

**FACTORS INFLUENCING SAFE WATER AND SANITATION  
PRACTICES ON COMMUNITY HEALTH IN KENYA: A CASE OF  
KAJIADO CENTRAL DISTRICT**

**BERTHA NALIKA**

**Research Project Report Submitted in Partial Fulfillment for the Requirements for the  
Award of the Degree of Master of Arts in Project Planning and Management  
At the University of Nairobi**

**2014**

## DECLARATION

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

Signature .....

Date .....

Bertha Naliaka

L50/70981/2011

This research project is presented for examination with my approval as the University supervisor

Signature ..... Date .....

Dr. John M. Wanjohi

School of Physical Sciences

University of Nairobi

## **DEDICATION**

I dedicate this work to my lovely son, Rawlings Wanyonyi Juma and my dear mother, Agnes Nabalayo Waswa.

## **ACKNOWLEDGEMENT**

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

First and foremost, my profound gratitude goes to my supervisor Dr. John Wanjohi of the School of Physical Sciences for his scholarly advice, encouragement and guidance without which this study would not have been a success. Secondly, I am indebted to Dr. Peter W. Makokha of the School of Continuing and Distance Education for his invaluable criticism, mentoring and support. To him I shall forever be indebted. He singlehandedly turned this study into a researchable module. The study could not have been successful without the valuable input of my course lecturers who taught me in class in the Department of Extra Mural Studies at the University of Nairobi's Main Campus.

I also express my heartfelt gratitude to my class mates especially group members with whom I shared ideas carrying out group assignments. Finally my appreciation goes to my family and friends for their support and encouragement. I say big thanks to all of you.

All Honor and Glory be to the Almighty God for the gift of life.

# TABLE OF CONTENT

	Page
DECLARATION.....	ii
DEDICATION .....	iii
ACKNOWLEDGEMENT.....	iv
TABLE OF CONTENT .....	v
LIST OF FIGURES.....	viii
LIST OF TABLES .....	ix
ABBREVIATIONS AND ACRONYMS .....	x
ABSTRACT .....	xi
<b>CHAPTER ONE: INTRODUCTION.....</b>	<b>1</b>
1.1 Background of the Study.....	1
1.2 Statement of the Problem .....	3
1.3 Purpose of the Study.....	3
1.4 Objectives of the Study .....	4
1.5 Research Questions .....	4
1.6 Significance of the Study .....	4
1.7 Delimitation of the Study .....	4
1.8 Limitations of the Study .....	5
1.9 Assumptions of the Study.....	5
1.10 Definition of significant terms as used in the study .....	5
1.11 Organization of the Study.....	6

<b>CHAPTER TWO: LITERATURE REVIEW .....</b>	<b>7</b>
2.1 Introduction .....	7
2.2 Safe Water Sources and Community Health Practices. ....	7
2.3 Safe Water Storage and Community Health Practices .....	9
2.4 Water Treatment and Community Health Practices.....	11
2.5 Theoretical Framework .....	13
2.6 Conceptual Framework .....	14
2.7 Knowledge Gaps .....	16
2.6 Summary of Literature Review. ....	17
<b>CHAPTER THREE: RESEARCH METHODOLOGY.....</b>	<b>18</b>
3.1 Introduction .....	18
3.2 Research Design .....	18
3.3 Target Population .....	18
3.4 Sample Size and Sampling Procedure.....	18
3.5 Research Instruments .....	19
3.5.1 Pilot-testing of the Research Instrument .....	20
3.5.1 Validity of Research Instrument.....	20
3.5.3 Reliability of the Research Instrument.....	21
3.6 Data Collection Methods.....	22
3.7 Data Analysis Methods .....	23
3.8 Ethical Considerations.....	23
3.9 Operational Definition of Variables .....	24

<b>CHAPTER FOUR : DATA ANALYSIS, PRESENTATION, INTERPRETATION AND DISCUSSION.....</b>	<b>25</b>
4.1 Introduction .....	25
4.2 Questionnaire Response Rate .....	25
4.3 Water Sources Influence on Community health Practices. ....	25
4.4 Water Storage Influence on Community Health Practices.....	28
4.5 Water Quality and Treatment Influence on Community Health Practices.....	31
<b>CHAPTER FIVE: SUMMARY OF THE FINDINGS, CONCLUSIONS AND RECOMMENDATIONS .....</b>	<b>35</b>
5.1 Introduction .....	35
5.2 Summary of the Findings. ....	35
5.3 Discussion of the Findings .....	38
5.3.1 Water Sources Influences Community Health Practices .....	38
5.3.2 Water Storage Influence On Community Health Practice.....	38
5.3.3 Water Treatment and Quality Influence on Community Health Practice.....	40
5.4 Conclusions .....	40
<b>REFERENCES .....</b>	<b>43</b>
APPENDIX I: LETTER OF TRANSMITTAL OF DATA COLLECTION INSTRUMENTS .	45
APPENDIX II: QUESTIONNAIRE .....	46

## LIST OF FIGURES

**Page**

Figure 2.1: Conceptual Framework.....	15
---------------------------------------	----



## LIST OF TABLES

	<b>Page</b>
Table 2.1: Summary of Knowledge Gaps.....	16
Table 3.1: Operationalization of Variables.....	24
Table 4.1: Questionnaire Response Rate.....	25
Table 4.2: Distance to Water during Rainy Season.....	26
Table 4.3: Distance to Water during Dry Season.....	26
Table 4.4: Source of water during Rainy Season.....	27
Table 4.5: Source of Water during Dry Season.....	27
Table 4.6: Cleanliness of Water Containers.....	28
Table 4.7: Frequency of Cleaning Water Containers.....	28
Table 4.8: Number of Water Containers.....	29
Table 4.9: How Water Containers are cleaned.....	30
Table 4.10: Method of Water Retrieval from the Source.....	30
Table 4.11: Water Storage in the Homes.....	30
Table 4.12: Water Treatment before Drinking.....	31
Table 4.13: Frequency of Water Treatment before Drinking.....	32
Table 4.14: Access to Latrine.....	32
Table 4.15: Disposal of Children’s Stool.....	33
Table 4.16: Times of Hand Washing.....	33
Table 4.17: Water Borne Disease Protection.....	34
Table 4.18: Maintaining Good Hygiene.....	34
Table 5.1: Statistics for Water Quality Practices.....	35
Table 5.2: Statistics for Water Treatment Practices.....	36
Table 5.3: Cross tabulation for Water Sources.....	37

## **ABBREVIATIONS AND ACRONYMS**

<b>ASAL:</b>	Arid and Semi-Arid Lands
<b>KAP:</b>	Knowledge Attitude and Practice
<b>MDG:</b>	Millennium Development Goals
<b>SPSS:</b>	Statistical Package for the Social Scientists
<b>UNDP:</b>	United Nations Development Programme
<b>UN:</b>	United Nations
<b>UNICEF:</b>	United Nations Children Educational Fund
<b>MDG:</b>	Millennium Development Goals
<b>SIDA:</b>	Swedish International Development Agency
<b>WASH:</b>	Water, Sanitation and Health
<b>WHO:</b>	World Health Organization

## ABSTRACT

Safe water and adequate sanitation are basic to the health of every person on the planet, yet many people throughout the world do not have access to these fundamental needs. The purpose of this study was to establish the factors Influencing safe water and sanitation practices on community health of Kajiado Central District Residents, Kenya, through the knowledge, attitude and practices survey for constructed water points. The study was conceived due to the fact that developing countries are lagging behind in meeting the set millennium goal and Kenya being one of them. The objectives of the study were to establish how water sources influences community health of Kajiado Central District Residents; to ascertain how water storage practice influence community health of Kajiado Central District Residents and to examine water treatment and quality influence on community health of Kajiado Central District Residents. The study employed the descriptive survey method and used qualitative methods to analyze the relationships between variables and further interpretation. The target population was 400 households and the sample size 78 households. The research instrument used was a questionnaire. The analysis of data was quantitative that involved use of frequency counts and distribution, tabulation, totals and calculation of percentages. Data was analyzed using the Statistical Package for Social Sciences (SPSS Version 17.0) software whose output was presented in form of frequency and percentages. Statistical analysis was by means of means, variance, and standard deviation with cross tabulation to draw conclusion. Majority of the respondents (55.1%) indicated that it takes more than one hour to get water during the dry season, which shows that the area lags behind in access to safe water. The study further ascertained that majority of the population (91%) do not have access to a latrine at the household level which clearly showed that sanitation level was still very low. The hygiene behavior is quite unacceptable especially considering that 88.5% of the respondents pointed out that stool are disposed of by throwing in the field. There is therefore the need to create awareness for safe excreta disposal. These results will assist the relevant government ministry and development partners to plan, mobilize resources and implement interventions for WASH in the area. From my study, recommendations of the report include: intervention to ease access to safe water at recommended service levels as they have to travel more than 30 minutes as the time taken to get water, need to create awareness for safe excreta disposal and hygiene education promotion within the community to create awareness for sanitation facilities at the household levels be put in place. The study concludes that promotion of community awareness on WASH so that people understand links between diarrheal diseases; latrine use and interruption of the fecal-route of disease transmission, and importance of hand-washing alongside provision of safe water will improve the health of the population and put Kenya on track in attaining the millennium goals. Suggested areas of research are in efficiency and effectiveness of health education or hygiene promotion awareness on safe water, sanitation and hygienic practices should be studied as a preventive measure of diseases.

# **CHAPTER ONE**

## **INTRODUCTION**

### **1.1 Background of the Study**

The impact of inadequate water and sanitation services falls primarily on the poor, that is caused by water and sanitation-related sicknesses that put severe burden on health services for the poor. Contaminated drinking water and an inadequate supply of water cause diseases that account for 10% of the total burden of disease in developing countries. Diarrhea spreads most readily in environment of poor sanitation where safe water is unavailable. A study shows that water-borne diseases are one of the major causes of under-five mortality, along with pneumonia, malaria, and measles (Doe, 2007).

There are several reasons why low levels of safe drinking water and poor sanitation exist. According to Human Development Report, poor sanitation can be a result of institutional fragmentation, weak national planning and low political status. Poverty is another barrier to progress as the poorest households often lack the financing capacity to purchase sanitation facilities. This may lead to lack of appropriate and well-maintained excreta disposal facilities, lack of refuse collection, and inadequate control of vectors. Additionally, limited quantity and poor quality of water for hygiene purposes, low level of hygiene understanding, poor hygiene practice (e.g. food contamination from soiled hands), and poor housing and drainage are the reasons that can increase disease prevalence in a community (UNICEF, 2006)

Other factors also constrain progress, including household demand and gender inequality. Women tend to attach more importance to sanitation than men, but female priorities carry less weight in household budgeting. The impact of inadequate water and sanitation services falls primarily on the poor, women, and children who are the main victims of poor health and sanitation due to unsafe drinking water. In adopting the Millennium Development Goals, the countries of the world pledged to reduce by half the proportion of people without access to safe drinking water and basic sanitation. With the exception of sub-Saharan Africa, many developing countries are well on their way to meet the drinking water target by 2015. However, progress in sanitation has stalled in many developing regions (WHO, 2011).

