FACTORS INFLUENCING ADOPTION OF WATER SANITATION AND HYGIENE PRACTICES IN KENYA: A CASE OF SHIVANGA LOCATION, KAKAMEGA COUNTY.

BY

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DECLARATION

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

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The research report has been submitted for examination with my approval as the university supervisor.

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DEDICATION

This work is dedicated to my father Mr. Fredrick Olwande Opele and my mother Mrs. Margaret Mukadi Luka, my little sisters Milka Akoth Olwande and Cornex Liz Olwande for being my fountain source of inspiration and continuous encouragement.

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ABSTRACT

The purpose of this study was to investigate factors that influenced adoption of water, sanitation and hygiene practices among the population of Shivanga Location, Kakamega County. The objectives included; establishing how social cultural aspects; determining extent which community participation stages; assessing how accessibility to WASH interventions; and determining the extent which water sources influenced adoption of water, sanitation and hygiene practices in the study area. The researcher encountered bad terrain and poor road network that posed challenges to accessibility of respondents and water points during data collection. The study adopted a descriptive survey research design that was appropriate as it enabled the researcher to collect and analyze both qualitative and quantitative data. The study was conducted to the household members of Shivanga location, targeting a population of 4,000 households, with a sample size of 351 respondents as determined by Krejcie and Morgans table within which consisted of 2 NGO representatives and 2 Nursing Officers in Charge from the community health care facilities. Open and closed ended questionnaires were utilized as primary tools for data collection. The collection technique included document analysis, questionnaires and interviews. Piloting of the instrument sought using 10% of the sample size to ascertain validity of the instrument, reliability was assessed using test – retest reliability technique and yielded a coefficient of 0.8 above the recommended 0.7 by Creswell,. Literature was reviewed from previous studies and journals. Data was analyzed using descriptive statistics such as frequencies and percentage counts, categorical responses were then cross tabulated to analyze relationship between variables and to further ascertain their significance of association chi square tests were conducted and presented using frequency and percentage, cross tabulations and chi tables. Quantitative data was analyzed using Statistical Package for Social Sciences (SPSS) Version 20.0, while qualitative data was thematically presented and reported in a narrative way. The study established that majorly socio-cultural aspects influenced the study as indicators studied within its components reveal that male roles significantly influenced adoption as presented by 166 (57.8%) of the respondent strongly agreeing, within which 107 (64.5%) held the opinion that it does and a p-value $0.005<0.05$, female roles were was also significant as they were represented by 167 (58.2%) within which 108 (64.7%) acknowledged it's influence, with a p-value $0.006<0.05$. Level of education also influences adoption by 164 (57.1%) strongly agreeing, within which 106 (64.6%) acknowledged the influence which depicted a p-value $0.007<0.05$. Information sharing was presented by163 (56.8%) who strongly agreed, within which 106 (65.0%) held the opinion that it does with a p-value $0.012<0.05$. Community level planning as a component within community participation as a factor studied, also post a significant association to the dependent variable as represented by those who strongly agreed at 161 (56.1%), within which 104 (64.6%) held the opinion that it influences adoption with a p-value $0.008<0.05$. Other factors that the studied revealed that policy implementation at multiple levels as a moderating factor, influenced adoption of WASH practices as elaborated with p-value 0.005. The study therefore recommends that further research is needed within the area of socio-cultural aspects and their influence in WASH behaviors.

LIST OF ABBREVIATION

ASAL Arid and Semi-Arid Land

CHW Community Health Worker

CP Community participation

EPA Environmental protection Agency

HIV/AIDS Human Immunodeficiency Virus/Acquired Immunodeficiency Disease

HBM Health Belief Model

IPA Innovations for Poverty Action

KAP Knowledge Attitude and Practice

KEMRI Kenya Medical Research Institute

MDG Millennium Development Goals

NACOSTI National Commission for Science Technology and Innovation

NGO Non-Governmental Organization

RWSH Rural Water Sanitation and Hygiene

SPSS Statistical Package for Social Scientist

UNESCO United nations Educational, Scientific and Cultural Organizations

UNICEF United Nations Children's Education Fund

WASH Water sanitation and Hygiene

WHO World Health Organization

CHAPTER ONE

INTRODUCTION

1.1. Background to the study

WASH-related diseases are endemic and leading cause to a high infant mortality rate. The basic deprivation is denying children a critical opportunity to build their knowledge of basic hygiene skills like hand washing, drinking safe water and adequate sanitation which are essential to protect their health and their ability to learn at school. About 4% of the global burden of diseases is attributed to water, sanitation and hygiene (Pruss et al. 2002). Globally, diarrhea alone kills more children compared to malaria and tuberculosis together (Odi 2008).

In Europe, Rural Turkey has faced greater issues of access to safe water and sanitation. Despite this, substantial gains have been made with access to basic sanitation increasing to 76% by 2011. Those numbers represent thousands of people whose lives have been improved by the simple investment of sanitation improvements. About 90% of Turks now have access to improved water sources and some level of sanitation infrastructure. Since 1989, life expectancy on average in Turkey rose from 64 to 75. While several other factors helped lead to this dramatic increase, sanitation has a vital role to play in decreasing preventable deaths and illnesses. Though Turkey is no longer a low-income country, it shows how better access to clean water and adequate sanitation can impact communities around the world struggling to escape extreme poverty (Water Supply, Sanitation and Sewage-Turkey, 2011)

In Bangladesh-Asia, every year more than a hundred thousand under-five children die due to diarrhea-related diseases. On average, episodes of diarrhea occur more than twice a year among the children (Bern et al. 1992). Research indicates that more than

half of acute illnesses are attributed to water, sanitation and hygiene-related across all age groups (BRAC 2008). Research indicates that washing hands without soap after defecation and before eating are common in Bangladesh. Several underlying factors such as availability, affordability and negligence are associated with these unhygienic practices. Furthermore, most of the people are not much aware about the route of transmission of waterborne diseases which increase the risk notably (BRAC 2008).

In Africa, Ghana's sanitation coverage still remains low, where only 18% and 7% of the urban and rural population respectively use unimproved sanitation facility (13% total). Shared sanitation is extremely common in Ghana, and 54% of the population uses this type of sanitation facility. Diarrheal diseases are major threat for the age of under-five mortality rate in Ghana as they are affected more than any other age group. In Ghana, 20% of the children under-five years of age experienced at least one episode of diarrhea during the two weeks preceding the DHS (GSS, 2009). In Rwanda approximately 29% of population does not have an access to improved water source while 25% do not have an access to improved sanitation facilities. Lack of access to improved water and sanitation facilities and poor hygiene practice in Rwanda, particularly in rural area, is contributing to high incidences of water, sanitation hygiene related mortality and morbidity. Due to low coverage of improved water supply, women and girls in rural areas have to walk long distances in difficulty hilly terrain to fetch water from unprotected sources. This not only affects the physical condition of women and girls adversely but also their economic productivity as fetching water takes bulk of their time from their hectic daily routine (UN Agency, 2014).

Kenya is facing big challenges with regards to water and sanitation where 23,000 deaths result annually from diarrheal diseases, and urgent attention is needed to meet

its national and international commitments. It is essential that water and sanitation facilities are available in schools and health centers, with separate facilities for male and female, and proportionate facilities for disabled people, all times of the year, at all levels (Kenya Water and Sanitation Network, 2013).

Kakamega is one of the counties experiencing scarcity of water. The county faces serious challenges with regards to protection of water resources, development of water infrastructure, adoption of appropriate technologies and sustainable provision of water and sanitation facilities. (County Water Supply and Urban Sewerage Strategic Plan 2015-2019).

This research will study the factors that influence adoption of water, sanitation and hygiene practices through a KAP survey; KAP survey serves as an educational diagnosis of the community (Khan, 2010).

1.2. Statement of the problem

Improved hygiene and adequate sanitation are the most fundamental components of effective public health regime. In order to estimate the diarrheal disease burden attributable to water, sanitation and hygiene, and help inform the MDG target of increasing access to improved water and sanitation, it is necessary to assess coverage, and to collect information about WASH Knowledge, Attitude and Practice within the communities of interest. Monitoring changes in access to and use of improved water and sanitation systems, as well as improvements in hygiene behavior, are essential to track growth or decline in access and use. In many rural communities of the developing countries, the practice of open defecation and use of unsafe water persists because the conditions that cause them have not been adequately analyzed or taken into account before projects are started (Dittmer, 2009). Unsafe water and unsanitary

practices is the root of many health problems in the developing world and are hindering U.S. and International global health effort, lack of safe water, adequate sanitation and good hygiene practices have continued to be a challenge exposing many people in Kenya to possible deaths as a result of infections despite many intervention programmes targeting the poor households, (UNICEF 2010). Addressing gaps in coverage will require not only fundamental shifts in policy making and funding priorities, but also significant and meaningful changes in behavior at the individual, household and community level, and if this is not addressed children will remain susceptible to unsafe water and poor sanitation related deaths and disability rates will be twice as high among children younger than 14. WHO (2012) points out that some 5,000 children die daily from preventable water- and sanitation-related diseases, 90% of whom die before age five. WHO believes the impact of unclean water and unsanitary practices is underestimated, because of weak data collection and insufficient research on several WASH issues. Kakamega is one of the counties experiencing scarcity of water. The county faces serious challenges with regards to protection of water resources, development of water infrastructure, adoption of appropriate technologies and sustainable provision of water and sanitation facilities. (County Water Supply and Urban Sewerage Strategic Plan 2015-2019).

Therefore, this study aims to investigate the factors that influence the adoption of water, sanitation and hygiene practices in Kakamega County.

1.3. Purpose of the study

The purpose of the study was to investigate the factors influencing the adoption of water, sanitation and hygiene practices in Kakamega County.

1.4. Research Objectives

The following research objectives guided the study;

1. To establish how social cultural aspects influence adoption of water, sanitation and hygiene practices in Shivanga location of Kakamega County.
2. To determine the extent which community participation influence adoption of water, sanitation and hygiene practices in Shivanga location of Kakamega County.
3. To assess how accessibility to WASH interventions influence adoption of water, sanitation and hygiene practices in Shivanga location of Kakamega County.
4. To determine the extent which water sources influence adoption of water, sanitation and hygiene practices in Shivanga location of Kakamega County.

1.5. Research Questions

1. How does socio-cultural aspect influence the adoption of Water sanitation and hygiene practices in Shivanga location of Kakamega County?
2. How does community participation influence adoption of water, sanitation and hygiene practices in Shivanga location of Kakamega County?
3. How does accessibility to WASH intervention influence the adoption of water, sanitation and hygiene practices in Shivanga location of Kakamega County?
4. How do water sources influence the adoption of water, sanitation and hygiene practices in Shivanga location of Kakamega County?

1.6. Significance of the study

The prevalence of diarrhea in developing countries has encouraged the development of low-cost, behavior based interventions to control diarrhea-causing

pathogen transmission by improving water quality at the point-of-use, environmental sanitation and hygiene promotion such as hand washing with soap at critical times.

The findings of this study therefore, shall inform practical aspects of water, sanitation and hygiene practices in developing countries. The study will provide information on socio-cultural aspects, community participation stage, accessibility to intervention, and water sources which can be taken into account when developing a water, sanitation and hygiene intervention programme and strategies. The findings can also be used to strengthen the designing and implementing projects as prescribed in the social pillar of Vision 2030 where Kenya, envisions a society enjoying equitable social development in a clean and secure environment. The findings will be used to inform implementation of national sanitation and hygiene policies such as the Water Act, National Environmental Sanitation and Hygiene policy, among others.

1.7. Basic assumptions of the study

The study was based on the assumption that

1. House-hold level members of the community are facing similar conditions in relation to factors influencing the adoption of water, sanitation and hygiene practices.
2. The respondents were co-operative and gave voluntary accurate information, honest and provided unbiased information, objective and found appropriate time to fill the questionnaires.
3. It is also assumed that the findings and recommendations of the study will be useful to the relevant stakeholders, future researchers, academicians, policy

makers and administrators in the Ministry of Health of the Government of Kenya.

1.8. Limitation of the study

The researcher faced the following limitations: bad terrain and poor network, which means that movement was a challenge. The researcher therefore made arrangements for suitable, flexible means to ease the movement and reduce the time taken during data collection.

1.9. Delimitation of the study

The study was carried out in Kakamega county particularly among the communities who live where WASH programme has been implemented. The findings were limited to the extent that it could not be purported to represent the views of Luhya community. The findings of this study was not taken as a full analysis of the culture of the Luhya but can be used to understand community participation, accessibility to intervention, and socio-cultural practices among others that affect safe water use, sanitation and hygiene practices in this community and others who live in similar context.

1.10. Definition of Significant Terms Used in the Study

Adoption of water and sanitation and hygiene practices –acquisition of behavior on adequate and proper utilisation of techniques of water and sanitation and hygiene.

Hygiene –Any practice that stops fecal-oral transmission of pathogens.

Sanitation- Any practice that ensures a safe disposal of faeces and hygienically separates human waste from human contact

Social-Cultural aspect - relating to, or involving a combination of social and cultural factors like beliefs, religion and attitude

Community participation stage- collective action point in which local people initiate action, set the agenda, and work towards a commonly defined goal.

Accessibility- Availability of water, sanitation and hygiene intervention

Water sources - Water collection points such as, boreholes, springs, earth dams, earth pans, shallow whales among others.

1.11. Organization of the study

The study is organized as follows: Chapter one which is introduction consists of background to the study, statement of the problem , purpose of the study , objectives of the study, research questions significance of the study , limitations of the study , delimitations of the study and definition of significance terms. Chapter two includes: introduction, the concept of adoption, Sanitation and Hygiene, accessibility, community participation, social cultural aspect, safety of water sources, theory and theoretical framework and conceptual framework. Chapter three; research methodology includes: introduction, research design, target population and sample size and sampling procedure, research instruments, instruments validity and reliability, data collection procedure and data analysis techniques and operational definition of variables of the study. Chapter four; data analysis, interpretation and presentation and finally chapter; summary of the findings which was drawn from the results of data analysis in chapter four, followed by discussions of the findings, conclusions and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

This chapter reviews literature about influence of adoption of Water and Sanitation practices on community hygiene in Kakamega North sub-county. It covers the concept of water and sanitation practices, theory and objectives and theoretical and conceptual framework of the study.

2.2. The Concept of Adoption of water and sanitation practices

In the decade since the publication of the 1995 paper on UNICEF strategies in water and environmental sanitation, a growing body of evidence has demonstrated the critical importance of water, sanitation and hygiene (WASH) for children. Increasing the equitable access to and use of safe water and basic sanitation services and improved hygiene practices will reduce child mortality, improve health and education outcomes, and contribute to reduced poverty and sustainable development as a whole, (UNESCO 2003). The Millennium Agenda and the Millennium Development Goals start with children: they can only be met and sustained when the rights of children to health, education, protection and equality are realized. The Millennium Declaration and the Goals recognize the importance of safe drinking water and sanitation to meet these global commitments. The World Summit on Sustainable Development in 2002 set the target of halving, by 2015, the proportion of people who do not have sustainable access to basic sanitation. This is now an integral part of Target 10 under Millennium Development Goal 7 on ensuring environmental sustainability: halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation. Two core human rights instruments — the Convention on the Rights of the Child and the Convention on the Elimination of All Forms of Discrimination

against Women explicitly recognize the right to water. The latter also recognizes the importance of sanitation. In 2002, the United Nations formally declared access to domestic water supply a human right in and of itself, through General Comment No. 15 of the Committee on Economic, Social and Cultural Rights, (UNICEF 2010).

2.2.1. Social Learning Theory

The social learning theory, later renamed social cognitive theory by Professor Albert Bandura 1986, proposes that behavior change describes a dynamic, ongoing process in which personal factors and human behavior exert influence upon each other. The theory states that “an individual learns from another by means of observational modeling; that is, one observes what another person is doing, and then does something similar” (Bandura, 1986). The basic perspective of social cognitive theory is that the individual can learn from observation of other people's activities, so the individual does not actually need to experience a verbal exchange of information in order for the individual's behavior to be influenced by the model. Thus, nonverbal communication is considered important in behavior change (as well as verbal communication).

Social learning theory seeks to explain how individuals change their overt behavior as a result of communication with another individual. The theory also stress information exchange is essential to behavior change, and views such network links as the main explanation of how individuals alter their behavior. Behavior is part of a cultural system which consists of abstract values, beliefs and world perceptions that lie behind people’s actions and which that behaviour reflects (Haviland, 2010).

People therefore learn and mimic practices associated with water use, sanitation and hygiene within their environment, observing the practices associated

with such practices and internalizing them within their socio-cultural context, and this affects their behavior.

