended that there is need to have security to use toilet at night. Community initiatives promoting sanitation practices can be seen where residents have built public toilets and have participated in cleaning residential areas. Residents pointed out that communities should come together to dig more pit latrines and more trenches for drainage purposes. Residents further observed that there are organized youth groups who work together so as to improve the environment. Government initiatives promoting sanitation practices are evident in arranging programs about sanitation campaigns and building public toilets. The residents also cited that the government has employed youths to assist in cleaning and the government through NYS have been making improvements in ensuring toilets are available to all as well as creating awareness through mass media.

5.3 Conclusions

This study concluded that there are efforts to improve sanitation practices in Kibera. However, these efforts have not met the needs of Kibera residents adequately. Availability of clean water for drinking and household use has not been realized. Kibera residents also do not have adequate waste disposal system key among them being lack of toilets and dustbins. Many factors influence the choices of sanitation practices. Key among them was availability of sanitation facilities such as soap and water for washing hands after visiting the toilet. Toilets are also limited and those that are available, the residents have to pay when they need to use them. Although a majority of Kibera

residents were satisfied with the place they choose to defecate or dispose when at home, a significant portion did not. This shows that many residents of Kibera have limited choices on sanitation practices they choose due to lack of basic sanitation facilities such as water, soap, toilets and dustbins.

From the study, a significant portion of Kibera residents have not heard about public promotion campaign on sanitation. Many of those that have heard about public promotion campaign on sanitation cannot remember when they last heard about it. This shows that the campaign has not been consistent. The study concluded that radio and television are the main sources of information in Kibera. This study also concluded that sensitization campaigns were able to change behavior of many Kibera residents to adopt and promote good sanitation practices.

Provision of adequate water, building of adequate toilets and creating awareness to residents through sensitization are critical in promoting sanitation practices in Kibera. It was evident that there are community and government initiatives promoting sanitation practices. Community members have come together to ensure that the environment they live in is clean while the government through the NYS has been engaged in initiatives promoting sanitation practices.

5.4 Recommendations

- i. There is need for these organizations and government units to combine efforts and work collaboratively to minimize chance of duplicated efforts. Moreover, with this synergy, they will be able to reach a greater population with sanitation-related services and information.

- ii. To minimize risk of diarrheal diseases caused by poor sanitation and hygiene conditions, the community should take responsibility of regularly cleaning and emptying these public latrines. This can be achieved by developing a communal roster that ensures each household is responsible for cleaning and emptying the latrine on specific days of the week.

- iii. It is necessary that programs that are implemented by the NGOs and the ministry are tailor-made to suit the slum dwellers. The content and context should be appropriate, such that household economics, inherent cultural practices and lowly established infrastructure in these locations should be put in consideration when developing these campaigns.

- iv. Further research should be conducted to establish possible partnerships for government, community and other stakeholders to promote sanitation practices in Kibera. Such future studies should focus on examining importance of involving local residents in design and implementation of sanitation awareness and promotion campaigns and programs.

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APPENDICES

Appendix I: Research Questionnaire for Households

Household Questionnaire:

Questionnaire Serial No. _____

Please respond by ticking in the brackets () or by writing your brief comment where applicable in the spaces provided. All the responses given are of great value to the researcher. The information that you will provide will be used strictly for purposes of this study and will be treated in strict confidence. **N.B. DO NOT WRITE YOUR NAME ON THE PAPER.**

Section A: Demographic Information

- 1) Gender a) male ()
 b) Female ()

2. Age of respondent

- a) 18 – 35 ()
b) 36 - 50 ()
c) Above 50 ()

3. Religious Affiliation

- a) Christian ()
b) Muslim ()
c) African Traditional Religion ()
d) Any other (specify) -----

4. Highest Educational Level attained

- a) Primary school ()
- b) Secondary school ()
- c) Diploma/Tertiary ()
- d) Undergraduate ()
- e) Post graduate ()
- f) Any other () (specify) -----

5. What is the number of family members living in this household?

- a) 1 -3 () b) 4-7 () c) Over 7 ()

6. What is your Income Level?

- a) 0 – 9999 ()
- b) 10,000 – 19,999 ()
- c) 20,000 – 29,999 ()
- d) 30,000 – 39,999 ()
- e) 40,000 – 49,999 ()
- f) Above 50,000 ()
- g) Any other (specify) -----

SECTION B: Sanitation Practices

7. (i) which kind of toilet do you use at home.

- a) Bush ()
- b) Plastic bag/flying toilets ()
- c) Bucket ()
- d) Shared latrine ()

- e) Personal latrine ()
- f) Public latrine ()
- g) Personal flash toilet ()
- h) Shared flash toilet ()
- i) Public flash toilet ()
- j) Shared VIP ()

(ii) If public, do pay for it? Yes () No ()

If yes, how much do you pay _____

8. i) Who removes the human waste/refuse from your latrine/ septic tank?