Recognizing this imminent crisis and importance of water, the UN General Assembly adopted a resolution at its 47th session to observe 22<sup>nd</sup> March as World Water Day. Besides, the UN General Assembly, in its Resolution proclaiming the period from 2005 to 2015 as the International Decade for Action, “Water for Life,” called for more concentrated action to reach the internationally agreed targets for accessing safe water and sanitation. The Millennium Development Goal envisions halving the population which has no access to basic water supply and sanitation by 2015. The target could be achieved through integrated development and management of water resources (UNDP, 2010).

Therefore, Safe water and adequate sanitation are essential to the health of a person, yet many people throughout the world lack access to these basic needs. A crucial step towards resolving this global crisis is to comprehend its scale by getting the figures of how many people lack access to drinking-water and sanitation. Household surveys and censuses are conducted every year throughout the world to assess drinking-water, sanitation, and hygiene-related practices at the household level to try to resolve the crisis. Accurate information about drinking-water, sanitation and hygiene related issues are invaluable to national leaders, decision-makers and stakeholders when making policy decisions (Chifunde & Changara, 1995).

The purpose of this research is to study factors that influence water, sanitation and hygiene through a KAP survey; “KAP” study measures the Knowledge, Attitude and Practices of a community. KAP survey thus serves as an educational diagnosis of the community (Khan, 2010). The main purpose of KAP study is for monitoring and evaluation for any planned intervention. KAP Study tells us what people know about certain things, how they feel and also how they behave. Understanding the levels of Knowledge, Attitude and Practice will enable a more efficient process of awareness creation as it will allow a program to be tailored more appropriately to the needs of the community (Yoder, 2008).

## **1.2 Statement of the Problem**

Safe drinking water, adequate sanitation, and acceptable hygiene practices are basic to the health of every person on the planet, yet approximately 5000 people die every day from diarrheal illness, mostly children under five primarily virtually all in developing countries due to unsafe water and sanitation. These statistics reflect the situation in Kajiado County according to is an arid and semi-arid land that is a water-strained area with an annual rainfall between 500 and 1,250 mm with water needs that are not met include livestock, irrigation, and domestic needs. (Odhiambo, 2010)

Past studies on safe water have focused on utilization (Panagopoulos, 2006), recycling and re-use (Mellor, 2009), water conservation, proper utilization and safety (Gingrich 2008) and livestock use (Berea, 2010) have given a detailed attention safe water. But none of these studies have focused on any perceived influence of safe water and sanitation practices on health. Again none of these studies have been undertaken in Kajiado Central. This in a nutshell, makes this research ideally very viable.

In view of this discrepancy, there is therefore need to plan for intervention measures towards helping about half of the Kajiado population access safe water, improve water supply mechanisms, improved sanitation and practice safe hygiene. If this is not addressed negative health effects and child mortality rates will continue to adversely affect wellbeing and development in Kajiado Central District (Kajiado CIDP, 2013). This study therefore seeks to understand the magnitude of this phenomenon and design tangible solutions to the safe water access problems that historically impacts negatively on the populations and residents of Kajiado Central District

## **1.3 Purpose of the Study**

The purpose of this study was to establish the factors influencing safe water and sanitation practices on community health in Kajiado Central District of Kajiado County, Kenya

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

The study was guided by the following objectives:

- i. To establish how water sources influence community health practices of Kajiado Central District Residents
- ii. To ascertain how water storage influence community health practices of Kajiado Central District Residents.
- iii. To examine the extent to which water treatment influence on community health practices of Kajiado Central District Residents.

#### **1.5 Research Questions**

To fulfill the above objectives, the following research questions were investigated;

- i. How do water sources influence community health practices of residents of Kajiado Central district?
- ii. To what level does water storage influence community health practices of Kajiado Central district residents?
- iii. To what extent does water treatment influence community health practices of Kajiado Central Residents?

#### **1.6 Significance of the Study**

It is hoped that this study shall help increase knowledge and update information on water; sanitation and hygiene and its adverse impacts on the poor in Kajiado Central. It will also serve as a working document to policy makers and stakeholders in the water, sanitation and health sector. The study will further serve as benchmark for further research for academic purposes and as an added literature to the existing body of knowledge.

#### **1.7 Delimitation of the Study**

This study was delimited on study variables that comprised the influence of water, sanitation and hygiene as was highlighted in the study objectives. The study was also delimited within the boundaries of Kajiado central District which is an area within Kajiado County that covers an area of 25,000 square kilometers. The study also did focus on functioning and non-functioning water points within the study area and negated other areas.

### **1.8 Limitations of the Study**

The major limitation of this study was language. Since the area is vastly inhabited by the Maasai community with most of them illiterate, it was difficult to communicate in any of the two national languages, the researcher however employed the services of a research assistant who hails from the area and who acted as a translator.

Kajiado Central is vast area with bad terrain and poor road network. This means movement was a big challenge. The researcher therefore made arrangements for a suitable, flexible means to ease the movement and reduce the time to be taken during data collection. Poor network connectivity was again a big challenge. This made community members stay out of service even for days. They also make trips to the nearest centers to charge their mobile phones hence becoming unreachable. The researcher therefore made prior arrangements and booked appointments where necessary to avoid botched out meetings with the respondents.

### **1.9 Assumptions of the Study**

This research assumed the prevailing conditions were favorable to undertaking data collection and that respondents were cooperative enough to fill and return the questionnaire in due time. The study also assumed that weather patterns would be favorable during the data collection process.

### **1.10 Definition of significant terms as used in the study**

**Safe Water and Sanitation Practices:** Refers to a community's feeling towards water, sanitation and hygiene, as well as any preconceived ideas that they may have towards it.

**Community Health:** Primary healthcare which refers to interventions that focus on the individual or family such as hand-washing, immunization, circumcision and Secondary healthcare that refers to those activities which focus on the environment such as draining puddles of water near the house, clearing bushes and spraying insecticides to control vectors like mosquitoes.



**Sanitation practices:** Generally refers to the provision of facilities and includes the appropriate disposal of human and the protection of the water sources.

**Community Hygiene:** Conditions or practices conducive to maintaining health and preventing disease, especially through cleanliness.

**Water Sources:** This is the mechanisms for water supply and delivery to a household or community

**Water Storage:** The drinking water to be reservation in a pot, jar or other container at the household level

**Water quality:** Water quality usually describes the level of certain compounds that could present a health risk. The quality of water is usually defined by guideline values of what is suitable for human consumption and for all usual domestic purposes, including personal hygiene.

### **1.11 Organization of the Study**

This research project report is made up of five chapters. Chapter one provides the introduction to water, sanitation, and hygiene background. The chapter also describes objectives, significance, limitation and delimitation of the study.

Chapter two discusses pertinent literature on the need for safe water and sanitation, effects of inadequate water supply and poor sanitation access to safe water and appropriate sanitation facilities water sources and sanitation classifications, the theoretical framework, conceptual framework and a summary of knowledge gaps.

Chapter three describes the materials and methods used in the study. The chapter describes the location of the study, research design and data analysis. Chapter four gives presentation of findings, analysis and interpretations while Chapter five is for summary of findings, conclusions and recommendations on the research study.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter discusses the literature related to the access of safe drinking water, safe excreta disposal and hygiene practices. It particularly focuses on factors that affect water, sanitation and hygiene; it also highlights how the factors affect WASH with highlights from the global perspective and overview of WASH. The conceptual framework is considered the pillar of the study.

#### **2.2 Safe Water Sources and Community Health Practices.**

The world's population has increased by almost 1.5 billion people since 1990; yet some countries are failing to increase access to improved drinking water sources in line with population growth. Globally 1.1 billion people lack access to safe drinking water, and 2.6 billion people lack access to adequate sanitation. Approximately 5000 people die every day from diarrheal illness, mostly children under five primarily virtually all in developing countries due to unsafe water and sanitation. The seventh of the eight United Nations Millennium Development Goals is to "halve by 2015 the proportion of people without sustainable access to safe drinking water". Water supply, safe drinking water, adequate sanitation, and hygiene have an incredible potential to save and improve lives (WHO, 2008)

It is now widely believed that safe water supplies alone can do little to improve health conditions without similar progress in sanitation. Unhygienic sanitation reduces the potential benefits of safe water supply by transmitting pathogens from infected to healthy people. Similarly, indiscriminate defecation leaves pathogen-rich fecal matter in the open that ultimately contaminates surface water, Cross-country studies also show that the method of disposing of excreta is one of the strongest determinants of child survival: the transition from unimproved to improved sanitation reduces overall child mortality by about a third (Tezera, 2011).

A basic question is how much water people need to sustain themselves and how do that amount of water change as access becomes easier and less time consuming. Although there are increased health benefits from increased availability of water, there is not a direct linear relationship with

water quantity used. It is the service levels that determine the benefit and not the actual quantity of water used (SIDA, 2004).

People need about 20 l/p/d which is considered being basic access to water and should be the baseline amount of water that development workers strive to provide. Below this level, there can be serious concerns about health and well-being. Beyond this amount communities should focus on water source protection, establishing good hygiene and sanitation as well as household treatment. Furthermore, the amount of water used for washing and bathing is very sensitive to service levels. Those who have to travel more than 1 km to fetch water do not use much for bathing or laundering (UNICEF, 2005).

Water accessibility is best described in terms of water service categories rather than an actual volume in liters (Bartram et al, 2005). Service levels are divided in terms of 'No Access,' 'Basic Access,' 'Intermediate Access' and 'Optimal Access' in which people respectively use, on average 5, 20, 50 and 100 l/p/d (liters per person per day). 'No Access' level have to travel more than 1 km or 30 minutes to fetch water, while those with 'Basic Access' need 5 to 30 minutes to travel 100 m to 1 km. Finally, those with 'Intermediate Access' have water in or near their compound and take less than 5 minutes to collect it, while those with 'Optimal Access' have multiple taps in their homes (UNICEF, 2005).