2.3. Social cultural aspects and adoption of water and sanitation practices

Traditional cultural practices reflect values and beliefs held by members of a community for periods often spanning generations. Every social grouping in the world has specific traditional cultural practices and beliefs, some of which are beneficial to all members, while others are harmful to a specific group, such as women A safe and sustainable water supply, basic sanitation and good hygiene are fundamental for a healthy, productive and dignified life. And yet many of the world's poor rural people lack access to an improved water supply (900 million) and improved sanitation facilities (2 billion) (Joint Monitoring Programme for Water and Sanitation, 2006). Progress towards the United Nations Millennium Development Goal 7 for water and sanitation is particularly poor in sub-Saharan Africa. Poor access to water, sanitation and hygiene results in tremendous human and economic costs and rein forces gender and other societal inequalities, most notably for women and girls. Chronic diarrheal diseases debilitate victims and, coupled with malnutrition, induce a negative spiral into poverty. The productive activities of poor rural people, such as schooling and farming, are severely restricted by ill health from water- and excreta-related disease, as well as by the time and energy spent fetching water. Rapidly increasing populations, more migration from rural to urban areas and the feminization of the rural economy are significantly changing the rural context. This 'new rurality' is also affected by external shocks – such as the effects of climate change and globally interdependent markets. Such changes augment the vulnerability of many poor rural people and demand innovative approaches to the provision of rural water, sanitation and hygiene.

In order to estimate the diarrheal disease burden attributable to water, sanitation and hygiene, and help inform the MDG target of increasing access to improved water and sanitation, it is necessary to assess coverage, and to collect information about WASH knowledge, attitude and practice within the communities of interest. Monitoring changes in access to and use of improved water and sanitation systems, as well as improvements in hygiene behavior, are essential to track growth or decline in access and use. In many rural communities of the developing countries, the practice of open defecation and use of unsafe water persists because the conditions that cause them have not been adequately analyzed or taken into account before projects are started (Dittmer, 2009).

Unlike in developed countries where almost everybody is accessing safe water and sanitation services (Semba, et al., 2011; WHO/UNICEF, 2010), poverty and other socio-cultural factors may be a contributing reason for lack of safe water, lack of latrines and use in many communities in developing countries. Studies have been done on WASH issues but many of them do not always explain why some people continue to practice open defecation or use unsafe water long after their community has been provided with water points and learned about latrines and hygiene practices (Dittmer, 2009).

Socio-cultural factors such as gender, religion and belief, attitude and awareness have influence in people's lives and are intertwined with daily activities such as water use, sanitation and hygiene. Problems associated with water, sanitation and hygiene span the globe but are embodied locally, within the specific circumstances that pertain to individual communities. According to WHO (2003), water is probably the only natural resources to touch all aspects of human civilization including cultural and religious values embedded in society. Culture shapes people's

behavior in any society and such behaviors play a key role in the way water and sanitation is perceived and practiced (WHO 2003).

Behaviors in water use and sanitation can be shaped through myths, fallacies and misconceptions that are developed overtime and passed from one generation to another (Quareshi & Shaikh 2006). Myths, fallacies and misconceptions about water use, sanitation and hygiene have existed in almost all the societies and through all ages. Myths are collectively shared fantasies that contribute to the psychological stability of both individuals and society. People in every culture or tradition have a stock of myths and fallacies not only about water use and sanitation, but on all societal aspects which they defend with various explanations as natural, cultural and biological (Qureshi & Shaikh, 2006).

On the other hand misconceptions are the false impressions and misapprehensions. These could be mistaken thoughts, ideas, or notions that develop and prosper in societies, mostly leading to malpractices in terms of health beliefs and health seeking behaviors. Such myths and fallacies hinder the logical approach to seek appropriate health care and information, resulting in various health problems and even death (Qureshi & Shaikh, 2006). These myths, fallacies and misconceptions play a major role in water management and use, improving sanitation and hygiene practices and form part of the socio-cultural characteristics which determines health seeking behavior in any given environment.

Any relations between people and their environment are embedded in culture (UNESCO, 2003). Due to the elementary role of water and sanitation for people's life, the way to treat, handle and use water as well as latrine has ever been anchored in people's cultural values and traditional practices. There are clear differences of

attitudes towards the use of sanitation facilities and the handling of feces between diverse cultures which inform diseases present in that particular society. In most cultures in the western world societies, it is the duty of the government to provide water and sanitation services to each and every individual as a social contract to avert diseases and therefore, almost all of the population have toilet. This came as a result of a threat from disease and social revolution in the nineteenth century which ensured that provision of safe water and waste disposal; especially faces is given higher priority (Jewitt, 2011).

According to Batram and Cairncross (2010), 99 percent of people in developed countries have access to improved sanitation, while in developing countries only 53 percent have such access exposing them to diseases. This comparison explains why in many developing countries where water use and sanitation provision is surrounded by cultural taboos and beliefs, report many cases of death due to diarrhea and other water borne infections (WHO, 2010).

Many behavior and attitude of the people are drawn from traditional beliefs and cultural values which, in certain circumstances resist the use of latrines (Water Aid, 2009). According to WHO/UNICEF (2012) joint monitoring programme on WASH report, Eastern Asia, Southern Asia and sub-Sahara Africa are the regions with the lowest sanitation coverage due to what Roberts (2005) calls socio-cultural aspects of health. Roberts argue that social and cultural aspects of a people are intertwined and together impact on their health and behavior. Despite an instinctive repulsion towards human waste, culture influence people's attitudes and perceptions towards handling of feces and influences latrine use (Schelwald & Reijerkerk, 2009; Warner et al., 2008). According to a study done in four countries in West Africa, environmental sanitation was found to be particularly poor in villages where

inadequate or non-existent latrines and a lack of dedicated areas for the disposal of rubbish sites which pollute the water sources are present (Water Aid, 2009), yet the communities were associating illnesses as a result of poor environmental sanitation with witchcraft. While lack of sanitation facilities may be attributable to poverty, or other socio-cultural factors, community members are responsible for most of the factors that affect their environment and health. Discharging waste water in public spaces, dumping garbage close to households, and open defecation in areas around the village affects the environment, contaminates ground water and cause health problems yet most of these practices are surrounded by cultural taboos and beliefs.

People's perceptions are informed by cultural dimensions and taboos which are often associated with existing hygiene and defecation practices, norms and preference across social groupings and settings (Jenkins et al., 2001). Social and cultural issues have a great impact on the environment and may lead to environmental pollution. Environmental pollution as a result of open defecation and poor waste management often leads to diarrheal and other infections within the community. Defecation in the open grounds also exposes people to parasitic infections such as worms or helminthes. Parasitic intestinal worms are transmitted by eggs excreted in human feces and urine which contaminates the soil and water sources in areas with poor sanitation practices or low adoption of point of use water improvement technologies.

In a study done in Nigeria, Gazzile et al, (2002) reports that poverty and other socio-cultural determinants of worm infestation in many developing countries are not documented, yet it is a major problem just like tuberculosis, HIV/AIDS and malaria. Ethno medical practices and beliefs tend to delay diagnosis and treatment. The worm infestation situation as a result of poor WASH practices is worse in sub-Sahara Africa

where many people in peri-urban slums and rural areas are infected. It is estimated that more than 400 million children are chronically infected in developing countries (Kimotho, 2011) and do not seek immediate medical attention. According to Gazzile et al, (2012) In Kenya as elsewhere in sub-Sahara Africa, according to Kenya Medical Research Institute (KEMRI), children are the most affected by helminthes infestation recording the highest intensity of worm infection in areas that are heavily contaminated and where sanitation and hygiene practices are poor such as the Coastal and Lake regions (Kimotho, 2011). This is also due to the contamination of the environments that people live with human feces and other household wastes due to poor sanitation and hygiene practices. This contamination of environment comes as a result of socio-cultural practices which are often ignored in most WASH interventions.

Despite many studies and surveys on water, sanitation and hygiene diseases transmission in community settings, there is little documentation on the social and cultural contribution to the transmission of these infections (Hancart-Petitet et al., 2011). Based on small scale studies on hand washing practices in sub Saharan Africa as documented by Curtis et al. (2009), the prevalence of hand washing ranges from between 3 per cent and 29 per cent due to socio-economic, psychosocial and behavioral factors (Schmidt et al., 2009). These shows how strong cultural issues are embedded into people's daily activities and how it defines their existence. In Kenya, due to socio-cultural issues such as distance to water sources, taboos, beliefs, economic implication and religious practices, some people are condemned to practice open defecation and reliance on unsafe water such as from street water vendors for their household water supply (Schmidt et al., 2009). Schmidt et al. (2009) further observed that mass media have a greater role in changing social norms and attitudes

of people, a factor that may contribute positively to adoption of WASH behaviors that promote health.

2.4. Community Participation stages and adoption of water, sanitation and hygiene practices

Participation does not necessarily imply self-help home building by undernourished and over-worked people without credit; with inadequate tools and poor materials. The central issue is that of control and power to decide (Turner 2007). The discussion of community participation in architecture, first initiated in the 1960s, became a buzzword in mid-1970s after the sites and services housing schemes received funding and acceptance by the World Bank in the developing countries (Nabeel Hamdi, 2004). However, it is important to understand the meaning of community participation as it has been misused and abused in many projects claiming to have community participation as a project component. First understanding the meanings of the words ‘community’ and ‘participation’ individually can best explain the term ‘community participation’. (Nabeel Hamdi et al 1997), points out that the term community has both “social and spatial dimensions” and that generally the people within a community come together to achieve a common objective, even if they have certain differences. The concept of a community works on the age old principles of ‘unity is strength’ and ‘united we stand’. A group of people always has advantage over a single individual in getting his or her voice heard, especially in the case of have-nots of the society.

Nabeel Hamdi presents an opposing view that the communities are not necessarily always organized and cohesive and sometimes lack the “sense of community” and “social identity” He explains that for community participatory projects, it is not a must to have an already well organized community right from the

beginning but the sense of community can be achieved during the course of the project, which can also be one of the objectives of including community participation in development projects Charles Abrams gives a good example of the sense of community in the case of people living in a squatter settlement. These squatters, living within the confines of the same settlement, have common objectives and work together to protect and legalize their dwellings. Their survival against the authorities rests upon cooperation among them and hence, the sense of community is strengthened by their common goals. Compare this with the generally nonexistent sense of community among the residents of a posh neighborhood with the best physical form of housing, (Abrams 1974).

According to Majory (2010), Communities can be defined by the characteristics of its people's geographic boundaries, history shared interests, values and power relations. There exists vital interactions and networking within the community. The elements of a community includes; common symbol systems, common values, a sense of membership, common needs and commitment to meet them and a shared history. A community is a Multidimensional system which is variable, shaped and re-shaped continuously by changing actions and relationships. For any community project to work, community participation and involvement is a must. Sustainability of project is wholly dependent on a community. For a community to sustain technologies or behaviors they must have adequate awareness and understanding of the behavior and its benefits. Community participation is vital in all projects implemented in a community. For community participation to be successful, community based need assessment needs to be conducted before any project is brought to them.

Communities should be involved in all stages of the project, from the planning through to the building and managing of systems, by doing this, long term solutions can be found that are suited to their own needs and locally available resources. Rather than being imposed by outsiders, for example; development agencies, donors and governments projects should solve the communities' own problems which in most cases are different from other communities. Community participation is very crucial especially during the initial stages of a project. With clear understanding of the how and why of their projects or systems, communities will be committed to their projects and feel a sense of ownership for them. Ultimately community participation is all about creating an enabling environment for communities to help themselves. By utilizing their own skills and resources communities are able to take their first steps out of poverty and move towards sustainable development. Awareness creation speeds the level of adoption of innovations among the users. (Bartle P. 2004).

Awareness is an important factor in encouragement of consumers to adopt related self service facilities Palvia (2010). Awareness campaign about innovations is a necessary step in ensuring that adoption of water and sanitation practice is effective. Organization of seminars, conferences and workshops for users should be done. These workshops, seminars and conferences should aim at raising the level of awareness of the infrastructure challenges, to discuss the users need, to promote and encourage multi-stakeholder approaches, to solicit feedback from management and staff. The Knowledge and attitude of the community largely impacts the sustainability and uptake of Wash practices (Medicine M, 2011). Awareness programs in communities can be done via outreaches and use of locals like CHW's who themselves are community members. Community participation (CP) contributes to all important enabling environments that community requires in order to function. Eventually, the

responsibilities of the community should be present at every stage of the project implementation. In this way the community assumes responsibility, authority and control over its own development. Despite the rather complex nature of community participation in the management of water resources, it is possible to identify the preconditions that create the enabling environment in which community management can occur. Important preconditions for Community Participation include: - There must be community demand for improved hygiene system (Gesci, 2011).

The information required to make informed decisions must be available to the community. Technologies and levels of service must commensurate with the community's needs and capacity to finance, manage, and maintain them. The community must understand its options and be willing to take responsibility for their system. The community must be willing to invest in capital and recurrent costs. The community must be empowered to make decisions to control the system. Effective external support must be available from governments, donors, and the private sector e.g. training, technical advice, credit, and Attention should be given to the community involvement in all the stages of projects implementation (Gicheru, 2012).

In a study conducted to assess the influence of community participation on the performance of Kiserian Dam project in Kenya, it revealed very low levels of community participation in identification, planning, implementation and monitoring of the dam project. This has influenced the overall performance of the project (Mukunga 2012). Community participation is also largely influenced by the mobilization methods to acquire, and use WASH technologies and adopt this practices without push and hence turning this practices to behavior. Evidence available seem to indicate that, adoption of community mobilization has greatly improved the effectiveness of water supply programs especially operations and maintenance of the

facilities. In Pakistan, Balochistan province community mobilization approach under the local name Karez has been responsible for effectively acquiring, allocating and managing water from the hill torrents without external institutional support (Karim Nawaz, 1998 Quresh and Abdallah, 2000)

2.5. Accessibility to intervention and adoption of water, sanitation and hygiene practices

Access to drinking water from an improved source is significantly higher in urban than in rural areas. In rural areas, in virtually the entire developing world, drinking water coverage from an improved source remains unacceptably low. (Cairncross et al, 2010). A 2012 update of the, "Progress on Drinking Water and Sanitation", published by the WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation, states that the United Nations' Millennium Development Goal (MDG)that aimed to halve the amount of people without access to potable water was successfully met five years ahead of schedule in 2010. Although this is laudable achievement, there are still almost 800 million people worldwide (11% of the total population) with no access to safe water sources. The report estimates that by 2015, 92 per cent of the global population will have access to improved drinking water (WHO/UNICEF, 2012).

The report highlights the immense challenges that remain. Global figures mask massive disparities between regions and countries, and within countries. Only 61 per cent of the people in sub-Saharan Africa have access to improved water supply sources compared with 90 per cent or more in Latin America and the Caribbean, Northern Africa, and large parts of Asia. Over 40 per cent of all people globally who lack access to drinking water live in sub-Saharan Africa, (WHO/UNICEF, 2012). Lack of access to safe, clean drinking-water and basic sanitation, as well as poor

hygiene cause nearly 90% of all deaths from diarrhea, mainly in children (Pruss-Ustun A. et al, 2008: 2009). While 87% of the world's population now has access to improved water sources, 39% still lack access to improved sanitation. Moreover, in developing countries 1.1 billion people still defecate in the open, and hand washing with soap is practiced, on average, only after 17% of toilet uses (WHO/UNICEF 2010).

In Kenya, as is in many societies in Africa, women, especially those in rural areas, bear the burden of collecting drinking water for the household. This perception is reinforced by the patriarchal nature of society. In nearly half of Kenyan households (49 percent), it is women and children especially girls who are responsible for water collection. In rural households, women are six times more likely than men to be the ones to fetch water. This water is more likely to be contaminated at the collection point, during transportation or storage thereby transmitting diseases despite the knowledge of water quality improvement options (UNICEF, 2010).

Availability of hand washing stations that have soap, clean water for use and sanitation technologies may highly affect the adoption of hand washing, clean environment and treated water. Most rural areas in Kenya get water from rain water or water pints like streams and bore holes, the treating and storage of this water which has been used for multiple purposes leaves a lot to be determined. Availability of materials to construct WASH technologies like the tippy tap, chlorine dispensers and ‘kipupuu’, Know how/skills on how to construct WASH technologies like the latrine, requirements needed what depth is appropriate for the latrine and its location. This however can be done through the community awareness seminars and methods. For WASH practices to be sustainable the materials for WASH technologies must be

available locally and they should also be affordable and materials that the community can relate with (Gicheru, 2012).