- a) Contracted ()
- b) Not removed ()
- c) Others (specify) _____

ii) How often is the human waste removed from the latrine you use?

- a) Daily ()
- b) Weekly ()
- d) Monthly ()
- d) Don't know ()
- e) Any other
(specify) _____

9. (i) Do you wash your hands with soap after visiting the toilet?

- a) Yes ()
- b) No ()

(ii) If No give your reasons why? _____

10. i) Do you separate water from solid garbage before disposing?

a) Yes () b) No ()

ii) Where do you dispose waste water from your household?

a) Trenches ()

b) Septic tank ()

c) Open place ()

d) Any others (specify) _____

iii) Where do you dispose the solid garbage waste from your house?

a) Burn ()

b) Disposal plastic bag ()

c) Open place ()

d) At a community dumpsite ()

e) Any other (specify) _____

11 i) What is the main source of water for your household?

a) Tap water from Nairobi water company ()

b) Borehole ()

c) River ()

d) Any Other
(specify) _____

ii) How often is water available at the household?

a) Daily ()

b) Weekly ()

c) Any other (specify)

iii) Do you treat the water that you use in your household?

- a) Yes b) No

iv) If yes, what makes you treat your water?

iv) How do you treat the water?

- a) Boiling ()
- b) Chlorination ()
-) Any other (specify)

v) If you treat water, what is the treated water used for?

- a) Drinking water ()
- b) General house use ()
- c) Any other (specify)

vi) If you do not treat water, why? _____

SECTION C: Factors that influence the choice of sanitation practice

12).This question seeks to determine the factrs that influence the sanitation practice 13.

Why are you unable to wash your hands after toilet use?

- a) No soap available ()
- b) No time ()
- c) No need ()

e) Any other (specify)

14.i) Please indicate the extent to which you agree to the following statement

“I am satisfied with the place I choose to defecate/dispose when I am at home”

- a) Fully agree ()
- b) Somewhat agree ()
- c) Fully disagree ()
- d) Don't know ()

ii) Are there special reasons why people defecating or dispose garbage in different way?

- a) Yes
- b) No

iii) What is the main reason for people to defecating or dispose garbage in different way?

SECTION D: Levels of awareness on existing safe sanitation practices

15 i) Have you ever heard about a public promotion campaign about sanitation?

- a.) Yes ()
- b.) No ()

ii) When was the last time you heard a public promotion campaign about sanitation?

- a) This week ()

b) 2-4 weeks ago ()

c) More than 4 weeks ago ()

d) Don't remember ()

iii) What was the source of the sanitation information?

a) Radio ()

b) Television ()

c) Newspaper ()

d) Chief/public meeting ()

e) Others (specify) _____

iv) What were the main issues discussed during the campaign?

v) Has your behavior changed because of the sanitation sensitization campaigns you have heard?

Yes ()

No ()

vi) If Yes or No why?

vii) Do you think the above discussed topics/issues were appropriate for sanitation awareness campaign?

Yes () No () Am not sure ()

16. In your opinion what is lacking in the sanitation awareness campaigns?

SECTION E: RECOMMENDATIONS TO PROMOTE SANITATION PRACTICES

17) What do you think can be done to improve sanitation practices in your household?

18) What are the community initiatives in promoting sanitation practices in your household?

19) What are the government initiatives in promoting sanitation practices in your household?

Appendix II: Key Informant Interview Guide

Introduce the study to the key informants and inform them the purpose of the study. Seek their consent to participate in the study as key informants and start the interview guided by the following questions:

1. How would you describe sanitation in this area?

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2. What do you think has contributed to the sanitation situation in this area?

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3. Do you think the attitudes of the residents affect sanitation practices in this area?

If yes, how? If no, why?

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4. Have you seen any behavioral intention to improve sanitation practices among the residents? If yes, has it helped?

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5. Do you think the county government has contributed to the poor sanitation situation in the informal settlement? If yes, which are these subjective norms? If no, why?

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6. Do you think social norms among the residents affect sanitation practices in this area? If yes, which are these social norms? If no, why?

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7. Do you think residents of this area have the power to change the sanitation situation in this area? If yes, how? If no, why?

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8. Do you think behavioral control among the residents of this area can change the sanitation situation in this area? If yes, how? If no, why?

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9. Has the environmental conditions influenced sanitation practices in this area? If yes, how? If no, why?

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10. What recommendations would you give to improve sanitation practices in the informal settlements?

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Appendix III: Observation Checklist

Item to observe	Yes	No	Remarks
Pit latrine Toilets Types of toilets			
Water pipe Water availability			
Dish pack Nature of dish pack			
Garbage can Location and nature of garbage can Emptying bins			
Water treatment Water treatment dispenser			
Availability of soap			
Hand washing			