Major public health gains can occur in two increments; the first is to overcome lack of basic access when households barely have enough water for consumption much less personal hygiene. Secondly, when homes have access at the household level, their health gains are more limited, but they now have more time for activities like child-care, school or other socioeconomic activities. Finally, equal attention should be paid to both water supply and sanitation and that easing access to improved sources outside the home will have limited health returns (Doe, 2007). Water for drinking purpose can be found from natural sources like surface water, ground water and rain water. Water from all these sources to use for household activities need treatment based up on their impurities (WHO, 2008)

Though the treatment and the degree of cleanness of the water make the water safe or unsafe to drink, WHO and UNICEF classified water sources as improved and unimproved based on their purity to drink. The quantities of water needed for domestic use may vary according to the climate, the sanitation facilities available, people's normal habits, their religious and cultural practices, the food they cook, the clothes they wear, and so on. Water consumption generally increases the nearer the water source is to the dwelling. Hence a water source should provide enough quantity to meet requirements and good quality water or water that can be treated to a good quality standard (UNICEF, 2005)

Human health and well-being are strongly affected by the environment in which we live- the air we breathe, the water we drink, and the food and nutrients we eat. Community water sources are important ways to ensure the health of the community. In arid and semi arid areas, communities lack the capacity to effectively adapt their current water sources for water, sanitation, and hygiene to the community's changing needs due population growth, changes in water quality as a result in climate change effect. The intervention for Household Water Treatment & Safe Water Storage consists of these steps: Point-of-use treatment of contaminated water, Safe water storage, improved hygiene and behavior change practices (Tezera, 2011).

According to the World Health Organization, the objectives of a water source are to ensure safe drinking water through good water supply practices, which include: Preventing contamination of source waters; Treating the water to reduce or remove contamination that could be present to the extent necessary to meet the water quality targets; and Preventing re-contamination during storage, distribution, and handling of drinking water (WHO, 2005).

### **2.3 Safe Water Storage and Community Health Practices**

Diseases related to unsafe water, poor sanitation, and lack of hygiene are some of the most common causes of illness and death among the poor of developing countries. These diseases fill half the hospital beds in developing countries (UNDP, 2006). Amongst the diseases related to unsafe water and sanitation are diarrhea, intestinal helminthes, guinea worm, skin diseases, cholera, trachoma and typhoid (Bartram *et al.*, 2005).

Good quality water is necessary to ensure that water-borne disease transmission is minimized or eliminated. Many diarrheal diseases may be spread by water, including cholera, dysentery, viral diarrhea, and others. Diseases related to unsafe water, poor sanitation, and lack of hygiene are some of the most common causes of illness and death among the poor of developing countries. These diseases fill half the hospital beds in developing countries (UNDP, 2010)

Water for drinking purpose can be found from natural sources like surface water, ground water and rain water. Water from all these sources to use for household activities need treatment based up on their impurities, though the treatment and the degree of cleanness of the water make the water safe or unsafe to drink, Surface sources are, by definition, unsafe because of their potential for contamination with disease-producing organisms (UNICEF, 2012).

In many situations, water-related disease transmission is due as much too insufficient water for personal and domestic hygiene as to contaminate water supplies. Until minimum standards for both quantity and quality are met, the priority should be to provide equitable access to an adequate quantity of water even if it is of intermediate quality, rather than to provide an inadequate quantity of water that meets the minimum quality standard (UNICEF, 2012).

Excessive queuing times are indicators of insufficient water availability either due to an inadequate number of water points or inadequate yields of water points as to therefore there are often long queues at water access points because it takes time to fill containers. The potential negative results of excessive queuing times are: reduced per capita water consumption; increased consumption from unprotected surface sources; and reduced time for water collectors to tend to other essential survival tasks. In order to reduce the time required for fetching water and to encourage the use of safe water sources, the Sphere Project recommends that no more than 15 minutes is spent waiting in queues at water access points (WASH, 2005).

Water should be treated with a residual disinfectant such as chlorine if there is a significant risk of water source or post-delivery contamination. This risk will be determined by conditions in the community, such as population density, excreta disposal arrangements, hygiene practices and the prevalence of diarrheal disease (WHO, 2012). People need vessels to collect water, to store it and to use it for washing, cooking and bathing. These vessels should be clean, hygienic and easy to carry and be appropriate to local needs and habits, in terms of size, shape and design. The

amount of storage capacity required depends on the size of the household and the consistency of water availability. Water collection and storage containers should have narrow necks and/or covers, or other safe means of storage, drawing and handling.

Water that is safe at the point of delivery can nevertheless present a significant health risk due to re-contamination during collection, storage and drawing. Steps that can be taken to minimize such risk include improved collection and storage practices, distributions of clean and appropriate collection and storage containers. Safe household water storage is a critical component of a Household Water Treatment and Safe Storage (HWTS) system being promoted by the World Health Organization (WHO) worldwide in areas that do not have piped drinking water. In these areas it is not uncommon for drinking water to be stored in a pot, jar, crock or other container in the home. Even if this drinking water was of acceptable microbiological quality initially, it can become contaminated from dirty hands and utensils, such as dirty dippers and cups. Drinking water containers with "narrow dispensers are key" to keeping water from being contaminated while being stored in the home. All types of 'safe household water storage must be used with water from known clean sources or with water having received prior efficacious treatment.

#### **2.4 Water Treatment and Community Health Practices**

Washing and bathing facilities are essential for improved sanitation to be met as to make live comfortable. People need a space where they can bathe in privacy and dignity. If this is not possible at the household level, central facilities may be needed. Where soap is not available or commonly used, alternatives can be provided such as ash, clean sand, soda or various plants suitable for washing and/or scrubbing. Washing clothes is an essential hygiene activity, particularly for children, and cooking and eating utensils also need washing. The location of facilities should be central, accessible and well-lit areas to contribute to ensuring the safety of users (Chifunde & Changara, 1995)

Safe disposal of human excreta creates the first barrier to excreta related disease, helping to reduce transmission through direct and indirect routes. Safe excreta disposal is therefore a major priority, and in all situations should be addressed with as much importance as the provision of safe water supply. The provision of appropriate facilities for defecation is essential for people's

dignity, safety, health and well-being Excreta disposal standard is to access to, and numbers of, toilets People have adequate numbers of toilets, sufficiently close to their dwellings, to allow them rapid, safe and acceptable access at all times of the day and night (Pondicherry, 2007). The importance of hand washing after defecation and before eating and preparing food, to prevent the spread of disease, cannot be over-estimated. Users should have the means to wash their hands after defecation with soap or an alternative (such as ash), and should be encouraged to do so. There should be a constant source of water near the toilet for this purpose (Yoder, 2008)

Water treatment refers to the chemical, physical, biological, and radiological characteristics of water. It is a measure of the condition of water relative to the requirements of one or more biotic species and or to any human need or purpose. It is most frequently used by reference to a set of standards against which compliance can be assessed. The most common standards used to assess water quality relate to health of ecosystems, safety of human contact and drinking water. Household water treatment and safe storage (HWTS) interventions can lead to dramatic improvements in drinking water quality and reductions in diarrhea disease-making an immediate difference to the lives of those who rely on water from polluted rivers, lakes and, in some cases, unsafe wells or piped water supplies.

Water quality is an important parameter touching on all aspects of ecosystems and human well-being such as the health of a community, food to be produced, economic activities, ecosystem health and biodiversity. Therefore, water quality also is influential in determining human poverty, wealth and educational levels. Sufficient quality of water is critical to ensure a healthy environment and human health. The basic requirement per person per day is 20 to 40 liters of water free from harmful contaminants and pathogens for the purposes of drinking and sanitation, rising to 50 liters when bathing and kitchen needs are considered (Yoder, 2008)

According to the World Health Organization (WHO) 4 billion cases of diarrhea each year in addition to millions of other cases of illness are associated with lack of access to water that is safe for human consumption. Per year 2,2 million people die as a result of diarrhea most of them are children under the age of five. Human health is severely impacted by water-related diseases (waterborne, water-washed, water-based, and water-related vector-borne infections) as well as by chemical pollution discharged to water. Despite progressive improvement in the provision of

sanitation since 1990, providing safe water and sanitation to large parts of the human population remains a challenge. Today, 1.1 billion people around the world still lack access to improved water supply and more than 2.6 billion people lack access to improved sanitation.

## **2.5 Theoretical Framework**

This work is based on empowerment theory which is traced back to the Brazilian humanitarian and educator, Paulo Freire. The theory was designed in the 1960's. The term empowerment has become widely used in the social sciences in the last decade across a broad variety of disciplines, such as Community psychology, Management, Political theory, Social work, Education, Women studies, and sociology. Freire states that there exist three issues basic to the understanding of empowerment. First, that empowerment is multidimensional since it occurs within sociological, psychological, economic and political dimensions. Empowerment can thus be examined on a community, organizational and individual basis, through processes or outcomes, measuring attitudes, knowledge and behaviors (Hur, 2006).

The theory of empowerment therefore touches on different dimensions of life. Empowerment theories are not only concerned with the process of empowerment, but also with results that can produce greater access to resources and power for the disadvantaged. Empowerment theory therefore suggests that interventions that provide genuine opportunities for individuals to participate may help them develop a sense of psychological satisfaction. The development of psychological empowerment theory may also help improve the design and evaluation of community interventions. Empowering interventions might begin with an environmental assessment of the opportunities to participate and develop strategies to include participants in the design, implementation and evaluation of an intervention (Hur, 2006).

Thus empowerment is not a panacea for all individual and social illness and has also been criticized in equal measure as “overly individualistic and conflict-oriented, resulting in an emphasis on mastery and control rather than cooperation and community”. Although the practice of empowerment is effective for the removal of powerlessness, certain factors still exist that may inhibit empowerment. These factors include organizational aspects, such as an interpersonal bureaucratic climate, supervisory styles described as authoritarianism and negativism, and arbitrary reward systems. Empowerment is a clear-cut set of policy initiatives. Instead, it is