The proximity from a household to the nearest water point is an indicator to the access to water. This is time consuming especially in emergency assessment surveys. In most cases water points are not evenly distributed and therefore households have to cover varying distances in search of water. This influences the level of involvement and ownership. Distance to water points influences the time taken and quantities drawn since there are no water distribution systems in most arid and semi-arid lands, ASALs (Gicheru,2012).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 1001/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 from all these sources to use for household activities need treatment based up on their impurities (WHO, 2008).

2.6. Water sources and adoption of water, sanitation and hygiene 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 safe drinking water, and 2.6 billion people lack access to adequate sanitation. Approximately 5000 people die from every day from diarrheal illness, mostly children under five primarily virtually all in developing countries due to unsafe water and sanitation. 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).

Communities should focus on water source protection, establishing good hygiene and sanitation as well as household treatment. People need about 20 liters/p/d which is considered being basic access to water and should be 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 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).

Though the treatment and the degree of cleanness of 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).

According to the Environmental Protection Agency, Sources of drinking water are subject to contamination and require appropriate treatment to remove disease-causing contaminants. Contamination of drinking water supplies can occur in the source water as well as in the distribution system after water treatment has already occurred. There are many sources of water contamination, including naturally occurring chemicals and minerals like uranium, local land use practices (fertilizers, pesticides, concentrated feeding operations), manufacturing processes, and sewer overflows or wastewater releases. The presence of contaminants in water can lead to adverse health effects, including gastrointestinal illness, reproductive problems, and neurological disorders. Infants, young children, pregnant women, the elderly, and people whose immune systems are compromised because of AIDs, chemotherapy, or transplant medications, may be especially susceptible to illness from some contaminants (EPA, 2008).

Water source and water resources protection are essential if high quality waters are to remain uncontaminated. Ground, waters and surface waters are vulnerable to pollution and both require localized and larger-scale actions to prevent pollution of drinking-water sources. Surface waters are open to more immediate pollution and once a pollutant enters a surface water body, it is likely to move rapidly. This means that the pollutant will spread rapidly through the surface aquatic system, although it may make remediation easier, except where there is significant water-sediment interchange. Groundwater has more natural defenses against pollution, however once it becomes polluted it is very difficult to remove the pollutant from the

groundwater system and residence times of pollutants may be decades, centuries or longer. Different types of aquifer have differing degrees of vulnerability and thus have different protection requirements. Both surface and groundwater resources are protected by defining land-use zones around them. This ensures that the establishment of potentially polluting activities is not allowed within a distance that would allow easy pollutant movement. Control of pollution is vital for water source and water resource protection and should be rigorously enforced (Chilton et al., (1996)

2.7. Theoretical Framework

Theories of health behavior change emphasize the role of individual's perceptions in influencing the probability of performing protective behavior to prevent illness. A whole set of theories and models including among others the Health Belief Model, Theory of Reasoned Action/ Planned Behavior, Social Cognitive Theory and Trans-theoretical Model, has been built to understand change in health behavior, (Redding et al. 2000). The health Belief Model (HBM) is probably the theory that is the most related to the purpose of this study since it focuses on the role of individual's perception in influencing the probability of performing protective behavior to prevent illness.

Health Belief Model is a psychological model that tries to explain and predict health behaviors by focusing on attitude and beliefs of individuals. The theory was first developed in 1950's by psychologists Hochbaum Rosenstock and Kegels. Some of the proponents are Irwin M. Rosenstock, Godfrey Hochbaum and Stephen Kegels who attempted to predict health-related behaviour in terms of certain belief patterns. This proposes that action is guided by beliefs about the impact of illness and its consequences, health motivation or readiness to be concerned about health matters, behavioral evaluation or belief about the consequences of health practices and

possibilities and efforts to put the acquired behaviour into practice (Hausmann-Muela et al., 2003). Thus, for behavioral change to succeed, people must have an incentive to take action, feel threatened by their current behavioral patterns and believe that change of a specific kind will be beneficial by resulting in a valued outcome at acceptable cost, but they must also feel themselves competent (self-efficacy) to implement that change (Rosenstock, Strecher& Becker, 1988).

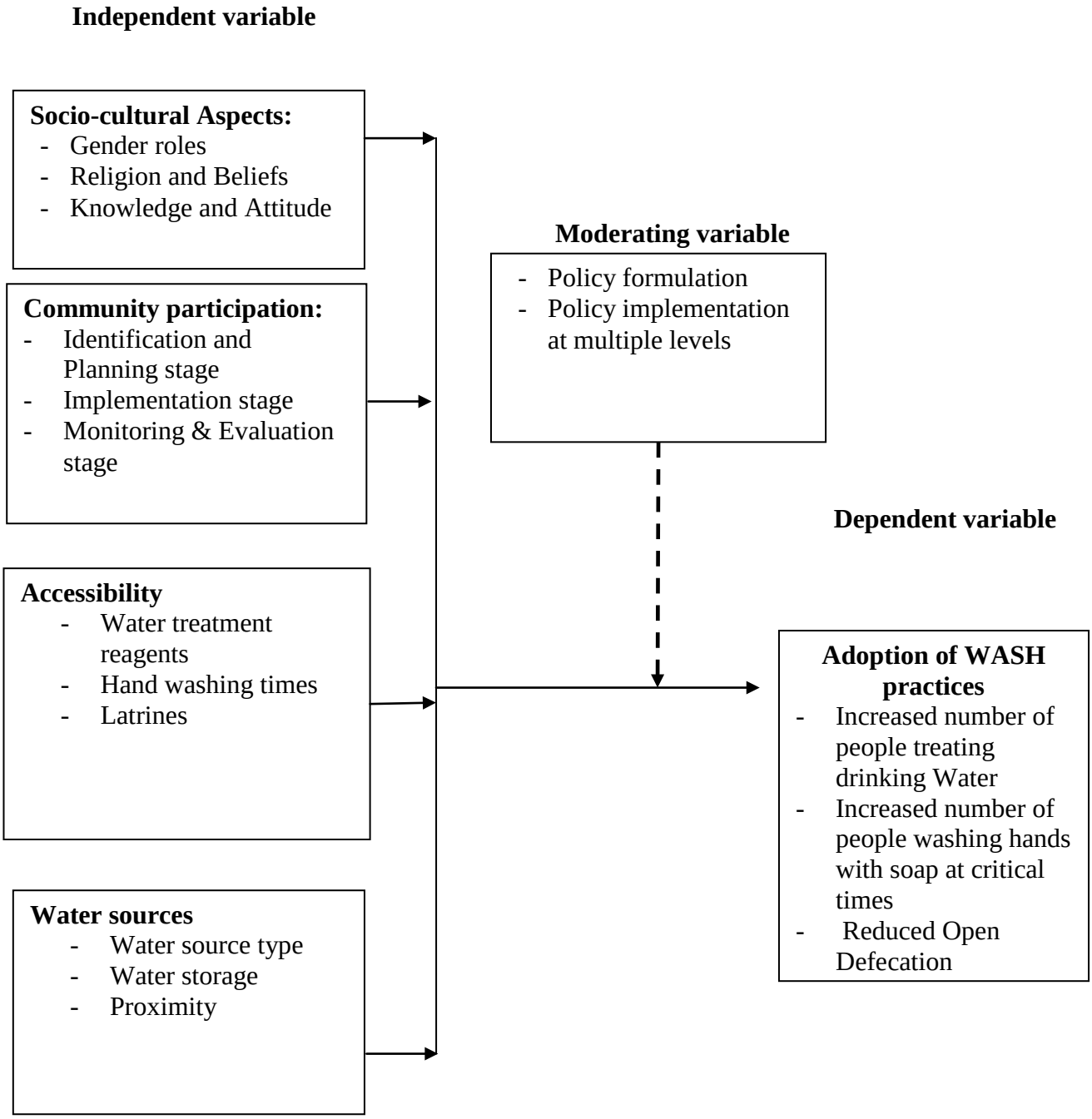
Individuals are therefore likely to adopt water and sanitation practices if they perceive that they are susceptible to develop hygiene related diseases, when there are some perceived benefits attached to adopting water and sanitation practices far much outweighs the cost of lost pay and perceived severity related to the consequences of not adopting water and sanitation practices, for example, if a person expects, as recommended, that using soap when washing hands, treating drinking water and properly disposing of feces will prevent diarrhea, then such a person will react to such recommendation positively and adopt its practice.

The health belief theory is relevant for the study in that individuals or household can adopt safe water and good hygiene practices such as construct latrines, water treatment, hand washing and other hygiene behaviors only after understanding the perceived benefits from such actions.

2.8. Conceptual Framework

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 presumed relationships among them.

Figure 1: Conceptual framework



2.9. Knowledge gap

Table 2.1: Gaps in knowledge

Study/Author	Findings	Gaps
Hancart-petitet et al, (2011), Social and Cultural Dimension of Hygiene in Cambodian Health Care Facilities	The importance of comprehensive understanding of hygiene practices	Ignored Social Cultural aspect of Health on health seeking behavior and hygiene practices
Cleaver and Toner (2006), Sustainability Assessment of National Rural Water Supply in Tanzania	Prioritized engineering component in safe water supply	Sidestepped community participation in improvement of hygiene
Hullan et al (2015), What factors affect sustained adoption of safe water, hygiene and sanitation technologies	Intervention factors external to users influence adoption of WASH	Ignored Outreach Availability of intervention
Shaheed et al (2014), why "improved" water sources are not always safe	Consistency to access to water of high quality is central to delivering health benefits.	Ignored health impacts associated with safety of water sources.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Introduction

This chapter on research design was composed of the following: research design, target population, sample and sampling techniques, research instruments, pilot testing, validity and variability, data collection procedure, data analysis techniques, ethical considerations and operational definitions of variables.

3.2. Research design

This study adopted a descriptive survey research design. Descriptive survey was appropriate for this study because it enabled the researcher to collect and analyze both qualitative and quantitative data. Descriptive survey design is a method of collecting information by interviewing or administering questionnaires to a sample of individuals hence suitable for extensive research. It is an excellent vehicle for the measurement of characteristics of large populations (Orodho, 2003). It maintains a high level of confidentiality, it is convenient and enables data to be collected faster, enables questions to be asked personally in an interview or impersonal through a questionnaire about things which cannot be observed easily. It also gives the study an opportunity to get an accurate view of responses to issues usually derived from the objectives at both the individual and group level (Kothari, 2004).

3.3. Target Population

A population is defined as complete set of individuals, cases or subjects with some common observable characteristics (Mugenda and Mugenda 2003). The study was conducted to the household members of Shivanga location of Kakamega county Kenya. The target population was 4,000 households, among which there were 4 key informants comprising of 2 Nursing Officers in Charge from two dispensaries of

Shivanga health center and Namagara dispensary, which are the health facilities used in the Location, and 2 NGO representatives from Innovations for Poverty Action.

3.4. Sample size and sampling procedures

This section discussed the number of respondents that were selected to represent the larger population and the process of selecting these respondents.

3.4.1. Sample size

The target population of the study was 4000 household of Shivanga location. Krejcie and Morgan's formula was used to determine sample size because the sample is less than 10,000 (Krejcie and morgan 1970)

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

s= Required sample size

X^2= The table value of chi-square for one degree of freedom of the desired confidence level ($1.96 \times 1.96 = 3.841$)

N= The population size

P= The population proportion (assumed to be 0.5)

d= The degree of accuracy expressed as a proportion (0.05)

s= $3.841 \times 4000 \times 0.5(1-0.5) \div 0.05^2 \times (4000-1) + 3.841 \times 0.5(1-0.5)$

$=7682 \times 0.25 \div 0.0025 \times 3999 + 3.841 \times 0.25$

$=3841 \div 9.9975 + 0.96025$

$=3841 \div 10.95775$

=350.53

S=351 household representatives

This formula yielded a sample size of 351 respondents out of 4000 target population.

3.4.2. Sampling procedure

Stratified sampling technique was use to categorize the population into strata of four sub-locations namely Teresia with 1,172 households, Muriola with 994 households, Fuvuye with 974 households and Cheptuli with 860 households. The number of households in each sub-location was obtained from the Sub-county data base file. To select the representative sample size of each stratum, the researcher employed the formula as shown in table 3.1;

Table 3.1 Sample distribution of Shivanga location

Sub-locations (Strata)	**No of HH** N_i	**Sample size** $n_{i=\frac{N_i}{N}} \times n$
Teresia	$N_i =$ 1,172	103
Muriola	$N_i =$ 994	87
Fuvuye	$N_i =$ 974	85.5
Cheptuli	$N_i =$ 860	75.5
Total	$N = 4000$	$n_i = 351$

Where: n is the sample size of the population in the whole location

N_i is the population of each stratum (where $_i$ =1, 2, 3, 4)

N is the population target in the whole location (N=N1+N2+N3+N4)

n_i is the sample size in each stratum/ sub-location (where $_i$=1, 2, 3, 4)

Source: Yamane, (1967) Elementary sampling Theory

Finally Simple random sampling was used to select one household representative from the sample size. This ensured that each household had an equal chance of participating in the study. The study also employed purposive sampling to select Key Informants who are representatives of a Non-Governmental Organization and Nursing Officers in Charge, since they were in key leadership positions to providing information relevant to the study.

3.5. Research Instruments

The study utilized questionnaires as primary tools for data collection. The questionnaire contained close-ended questions. Qualitative data was collected through use of open ended questions from the Key Informants who were the representatives from the Innovations for Poverty Action an Non-Governmental Organization and Nursing officers in Charge. Quantitative data was collected from closed-ended questions which were developed to obtain information from the respondents. The collection technique included document analysis, questionnaires and interviews. The instruments were self-made.

3.5.1 Pilot Testing

The instruments were piloted in order to standardize them for the actual study. The pilot study was carried out in the neighboring Burundu location with a buffer zone of one location between them. According to Mugenda and Mugenda (2009), 10% the total number of respondents was appropriate to conduct pilot study and a population of 35 household representatives was sampled. The questionnaire return rate was 100%.

The pilot testing enabled the researcher to identify any possible errors in the instruments and rephrase some questions. Interviewer effect was also checked and the researcher and the research assistants together went through the questions to ensure uniformity in the mode of how to administer the questionnaire to the respondents and also to help in testing for reliability and validity of instruments.

3.5.2 Validity of the Research Instruments

Validity determines whether the research items truly measure what they are intended to measure or how factual the research results are (Golafshani, 2003). To test content validity (extent to which the sample is representative of the population) experts opinion in the water, sanitation and hygiene field was sought. The result from the pretest were compared and all necessary corrections were made before the main stages of data collection

3.5.3 Reliability of the Research instruments

Reliability is the measure of the degree to which a research instrument yields consistent results of data after repeated trials (Mugenda and Mugenda, 2003). In this study, reliability was assessed using test – retest reliability technique. This method involved giving the same test to the same respondents on two separate occasions and the scores on the two occasions were then correlated. The closer each respondent's score was on test one (T1) and test 2 (T2), the more reliable the test measure

The instruments were categorized into two sets to determine if the responses were consistent. The first set was administered to pretest respondents and responses collected. After two weeks the same instruments were administered to the same respondents and responses collected. Comparison in responses was done at 95% confidence level. The results yielded a coefficient of 0.8 and according to Creswell

(2008), a reliability coefficient of 0.7 and above implied that there was significant test-retest reliability of the instruments.

3.6. Data Collection procedure

Before the start of data collection, research permit was obtained from National Council for Science and Technology Innovations (NACOSTI), and a letter of introduction from University of Nairobi. Four research assistants were recruited and trained. Questionnaires were administered with the aid of the research assistants who guided household representatives in filling; and in order to ensure high response rate, the research assistants made known the purpose of the study to the respondents with precision, clarity and assurance of confidentiality. The researcher booked appointment with key informants and set a prior date where she conducted the interviews to the respective key informants. The research assistants later collected the field questionnaires, checked for completeness, performed data cleaning to ensure data quality before coding.

3.7. Data Analysis Technique

The data collected was edited, coded and analyzed using SPSS was analyzed using descriptive statistics such as frequencies and percentage counts and presented using frequency and percentage tables and cross tabulations. Quantitative data was analyzed using Statistical Package for Social Sciences (SPSS) Version 20.0. Quantitative data was presented as guided by themes and objectives and reported in a narrative way, frequencies and percentage tables presented quantitative data while categorical responses on the dependent variable on the factors influencing the adoption of water, sanitation and hygiene practices were cross tabulated and to further ascertain there level of significance on the dependent variable, chi-square tests were conducted.