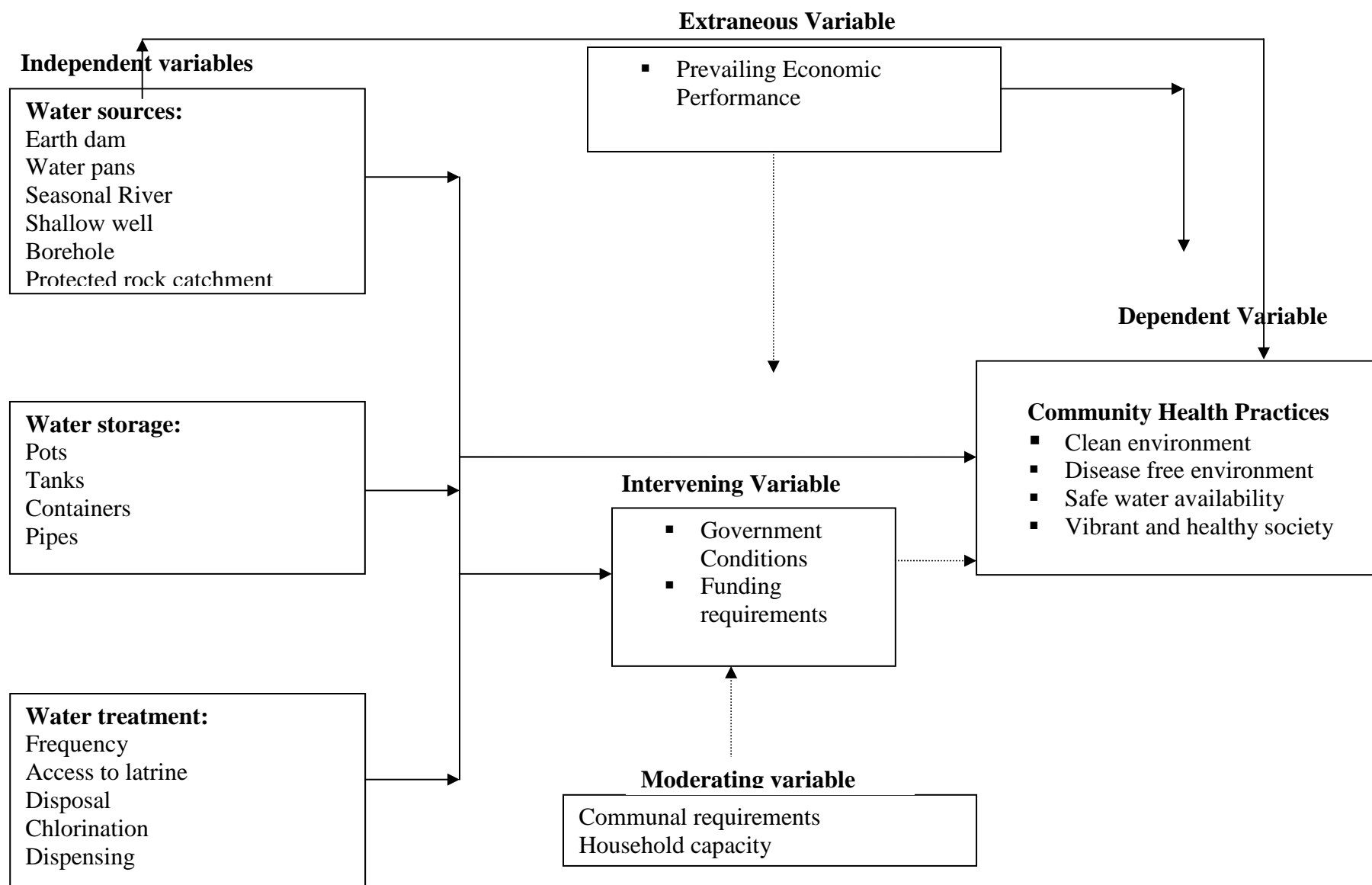
much more free-floating, evoking, in vague terms, a new liberated world of work within all levels of an organization (Wilkinson, 2002)

## **2.6 Conceptual Framework**

A conceptual framework is used in research to outline possible courses of action or to present a preferred approach to an idea (Mathew, 1988) defined a conceptual framework as a visual or written product, one that “explains, either graphically or in narrative form, the main things to be studied, the key factors, concepts, or variables and the presumed relationships among them.

In the conceptual framework depicted in Figure 1, knowledge, attitude and practices are hypothesized to influence water, sanitation and hygiene. The framework postulates that the status of water sources; water storage containers; water quality and treatment; hand washing practice; use of latrines; water related diseases and general hygiene directly affects the water, sanitation and hygiene. However the relationship may be modified by hygiene promotion awareness campaigns and donor funding for interventions programmes.

**Figure 2.1: Conceptual Framework**



## 2.7 Knowledge Gaps

The knowledge gaps identified within the reviewed literature are as shown on the table below:

**Table 2.1: Summary of Knowledge Gaps**

Objective	Author	Findings	Knowledge gap
Influence of Water Source on Community Health Practices	UNDP, 2010 Tereza, 2011 UNICEF, 2004	Quality water is necessary to ensure water-borne disease transmission is minimized or eliminated. Many diarrheal diseases may be spread by water, including cholera, dysentery, viral diarrhea, and others. Diseases related to unsafe water, poor sanitation, and lack of hygiene are some of the most common causes of illness and death among the poor of developing countries.	Need to investigate these findings in with a focus on Kajiado Central district so as to examine their implications on livelihood
Influence of Water Storage on Community Health Practices	Chifunde & Changara, 1995  UNDP, 2010  UNICEF, 2005	Washing and bathing facilities are essential for improved sanitation. People need space where they can bathe in privacy and dignity. Sanitation facilities should be sufficient at household level.	There is need to find out the usage of sanitation practices and their level of practice
Influence of Water Treatment on Community Health Practices	Yoder, 2008 Chifunde & Changara, 1995 WHO, 2008	Safe disposal of human excreta creates the first barrier to excreta related disease, helping to reduce transmission through direct and indirect routes. Safe excreta disposal is a major priority, and in all situations should be addressed with as much importance.	A disconnect on excreta disposal methodology and how it impacts on health in Kajiado Central needs to be investigated.

## **2.6 Summary of Literature Review.**

This study presents the status of water, sanitation and hygiene situation in the study area. Besides providing the utility of being a baseline, the study also identifies the status of perception of water, sanitation and hygiene practices amongst the residents of this county. This was accomplished through undertaking a knowledge, attitude and practice (KAP) survey at community level around water points in regard to factors that influence water, sanitation and hygiene (WASH). The survey generally sought to identify needs, gaps and understand the WASH situation among targeted community in the study area. Specifically the survey identified gaps and has given recommendations on the status of the household and communal water quality, poor adoption of hygiene practices and the socio-cultural practices that undermine WASH interventions. The findings will inform any interested stakeholder of the status of water, sanitation and hygiene within the study area.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter addresses the research methodology that was applied in this study. The study also focuses on research design, target population, Sample size, and data collection, validity and reliability of research instruments and operationalization of variables.

#### **3.2 Research Design**

Research design is the scheme, outline or plan that is used to generate the answers to research problems. This study was conducted using descriptive survey design. This is a type of research used to obtain data that can help determine specific characteristics of a group. A descriptive survey that involves asking questions, often in the form of a questionnaire for the data collection method called an interview was used. The design was selected for this study because of the economical nature of the design, its rapid ability of data collection and ability to understand a population from using part of the population. The descriptive statistics obtained after the survey were utilized to describe, organize and summarizes data obtained to come up with conclusive factors that affect the status of water, sanitation and hygiene for the study area (Kyeyune, 1999)

#### **3.3 Target Population**

This study was conducted with members in established community water points. This criterion was chosen because communities around established water points are easy to access. The population consisted of both female and male members that consisted of 400 households with average members of seven per household.

#### **3.4 Sample Size and Sampling Procedure**

This study employed stratified sampling to select the sample. The stratified sampling technique refers to one in which the researcher stratifies the population according to some pre-determined criteria and then separates from each stratum (Odhiambo, 2010). It was used to insure that enough cases of each stratum fall into the sample to make analysis possible. It was preferred for this study because the population of study contained households around water points and the researcher wanted a sample of all the constructed functioning water points. The minimum sample

size (s) required for determining the households in Kajiado Central was calculated using the formula:

Formula: Sample Size  $n / [1 + (n / \text{population})]$

In which  $n = Z^2 [P (1-P) / D^2]$  (Patton., 1990); where:

Z= value of the standard deviation at the 90% confidence level (1.645)

P= True proportion of factor in the population

D = maximum difference between the sample mean and the population mean

Number of Households (population) = 400

P = Expected frequency value = 10%

Worst Acceptable Frequency = 5%

D = (Expected frequency – worst acceptable) = 5%

Where:

$N = Z * Z [P (1-P) / (D * D)]$

$N = 1.645 * 1.645 [0.1(1 - 0.1) / (0.05 * 0.05)]$

$N = 97.42$  Next, Calculate the Sample Size. (S = Sample Size)

$S = n / [1 + (n / \text{population})]$

$S = 97.42 / [1 + (97.42 / 400)]$

$S = 78$  for this study, a sample size of 78 households was taken to be adequate representation of the population.

### **3.5 Research Instruments**

This study utilized a questionnaire as a primary tool for data collection. The questionnaire contained both structured and unstructured questions meaning had both open-ended and close-ended questions. The questionnaire contained 5 sections that entailed systematic and pre-determined questions that were presented with exactly the same wording and in the same order to all respondents. For the closed-ended questions, a Five-point Likert Scale will be used which will include: (1) Strongly Agree, (2) Agree, (3) Uncertain, (4) Disagree and (5) Strongly Disagree. The strongly agreed responses were scored at 5 for direct positive responses while those of strongly disagree were scored at 1 for direct negative responses. Closed ended questions were also included. The questionnaire facilitated the evaluation of the phenomenon under study and was self-administered. This was done so as enhance objectivity and ensure that participants answered the same questions thus preventing bias. The procedure for data collection ensured

compliance to the procedure put in place by the National Science and Technology Council, the University of Nairobi and ethics in social science research.

### **3.5.1 Pilot-testing of the Research Instrument**

A pilot study was carried out two weeks prior to the main study. The researcher randomly picked 10 respondents and administered the questionnaire to them so as to find out if the questionnaire was sufficient. This process entailed a small-scale trial, where a few respondents took the test and commented on the mechanics of the test and pointed out any problems with the test instructions, instances where items were not clear and help the researcher format the questionnaire and remove any noted typographical errors and inconsistencies.

The primary purpose of pilot-testing of the research instrument was to construct an initial picture of test validity and reliability. Again, pilot testing is usually undertaken to elicit appropriate responses to the study so as to determine if questions asked were relevant and appropriate. Pilot testing also helps to check on the clarity and suitability of the wording in the questionnaire (Basavanthappa, 2007). Information from the pilot study was cross-checked to establish the deficiencies in the instruments. Corrections and modifications were therefore be undertaken to correct any anomalies noted on the instrument before it was administer

### **3.5.1 Validity of Research Instrument**

Validity refers to the appropriateness, meaningfulness and usefulness of the inferences a researcher makes based on the data collected. It is the ability of a measuring instrument to measure what it is supposed to measure. To ensure validity of the instrument used, the researcher used content validity and carried out a pilot study on five respondents randomly sampled from the target population. The same process was repeated after a period of two weeks. This enabled the researcher to ascertain that the correct concept is being measured and not something else.

According to (Mathew, 1988) defines validity as the extent to which a measure actually measures what is supposed to measure. Validity therefore has to do with how accurately the data obtained in the study represents the variables of the study to ascertain the validity of the research instrument. In this study, content validity was utilized. A pre-test was conducted on a population similar to the target population to ensure that enumerators and the study population alike have

the same understanding of the study topics, and revised based on identified shortcomings. In this case a small group of the population was given questionnaires to fill and any difficulty experienced taken into account then the questions were amended accordingly. The researcher used simple understandable language through training of the research assistants also to ensure that they were able to guide the respondents in filling of the questionnaire which also included translation of the study tools into local language where necessary to enhance validity.

### 3.5.3 Reliability of the Research Instrument

Reliability is the consistency of measurement, or the degree to which an instrument measures the same way each time it is used under the same condition with the same subjects. A reliable instrument is one with small errors of measurement, one that shows stability, consistency and dependability of scores for individuals on the trait, characteristic or behavior being assessed. Reliability of a research instrument is its ability to give consistent results over a number of repeated trials (Mugenda & Mugenda, 1999).

This study utilized split half method to obtain reliability of the research instrument. The first step under split half methodology involved administering the instrument to 1% of the sample size. The responses were then scored and split into two on the basis of odd and even numbers. Pearson product moment correlation coefficient was then be computed for the two groups using Pearson (r) formula:

$$r = \frac{\sum XY - \frac{(\sum X)(\sum Y)}{N}}{\sqrt{\left[ \frac{\sum X^2 - \frac{(\sum X)^2}{N}}{N} \right] \left[ \frac{\sum Y^2 - \frac{(\sum Y)^2}{N}}{N} \right]}}$$

**Where**

r = Pearson product moment correlation coefficient

Y= score in odd number questionnaire items;

X= score in even number questionnaire items;

N= Number of respondents.



Spearman Brown Prophecy formula was then used to compensate for the reduction of the instruments to one half of the final length. This yielded the reliability coefficient (re) for the full length which was given by the formula:

$$re = \frac{2r}{r-1}$$

**Where**

r = Spearman Correlation Coefficient between the two halves where the first half was odd numbers and the second half was even numbers.

re=the reliability co-efficient for the full length.

After calculation my reliability coefficient was found to be 0.75, meaning my instrument was deemed reliable

**3.6 Data Collection Methods**

Structured interviews with questionnaires were used as the main tools for collecting data. Structured interviews are those conducted by the interviewer with a predetermined standardised list of both close and open ended questions of which are put in precisely the same format and sequence to every respondent (Patton, 1990). The selection of this tool was guided by the nature of data to be collected, the time available as well as the objectives of the study. The overall aim of this study was to define factors that influence water, sanitation, and hygiene within the study areas. The researcher was mainly concerned with view, opinions, perceptions, feelings and altitude. Such information can be best collected through the use of questionnaire and interview techniques. In the survey method, an interview questionnaire, of which the interviewer often recorded the answers on the questionnaire, was administered to selected persons around constructed water points. The questionnaire used in the study was developed and organized based on the research objectives. It was structured and divided into sections as per the research objectives detailing the knowledge, attitude and practices in relation to effect of access to safe water, improved sanitation and acceptable hygiene in terms of water sources; water storage containers; water quality and treatment; hand washing practice; use of latrines; water related diseases and general hygiene

### **3.7 Data Analysis Methods**

Data analysis refers to the computation of certain measures along with searching for patterns of relationship that exists among data-groups (Panagopoulos et al., 2006.). In this study, the independent variable comprise of knowledge, attitude and practice for water sources; water storage containers; water quality and treatment; hand washing practice; use of latrines; water related diseases and general hygiene, while the dependent variable is water, sanitation and hygiene. Data processing operations were performed upon completion of the interviews in the field included: editing, coding, classification and tabulation of raw data. The questionnaires were coded and cross checked for accuracy. The analysis of data was quantitative that involved use of frequency counts and distribution, tabulation, totals and calculation of percentages. Data was analyzed using the Statistical Package for Social Sciences (SPSS) version 17 software whose output was presented in form of Tables, percentages and charts to draw conclusions

### **3.8 Ethical Considerations**

In this study confidentiality of respondents was maintained, the information gathered was treated with utmost confidentiality and used for academic purposes only. Respondents were informed that participation in this study was voluntary and that anyone was free to pull out at any given time. This meant that no one was coerced or unduly influenced.

The researcher ensured informed consent of the participants by providing them with all the information required including the purpose of the research, their right to refusal and an explanation to their right to privacy and protection.

The respondents were also accorded privacy, respect and assurance that the information generated would be held confidential and would be used solely for the purpose of research. Respondents were further requested not to write their names anywhere on the questionnaire.

### 3.9 Operational Definition of Variables

All variables under study were operationalized as shown in the table below:

**Table 3.1: Operationalization of Variables**

Research Variables	Indicator of variables	Measurement scale	Tool of analysis
Water Sources and Community Health Practices	<ul style="list-style-type: none"> <li>• Earth dam/pan</li> <li>• Seasonal river</li> <li>• Scooped dry river bed</li> <li>• Shallow well</li> <li>• Borehole</li> <li>• Protected rock catchment</li> <li>• Distance to water source</li> </ul>	Ordinal	Mean Mode ANOVA
Water Storage and Community Health Practices	<ul style="list-style-type: none"> <li>• Pots</li> <li>• Tanks</li> <li>• Containers</li> <li>• Pipes</li> </ul>	Ordinal	ANOVA Regression
Water Quality and Community Health Practices.	<ul style="list-style-type: none"> <li>• Frequency</li> <li>• Access to latrine</li> <li>• Disposal</li> <li>• Chlorination</li> <li>• Dispensing</li> </ul>	Ordinal	Regression Correlation

## CHAPTER FOUR

### DATA ANALYSIS, PRESENTATION, INTERPRETATION AND DISCUSSION

#### 4.1 Introduction

This chapter presents the study findings and interpretations. The study findings were analyzed, interpreted and discussed in line with the objectives. The analysis of data was quantitative that involved use of frequency counts and distribution, tabulation, totals and calculation of percentages. Data was analyzed using the Statistical Package for Social Sciences (SPSS, version 17) software whose output was presented in form of Tables, percentages and cross tabulations were used to draw conclusions.

#### 4.2 Questionnaire Response Rate

The questionnaire response rate was 100 percent.

**Table 4.1: Questionnaire Response Rate**

<b>Respondents</b>	<b>Number of respondents reached</b>	<b>Percent</b>	<b>% of respondents reached</b>	<b>Sample size of respondents targeted</b>
Male	25	32.1	32.1	36
Female	53	67.9	67.9	36
<b>Total</b>	<b>78</b>	<b>100.0</b>	<b>100.0</b>	<b>78</b>

#### 4.3 Water Sources Influence on Community health Practices

The first objective of this study was to establish how water sources influences community health practices of Kajiado Central District Residents. To achieve this objective, the respondents were asked to state the source they fetch water from for domestic use during rainy or dry season; if they treat their water, state water retrieval from the source at home, method they use to transport water, the duration to fetch their water during dry or rainy season, Data collected was analyzed under the question of how do water sources influence community health of Kajiado Central district Residents? The results are presented in Tables 4.2 to 4.5.

**Table 4.2: Distance to Water during Rainy Season**

UNICEF and WHO (2008) suggest that when the time invested in going to the source, collecting water, and returning to the household is between three and 30 minutes, the amount of water collected may vary between 15 and 25 liters per person per day. This range is considered suitable for a person to meet basic needs. Table 4.2 highlights time taken to fetch water from the households during rainy season that is less than one hour but more than thirty minutes showing even in the rainy season the time invested in fetching water is longer than 30 minutes, the satisfaction of basic water needs is compromised.

<b>Time to fetch water</b>	<b>Frequency</b>	<b>Percent</b>
less than 1hour	69	88.5
1-2 hours	8	10.3
Total	77	98.7
Missing	1	1.3
<b>Total</b>	<b>78</b>	<b>100.0</b>

**Table 4.3: Distance to Water during Dry Season**

The amount of time spent fetching water will have implications for the amount of water that a household makes available to its members. The longer the time invested in fetching water, the less chance a family has to acquire enough water to satisfy household water per capita needs. This is most critical during dry season with lesser options of available water sources. Table 4.3 highlights time taken to fetch water from the households during dry season. The Table shows time taken to get water during the dry season with the majority at 43 with 55.1% going beyond the minimum threshold.

<b>Time To Fetch Water</b>	<b>Frequency</b>	<b>Percent</b>
less than 1hour	20	25.6
1-2hours	43	55.1
2-5hours	15	19.2
<b>Total</b>	<b>78</b>	<b>100.0</b>

**Table 4.4: Source of water during Rainy Season**

Water source needs to provide enough quantity to meet minimum requirements normally 20 liters per person per day with good quality water or water that can be treated to a good quality standard. Table 4.4 highlights the source of water during rainy season. This results shows the source of water during the rainy season that majority of the population at 43 with 55% get their household water from an improved source of protected rock yet a significant portion of the population at 35 with 45% still get water from unimproved sources.

<b>Sources of Water</b>	<b>Frequency</b>	<b>Percent</b>
Earth Dam	32	41
Seasonal Rivers	2	3
Scoop Dry River Beds	1	1
Protected Rock	43	55
<b>Total</b>	<b>78</b>	<b>100</b>

**Table 4.5: Source of Water during Dry Season**

Community water sources are important ways to ensure the health of the community. In arid and semi arid areas, communities lack the capacity to effectively adapt their current water sources to the community's changing needs in face of climate change thus Table 4.5 highlights the source of water during dry season. This result shows the source of water during the dry season for majority of the population is at 27 with 34.62 % get their household water from an improved source of protected rock and depicts more options for water source as it shows scarcity and need to get more from other sources like boreholes at 20 with 25.64 %.

<b>Sources of Water</b>	<b>Frequency</b>	<b>Percent</b>
Earth dam	9	11.54
Seasonal rivers	4	5.13
Scoop dry river beds	16	20.51
Boreholes	20	25.64
Protected rock	27	34.62
Piped water	2	2.56
<b>Total</b>	<b>78</b>	<b>100.00</b>

#### 4.4 Water Storage Influence on Community Health Practices

The second objective of this study was to ascertain how water storage practice influence community health practices of Kajiado Central District Residents. To achieve this objective, the respondents were asked to state how they maintain cleanliness of water storage containers, if they clean their water containers, the number of storage containers, how they store water at household level, how often they treat their drinking water, the cleanliness of water containers, Data collected was analyzed under the question, what extend does water storage influence community health practices of Kajiado Central district residents? The results are presented in Tables 4.6 to 4.11.

**Table 4.6: Cleanliness of Water Containers**

Water that is safe at the point of delivery can nevertheless present a significant health risk due to re-contamination during collection, storage and drawing. Table 4.6 highlights cleanliness of water storage container that mostly is the source of contamination of drinking water at the point of use. The Table shows that the majority of the population at 75 with 96.2% do clean their containers a good indicator for water quality.