3.8. Ethical Considerations

The researcher obtained a research permit from National commission for science, technology and innovation (NACOSTI), and an introduction letter from the university. Informed consent was obtained from all the respondents to ensure that they participated willingly and the researcher assured the respondents of the privacy and confidentiality of the information provided. The respondents were informed of the purpose of the study, which was for academic purpose. And lastly the identity of individuals was protected by using unique codes that kept them anonymous.

3.9 OPERATIONALIZATION OF VARIABLES

Table 3.2: Operationalization of variables

Research Question	**Indicators of variables**	**Measurement scales**	**Tools of Analysis**
Social-cultural aspect and Water, Sanitation and Hygiene practices	- Gender roles - Religion & Belief - Knowledge & Attitude	- Nominal	- Frequency tables and percentages - Cross tabulation with Chi-square
Community participation and Water, Sanitation and Hygiene practices	- Identification and planning stage - Implementation stage - Monitoring and evaluation stage	- Nominal	- Frequency tables and percentages - Cross tabulation with Chi-square
Accessibility to intervention and Water, Sanitation and Hygiene practices	- Availability of water treatment reagents - Hand washing interventions - Latrines	- Nominal	- Frequency tables and percentages - Cross tabulation with Chi-square
Water sources and Water, Sanitation and Hygiene practices	- Water source type - Water treatment at source - Proximity to the source	- Nominal	- Frequency tables and percentages - Cross tabulation with Chi-square

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION, INTERPRETATION AND DISCUSSION

4.1 Introduction

This chapter presents findings of the study which have been discussed under thematic and sub-thematic sections in line with the study objectives. The thematic areas include; demographic characteristics of respondents, socio-cultural factors, community participation, accessibility, and water sources in regard to households in Shivanga location.

4.2 Questionnaire return rate

The questionnaire return rate was as shown in table 4.1.

Table 4.1: Sample population and response rate

Category	**Sample size**	**Response rate**	**Percent**
House wives	172	142	40.5
Peasant farmers	76	73	20.8
Teachers	15	13	3.7
Entrepreneurs (trader)	70	41	11.7
Civil servant	14	14	3.9
Nurses	2	2	0.6
NGO representatives	2	2	0.6
Total	**351**	**287**	**81.77**

Results from table 4.1 indicate that there was a return rate of 287 (81.77%). According to Werner (2004), results from surveys with response rates above 80% are considered reliable. The study therefore had a response rate of 287 respondents that constituted 81.77% of the total population. Categorical responses among the

populations included; housewives 142 (40.5%), 73 (20.8%) were peasant farmers, 13 (3.7%) were teachers, 41 (11.7%) were self-employed (traders), 14 (3.9%) were civil servants, 2 (0.6%) and another 0.6% were Nurses and NGO representatives respectively. The high turnout of responses in the category of nurses and NGO representatives and civil servants could be due to their stations of work, which was followed by teachers at 13 (3.7%) and peasant farmers at 73 (20.8%) and then came traders and housewives respectively with 11.7 and 40.5% response rate.

4.3 Demographic characteristics of respondents

4.3.1 Distribution of respondents by gender

The study was interested in establishing how gender related to the adoption of water, sanitation and hygiene practices among the community and the results were as presented in the table 4.2;

Table 4.2: Distribution of respondents by gender

Respondents	**Frequency**	**Percent**
Male	79	27.5
Female	208	72.5
Total	**287**	**100.0**

Results from table 4.2 indicates that from the study population, 79 (27.5%) were males whereas 208 (72.5%) were females. This could be factored as most females chores are water related in the households. This implied that most women in the households are the ones who bear the burden of collecting drinking water for the households which concurs with UNICEF report of 2010, that indicates that nearly half of Kenyan households, it is women and children especially girls who are responsible for water collection.

4.3.2 Distribution of responses according to marital status

The study further sought to establish the marital status of respondents in the study in relation to the adoption of WASH practices in Shivanga location and the results were as tabulated in table 4.3;

Table 4.3: Distribution of responses according to marital status

Respondents	**Frequency**	**Percent**
Married	201	70.0
Divorced	74	25.8
Widowed	7	2.4
Widower	5	1.7
Total	**287**	**100.0**

Results from table 4.3, indicate that married respondents represented the larger population standing at 201 (70%) followed by the divorced at 74 (25.8%), widowed at 7 (2.4%) and lastly widower at 5 (1.7%). This implied that most of the respondents under study, where there is adoption of WSH practices are married.

4.3.3 Distribution of responses according to age

The study further sought to establish how age of the respondents was related to the adoption of water, sanitation and hygiene practices among households of Shivanga location in Kakamega North sub-county. The respondents were therefore asked to state their ages and the results are as shown in the table 4.4

Table 4.4: Distribution of responses according to age

Measurement scale	Frequency	Percent
15 – 19 years	84	29.3
20 – 25 years	119	41.5
26 – 31 years	55	19.2
31 – 36 years	23	8.0
37 – above years	6	2.1
Total	**287**	**100.0**

Results in table 4.4 indicate that most respondents under the study were between the ages of 20-25 years 119 (41.5%) followed by 84 (29.3%) between 15-19 years, 55 (19.2%) between 26-31 years, 23 (8.0%) between 31-36 years and respondents above 37 years were 6 (2.1%). This implied that most among the respondents were aged between 20-25 years represented by 119 (41.5%) and the least representation was of ages above 37 years.

4.3.4 Distribution of responses according to the number of people living in the household

The study also sought to establish how the number of people living in the household related to the adoption of water, sanitation and hygiene practices. The researcher asked the respondents to indicate how many people live in their households and the results were depicted as in the table 4.5;

Table 4.5: Distribution of responses according to the number of people living in the household

Measuring scale	Frequency	Percent
2-5	158	55.1
5-9	98	34.1
10 – above	31	10.8
Total	**287**	**100.0**

The results in table 4.5 indicate that the majority of households are occupied by 2-5 people represented by 158 (55.1%), followed by 5-9 people 98 (34.1%) and above 10 people in the household represented by 31 (10.8%). This implied that, the majority of the respondents lived with 2-5 people in their households and very few respondents lived with more than 10 people in their households.

4.3.5 Distribution of responses according to the number of children living in the household

The study also sought to establish how the number of children living in the household related to the adoption of water, sanitation and hygiene practices. The researcher asked the respondents to indicate how many children live in their households and the results were depicted as in the table 4.6;

Table 4.6: Distribution of responses according to the number of children living in the household

Measuring scale	Frequency	Percent
2-4	173	60.3
5-8	86	30.0
9-above	28	9.8
Total	**287**	**100.0**

Results from table 4.6 indicate that the largest number of children living in a household is between 2-4 children represented by 173 (60.3%), followed by 5-8children 86 (30.0%) and few households had more than 9 children in their households represented by 28 (9.8%).

4.3.6 Distribution of responses according to occupation

The study further sought to establish whether occupation of the male respondents relate to their adoption of water, sanitation and hygiene practices and the results were presented as in table 4.7;

Table 4.7: Distribution of responses according to occupation

Measuring scale	Frequency	Percent
House wives	142	49.5
Peasant farmer	73	25.4
Teacher	15	5.2
Entrepreneur (trader)	41	14.3
Civil servant	16	5.6
Total	**287**	**100.0**

4.3.7 Distribution of responses according to level of education

The study sought to establish how the level of education of their respondents related to their adoption of water, sanitation and hygiene practices. This was the case because awareness levels directly influenced one's knowledge on a topic under study. The researcher asked the respondents to indicate their levels of educations and the results were depicted as in the table 4.8;

Table 4.8: Distribution of responses according to Level of education

Measuring scale	Frequency	Percent
Semi-literate	187	65.2
"O" level	90	31.4
Secondary school	10	3.5
Total	**287**	**100.0**

Results from table 4.8 indicates that the majority of people in the study were semi-illiterate represented by 187 (65.2%), followed by "O" level certificate holders 90 (31.4%) and finally secondary school 10 (3.5%).

4.4. Sociocultural practices and adoption of water, sanitation and hygiene practices

Traditional cultural practices reflect values and beliefs held by members of a community for periods often spanning generations. These aspects are often considered insufficiently if identified at all and there is inadequate knowledge on the subject to be able to ensure suitable and sustainable. Every social grouping in the world has specific traditional cultural practices and beliefs, some of which are beneficial to all members, while others are harmful to a specific group, such as women (UNICEF/WHO, 2014)

4.4.1 Distribution of responses according to male roles that influence adoption of WASH practices

The study sought to investigate male roles that influence adoption of water, sanitation and hygiene practices in Shivanga location, and the results were presented in the table 4.9;

Table 4.9: Distribution of responses according to male roles

Response category	Frequency	Percent
Strongly agree	166	57.8
Agree	102	35.5
Disagree	19	6.6
Total	**287**	**100.0**

Results from table 4.9 indicates that majority of respondents strongly agreed that male roles influenced adoption of water, sanitation and hygiene practice, represented by 166 (57.8%), followed by those who agreed at 102 (35.5%) and those who disagreed were represented by 19 (6.6%).

4.4.2 Cross tabulation showing adoption of water sanitation and hygiene practices and male roles

The study conducted a cross tabulation to investigate significant relationship

within categorical responses and the results were as presented in table 4.10

Table 4.9: Cross tabulation showing adoption of water sanitation and hygiene practices and male roles

		male roles influencing adoption			
Decision status	**Measuring scale**	**strongly agree**	**Agree**	**disagree**	**Total**
Influence adoption	Count % within male roles influencing adoption	107 64.5%	83 81.4%	16 84.2%	206 71.8%
Doesn't influence adoption	Count % within male roles influencing adoption	59 35.5%	19 18.6%	3 15.8%	81 28.2%
Total	**Count % within male roles influencing**	**166** **100.0**	**102** **100.0**	**19** **100.0**	**287** **100.0**
adoption		**%**	**%**	**%**	**%**

Results from table 4.10 show that within the strongly agree category, 107 (64.5%) among the respondents acknowledged that male roles influence adoption of water, sanitation and hygiene practices whereas in the same category, 59 (35.5) were of a different opinion followed by those in agree category where 83 (81.4%) acknowledged its influence on adoption whereas 19 (18.6%) declined and lastly those in the disagree category where 16 (84.2%) acknowledged its influence while 3 (15.8%) held a contrary opinion. This in line with van Wijk-Sijbesma 1998 who asserted that the whole community, women, men and children experience the negative effects of inadequate supply and service through poor health, nutrition and the emotional and physical devastation of recurrent water and waste related disease. However, 'participation of women alongside men in planning, design, maintenance and management has brought distinct benefits to the functioning and use of (water) systems and created more equal chances for training and functions of women and men'.

When a chi-statistic was conducted to establish significance between association of the indicator to the dependent variable, a chi-value, 10.476 (a) at a 2df obtained a p-value of .005, less than the alpha level .05 and therefore posting a significant association.

4.4.3 Distribution of responses according female roles

The study further sought to investigate whether female roles influenced adoption of water, sanitation and hygiene practices and the results were as follows;

Table 4.11: Distribution of responses according to female roles

	Frequency	Percent
Strongly agree	167	58.2
Agree	99	34.5
Disagree	21	7.3
Total	287	100.0

Results from table 4.11 indicates that majority of respondents strongly agreed that female roles influenced adoption of water, sanitation and hygiene practice, represented by 167 (58.2%), followed by those who agreed at 99 (34.5%) and those who disagreed were represented by 21 (7.3%).

4.4.4 Cross tabulation showing distribution of respondents according to female roles.

The study further sought to establish the relationship between categorical responses and the results were as presented on table 4.12;

Table 4.12: Cross tabulation showing distribution of responses between female roles and adoption of WASH

Decision Status	Measuring scale	female roles influencing adoption: strongly agree	Agree	disagree	Total
Influence adoption	Count % within female roles influencing adoption	108	80	18	206
		64.7%	80.8%	85.7%	71.8%
Doesn't influence adoption	Count % within female roles influencing adoption	59	19	3	81
		35.3%	19.2%	14.3%	28.2%
Total	**Count % within female roles influencing adoption**	**167**	**99**	**21**	**287**
		100.0 %	**100.0 %**	**100.0 %**	**100.0 %**

Results from table 4.12 revealed that among the respondents in the category strongly agree, 108 (64.7%) held an idea that female roles influenced adoption of water, sanitation and hygiene practices whereas in the same category 59 (35.3%) held a contrary opinion, this was followed by those in the agree category where 80 (80.8%) agreed its influence while 19 (19.2%) declined and lastly those in the category disagree 18 (85.7%) acknowledged its influence to adoption while 3 (14.3%) declined. This implied that most women in the households are the ones who bear the burden of collecting drinking water for the households which concurs with UNICEF report of 2010, that indicates that nearly half of Kenyan households, it is women and children especially girls who are responsible for water collection.

female roles are enabling adoption of WASH practices was paramount.

To further ascertain significance between association of the indicator to the dependent variable, a chi-value, 10.163 (a) at 2df obtained a p-value .006, less than the alpha level .05 and therefore posting a significant association.

4.4.5 Distribution of responses according to level of education

The study further sought to establish if level of education influenced adoption of water and sanitation practices and the results were as follows;

Table 4.13: Distribution of responses according to level of education

	Frequency	Percent
strongly agree	164	57.1
Agree	102	35.5
Disagree	21	7.3
Total	287	100.0

Results from table 4.13 indicates that majority of respondents strongly agreed that level of education influenced adoption of water, sanitation and hygiene practice, represented by 164 (57.1%), followed by those who agreed at 102 (35.5%) and those who disagreed were represented by 21 (7.3%).

4.4.6 Cross tabulation showing adoption of water sanitation and hygiene practices and level of education

Categorical responses were further obtained to ascertain the relationships within categories and the results were as follows;

Table 4.14: Cross tabulation showing adoption of water sanitation and hygiene practices and level of education

Decision status	Measuring scale	level of education influencing adoption			
		strongly agree	**agree**	**Disagree**	**Total**
Influences adoption	Count % within level of education influencing adoption	106	82	18	206
		64.6%	80.4%	85.7%	71.8%
Doesn't influence Adoption	Count % within level of education influencing adoption	58	20	3	81
		35.4%	19.6%	14.3%	28.2%
Total	**Count % within level of education influencing adoption**	**164**	**102**	**21**	**287**
		100.0 %	**100.0 %**	**100.0 %**	**100.0 %**

Table 4.14 shows that majority of respondents who strongly agreed that level of education was an influencing factor in adoption of WASH practices, 106 (64.6%) held the opinion that it does while 58 (35.4%) held a contrary opinion, followed by those who were in the agree category where 82 (80.4%) acknowledged its influence whereas 20 (19.6%) declined and lastly those who disagreed, 18 (85.7%) were of the idea that it does whereas 3 (14.3%) declined its influence. This had an implication that education is Key to the adoption of WASH practices. Education plays a major role in comprehension of issues and may help in disease prevention and control. According to a Commonwealth Report (2003), level of education broadens a person's way of thinking and generates social understanding of issues in ways that may be extremely important in facing and tackling epidemiological problems

A chi square test was further conducted to reveal the significance between association of the indicator to the dependent variable, and a chi-value, 9.881(a) at 2df obtained a p-value .007, less than alpha level of .05 and thereby posting a significant association.

4.4.7 Distribution of responses according to Religion

The study further sought to establish the influence of religion on adoption of water, sanitation and hygiene practices and the results were as follows;

Table 4.15: Distribution of responses according to religion on water and fecal disposal

	Frequency	Percent
strongly agree	165	57.5
Agree	101	35.2
Disagree	21	7.3
Total	287	100.0

Results from table 4.15 indicates that majority of respondents strongly agreed that religion influenced adoption of water, sanitation and hygiene practice, represented by 165 (57.5%), followed by those who agreed at 101 (35.2%) and those who disagreed were represented by 21 (7.3%).