<b>Response</b>	<b>Frequency</b>	<b>Percent</b>
Yes	75	96.2
No	2	2.6
Total	77	98.7
Missing	1	1.3
<b>Total</b>	<b>78</b>	<b>100.0</b>

**Table 4.7: Frequency of Cleaning Water Containers**

Steps that can be taken to minimize risk due to re-contamination include cleaning of water storage containers. Table 4.7 highlights how often the practice of cleaning the containers is carried out. This highlights the frequency of cleaning the water storage containers with majority doing it at every two weeks at 28 with 35.9%.

<b>Cleaning Frequency</b>	<b>Frequency</b>	<b>Percent</b>
Daily	1	1.3
Once a week	16	20.5
Every 2 weeks	28	35.9
Once a month	15	19.2
When dirty	18	23.1
<b>Total</b>	<b>78</b>	<b>100.0</b>

**Table 4.8: Number of Water Containers**

Rather than to provide an inadequate quantity of water that meets the minimum quality standard. Average water use for drinking, cooking and personal hygiene in any household is at least 15 liters per person per day, and storage containers indicate the quantity available per household as in The Table 4.8 highlights the number of water storage container per household as indicates the quantity per household. The Table shows an average of four twenty liter containers per household with 20.5% that is 80 liters in a 7 member household falling short of 4 liters per person per day, hence water in majority of the households is not sufficient.

<b>Number of Containers</b>	<b>Frequency</b>	<b>Percent</b>
1	1	1.3
2	4	5.1
3	14	17.9
4	16	20.5
5	10	12.8
6	14	17.9
7	3	3.8
8	6	7.7
9	2	2.6
10	8	10.3
<b>Total</b>	<b>78</b>	<b>100.0</b>



**Table 4.9: How Water Containers are cleaned**

Basic measures that can be taken to minimize post-delivery contamination including cleaning of the water containers Table 4.9 highlights the methods of cleaning for water storage containers at 41.18% that is use of water, soap and scouring pad.

<b>Cleaning of water containers</b>	<b>Frequency</b>	<b>Percent</b>
Water only	7	8.82
Water and soap	20	25.49
Water, soap and scouring pad	32	41.18
Water and sand	11	13.73
Water, sand and scouring pad	8	10.78
<b>Total</b>	<b>78</b>	<b>100.00</b>

**Table 4.10: Method of Water Retrieval from the Source**

Water handling practices can affect and contaminate water stored at the household level. Some household water treatment and storage methods include safe storage that is integral to the design. Table 4.10 shows water retrieval from with a jug with 46.15% as the majority though not safe as water collection and storage containers should have narrow necks and/or covers, or other safe means of storage, drawing and handling.

<b>Method of water retrieval</b>	<b>Frequency</b>	<b>Percent</b>
Dipping Jerri cans in water	7	8.97
Jug with handle	36	46.15
Tap stand	34	43.59
Bucket and rope	1	1.28
<b>Total</b>	<b>78</b>	<b>100.00</b>

**Table 4.11: Water Storage in the Homes**

People need vessels to collect water, to store it and to use it for washing, cooking and bathing. These vessels should be clean, hygienic and easy to carry and be appropriate to local needs and

habits, in terms of size, shape and design. Table 4.11 highlights the type of water storage containers that is used for storing and fetching water in the households.

<b>Water storage containers</b>	<b>Frequency</b>	<b>Percent</b>
Jerry cans open	4	5.1
Jerry cans closed	8	10.2
Bucket closed	1	1.3
Plastic tanks open	1	1.3
Plastic tanks closed	64	82.1
<b>Total</b>	<b>78</b>	<b>100.0</b>

#### **4.5 Water Quality and Treatment Influence on Community Health Practices**

The third objective of this study was to examine water treatment and quality influence on community health practices of Kajiado Central District Residents. To achieve this objective, the respondents were asked to state if they got access to a latrine, how they dispose children’s stool, how they protect their family from water borne diseases, preventive measure from waterborne diseases they take, actions they take to maintain good hygiene. Data collected was analyzed under the question, how does water treatment and quality influence community health practices of Kajiado Central district Residents? The results are presented in Tables 4.12 to 4.18.

##### **Table 4.12: Water Treatment before Drinking**

Water should be treated with a residual disinfectant such as chlorine if there is a significant risk of water source or post-delivery contamination. This risk will be determined by conditions in the community, such as population density, excreta disposal arrangements, hygiene practices and the prevalence of diarrheal disease. Table 4.11 highlights water treatment practice at the household level. The shows that majority of the households do not treat their water at 53 with 67.9 %.

<b>Response for water treatment</b>	<b>Frequency</b>	<b>Percent</b>
Yes	25	32.1
No	53	67.9
<b>Total</b>	<b>78</b>	<b>100.0</b>

**Table 4.13: Frequency of Water Treatment before Drinking**

Treatment with a residual disinfectant or treatment at the point of use should be routinely done at the point of use to prevent the extent of any post-delivery contamination. Table 4.12 highlights frequency of drinking water treatment at the point of use. The Table shows that treating drinking water at the household level is at 10 with 12.8% always treating their water.

<b>Frequency of water treatment</b>	<b>Frequency</b>	<b>Percent</b>
Always	10	12.8
Sometimes	4	5.1
Total	14	17.9
Missing	64	82.1
<b>Total</b>	<b>78</b>	<b>100.0</b>

**Table 4.14: Access to Latrine**

The aim of a safe excreta disposal is to ensure that the environment is free from contamination by human feces. People have adequate numbers of toilets, sufficiently close to their dwellings, to allow them rapid, safe and acceptable access at all times of the day and night. As fecal coli form bacteria (>99% of which are *E. coli*) are an indicator of the level of human/animal waste contamination in water and the possibility of the presence of harmful pathogens. Table 4.14 highlights access to latrine at the household level. This Table shows that the majority of the population's at 71 with 91% do not have access to a sanitation facility as a latrine.

<b>Latrine access</b>	<b>Frequency</b>	<b>Percent</b>
Yes	7	9.0
No	71	91.0
<b>Total</b>	<b>78</b>	<b>100.0</b>

**Table 4.15: Disposal of Children’s Stool**

Particular attention should be given to the disposal of children’s feces, which are commonly more dangerous than those of adults, as the level of excreta-related infection among children is frequently higher and children lack antibodies and can easily be carried off to water sources by caregivers. Table 4.15 highlights the disposal of children stool after defecation. This Table shows that majority of the responses at 88.5% do throw it the open field. In these households it is highly likely that feces from children may play a significant role in transmitting diseases to other children and adults.

<b>Disposal means</b>	<b>Frequency</b>	<b>Percent</b>
Bury it	1	1.3
Throw in the field	69	88.5
Throw in the latrine	7	9.0
Missing	1	1.3
<b>Total</b>	<b>78</b>	<b>100.0</b>

**Table 4.16: Times of Hand Washing**

The first indicator proposed is based on the assumption that knowledge of the critical moments for hand washing with soap to prevent diarrheal disease is an internal determinant of the practice. The five critical moments include: after defecation, after cleaning a child, before preparing food, before feeding a child, and before eating.

<b>Hand washing times</b>	<b>Frequency</b>	<b>Percent</b>
Always when the hand is dirty	5	6.41
After visiting the latrine	3	3.85
Before preparing food	10	12.82
Before eating	23	29.49
After eating	17	21.79
After cleaning children	6	7.69
Before and after milking	14	17.95
<b>Total</b>	<b>78</b>	<b>100.00</b>

**Table 4.17: Water Borne Disease Protection**

Water-related disease transmission is due to much as insufficient water for personal and domestic hygiene as to contaminate water supplies. Table 4.17 highlights how the community protects from waterborne diseases. The Table shows 25.51% have the knowhow of hand washing as the main means of protection from water borne diseases with the least at 1 with 1.23% linking water borne disease to the use of a latrine.

<b>Protection of water borne diseases</b>	<b>Frequency</b>	<b>Percent</b>
Using safe drinking water	15	19.75
Use of latrine	1	1.23
Keeping the environment clean	18	23.46
Washing hands	20	25.51
Maintaining personal hygiene	14	18.11
Mosquito nets	10	11.93
<b>Total</b>	<b>78</b>	<b>100</b>

**Table 4.18: Maintaining Good Hygiene**

If organic solid waste is not disposed of, major risks are incurred such as surface water pollution which can leads to environmental health problems associated with polluted surface water. Table 4.18 highlights action the community practices to maintain good hygiene. The Table shows that the majority at 37 with 46.98% cite keeping compound clean as the main action to maintaining good hygiene.

<b>Actions for good hygiene</b>	<b>Frequency</b>	<b>Percent</b>
Bathing regularly	30	38.26
Keeping compound clean	37	46.98
Washing hands all the time	11	14.77
<b>Total</b>	<b>78</b>	<b>100</b>

## CHAPTER FIVE

### SUMMARY OF THE FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 Introduction

This chapter summarizes findings, conclusions and recommendations made from the study. The discussions are thematically presented based on the objectives of the study.

#### 5.2 Summary of the Findings

The findings are summarized in tables output from data analysis of SPSS to reflect the relationships by mean, standard deviation and variance.

**Table 5.1: Statistics for Water Quality Practices**

		Do you have access to the latrine	What do you do with children stool
N	Valid	78	77
	Missing	0	1
	Mean	1.90	2.08
	Std. Deviation	.305	.315
	Variance	.093	.099

The Table 5.1 highlights access to latrine and children's disposal at the household level. The responses from the mean for access to latrine indicate low deviation and insignificant variance showing poor access to latrine. Hand washing appropriateness can be determined through observations and questioning caregivers or food preparers, as "how and when do you wash your hands usually or in the last 24 hours. Data analysis and interpretation of responses from the target population revealed the following major findings under this objective. It revealed that majority at 90% do wash hands before eating and the least at 11% after visiting "the latrine". Majority at 86% washed hands with soap and water citing major reasons for washing hands as to prevent diseases at 50%. Majority of the population sampled at 26% thought washing of hands best protected them from diseases with the least at 1% of use of latrine. How to maintain hygiene was best cited as by keeping the compound clean at 47% with bathing regularly at 30%.

**Table 5.2: Statistics for Water Treatment Practices**

---

	How do you protect your family from water borne disease?	What are the important actions to maintain good hygiene
N Valid	78	78
Missing	0	0
Mean	3.60	1.76
Std. Deviation	1.606	.687
Variance	2.580	.472

---

The Table 5.2 highlights water borne diseases protection and actions to maintain good hygiene. The mean for how the community protects family from water borne diseases is relatively high with a higher variance than deviation indicating many options for the community in means they use while actions to maintain good hygiene show fewer options but larger margins in difference options.