4.4.8 Cross tabulation showing distribution of responses according to religion on water and fecal disposal and adoption of water sanitation and hygiene practices

The study further sought to establish the relationship within categorical responses and the results were as follows;

Table 4.16: Cross tabulation showing distribution of responses according to religion on water and fecal disposal and adoption of WASH practices

Decision Status	Measuring scale	religion on water and fecal disposal			
		strongly agree	**agree**	**Disagree**	**Total**
Influences adoption	Count % within religion on water and fecal disposal	107	82	17	206
		64.8%	81.2%	81.0%	71.8%
Doesn't influence Adoption	Count % within religion on water and fecal disposal	58	19	4	81
		35.2%	18.8%	19.0%	28.2%
Total	**Count % within religion on water and fecal disposal**	**165**	**101**	**21**	**287**
		100.0 %	**100.0 %**	**100.0 %**	**100.0 %**

Table 4.16, reveals that majority of respondents in the strongly agree category acknowledged the influence of religion in adoption of water, sanitation and hygiene practices as re represented by 107 (64.8%) who said it does whereas in the same category 58 (35.2%) declined, followed by agree category who 82 (81.2%) held an opinion that it does whereas 19 (18.8%) held a contrary opinion and lastly those in the category of those who disagreed 17 (81.0%) held an opinion that it does whereas 4 (19.0.%) held a contrary opinion. This had an implication that religion plays a major role in the society and a s part of the culture to dictate how people perceive things, this concurs with Kasomo (2010) who asserts that the preoccupation with religio-cultural heritage is almost in corruptible in the African mind. This religio-cultural heritage may account for non-treatment of water and the risk of falling sick due to water contamination, although the younger generation is changing this perception. Religion plays a powerful role in shaping people's behaviour and it is one of the socio-cultural aspects which affect water treatment

To further ascertain the significance of association between the indicators to

the dependent variable a chi statistic was conducted and a chi-value, 9.199(a) at 2df obtained the p-value .010, less than the alpha level .05, posting a significant association.

4.4.9: Distribution of responses according to beliefs

The study further sought to investigate the influence of beliefs on adoption of water, sanitation and hygiene practices and the results were as follows;

Table4.17: Distribution of responses according to belief

	Frequency	Percent
strongly agree	167	58.2
Agree	99	34.5
Disagree	21	7.3
Total	287	100.0

Results from table 4.17 indicates that majority of respondents strongly agreed that beliefs influenced adoption of water, sanitation and hygiene practice, represented by 167 (58.2%), followed by those who agreed at 99 (34.5%) and those who disagreed were represented by 21 (7.3%)

4.4.10: Cross tabulation showing distribution of responses according to belief and adoption of water, sanitation and hygiene practices

Categorical respondents were further established and results presented as in table 4.18;

Table 4.18 Cross tabulation showing distribution of responses according to belief and adoption of water, sanitation and hygiene practices

Decision Status	Measuring scale	beliefs influencing adoption			
		strongly agree	Agree	Disagree	Total
Influences adoption	Count % within beliefs influencing adoption	109	80	17	206
		65.3%	80.8%	81.0%	71.8%
Doesn't influence Adoption	Count % within beliefs influencing adoption	58	19	4	81
		34.7%	19.2%	19.0%	28.2%
Total	**Count % within beliefs influencing adoption**	**167**	**99**	**21**	**287**
		100.0 %	**100.0 %**	**100.0 %**	**100.0 %**

Categorical responses revealed in table 4.18, that respondents among the category strongly agreed 109 (65.3%) opined that beliefs among communities of Shivanga location had great influence on the adoption of water, sanitation and hygiene practices whereas within the same category 58 (34.7%) held a contrary opinion, followed by agree category where 80 (80.8%) acknowledged the influence on adoption whereas 19 (19.2%) declined and lastly in disagree category 17 (81.0%) said it does whereas 4(19.0%) declined its influence. People's beliefs associated with water qualities can affect their water treatment behavior. In a study in rural North Eastern Brazil (Kirchhoff, et al., 1985), households discontinued water chlorination because they believed that the chlorine would interfere with the cooling process that takes place when the water is left in clay containers overnight

When a chi-statistic was conducted to establish significance between associations of indicator to the dependent variable, a chi-value, 8.350(a) at 2df obtained a p-value .015, less than the alpha level of .05 thus posting a significant association.

4.4.11: Distribution of responses according to acquisition of relevant knowledge

The study further sought to investigate how acquisition of relevant knowledge influences adoption of water, sanitation and hygiene practices among the residents of Shivanga and the respondents were as follows;

Table 4.19 showing distribution of responses according to acquisition of relevant knowledge and adoption of WASH practices

	Frequency	Percent
strongly agree	167	58.2
Agree	97	33.8
Disagree	23	8.0
Total	287	100.0

Results from table 4.19 indicates that majority of respondents strongly agreed that acquisition of relevant knowledge influenced adoption of water, sanitation and hygiene practice, represented by 167 (58.2%), followed by those who agreed at 97 (33.8%) and those who disagreed were represented by 23 (8.0%).

4.4.12: Cross tabulation showing distribution of responses according to acquisition of relevant knowledge and adoption of WASH practices

To further establish relationship within categorical responses, results we cross tabulated and results were as presented in table 4.20;

Table 4.20: Cross tabulation showing distribution of responses according to acquisition of relevant knowledge and adoption of WASH practices

Decision Status	Measuring scale	acquisition of relevant knowledge influencing adoption			
		strongly agree	**agree**	**disagree**	**Total**
Influences adoption	Count % within acquisition of relevant knowledge influencing adoption	110	78	18	206
		65.9%	80.4%	78.3%	71.8%
Doesn't influence adoption	Count% within acquisition of relevant knowledge influencing adoption	57	19	5	81
		34.1%	19.6%	21.7%	28.2%
Total	**Count % within acquisition of relevant knowledge influencing adoption**	**167**	**97**	**23**	**287**
		100.0 %	**100.0 %**	**100.0 %**	**100.0 %**

Table 4.20, reveals that within the category strongly agree, 110 (65.9%)held the opinion that acquisition of relevant knowledge influence adoption of WASH practices whereas within the same category 57 (343.1%) held a contrary opinion followed by those in the agree category where 78 (80.4%) held the opinion that it influences adoption whereas within the same category 19 (19.6%) held a contrary opinion and lastly, those in the category disagree 18 (78.3%) acknowledged while 5 (21.7%) declined its influence on adoption. This had implication that if people acquired relevant knowledge, then there will be easy adoption of water, sanitation and hygiene practices.

To establish significance between association of the indicator to the dependent variable, a chi-value, 6.926(a) at 2df obtained a p-value .031, less than the alpha level .05 posting a significant association

4.4.13 Distribution of responses according to attitude

The study further sought to establish the influence of attitude on adoption of water, sanitation and hygiene practices and the results were as follows;

Table 4.21: Distribution of responses according to attitudes and adoption of WASH practices

	Frequency	Percent
strongly agree	164	57.1
Agree	105	36.6
Disagree	18	6.3
Total	287	100.0

Results from table 4.21 indicates that majority of respondents strongly agreed that attitudes influenced adoption of water, sanitation and hygiene practice, represented by 164 (57.1%), followed by those who agreed at 105 (36.6%) and those who disagreed were represented by 18 (6.3%).

4.4.13 Cross tabulation showing distribution of responses according to attitude and adoption of WASH

To attain categorical responses, responses were cross tabulated as is on table 4.22;

Table 4.22: Cross tabulation showing distribution of responses according to attitude and adoption of WASH

		attitudes influencing adoption			
Decision Status	**Measuring scale**	**strongly agree**	**agree**	**disagree**	**Total**
Influences adoption	Count % within attitudes influencing adoption	107	84	15	206
		65.2%	80.0%	83.3%	71.8%
Doesn't influence Adoption	Count % within attitudes influencing adoption	57	21	3	81
		34.8%	20.0%	16.7%	28.2%
Total	**Count% within attitudes influencing adoption**	**164**	**105**	**18**	**287**
		100.0 %	**100.0 %**	**100.0 %**	**100.0 %**

Majority of respondents in the category strongly agree with a representation of

107 (65.2%) were of the opinion that attitude had an influence on adoption of water, sanitation and hygiene practices whereas within the category 57 (34.8%) held a contrary opinion, followed by the category agree where 84 (80.0%) held an opinion that it does while in the same category 21 (20.0%) held a contrary opinion and lastly those who were in the category disagree 15 (83.3%) held the opinion it has influence whereas 3 (16.7%) declined its influence. People's perceptions are informed by cultural dimensions and taboos which are often associated with existing hygiene and defecation practices, norms and preference across social groupings and settings (Jenkins et al., 2001).

To reveal the level of significance between the association of indicators to the dependent variable, a chi-value 8.147(a) at 2df obtained a p-value .017, less than the alpha level of .05 thus posting a significant association

4.4.13 Distribution of responses according information sharing

The study sought to establish how information sharing influences adoption of water, sanitation and hygiene practices and the results were as follows;

Table 4.23: Distribution of responses according to information sharing

	Frequency	Percent
strongly agree	163	56.8
agree	102	35.5
disagree	22	7.7
Total	287	100.0

Results from table 4.23 indicates that majority of respondents strongly agreed that information sharing influenced adoption of water, sanitation and hygiene practice, represented by 163 (56.8%), followed by those who agreed at 102 (35.5%) and those who disagreed were represented by 22 (7.7%).

4.4.14 Cross tabulation showing distribution of responses according to information sharing and adoption of WASH practices

Further, the responses were cross tabulated to obtain categorical responses and the results were as in table 4.24;

Table 4.24: Cross tabulation showing distribution of responses according to information sharing and adoption of WASH practices

		information sharing influencing adoption			
Decision Status	**Measuring scale**	**strongly agree**	**agree**	**disagree**	**Total**
Influences adoption	Count	106	81	19	206
	% within information sharing influencing adoption	65.0%	79.4%	86.4%	71.8%
Doesn't influence Adoption	Count % within information	57	21	3	81
	Sharing influencing adoption	35.0%	20.6%	13.6%	28.2%
Total	**Count% within information sharing influencing adoption**	**163**	**102**	**22**	**287**
		100.0 %	**100.0 %**	**100.0 %**	**100.0 %**

Table 4.24 revealed that majority of respondents within the category strongly agree opined that information sharing is important in the influence of adoption of WASH practices by 106 (65.0%) responses whereas within the same category 57 (35%) were contrary to the opinion, followed by those within the category agree who 81 (79.4%) held an opinion that it influences adoption whereas within the same category 21 (20.6%) held a contrary opinion and lastly within the category disagree 19 (86.4%) held the opinion that it does while in the same category 4 (13.6%) declined.

When a chi-statistic was conducted to establish significant association to the dependent variable, a chi-value 8.908(a) at 2df obtained a p-value .012, less than the alpha level, therefore posting a significant association.

4.5 community participation and adoption of water, sanitation and hygiene practices

The study further sought to understand whether community participation influenced adoption of water, sanitation and hygiene practices among residents of Shivanga location. Theresia Mnaranga (2010) points out that in order to achieve sustainable development, an implementing organization had to change the nature and character of economic system by improving access and quality of service delivery, strengthening local government financially through local taxation aimed at reducing dependency on the government and increasing local contribution through community development policy, which ultimately increase community participation (empowerment) in development activities in an area. Communities should be involved in all stages of the project, from the planning through to the building and managing of systems, by doing this, long term solutions can be found that are suited to their own needs and locally available resources. Rather than being imposed by outsiders, for example; development agencies, donors and governments projects should solve the communities' own problems which in most cases are different from other communities. Stages involved in community participation were studied as follows;

4.5.1 Distribution of responses according to identification of community needs

The study further sought to investigate the influence of identification of community needs on adoption of water, sanitation and hygiene practices.

Table 4.25: Distribution of responses according to identification of community needs by projects

	Frequency	Percent
strongly agree	164	57.1
Agree	101	35.2
Disagree	22	7.7
Total	287	100.0

Results from table 4.25 indicates that majority of respondents strongly agreed that identification of community needs by projects influenced adoption of water, sanitation and hygiene practice, represented by 164 (57.1%), followed by those who agreed at 101 (35.2%) and those who disagreed were represented by 22 (7.7%).

4.5.2 Cross tabulation showing distribution of responses according to identification of community needs and adoption of water sanitation and hygiene practices

To establish categorical responses among the categories, cross tabulation was conducted and the results were as in table 4.26;

Table 4.26: Cross tabulation showing distribution of responses according to identification of community needs and adoption of water sanitation and hygiene practices

		identification of community needs by projects influencing adoption			
Decision Status	**Measuring scale**	**strongly agree**	**agree**	**disagree**	**Total**
Influences adoption	Count% within identification of community needs by projects influencing adoption	107 65.2%	81 80.2%	18 81.8%	206 71.8%
Doesn't influence Adoption	Count% within identification of community needs by projects influencing adoption	57 34.8%	20 19.8%	4 18.2%	81 28.2%
Total	**Count% within identification community needs by projects influencing adoption**	**164** **100.0 %**	**101** **100.0 %**	**22** **100.0 %**	**287** **100.0 %**

Table 4.26 reveals that in the category strongly agree, majority of respondents held the idea that community needs identification influenced adoption of water, sanitation and hygiene practices at 107 (65.2%) whereas 57 (34.8%) within the same category declined, followed by agree category where 81 (80.2%) acknowledged its influence while within the same category 20 (19.8%) held a contrary opinion and lastly those in the category disagree 18 (81.8%) were of the opinion it does whereas 4(18.2%) in the same category were of the idea that it does not. For community participation to be successful, community based need assessment needs to be conducted before any project is brought to them. Rather than being imposed by outsiders, for example; development agencies, donors and governments projects

should solve the communities' own problems which in most cases are different from other communities, (Bartle P. 2004).

A chi-square statistic was conducted to establish significance between association of the indicators to the dependent variable and a chi-value, 8.086(a) at 2df obtained a p-value .018, less than the alpha level .05 therefore posting a significant association.

4.5.3 Distribution of responses according to community level planning of project activities

The study also sought to establish if community level planning of WASH related project activities influence adoption and the results were as follows;

Table 4.27: Distribution of responses according to community level planning

	Frequency	Percent
strongly agree	161	56.1
Agree	105	36.6
Disagree	21	7.3
Total	287	100.0

Results from table 4.27 indicates that majority of respondents strongly agreed that community level planning influenced adoption of water, sanitation and hygiene practice, represented by 161 (56.1%), followed by those who agreed at 105 (36.6%) and those who disagreed were represented by 21 (7.3%).

4.5.4: Cross tabulation showing responses according to community level planning of project activities and adoption of water sanitation and hygiene practices

A cross tabulation was further conducted and the results were presented as follows;

Table 4.28: Cross tabulation showing responses according to community level planning of project activities and adoption of water sanitation and hygiene practices

Decision Status	Measuring scale	community level planning of project activities influencing adoption			
		strongly agree	**agree**	**disagree**	**Total**
Influences adoption	Count % within community level planning of project activities influencing adoption	104	84	18	206
		64.6%	80.0%	85.7%	71.8%
Doesn't influence Adoption	Count % within community level planning of project activities influencing adoption	57	21	3	81
		35.4%	20.0%	14.3%	28.2%
Total	**Count % within community level planning of project activities influencing adoption**	**161**	**105**	**21**	**287**
		100.0%	**100.0%**	**100.0%**	**100.0 %**

Table 4.28, reveals that within the category strongly agree 104 (64.6%) representation were of the idea that community level planning influence adoption of water, sanitation and hygiene practices, whereas within the same category 57 (35.4%) declined, followed by agree category whereby 84 (80.0%) agreed on influence whereas 21 (20.0%) were of the contrary opinion, this was finally followed by disagreed category whereby 18 (85.7%) held the opinion it does whereas within the same category 3 (14.3%) declined its influence.

To further establish the influence between association of indicators to the dependent variable, the study conducted a chi-square statistics test and a chi-value 9.616(a) at 2df obtained a p-value .008, less than the alpha level .05, therefore posting a significant association.

4.5.5 Distribution of responses according to community involvement

The study further sought to establish whether community involvement

influence adoption of water, sanitation and hygiene practices as shown in table 4.29;

Table 4.29 Distribution of responses according to community involvement

	Frequency	Percent
strongly agree	169	58.9
Agree	99	34.5
disagree	19	6.6
Total	287	100.0

Results from table 4.29 indicates that majority of respondents strongly agreed that community involvement influenced adoption of water, sanitation and hygiene practice, represented by 169 (58.9%), followed by those who agreed at 99 (34.5%) and those who disagreed were represented by 19 (6.6%).