Data analysis and interpretation of responses from the target population revealed the following major findings under this objective. It revealed that Majority of the population sampled have 5 Jerri canes of 20 liter storage capacity at the household level. 96.2 % of the respondents cleaned their water storage containers with the majority cleaning them at least once every 2 weeks at 35.9%. Majority at 53.8% used water, soap and scouring pad to clean their water storage containers. Mode of water transportation from source was mainly the donkey at 76.9% with the majority of the people not treating their water at 67.9%. Water storage in the majority of the household with plastic tank closed was at 82.1%. it also revealed that the majority of the population at 91% sampled lacked access to latrines citing high costs/expensive to have to acquire a latrine at 42%. The findings revealed that 88% mostly disposing the children's stool by throwing in the field. These findings indicate that sanitation level is still very low a high risk to water sources which can be termed as unimproved sanitation situation this could owe to the lack of awareness of usage and importance of latrines, when used by adults themselves and for the disposal of infants stools can reduce diarrhea by 36%; cholera by 66% or more worm infestations by 12-86%.

**Table 5.3: Cross tabulation for Water Sources**

		From which source do you fetch water for domestic use during dry season						<b>Total</b>
		Earth dam	Seasonal river	Scoop dry river bed	Boreholes	Protected rocks	Piped water	
From which source do you fetch water for domestic use during rainy season	Earth dam	7	1	4	8	10	2	<b>32</b>
	Seasonal river					2		<b>2</b>
	Scoop river beds				1			<b>1</b>
	Protected rocks	2	3	12	11	15		<b>43</b>
<b>Total</b>		<b>9</b>	<b>4</b>	<b>16</b>	<b>20</b>	<b>27</b>	<b>2</b>	<b>78</b>

Table 5.3 highlights from which source do you fetch water for domestic use during rainy season with which source do you fetch water for domestic use during dry season. The relationship shows that the most preferred source of water both during dry and rainy season is the protected rock catchment.



### **5.3 Discussion of the Findings**

#### **5.3.1 Water Sources Influences Community Health Practices**

The first objective was to establish how water sources influences community health practices of Kajiado Central District Residents; data analysis and interpretation of responses from the target population revealed the following major findings under this objective. The distance between the nearest water access point and each household is one indicator of the access to safe water. The number of people with access to safe water is defined as within 30 minutes or 1 kilometer of the household in rural areas, and 5 minutes or 200 meters in urban areas. The time includes traveling each way, waiting, and collection of water. In order to reduce the time and energy required for fetching water and to encourage the use of safe water sources, the Sphere Project states that water access points should be a maximum of 500 meters from every household or at least thirty minutes away.

The study revealed that the time taken to fetch water during the rainy season was at 88.5% of less than one hour. Time taken to fetch water during the dry season was 55.1% of 1-2 hours. It further revealed that the source most preferred for domestic water use both during rainy and dry season is protected rock catchment, with piped water as the least at 3.8%.

These findings indicate that the population still lacks access to safe water as they have to travel more than 30 minutes as the time taken to get water with low storage capacity per household of about 80 liters per household of seven persons yet minimal requirements are 20 l/p/d with the water quality an issue as it not treated at source or point of collection. This could owe to the low intervention by the government and aid agencies to intervene to construct water infrastructure close to the villages or communities to improve the health of the community. Improved water supply can generally be associated with a reduction in diarrhea by 20%.

#### **5.3.2 Water Storage Influence On Community Health Practice**

The second objective was to ascertain how water storage influence community health practice of Kajiado Central District Residents. People should have adequate facilities and supplies to collect, store and use sufficient quantities of water for drinking, cooking and personal hygiene, and to

ensure that drinking water remains safe until it is consumed according to sphere standards. The amount of storage capacity required depends on the size of the household and the consistency of water availability. Sanitation is defined as an improved sanitation facility such as a latrine that is functional and hygienic according to (Bartram, et al 2005). They stated further that for people to have access, it should be located within 30 meters or less of the household, be available at all hours, and be useable by children and the elderly. Other considerations include whether the facility is shared, public, or private and the time to reach the facility. Specific observations may involve the type of facility whether it is simple pit latrine, ventilated improved pit latrine, as a basic structure of facility to provide privacy and keep out animals, place for hand-washing within or near the facility and proper disposal of the feces of young children. For a maximum health impact, at least 75% of households in a given community should use hygienic toilets or latrines (esrey et. al, 1991).

Data analysis and interpretation of responses from the target population revealed the following major findings under this objective. It revealed that Majority of the population sampled have 5 Jerri canes of 20 liter storage capacity at the household level. 96.2 % of the respondents cleaned their water storage containers with the majority cleaning them at least once every 2 weeks at 35.9%. Majority at 53.8% used water, soap and scouring pad to clean their water storage containers. Mode of water transportation from source was mainly the donkey at 76.9% with the majority of the people not treating their water at 67.9%. Water storage in the majority of the household with plastic tank closed was at 82.1%. it also revealed that the majority of the population at 91% sampled lacked access to latrines citing high costs/expensive to have to acquire a latrine at 42%. The findings revealed that 88% mostly disposing the children's stool by throwing in the field. These findings indicate that sanitation level is still very low a high risk to water sources which can be termed as unimproved sanitation situation this could owe to the lack of awareness of usage and importance of latrines, when used by adults themselves and for the disposal of infants stools can reduce diarrhea by 36%; cholera by 66% or more worm infestations by 12-86%.

### **5.3.3 Water Treatment and Quality Influence on Community Health Practice**

The third objective examines water treatment and quality influence on community health practices of Kajiado Central District Residents. According to (Doe, 2007) appropriate hand-washing for caregivers and food preparation consists of three main elements; of an available hand-washing area, soap with water and correct hand-technique, lastly practicing hand washing at critical moments. Critical moments include after defecation, after handling children's feces, before feeding, before eating, and before preparing food (Bartram, et. al, 2005). Hand washing appropriateness can be determined through observations and questioning caregivers or food preparers, as "how and when do you wash your hands usually or in the last 24 hours. Data analysis and interpretation of responses from the target population revealed the following major findings under this objective. It revealed that majority at 90% do wash hands before eating and the least at 11% after visiting "the latrine". Majority at 86% washed hands with soap and water citing major reasons for washing hands as to prevent diseases at 50%. Majority of the population sampled at 26% thought washing of hands best protected them from diseases with the least at 1% of use of latrine. How to maintain hygiene was best cited as by keeping the compound clean at 47% with bathing regularly at 30%.

These findings indicate that importance of hand washing and keeping clean among the population is modest this could owe to the fact that there is awareness but more education on critical times of hand washing. Hand washing with soap or substitute and water after contact with stools can reduce diarrheal disease by 35% -48% or more. Soap is important in cleaning hands, clothes, bodies, and removing disease-causing organisms from the environment in other ways. Eye and skin infections can also be reduced with more frequent face and body washing. This indicator measures the ability of individuals in the population to carry out necessary cleaning.

### **5.4 Conclusions**

This study investigated factors influencing safe water and sanitation practices on community health of Kajiado Central District Residents in Kenya, it was intended that the study was to determine and describe how water sources; water storage containers; water quality and treatment; hand washing practice; use of latrines; water related diseases and general hygiene as the factors

that affect the water, sanitation and hygiene this was in relation that the study sought to establish and recommend why there are still millions of people particularly the poor in sub-Saharan Africa who are missing out on improvements to drinking water and sanitation within the study area.

The study specifically sought to establish how water sources influences community health practices of Kajiado Central District Residents. The study established that the study area stills lacks access to safe water in view of these findings, the study concludes that health education awareness on use of safe drinking water sources with focus on water source for the community for drinking and water for domestic use should be upheld by the government and development partners. Furthermore, awareness for drinking water treatment should be conducted, by encouraging either boiling or filtering and treating with chlorine bleach to be an integrated part of the education program. Additionally, the regular cleaning of water storage containers should be emphasized in the awareness program for water quality improvement.

The study further sought to ascertain how water storage practice influence community health practices of Kajiado Central District Residents. The study established that the study area stills lacks access to improved sanitation in view of these findings, the study concludes that awareness on latrine usage and illustration on link between feces and how disease spread with proper disposal of feces should be supported by concerned stakeholders in the sector.

Lastly, the study further examined water treatment and quality influence on community health practices of Kajiado Central District Residents. The study established that the study area hygiene practices are still low as many people reported washing their hands before eating or after eating and before and after milking. Relatively few, however, reported washing hands after “using the latrine” a major cause for water contamination at household level; and in view of these findings, the study concludes that focus for health awareness is to be on hand washing with key times to wash hands “using the latrine”.; use of soap or soap alternatives such as ash with training of what is ‘dirty’.

The researcher has argued in this report that water, sanitation and hygiene activities should be fully integrated so that people understand links between unprotected water sources, diarrheal diseases, latrine use and interruption of the fecal-route of disease transmission, and importance of hand-washing. This could be done well through health promotion awareness to encourage people to wash their hands after defecation, before eating and food preparation. More so, average water use for drinking, cooking and personal hygiene in any household should be at least 15 liters per person per day (water quantity) and construction of sanitation facilities within the study area should be encouraged and promoted with support of relevant government and aid agencies.

It is against this background that the recommendations below are made. Despite its limitations, this study should be able to update information on water; sanitation and hygiene and its adverse impacts on the poor within the study area. It should serve as a working document to policy makers and stakeholders in the water, sanitation and health sector. Last but not least, the study should further serve as benchmark data for further research for academic purposes and as an added literature to the existing knowledge. Basing generalizations on the findings of this study, the researcher recommends that factors that influence water situation within Kajiado Central are improved to reduced incidence of water-related diseases amongst target population. Furthermore, factors that influence sanitation within Kajiado Central are enhanced by promotion of improved access to safe and appropriate construction of household sanitation facilities. Lastly, factors that affect hygiene within Kajiado Central are addressed through promotion and awareness campaigns on key sanitation and hygiene practices in target areas.

### **5.5 Recommendations for Further Research**

Research into efficiency and effectiveness of hygiene promotion awareness as a way of preventive measure of diseases through sensitize community to construct and use latrines and safe disposal of children's feces after cleaning and not throwing into the open fields.

Health education or hygiene promotion awareness that borders on the benefits obtained from acceptable sanitation and hygienic practices should be studied to see how it will be able to contribute to the attainment of the millennium goals.