4.5.6 Cross tabulation showing distribution of responses according to community involvement and adoption of water sanitation and hygiene practices

These results were further cross tabulated to determine categorical responses within which community level planning influenced adoption of water, sanitation and hygiene practices and the results were presented as in table 4.30;

Table 4.30: Cross tabulation showing distribution of responses according to community involvement and adoption of water sanitation and hygiene practices

		community involvement influencing adoption			
Decision Status	**Measuring scale**	**strongly agree**	**agree**	**disagree**	**Total**
Influences adoption	Count % within community involvement influencing adoption	111 65.7%	79 9.8%	16 84.2%	206 71.8%
Doesn't influence Adoption	Count % within community involvement influencing adoption	58 34.3%	20 20.2%	3 15.8%	81 28.2%
Total	**Count % within community involvement influencing adoption**	**169** **100.0 %**	**99** **100.0 %**	**19** **100.0 %**	**287** **100.0 %**

Table 4.30 reveals that within the category strongly agree respondents represented by 111 (65.7%) were of the opinion that community involvement influenced adoption whereas within the same category 58 (34.3%) were of the contrary opinion, followed by those within the category agree whereby 79 (79.8%) opined that it influences adoption whereas within the same category 20 (20.2%) declined its influence and lastly in the disagree category 16 (84.2%) acknowledged influence of community involvement on adoption of water, sanitation and hygiene practices while within the same category 3 (15.8%) declined its influence. This is in line to Bartle P. 2004, who asserts that communities should be involved in all stages of the project, from the planning through to the building and managing of systems, by doing this, long term solutions can be found that are suited to their own needs and locally available resources. In rural Guatemala, individuals involved in community groups were significantly more likely to understand the relationship between poor hygiene and diarrhea, presumably because they were more likely to come in contact with innovative ideas than those who were not involved (Goldman, et al., 2001).

To establish significance between association of the indicator and the dependent variable, a chi-statistic was conducted and a chi-value, 7.695(a) at 2df obtained a p-value .021 less than the alpha level of .05 therefore posting a significant association.

4.5.7 Distribution of responses according to utilization of local resources

The study further sought to establish the influence of utilization of local resources on adoption of water, sanitation and hygiene practices as shown;

Table 4.31: Distribution of responses according to utilization of local resources

	Frequency	Percent
strongly agree	169	58.9
Agree	99	34.5
Disagree	19	6.6
Total	287	100.0

Results from table 4.31 indicates that majority of respondents strongly agreed that utilization of local resources influenced adoption of water, sanitation and hygiene practice, represented by 169 (58.9%), followed by those who agreed at 99 (34.5%) and those who disagreed were represented by 19 (6.6%).

4.5.7 Cross tabulation showing responses according to utilization of local resources and adoption of water sanitation and hygiene practices

Results were further cross tabulated to determine the relationship within categorical responses and the results were as follows;

Table 4.32: Cross tabulation showing responses according to utilization of local resources and adoption of water sanitation and hygiene practices

		utilization of local resources influencing adoption			
Decision Status	**Measuring scale**	**strongly agree**	**agree**	**disagree**	**Total**
Influences adoption	Count % within utilization of local resources influencing adoption	110	80	16	206
		65.1%	80.8%	84.2%	71.8%
Doesn't influence Adoption	Count % within utilization of local resources influencing adoption	59	19	3	81
		34.9%	19.2%	15.8%	28.2%
Total	**Count % within utilization of local resources influencing adoption**	**169**	**99**	**19**	**287**
		100.0 %	**100.0 %**	**100.0 %**	**100.0 %**

Table 4.32 indicates that within the category strongly agree 110 (65.1%)

respondents were of the idea that utilization of local resources during project execution influences adoption of water, sanitation and hygiene practices whereas within the same category 59 (34.9%) held a contrary opinion, followed by agree category whereby 80 (80.8%) held the opinion that if influences adoption whereas within the same category 19 (19.2%) held a contrary opinion and lastly disagree category whereby 16 (84.2%) accepted its influence whereas 3 (15.8%) declined

By use of chi-statistics, the further attempted to ascertain the significance between association of the indicator to the depended variable, a chi-value, 9.168(a) at 2df obtained a p-value .010, less than the alpha level of .05, thus posting a significant association.

4.5.8 Distribution of responses according to community control over project development

The study further sought to establish the influence of community control over the project and its influence on adoption as shown;

Table 4.33 Distribution of responses according to community control

	Frequency	Percent
strongly agree	166	57.8
Agree	103	35.9
Disagree	18	6.3
Total	287	100.0

Results from table 4.33 indicates that majority of respondents strongly agreed that community control over project development influenced adoption of water, sanitation and hygiene practice, represented by 166 (57.8%), followed by those who agreed at 103 (35.9%) and those who disagreed were represented by 18 (6.3%).

4.5.9 Cross tabulation showing response according to community control and adoption of water sanitation and hygiene practices

To further establish relationship between categorical responses, a cross tabulation was conducted and the results are as presented on table 4.34;

Table 4.34: Cross tabulation showing response according to community control and adoption of water sanitation and hygiene practices

		community control over project development influencing adoption			
Decision Status	**Measuring scale**	**strongly agree**	**agree**	**disagree**	**Total**
Influences adoption	Count% within community control over project development influencing adoption	108	83	15	206
Doesn't influence Adoption		65.1%	80.6%	83.3%	71.8%
	Count% within community control over project development influencing adoption	58	20	3	81
		34.9%	19.4%	16.7%	28.2%
Total	**Count % within community control over project development influencing adoption**	**166**	**103**	**18**	**287**
		100.0 %	**100.0 %**	**100.0 %**	**100.0 %**

Table 4.34 reveals that majority of respondents within the category strongly agree acknowledged influence of community control on influence of adoption of water, sanitation and hygiene practices by 108 (65.1%) whereas in the same category 58 (43.9%) had a contrary view, followed by agree category whereby 83 (80.6%) had the opinion that it does influence while within the same category 20 (19.4%) held a contrary view and lastly within the category disagree 15 (83.3%) were of the opinion that if influences adoption while 3 (16.7%) within the same category declined its influence.

A chi-statistic was conducted to establish significance between the indicator and dependent variable, a chi-value 8.826(a) at 2df obtained .012, less than the alpha

level of .05, therefore posting a significant association.

4.5.10 Distribution of responses according to frequent assessment

The study also sought to establish if frequent assessment of WASH related activities in Shivanga location influenced adoption

Table 4.35: Distribution of responses according to frequent assessment

	Frequency	Percent
strongly agree	172	59.9
Agree	96	33.4
disagree	19	6.6
Total	287	100.0

Results from table 4.35 indicates that majority of respondents strongly agreed that frequent assessment influenced adoption of water, sanitation and hygiene practice, represented by 172 (59.9%), followed by those who agreed at 96 (33.4%) and those who disagreed were represented by 19 (6.6%).

4.5.11 Cross tabulation showing frequent assessment and adoption of water sanitation and hygiene practices

The study sought to establish relationship between categorical responses and the results were as presented on table 4.36;

Table 4.36 Cross tabulation showing frequent assessment and adoption of water sanitation and hygiene practices

Decision Status	Measuring scale	frequent assessment influencing adoption			
		strongly agree	**agree**	**disagree**	**Total**
Influences adoption	Count% within frequent assessment influencing adoption	113	77	16	206
		65.7%	80.2%	84.2%	71.8%
Doesn't influence adoption	Count% within frequent assessment influencing adoption	59	19	3	81
		34.3%	19.8%	15.8%	28.2%
Total	**Count% within frequent assessment influencing adoption**	**172**	**96**	**19**	**287**
		100.0 %	**100.0 %**	**100.0 %**	**100.0 %**

Table 4.36 reveals that majority of respondents strongly agreed by 113 (65.7%) that frequent assessment influences adoption of water, sanitation and hygiene practices whereas within the same category 59 (34.3%) were of a contrary opinion, followed by agree category whereby 77 (80.2%) held the opinion that it influences adoption whereas 19 (19.8%) within the same category held a contrary opinion and lastly those in the category disagree 16 (84.2%) acknowledged its influence whereas within the same category 3 (15.8%) declined.

When a chi-statistic was conducted to establish the significance between the indicator and the dependent variable, a chi-value 7.957(a) at 2df obtained a p-value .019, less than the alpha level of .05, this posts a significant association.

4.5.12 Distribution of responses according to assessment at the end of project

The study further sought to establish if assessment at the end of project and its influence on adoption of water, sanitation and hygiene practices and the results were as follows;

Table 4.37: Distribution of responses according to assessment at the end of project

	Frequency	Percent
strongly agree	167	58.2
Agree	95	33.1
disagree	25	8.7
Total	287	100.0

Results from table 4.37 indicates that majority of respondents strongly agreed that assessment at the end of the project influenced adoption of water, sanitation and hygiene practice, represented by 167 (58.2%), followed by those who agreed at 95 (33.1%) and those who disagreed were represented by 25 (8.7%).

4.5.13 Cross tabulation showing assessment at end project and adoption of water sanitation and hygiene practices

The study further determined categorical relationship within the extent which respondents agreed the influence of assessment at the end of the project influenced adoption of water, sanitation and hygiene practices and the results were as follows;

Table 4.38 Cross tabulation showing assessment at end project and adoption of water sanitation and hygiene practices

		assessment at the end of project influence adoption			
Decision Status	**Measuring scale**	**strongly agree**	**agree**	**disagree**	**Total**
Influences adoption	Count% within assessment at the end of project influence adoption	108	78	20	206
		64.7%	82.1%	80.0%	71.8%
Doesn't influence Adoption	Count% within assessment at the end of project influencing adoption	59	17	5	81
		35.3%	17.9%	20.0%	28.2%
Total	**Count % within assessment at the end of project influencing**	**167**	**95**	**25**	**287**

Adoption	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Table 4.38 revealed that among the category of strongly agree 108 (64.7%) acknowledged the influence of assessment at the end of the project whereas within the same category 59 (35.3%) held a contrary opinion, followed by agree category whereby 78 (82.1%) agreed its influence whereas within the same category 17 (17.9%) declined and lastly a disagree category whereby 20 (80%) were of the opinion that it does while 5 (20%) declined its influence.

When a chi-statistic was conducted to establish the significance between the indicator and a dependent variable, a chi-value 10.000(a) at 2df obtained a p-value .007, less than the alpha level of .05, therefore posting a significant association.

4.5.14 Distribution of responses according to training and capacity

The study further sought to establish if training and capacity building influence adoption as shown:

Table 4.39 Distribution of responses according to training and capacity

	Frequency	Percent
strongly agree	171	59.6
Agree	97	33.8
Disagree	19	6.6
Total	287	100.0

Results from table 4.39 indicates that majority of respondents strongly agreed that training and capacity building influenced adoption of water, sanitation and hygiene practice, represented by 171 (59.6%), followed by those who agreed at 97 (33.8%) and those who disagreed were represented by 19 (6.6%).

4.5.15 Cross tabulation showing responses according to training and capacity building and adoption of water, sanitation and hygiene practices

Results were further cross tabulated to establish the relationship within categorical responses and the results were as presented in table 4.40;

Table 4.40 Cross tabulation showing responses according to training and capacity building and adoption of water, sanitation and hygiene practices

Decision Status	Measuring scale	training and capacity building influencing adoption			
		strongly agree	**agree**	**disagree**	**Total**
Influences adoption	Count% within training and capacity building influencing adoption	112	78	16	206
		65.5%	80.4%	84.2%	71.8%
Doesn't influence Adoption	Count% within training and capacity building influencing adoption	59	19	3	81
		34.5%	19.6%	15.8%	28.2%
Total	**Count% within training and capacity building influencing adoption**	**171**	**97**	**19**	**287**
		100.0%	**100.0%**	**100.0%**	**100.0%**

Table 4.40 depicts that within the category strongly agree, 112 (65.5%) respondents held the opinion that training and capacity building among the residents of Shivanga location was in influencing factor to adoption of water, sanitation and hygiene practices while within the same category 59 (34.5%) decline, followed by those in the category agree whereby 78 (80.4%) held the opinion that it does influence whereas within the same category 19 (19.6%) held a contrary opinion and lastly those in the category disagree 16 (84.2%) held the opinion it influences adoption while in the same category 3 (15.8%) declined its influence.

When a chi-statistic was conducted to establish significance between the association of the indicator to the dependent variable, a chi-value 8.350(a) at 2df obtained a p-value .015, less than the alpha level of .05, posting a significant association.

4.6 Accessibility to intervention and adoption of water, sanitation and hygiene practices

Access to and use of improved intervention systems, as well as improvements

in hygiene behavior, are essential to track growth or decline in access and use. In many rural communities of the developing countries, the practice of open defecation and use of unsafe water persists because the conditions that cause them have not been adequately analyzed or taken into account before projects are started.

4.6.1 Distribution of responses according to chlorine for water treatment

The study further sought to establish if chlorine use for water treatment influences adoption of water, sanitation and hygiene practices

Table 4.41: Distribution of responses according to chlorine for water treatment

	Frequency	Percent
strongly agree	170	59.2
Agree	98	34.1
Disagree	19	6.6
Total	287	100.0

Results from table 4.41 indicates that majority of respondents strongly agreed that chlorine for water treatment influenced adoption of water, sanitation and hygiene practice, represented by 170 (59.2%), followed by those who agreed at 98 (34.1%) and those who disagreed were represented by 19 (6.6%).

4.6.2 Cross tabulation adoption of water sanitation and hygiene practices and chlorine for water treatment influence adoption

To further establish categorical responses within various categories, the results were cross tabulated as shown in table 4.42;

Table 4.42: Cross tabulation adoption of water sanitation and hygiene practices and chlorine for water treatment influence adoption

Decision Status	Measuring scale	chlorine for water treatment influence adoption			
		strongly agree	**agree**	**disagree**	**Total**
Influences adoption	Count% within chlorine for water treatment influence Adoption	112	79	15	206
		65.9%	80.6%	78.9%	71.8%
Doesn't influence Adoption	Count% within chlorine for water treatment influence Adoption	58	19	4	81
		34.1%	19.4%	21.1%	28.2%
Total	**Count% within chlorine for water treatment influence Adoption**	**170**	**98**	**19**	**287**
		100.0%	**100.0%**	**100.0%**	**100.0%**

Table 4.42, revealed that majority of respondents within the category strongly agree, 112 (65.9%) were of the opinion that using chlorine for water treatment in the community of Shivanga location had greatest influence on the adoption of water, sanitation and hygiene practices whereas within the same category 58 (34.1%) declined its influence, followed by those in the category agree held the opinion that it influences adoption by 79 (80.6%) whereas 19 (19.4%) within the same category held a contrary opinion and lastly the category disagree 15 (78.9%) acknowledged the influence while 4 (21.1%) declined.

Further, chi square statistics were conducted to establish significance between association of the indicator to the dependent variable, a chi-value 7.17(a) at 2df obtained a p-value .028, less than the alpha level of .05, therefore posting a significant association.

4.6.3 Distribution of responses according to water guard for water treatment

The study also sought to investigate the influence of water guard on adoption

of water, sanitation and hygiene practices as follows;

Table 4.43 Distribution of responses according to water guard for water treatment

	Frequency	Percent
strongly agree	171	59.6
agree	98	34.1
disagree	18	6.3
Total	287	100.0

Results from table 4.43 indicates that majority of respondents strongly agreed that water guard for water treatment influenced adoption of water, sanitation and hygiene practice, represented by 171 (59.6%), followed by those who agreed at 98 (34.1%) and those who disagreed were represented by 18 (6.3%).

4.6.4 Cross tabulation showing responses according to use of water guard for water treatment and adoption of water sanitation and hygiene practices

To establish categorical a responses, a cross tabulation was conducted and the results were as presented in table 4.44;

Table 4.44: Cross tabulation showing responses according to use of water guard for water treatment and adoption of water sanitation and hygiene practices

		water guard for water treatment influence adoption			
Decision Status	**Measuring scale**	**strongly agree**	**agree**	**disagree**	**Total**
Influences adoption	Count% within water guard for water treatment influence adoption	113 66.1%	78 79.6%	15 83.3%	206 71.8%
Doesn't influence adoption	Count% within water guard for water treatment influence adoption	58 33.9%	20 20.4%	3 16.7%	81 28.2%
Total	**Count% within water guard for water treatment influence adoption**	**171** **100.0 %**	**98** **100.0 %**	**18** **100.0 %**	**287** **100.0 %**

Table 4.44, revealed that 113 (66.1%) within the category strongly agree acknowledged the influence of water guard to adoption of water, sanitation and hygiene whereas 58 (33.9%) within the same category had a contrary opinion, followed by agree category whereby 78 (79.6%) opined its influence on adoption with 20 (20.4%) within the same category declining its influence and lastly in the category disagree whereby 15 (83.3%) held an opinion that it does while 3 (16.7%) declined its influence on adoption of water, sanitation and hygiene practices.

Results obtained from a chi statistics revealed a chi-value 6.879(a) at 2df which obtained a p-value of .032 less than alpha level .05, therefore posting a significant association.