## REFERENCES

- Bartram, J., Lewis, K., Lenton, R., & Wright, A. (2005). Focusing on improved water and sanitation for health . *Lancet.* , 365: 810-12.
- Chifunde, & Changara. (1995). *Water and Sanitation Baseline Survey in Tete Province.*, Mozambique: American Refugee Committee.
- Doe, H. W. (2007). *Assessing the Challenges of Water Supply in Urban Ghana: The case of North Teshie* . Department of Land and Water Resources Engineering . Stockholm: Royal Institute of Technology (KTH).
- esrey et. al. (1991). Importance of hygiene and sanitation in reducing disease transmission study. *the effects of water supply and sanitation*. Bull. WHO.
- Handicap International. (2009). *Guideline for KAP Survey Managers Knowledge, Attitudes and Practices for Risk Education: how to implement KAP surveys*.
- IWA. (2004). *The Bonn Charter for Safe Drinking Water*. Bonn: International Water Association.
- JMP. (2012). *Progress on Drinking Water and Sanitation: 2012 Update WHO/UNICEF*. Joint Monitoring Programme for Water Supply and Sanitation. WHO/UNICEF.
- Khan, M. R. (2010 ). *Beyond Traditional KAP Surveys . Need for Addressing Other Determinants of Behavioral Change For More Effective Hygiene Promotion* . Bangladesh: South Asia Hygiene Practitioners' Workshop.
- Kyeyune, R. (1999). *Ethnography: A Handbook for beginning researchers*. Kampala: Quick Acts Entrprises.
- Lagardere, J. (2007). Methodology for a health and hygiene baseline survey for WSUP projects. In *MSc. Thesis*. Cranfield University.
- LDA, W. C. (2009). *Findings of a household survey conducted in 18 districts of Mozambique* . Mozambique : UNICEF.
- Mathew, B. (1988). A planner manager's guide to the socio-economic issues involved in rural water projects in the Third World. In *MA Dissertation, Agricultural Extension and Rural Development Centre*,. UK.: Reading University.
- Mellor, J. E. (2009). *Water and Sanitation Accessibility and the Health of Rural Ugandans* by A. Michigan Technological University.

- Mugenda, O., & Mugenda, A. (1999). *Research methods; quantitative & qualitative approaches*. Nairobi: Acts press.
- Odhiambo, A. (2010). *KAP Baseline Survey Report for Water and Sanitation in Kajiado District*. Nairobi: Care International Kenya (CIK).
- Panagopoulos, G. P., Antonakos, A. K., & Lambrakis, N. J. (2006.). Optimization of the DRASTIC method for groundwater vulnerability assessment via the use of simple statistical methods and GIS,. *Hydrogeology journal* , 14:894-911.
- Patton., M. (1990). *Qualitative evaluation and research methods* (2nd ed.). Newbury.
- Peletz, R. L. ( 2006). *Cross-Sectional Epidemiological Study On Water And Sanitation Practices In The Northern Region Of Ghana* . The Massachussets Institute Of Technology .
- SIDA. (2004). *Strategy for water supply and sanitation: Pure Water*. Stockholm: SIDA.
- Tezera, B. S. (2011). *Development Impacts of Poor Accessibility of PoTable Water Supply and Basic Sanitation in Rural Ethiopia: A case study of Soddo District*. Faculty of Economics and Social Sciences Center for Development Studies. University of Agder.
- UNDP. (2010). *'Millennium Development Goals report 2010'*. Retrieved June 2013, from <http://www.un.org/millenniumgoals/environ.shtml>
- UNICEF. (2005). *UNICEF Baseline Household Survey: Household-Based Drinking Water Treatment*. Solutions Consultant.
- UNICEF. (2011). *WASH in Schools Monitoring Package*. UNICEF/INDA.
- UNICEF, & WHO. (2006). *Core questions on drinking-water and sanitation for household surveys*. World Health Organization and UNICEF.
- Verweij, M., Mukakalisa, B., & Mukasine, A. S. (2008). *Does A Baseline Exercise Strengthen Capacities For Wash? Rwanda Water and Sanitation Case Studies*. SNV Netherlands Development Organisation.
- WASH, R. T. (2008). *WASH Programme of BRAC: Towards Attaining the MDG Targets: Baseline Findings*. BRAC.
- WHO. (2012). *Rapid assessment of drinking-water quality: a handbook for implementation*. World Health Organization.
- Yoder, R. A. (2008,). *Knowledge, Attitudes, And Practices Survey Baseline Evaluation In Aragatsotn, Armavir, And Ararat Marzes*. MPH Chief of Party Primary Healthcare Reform Project.

## APPENDIX I

### LETTER OF TRANSMITTAL OF DATA COLLECTION INSTRUMENTS

Bertha Naliaka,  
P.O Box 79, 50204.  
Kimilili

12<sup>th</sup> May 2014

Dear Sir/Madam,

**Re: FACTORS INFLUENCING SAFE WATER AND SANITATION PRACTICES ON  
COMMUNITY HEALTH IN KENYA: A CASE OF KAJIADO CENTRAL DISTRICT**

My name is Bertha Naliaka of University of Nairobi, am carrying out this research for partial fulfillment of the requirement for the award of the degree of Masters of Arts in project planning and management at the University of Nairobi

My research shall be on factors influencing water, sanitation and hygiene by use of a knowledge, attitude and practice household interview survey.

The information you are going to give is for academic purposes only and your identity and information will not be shared with anyone hence will be treated with utmost confidentiality.

Thank you in advance.

Yours Faithfully,

Bertha Naliaka,  
MA Student,  
**University of Nairobi**



**APPENDIX II**

**QUESTIONNAIRE**

**Section A: Demographic Characteristics of Respondents**

1. My gender is (use  $\surd$ ) (a) Male [ ] (b) Female [ ] Indicate your gender

Male [ ] Female [ ]

2. Indicate your highest level of education

Secondary level [ ] bachelors degree [ ]

Masters degree [ ] PhD holder [ ]

Other certification (specify) [ ]

**Section B: Water Sources on Community Health Practices.**

3. How long does it take you to walk to and from the water source during rainy season?

Indicate the most likely time taken to walk. (Use  $\surd$ ).

1	2	3	4
Less than one hour	1- 2 hours	2-5 hours	Above 5 hours

4. How long does it take you to walk to and from the water source during dry season?

Indicate the most likely time taken to walk. (Use  $\surd$ ).

1	2	3	4
Less than one hour	1- 2 hours	2-5 hours	Above 5 hours

5. From which source do you mostly fetch water form for domestic use during rainy season?

Indicate the most likely source to which. (Use  $\surd$ ). Use: 1- Unlikely 2-Sometimes 3Most Likely

Indicators for Source of water	1	2	3
Earth Dam/Pan			
Flowing seasonal river			
Scoop dry river bed			
Protected Shallow well			

Unprotected shallow well			
Borehole			
Protected Rock /roof catchment			

6. From which source do you mostly fetch water from for domestic use during dry season? Indicate the most likely source to which. (Use √). Use: 1- Unlikely 2-Sometimes 3Most Likely

<b>Indicators for Source of Water</b>	<b>1</b>	<b>2</b>	<b>3</b>
Earth Dam/Pan			
Flowing seasonal river			
Scoop dry river bed			
Protected Shallow well			
Unprotected shallow well			
Borehole			
Protected Rock /roof catchment			

### Section C: Water Storage and Community Health Practices

7. Do you clean your water containers? Yes  No

Indicate if the water containers are cleaned. (Use √). Use: 1- Never 2-Occasionally 3-Frequently

<b>Indicators for cleaning water containers</b>	<b>1</b>	<b>2</b>	<b>3</b>
Daily			
Once a week			
Every two weeks			
Once a month			
When dirty			
Don't Clean			

8. a) How many Jerri cans (20 liters) of water do you have? \_\_\_\_\_

b) Any other additional water storage \_\_\_\_\_

9. What do you use to clean the containers?

Indicate how the water containers are cleaned. (Use √). Use: **1-** Never **2-**Occasionally **3-** Sometimes **4-** Frequently

<b>Indicators on how water containers are cleaned</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Water only				
Water +Soap				
Water +Soap+ Scouring pad				
Water+ Sand				
Water+ Sand+ Scouring pad				
Water+ Scouring pad				

Other (specify) \_\_\_\_\_

10What is your main method of water retrieval from the source?

Indicate main method for water retrieval from source. (Use √). Use: **1-** Unlikely **2-**Sometimes **3-** Likely **4-**Most Likely

<b>Indicators on reasons for cleaning water containers</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Dipping jerrican into water				
Jug with handle				
Tap stand				
Bucket and rope				
Hand				

a) Other (specify) \_\_\_\_\_

10. How do you store water in your home?

Indicate most probable means of storage at home. (Use √). Use: **1-** unlikely **2-**Sometimes **3-** Likely **4-**Most Likely

<b>Indicators for water storage</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Jerry can (open)				
Jerry can (closed)				
Bucket (open)				
Bucket (closed)				
Pot				
Plastic tank (open)				
Plastic tank (closed)				

Other (specify) \_\_\_\_\_

**Section D: Water Quality and Community Health Practices**

11. Do you treat your water before drinking? 1. Yes  2. No

12. How often do you treat your water? . (Use √).

1. Never  2. Sometime  3. Always

13 Why do you treat your domestic water?

Indicate reasons for treating water. (Use √). Use: **1-** Never **2-**Sometimes **3-** Likely **4-**Most Likely

<b>Indicators for treating water</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
To avoid diseases				
To kill germs				
To make it clean/pure				

14 Do you have access to a latrine? (Use √). s No

15 What do you do with children stool? Indicate most likely action for children's stool disposal.

(Use √). Use: 1- unlikely 2-Sometimes 3- Likely 4-Most Likely

Indicators for children's stool disposal	1	2	3	4	5
Bury it					
Throw in the field					
Throw in the latrine					

Other (Specify) \_\_\_\_\_

16. Indicate most probable time for washing hands. (Use √). Use:

1- unlikely 2-Sometimes 3- Likely 4-Most Likely

Indicators for times of washing hands	1	2	3	4
Always when my hands are dirty				
After visiting the latrine				
Before preparing food				
Before eating				
After eating				
After cleaning children				

17 What do you use to wash your hands? Indicate most probable means for washing hands.

(Use √). Use: 1- unlikely 2-Sometimes 3- Likely 4-Most Likely

Indicators for times of washing hands	1	2	3	4
Plain water				
Water + Soap				
Water + Ash				
Water + Sand				

How do you protect your family from water borne diseases? Indicate most likely action for protection from water borne diseases

(Use √). Use: **1**- unlikely **2**-Sometimes **3**- Likely **4**-Most Likely

<b>Indicators for protection from water borne diseases</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Use of safe drinking water				
Use of latrines				
Keeping the environment clean				
Washing hands				
Maintain personal hygiene				
Mosquito net				

Other (Specify) \_\_\_\_\_

What are the important actions to maintain good hygiene? Indicate most likely action for maintaining good hygiene. (Use √). Use: **1**- unlikely **2**-Sometimes **3**- Likely **4**-Most Likely

<b>Indicators for maintaining good hygiene.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Bathing regularly				
Keeping compound clean				
Washing hands all the times				

**THANK YOU**