4.6.5. Distribution of responses according to life-straw sieve for water treatment

The study further sought to establish if use of life straw sieve for water treatment influence adoption of water, sanitation and hygiene practices

Table 4.45: Distribution of responses according to life-straw sieve for water treatment

	Frequency	Percent
strongly agree	170	59.2
Agree	97	33.8
Disagree	20	7.0
Total	287	100.0

Results from table 4.45 indicates that majority of respondents strongly agreed that life-straw sieve for water treatment influenced adoption of water, sanitation and hygiene practice, represented by 170 (59.2%), followed by those who agreed at 97 (33.8%) and those who disagreed were represented by 20 (7.0%)

4.6.6 Cross tabulation showing response distribution according to adoption of water sanitation and hygiene practices and life-straw sieve for water treatment

Further the study sought to establish the significant relationship within

categorical responses and the results were as in table 4.46;

Table 4.46: Cross tabulation showing response distribution according to adoption of water sanitation and hygiene practices and life-straw sieve for water treatment

Decision Status	Measuring scale	life-straw sieve for treatment influence adoption			
		strongly agree	**agree**	**disagree**	**Total**
Influences adoption	Count % within life-straw sieve for treatment influence adoption	111	78	17	206
		65.3%	80.4%	85.0%	71.8%
Doesn't influence Adoption	Count % within life-straw sieve for treatment influence adoption	59	19	3	81
		34.7%	19.6%	15.0%	28.2%
Total	**Count % within life-straw sieve for treatment influence adoption**	**170**	**97**	**20**	**287**
		100.0%	**100.0%**	**100.0%**	**100.0%**

Table 4.46 reveals that majority of respondents in strongly agree category held an opinion that use of life-straw for water treatment influenced adoption of water, sanitation and hygiene practices presented with 111 (65.3%) whereas , within the same category 59 (34.7%) declined its influence, followed by those in the category agree whereby 78 (80.4%) acknowledged its influence while within the same category 19 (19.6%) held a contrary opinion, and lastly within the category disagree 17 (85%) were of the opinion that it has influence on adoption while in the same category 3 (15%) were of a contrary opinion.

Further test was conducted to establish the significance between association of indicator to the dependent variable and chi-value 8.824(a) at 2df obtained a p-value .012, less than the alpha level of .05, therefore posting a significant association.

4.6.7 Distribution of responses according to hand washing practices before and after meals

The study sought to establish the influence of hand washing with soap before and after meals have any influence on adoption of the practice and the results were as follows;

Table 4.47: Distribution of responses according to hand washing practices before and after meals

	Frequency	Percent
strongly agree	172	59.9
Agree	97	33.8
Disagree	18	6.3
Total	287	100.0

Results from table 4.47 indicates that majority of respondents strongly agreed that hand washing practices before and after meals influenced adoption of water, sanitation and hygiene practice, represented by 172 (59.9%), followed by those who agreed at 97 (33.8%) and those who disagreed were represented by 18 (6.3%).

4.6.8 Cross tabulation showing adoption of water sanitation and hygiene practices and hand washing practices before and after meals

The study further sought to establish the significant relationship within categorical responses and the results were as presented in table 4.48;

Table 4.48: Cross tabulation showing adoption of water sanitation and hygiene practices and hand washing practices before and after meals

Decision Status	Measuring scale	hand washing practices before and after meals influencing adoption			
		strongly agree	**agree**	**disagree**	**Total**
Influences adoption	Count% within hand washing practices before and after meals influencing adoption	113	78	15	206
		65.7%	80.4%	83.3%	71.8%
Doesn't influence adoption	Count% within hand washing practices before and after meals influencing adoption	59	19	3	81
		34.3%	19.6%	16.7%	28.2%
Total	**Count% within hand washing practices before and after meals influencing adoption**	**172**	**97**	**18**	**287**
		100.0%	**100.0%**	**100.0%**	**100.0%**

Table 4.48 reveal that majority of respondents in the category strongly agree opined that hand washing with soap before and after meals greatly influenced adoption of water, sanitation and hygiene practices as represented by 113 (65.7%) whereas 59 (34.3%) within the same category declined, followed by the category agree with 78 (80.4%) who held the opinion that it influenced adoption while 19 (19.6%) within the same category held a contrary opinion and lastly those in the category disagree whereby 15 (83.3%) held the opinion it does influence while 3 (16.7%) had a contrary opinion. The use of soap as a hygienic measure to wash hands reduces the spread of infection from one person to the other. Handwashing is a simple, low-cost method for preventing diarrheal and respiratory illnesses with demonstrated efficacy in both community and institutional settings (Luby et al. 2005).

A chi square test was further conducted to establish the significance between the association of the indicator to the dependent variable, a chi-value 7.895(a) at 2df

obtained a p-value .019, less than the alpha level therefore posting a significant association

4.6.7 Distribution of responses according to hand washing with soap after fecal contact

The study further sought to establish whether hand washing with soap after fecal contact influenced adoption of water, sanitation and hygiene

Table 4.49: Distribution of responses according to hand washing with soap after fecal contact

	Frequency	Percent
strongly agree	170	59.2
Agree	94	32.8
Disagree	23	8.0
Total	287	100.0

Results from table 4.49 indicates that majority of respondents strongly agreed that hand washing with soap after fecal contact influenced adoption of water, sanitation and hygiene practice, represented by 170 (59.2%), followed by those who agreed at 94 (32.8%) and those who disagreed were represented by 23 (8.0%).

4.6.9 Cross tabulation showing responses according to adoption of water sanitation and hygiene practices and hand washing with soap after fecal contact

To determine categorical responses, results were tabulated and the results were as indicated in table 4.50;

Table 4.50: Cross tabulation showing responses according to adoption of WASH practices and hand washing with soap after fecal contact

Decision Status	Measuring scale	hand washing with soap after fecal contact influencing adoption: strongly agree	agree	disagree	Total
Influences adoption	Count% within hand washing with soap after fecal contact influencing adoption	113	75	18	206
		66.5%	79.8%	78.3%	71.8%
Doesn't influence Adoption	Count% within hand washing with soap after fecal contact influencing adoption	57	19	5	81
		33.5%	20.2%	21.7%	28.2%
Total	**Count% within hand washing with soap after fecal contact influencing adoption**	**170**	**94**	**23**	**287**
		100.0 %	**100.0 %**	**100.0 %**	**100.0 %**

Table 4.50 indicate that within the category strongly agree, 113 (66.5%) respondents were of the idea that washing hand with soap after fecal contact influences adoption of water, sanitation and hygiene practices whereas within the same category 57 (33.5%) held a contrary opinion, followed by those in the category agree whereby 75 (79.8%) held the opinion that it influences the adoption of the WASH practices while in the same category 19 (20.2%) held a contrary opinion and lastly within the category disagree 18 (78.3%) held the opinion that it does influence adoption whereas within the same category 5 (21.7%) declined its influence.

To further determine the significance between associations of indicator to the dependent variable, chi-value 5.818(a) at 2df obtained a p-value .055, slightly higher than the alpha level of .05, which posts a moderate association.

4.6.10 Distribution of responses according to availability of latrines

The study further sought to determine the influence of latrine availability on adoption of water, sanitation and hygiene practices and the responses were as follows;

Table 4.51: Distribution of responses according to availability of latrines

	Frequency	Percent
strongly agree	167	58.2
Agree	99	34.5
Disagree	21	7.3
Total	287	100.0

Results from table 4.51 indicates that majority of respondents strongly agreed that availability of latrines influenced adoption of water, sanitation and hygiene practice, represented by 167 (58.2%), followed by those who agreed at 99 (34.5%) and those who disagreed were represented by 21 (7.3%).

4.6.11 Cross tabulation showing response distribution according to adoption of water sanitation and hygiene practices and availability of latrines

The study further sought to establish significant relationship within categorical responses and the results were as presented in table 4.52;

Table 4.52: Cross tabulation showing response distribution according to adoption of water sanitation and hygiene practices and availability of latrines

		availability of latrines influencing adoption			
Decision Status	**Measuring scale**	**strongly agree**	**agree**	**disagree**	**Total**
Influences adoption	Count% within availability of latrines influencing adoption	109	79	18	206
		65.3%	79.8%	85.7%	71.8%
Doesn't influence Adoption	Count% within availability of latrines influencing adoption	58	20	3	81
		34.7%	20.2%	14.3%	28.2%
Total	**Count% within availability of latrines influencing Adoption**	**167**	**99**	**21**	**287**
		100.0%	**100.0%**	**100.0%**	**100.0%**

Table 4.52 reveals that within the category strongly agree, majority of respondents represented by 109 (65.3%) held the opinion that availability of latrines

had a great influence on the adoption of water, sanitation and hygiene practices whereas within the same category 58 (34.7%) held a contrary opinion, followed by the category agree whereby 79 (79.8%) acknowledged its influence whereas 20 (20.2%) held a contrary opinion and lastly in the category disagree 18 (85.7%) held an opinion that availability of latrines influenced adoption of water, sanitation and hygiene practices while within the same category 3 (14.3%) held a contrary opinion.

To determine if there was any significance between the association of the indicator to the dependent variable, a chi-value 8.649(a) at 2df obtained a p-value .013 less than the alpha level, therefore posting a significant association.

4.6.12 Distribution of responses according to proper use of latrines

The study sought to establish the influence of proper use of latrine and its influence on adoption of water, sanitation and hygiene practices,

Table 4.53: Distribution of responses according to proper use of latrines

	Frequency	Percent
strongly agree	167	58.2
Agree	97	33.8
Disagree	23	8.0
Total	287	100.0

Results from table 4.53 indicates that majority of respondents strongly agreed that proper use of latrines influenced adoption of water, sanitation and hygiene practice, represented by 167 (58.2%), followed by those who agreed at 97 (33.8%) and those who disagreed were represented by 23 (8.0%).

4.6.13 Cross tabulation showing adoption of water sanitation and hygiene practices and proper use of latrines influencing adoption

Further to establish significant relationship within categorical responses, results were cross tabulated and results were as presented in table 4.54;

Table 4.54 Cross tabulation showing adoption of water sanitation and hygiene practices and proper use of latrines influencing adoption

Decision Status	Measuring scale	proper use of latrines influencing adoption			
		strongly agree	agree	disagree	Total
Influences adoption	Count% within proper use of of latrines influencing adoption	111	75	20	206
		66.5%	77.3%	87.0%	71.8%
Doesn't influence Adoption	Count% within proper use of latrines influencing adoption	56	22	3	81
		33.5%	22.7%	13.0%	28.2%
Total	**Count% within proper use of latrines influencing Adoption**	**167**	**97**	**23**	**287**
		100.0%	**100.0%**	**100.0%**	**100.0%**

Table 4.54 reveals that within the category strongly agree 111 (66.5%) were of the opinion that proper use of latrines influenced adoption of water, sanitation and hygiene practices whereas within the same category 56 (33.5%) were of a contrary opinion, followed by the category agree whereby 75 (77.3%) held the opinion that proper use of latrine influences adoption whereas 22 (22.7%) within the same category had a contrary opinion and lastly those within the category disagree 20 (87.0%) held the opinion that it influences adoption whereas in the same category 3 (13.0%) held a contrary opinion.

To further establish significance between association of indicator to the dependent variable, a chi test was conducted which yield a chi-value 6.411(a) at 2df obtained a p-value .041 showing significant association

4.6.14 Distribution of responses according to proper maintenance

The study further sought to establish if proper maintenance of latrine facilities have any influence on adoption of water, sanitation and hygiene practices

Table 4.55: Distribution of responses according to proper maintenance

	Frequency	Percent
strongly agree	170	59.2
Agree	97	33.8
Disagree	20	7.0
Total	287	100.0

Results from table 4.55 indicates that majority of respondents strongly agreed that proper maintenance influenced adoption of water, sanitation and hygiene practice, represented by 170 (59.2%), followed by those who agreed at 97 (33.8%) and those who disagreed were represented by 20 (7.0%).

4.6.15 Cross tabulation showing responses according to proper maintenance of latrine and adoption of water sanitation and hygiene practices

The study further established the significant relationship within the categorical responses by use of cross tabulations and the results were as presented in table 4.56;

Table 4.56: Cross tabulation showing responses according to proper maintenance of latrine and adoption of water sanitation and hygiene practices

		proper maintenance influencing adoption			
Decision Status	**Measuring scale**	**strongly agree**	**agree**	**disagree**	**Total**
Influences adoption	Count% within proper maintenance influencing adoption	112 65.9%	76 78.4%	18 90.0%	206 71.8%
Doesn't influence Adoption	Count% within proper maintenance influencing adoption	58 34.1%	21 21.6%	2 10.0%	81 28.2%
Total	**Count% within proper maintenance influencing adoption**	**170** **100.0%**	**97** **100.0%**	**20** **100.0%**	**287** **100.0%**

Table 4.56 reveals that majority of respondents within the category strongly

agree, 112 (65.9%) held an opinion that proper maintenance of latrines influenced adoption of water, sanitation and hygiene practices whereas within the same category 58 (34.1%) held a contrary opinion, followed by those in the category agree whereby 76 (78.4%) held the opinion that proper maintenance influence adoption while 21 (21.6%) within the same category held a contrary opinion, and lastly those in the category disagree 18 (90.0%) held the opinion that proper maintenance of latrines influence adoption of water, sanitation and hygiene practices whereas within the same category 2 (10.0%) held a contrary opinion.

A chi-square test was further conducted to establish the significance between association of the indicator to the dependent variable which yielded a chi-value 8.264(a) at 2df obtained a p-value .016, thus posting a significant association to the dependent variable.

4.7 Water sources and adoption of water, sanitation and hygiene practices

According to WHO/UNICEF(2010) while 87% of the world's population now has access to improved water sources, 39% still lack access to improved sanitation, moreover, in developing countries 1.1 billion people still defecate in the open, and hand washing with soap is practiced, on average, only after 17% of toilet uses. This implied that, the most commonly used water source was boreholes. UNICEF (2010) asserts that in rural households, women are six times more likely than men to be the ones to fetch water. This water is more likely to be contaminated at the collection point, during transportation or storage thereby transmitting diseases despite the knowledge of water quality improvement options. Community water sources are important ways to ensure the health of the community. Tereza (2011) further states that 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.

4.7.1 Distribution of responses according to availability of surface water

The study further sought to establish the influence of availability of surface water on adoption of WASH practices.

Table 4.57: Distribution of responses according to availability of surface water

	Frequency	Percent
strongly agree	169	58.9
Agree	97	33.8
Disagree	21	7.3
Total	287	100.0

Results from table 4.57 indicates that majority of respondents strongly agreed that availability of surface water influenced adoption of water, sanitation and hygiene practice, represented by 169 (58.9%), followed by those who agreed at 97 (33.8%) and those who disagreed were represented by 21 (7.3%).

4.7.2 Cross tabulation showing adoption of water sanitation and hygiene practices and availability of surface water influencing adoption

Cross tabulation was further conducted to establish the significant relationship within categorical responses and the results were as presented in table 4.58;

Table 4.58: Cross tabulation showing adoption of water sanitation and hygiene practices and availability of surface water influencing adoption

Decision Status	Measuring scale	availability of surface water influencing adoption: strongly agree	agree	disagree	Total
Influences adoption	Count% within availability of surface water influencing adoption	111	76	19	206
		65.7%	78.4%	90.5%	71.8%
Doesn't influence Adoption	Count% within availability of surface water influencing adoption	58	21	2	81
		34.3%	21.6%	9.5%	28.2%
Total	**Count% within availability of surface water influencing adoption**	**169**	**97**	**21**	**287**
		100.0%	**100.0%**	**100.0%**	**100.0%**

Table 4.58 reveals that within the category strongly agree, 111 (65.7%) agreed on the strong influence of availability of water sources and their influence on adoption of water, sanitation and hygiene practices whereas within the same category 58 (34.3%) declined its influence, followed by the category agree whereby 76 (78.4%) accepted the influence of availability of surface water on adoption of water, sanitation and hygiene practices while 21 (21.6%) declined and lastly within the category disagree 19 (90.5%) acknowledged influence on adoption whereas 2 (9.5%) held a contrary opinion.

To establish significance between association of the indicator to the dependent variable, a chi-value 8.795(a) at 2df obtained a p-value .012, therefore posting a significant association.

4.7.3 Distribution of responses according to availability of rain water

The study sought to establish the influence of availability of rain water on water, sanitation and hygiene practices

Table 4.59: Distribution of responses according to availability of rain water

	Frequency	Percent
strongly agree	168	58.5
Agree	97	33.8
Disagree	22	7.7
Total	287	100.0

Results from table 4.59 indicates that majority of respondents strongly agreed that availability of rain water influenced adoption of water, sanitation and hygiene practice, represented by 168 (58.5%), followed by those who agreed at 97 (33.8%) and those who disagreed were represented by 22 (7.7%).

4.7.4 Cross tabulation showing responses according to availability of rain water and adoption of water sanitation and hygiene practices

The study further sought to establish significant relationship within categorical responses and the results were as presented in table 4.60;

Table 4.60: Cross tabulation showing responses according to availability of rain water and adoption of water sanitation and hygiene practices

		availability of rain water influence adoption			
Decision Status	**Measuring scale**	**strongly agree**	**agree**	**disagree**	**Total**
Influences adoption	Count% within availability of rain water influence adoption	114	76	16	206
		67.9%	78.4%	72.7%	71.8%
Doesn't influence Adoption	Count% within availability of rain water influence adoption	54	21	6	81
		32.1%	21.6%	27.3%	28.2%
Total	**Count% within availability of rain water influence adoption**	**168**	**97**	**22**	**287**
		100.0%	**100.0%**	**100.0%**	**100.0%**

Table 4.60 reveals that within the category strongly agree, 114 (67.9%) held the opinion that availability of rain water influence adoption of water, sanitation and

hygiene practices whereas 54 (32.1%) held a contrary opinion, followed by in the category agree with 76 (78.4%) acknowledging its influence whereas 21 (21.6%) within the same category declined its influence and lastly 16 (72.7%) of the category disagree acknowledged its influence whereas 6 (27.3%) declined its influence on adoption.

To further ascertain the significance between association of the indicator to the dependent variable, a chi test was conducted which yielded a chi-value 3.353(a) at 2df obtained a p-value .187, larger than the alpha level of .05, therefore posting moderate significant association.

4.7.5 Distribution of responses according to availability of borehole water

The study sought to establish influence of availability of borehole water and its influence on adoption of water, sanitation and hygiene practices

Table 4.61: Distribution of responses according to availability of borehole water

	Frequency	Percent
strongly agree	158	55.1
Agree	105	36.6
Disagree	24	8.4
Total	287	100.0

Results from table 4.61 indicates that majority of respondents strongly agreed that availability of borehole water influenced adoption of water, sanitation and hygiene practice, represented by 158 (55.1%), followed by those who agreed at 105 (36.6%) and those who disagreed were represented by 24 (8.4%).

4.7.6 Cross tabulation showing responses according to availability of borehole water and adoption of water sanitation and hygiene practices

The results were further cross tabulated and the results were as presented in table 4.62;

Table 4.62: Cross tabulation showing responses according to availability of borehole water and adoption of water sanitation and hygiene practices

Decision Status	Measuring scale	availability of borehole water influencing adoption			
		strongly agree	**agree**	**disagree**	**Total**
Influences adoption	Count% within availability of borehole water influencing Adoption	107	79	20	206
		67.7%	75.2%	83.3%	71.8%
Doesn't influence Adoption	Count% within availability of borehole water influencing Adoption	51	26	4	81
		32.3%	24.8%	16.7%	28.2%
Total	**Count% within availability of borehole water influencing Adoption**	**158**	**105**	**24**	**287**
		100.0%	**100.0%**	**100.0%**	**100.0%**

Table 4.62 revealed that within the category strongly agree, 107 (67.7%) respondents held the opinion that availability of boreholes influenced adoption of water, sanitation and hygiene practices whereas within the same category 51 (32.3%) held a contrary opinion, followed by the category agree whereby 79 (75.2%) held the opinion that it influences adoption while 26 (24.8%) in the same category held a contrary opinion and lastly those in the category disagree, 20 (83.3%) , acknowledged the influence whereas within the same category 4 (16.7%) declined its influence on adoption of water, sanitation and hygiene practices among the residents of Shivanga location.

When a chi-statistic was conducted to establish the significance between association of the indicator to the dependent variable, a chi value 3.486(a) at 2df obtained a p-value .175, slightly larger the alpha level of .05 therefore posting a moderate significant association.

4.7.7 Distribution of responses according to cleaning water storage facilities

The study was also interested in establishing the influence of cleaning water storage facilities on adoption of water, sanitation and hygiene practices

Table 4.63: Distribution of responses according to cleaning water storage facilities

	Frequency	Percent
strongly agree	179	62.4
Agree	93	32.4
Disagree	15	5.2
Total	287	100.0

Results from table 4.63 indicates that majority of respondents strongly agreed cleaning water storage facilities influenced adoption of water, sanitation and hygiene practice, represented by 179 (62.4%), followed by those who agreed at 93 (32.4%) and those who disagreed were represented by 25 (5.2%).

4.7.8 Cross tabulation showing responses according to cleaning water storage facilities and adoption of water sanitation and hygiene practices

The results were further cross tabulated and the results were as presented in table 4.64;

Table 4.64: Cross tabulation showing responses according to cleaning water storage facilities and adoption of water sanitation and hygiene practices

Decision Status	Measuring scale	cleaning water storage facilities influencing adoption			
		strongly agree	agree	disagree	Total
Influences adoption	Count% within cleaning water storage facilities influencing Adoption	122	70	14	206
		68.2%	75.3%	93.3%	71.8%
Doesn't influence Adoption	Count% within cleaning water storage facilities influencing Adoption	57	23	1	81
		31.8%	24.7%	6.7%	28.2%
Total	**Count% within cleaning water storage facilities influencing adoption**	**179**	**93**	**15**	**287**
		100.0%	**100.0%**	**100.0%**	**100.0%**

Table 4.64 revealed that within the category strongly agree, 122 (68.2%) respondents were of the opinion that cleaning water storage facilities influenced adoption of water, sanitation and hygiene practices whereas within the same category 57 (31.8%) held a contrary opinion, followed by the agree category whereby 70 (72.3%) held the opinion that it influences adoption whereas 23 (24.7%) within the same category declined its influence, and lastly in the category disagree 14 (93.3%) acknowledged its influence on adoption whereas 1 (6.7%) held a contrary opinion.

To further establish significance between association of the indicator to the dependent variable, a chi test was conducted and a chi-value 5.159(a) at 2dg obtained a p-value .076 less than the alpha level of .05, therefore indicating a significant association.

4.7.9 Distribution of responses according to water storage models

The study also sought to establish the influence of water storage modes on adoption of water, sanitation and hygiene practices.

Table 4.65: Distribution of responses according to water storage models

	Frequency	Percent
strongly agree	183	63.8
Agree	92	32.1
Disagree	12	4.2
Total	287	100.0

Results from table 4.65 indicates that majority of respondents strongly agreed that water storage models influenced adoption of water, sanitation and hygiene practice, represented by 183 (63.8%), followed by those who agreed at 93 (32.1%) and those who disagreed were represented by 12 (4.2%).

4.7.10 Cross tabulation showing responses according to water storage modes and adoption of water sanitation and hygiene practices

The results were further cross tabulated and the results presented as is on table 4.66;

Table 4.66: Cross tabulation showing responses according to water storage modes and adoption of water sanitation and hygiene practices

		water storage modes influencing adoption			
Decision Status	**Measuring scale**	**strongly agree**	**Agree**	**disagree**	**Total**
Influences adoption	Count% within water storage modes influencing adoption	134	63	9	206
		73.2%	68.5%	75.0%	71.8%
Doesn't influence Adoption	Count% within water storage modes influencing adoption	49	29	3	81
		26.8%	31.5%	25.0%	28.2%
Total	**Count% within water storage modes influencing adoption**	**183**	**92**	**12**	**287**
		100.0%	**100.0%**	**100.0%**	**100.0%**

Table 4.66 reveals that within the category strongly agree, 134 (73.2%) held the opinion that water storage mode influences adoption of water, sanitation and

hygiene practices whereas within the same category 49 (26.8%) held a contrary opinion, followed by the category agree whereby 63 (68.5%) opined that water storage mode influences adoption of water, sanitation and hygiene practices while within the same category 29 (31.5%) declined, and lastly those in the category disagree 9 (75.0%) opined its influence to adoption whereas 3 (25.0%) held a contrary opinion.

To establish the significance between the indicator to the dependent variable, a chi test was conducted which yielded a chi-value .745(a) at 2df obtained a p-value .689, larger than the alpha level of .05, therefore posting no significant association on the influence of adoption of WASH practice.

4.7.11 Distribution of responses according to distance of water sources

The study sought to establish the influence of distance to water sources to adoption of water, sanitation and hygiene practices

Table 4.67: Distribution of responses according to distance of water sources

	Frequency	Percent
strongly agree	158	55.1
Agree	115	40.1
Disagree	14	4.9
Total	287	100.0

Results from table 4.67 indicates that majority of respondents strongly agreed that distance of water sources influenced adoption of water, sanitation and hygiene practice, represented by 158 (55.1%), followed by those who agreed at 115 (40.1%) and those who disagreed were represented by 14 (4.9%).

4.7.12 Cross tabulation showing responses according to distance to water sources and adoption of WASH practices

The study further sought to establish relationship in the categorical responses as

presented in table 4.68;

Table 4.68: Cross tabulation showing responses according to distance to water sources and adoption of WASH practices

Decision Status	Measuring scale	distance to water sources influencing adoption			
		strongly agree	**Agree**	**disagree**	**Total**
Influences adoption	Count% within distance to water sources influencing adoption	118	78	10	206
		74.7%	67.8%	71.4%	71.8%
Doesn't influence Adoption	Count% within distance to water sources influencing adoption	40	37	4	81
		25.3%	32.2%	28.6%	28.2%
Total	**Count% within distance to water sources influencing Adoption**	**158**	**115**	**14**	**287**
		100.0%	**100.0%**	**100.0%**	**100.0%**

Result from table 4.68 of cross tabulation indicate that majority of the respondents within the strongly agree category agreed that distance to water sources influenced adoption of water sanitation and hygienic practices as represented by 118 (74.7%) respondents, whereas in the same category 40 (25.3%) respondents held a contrary view. This was followed by those within agree category with 78 (67.8%) respondents who agree and in the same category 37 (32.2%) respondents had a contrary opinion, followed by disagree category which had 10 (28.6%) respondents and in the same category 4 (28.6%) respondents held a different opinion.

When a chi-statistic was conducted to establish significance between the indicators to the dependent variable, a chi value 1.546(a) at 2df obtained a p-value .462, larger than the alpha level .05 therefore posting no significant association in influencing adoption of WASH practices.

4.7.13 Distribution of responses according to security of dispensers

The study also sought to establish influence of security of chlorine dispensers on adoption of water, sanitation and hygiene practices

Table 4.69: Distribution of responses according to security of dispensers

	Frequency	Percent
strongly agree	152	53.0
Agree	120	41.8
Disagree	15	5.2
Total	287	100.0

Results from table 4.69 indicates that majority of respondents strongly agreed that security of dispensers influenced adoption of water, sanitation and hygiene practice, represented by 152 (53.0%), followed by those who agreed at 120 (41.8%) and those who disagreed were represented by 15 (5.2%).

4.7.14 Cross tabulation showing responses according to security to dispensers and adoption of WASH practices

Results were further cross tabulated to establish relationship in categorical responses as presented in table 4.70;

Table 4.70: Cross tabulation showing responses according to security to dispensers and adoption of WASH practices

Decision Status	Measuring scale	security of dispensers influencing adoption			
		strongly agree	**agree**	**disagree**	**Total**
Influences adoption	Count% within security of dispensers influencing adoption	101	92	13	206
		66.4%	76.7%	86.7%	71.8%
Doesn't influence Adoption	Count% within security of dispensers influencing adoption	51	28	2	81
		33.6%	23.3%	13.3%	28.2%
Total	**Count% within security of dispensers influencing adoption**	**152**	**120**	**15**	**287**
		100.0%	**100.0%**	**100.0%**	**100.0%**

Results from table 4.70 of cross tabulation indicate that majority of the respondents within the category strongly agree consented that security of dispensers influenced adoption of water sanitation and hygienic practices. This category had 101 (66.4%) respondents who strongly agreed and in the same category 51 (33.6%) respondents had a contrary opinion. This was followed by 92 (76.7%) respondents who agree that security of dispensers influenced adoption of water sanitation and hygienic practices, whereas in the same category 28 (23.3%) respondents held a contrary opinion. This was followed by 13 (86.7%) of respondents in the disagreed category, and in the same category 2 (13.3%) respondents had a contrary opinion.

To establish significance between association of the indicator to the dependent variable, a chi-value 5.189(a) at 2df obtained a p-value .075, posting a moderate significant association.

4.7.15 Distribution of responses according to proper maintenance and care of the water sources

The study further sought to establish the influence of proper maintenance and care of water sources and its influence on adoption of water, sanitation and hygiene practice

Table 4.71: Distribution of responses according to proper maintenance and care of the water sources

	Frequency	Percent
strongly agree	169	58.9
Agree	105	36.6
Disagree	13	4.5
Total	287	100.0

Table 4.71 demonstrates that majority of the respondents strongly agreed that proper maintenance and care of water sources influenced water sanitation and hygiene practices. This category had 169 (58.9%) respondents followed by 105 (36.6%) who agreed and 13 (4.5%) who disagreed that proper maintenance and care of water sources influenced water sanitation and hygiene practices.

4.7.16 Cross tabulation showing responses according to proper maintenance and care of water sources and adoption of WASH practices

Results obtained were further cross tabulated to establish the relationship within categorical responses as presented in table 4.72;

Table 4.72 Cross tabulation showing responses according to proper maintenance and care of water sources and adoption of WASH practices

Decision Status	Measuring scale	proper maintenance and care of the water sources influence adoption			Total
		strongly agree	agree	disagree	
Influences adoption	Count% within proper maintenance and care of the Water source influences adoption	117	79	10	206
		69.2%	75.2%	76.9%	71.8%
Doesn't influence Adoption	Count% within proper maintenance and care of the water sources influence adoption	52	26	3	81
		30.8%	24.8%	23.1%	28.2%
Total	**Count% within proper maintenance and care of the water sources influence adoption**	**169**	**105**	**13**	**287**
		100.0%	**100.0%**	**100.0%**	**100.0%**

Results from table 4.72 of cross tabulation indicate that majority of respondents within strongly agree category agreed that proper maintenance and care of water sources influenced adoption of water sanitation and hygienic practices. This category had 117 (69.2%) respondents who strongly agreed whereas in the same category 52 (30.8%) respondents held a contrary opinion. This was followed by 79 (75.2%) respondents in the agree category who agreed that proper maintenance and care of water influenced, while in the same category 26 (24.8%) respondents held a contrary opinion. This was followed by 10 (76.9%) respondents in the disagree category, while in the same category 3 (23.1%) respondents held a contrary opinion.

When a chi-statistic was conducted to establish significance between association of the indicator to the dependent variable, a chi-value 1.332(a) at 2df

obtained a p-value .514, implying no significant association on influence of adoption of WASH practices.

4.8. Other factors influencing adoption of water, sanitation and hygiene practices

The study sought to establish the extent to which other factors influence adoption of water, sanitation and hygiene practices among the community of Shivanga location.

Water-related efforts in the developing world are often balkanized and not sufficiently integrated to ensure sustainable water services. There can be different strategies to ensure access to safe water depending on the country and its social needs. The different strategies may have impacts on reaching the Millennium Development Goal of reducing by half the proportion of the population that lacks access to improved water and sanitation by 2015. A greater focus on policy formulation and local initiatives, along with new discussion of ecological sanitation and culturally appropriate initiatives, is led by empowered community members. More than a decade ago, Lockwood et al identified main groups of factors that affect the post-project sustainability of water systems in a significant way: technical; financial; community and social; institutional and policy; and environmental. These factors are widely agreed upon in the sector-wide sustainability conversation. But in practice, a project vs. services mindset continues.

4.8.1 Distribution showing extent of Policy formulation and influence on adoption of WASH practices

The study sought to establish the extent to which policy formulation influence adoption of water, sanitation and hygiene practices in this community. The results were as presented in table 4.73;

Table 4.73: Distribution showing extent of policy formulation and influence on adoption of water, sanitation and hygiene practices

Measuring scale	Frequency	Valid Percent
Very great	152	53.0
To some extent	101	35.2
No extent	34	11.8
Total	**287**	**100.0**

Results from table 4.73 revealed that 152 (53.0%) among respondents in Shivanga location thought that policy formulation very greatly influenced adoption of water, sanitation and hygiene practices, followed by 101 (35.2%) who had the opinion that policy formulation influenced adoption to some extent, and lastly those with the opinion no extent at influence were 34 (11.8%). This implied that, as asserted by Bethel et, al (2008) a striking feature of adoption of water, hygiene and sanitation practices is that its key elements are often formulated in brief and general terms. This included removing hardware subsidies to latrine construction and encouraging construction of latrines from locally available materials; 'Broad-based' and 'household-centred': Shifting from a service driven to a demand driven approach across the region. This required more focus on water, hygiene and sanitation education reaching people at village level. It included changing the features of water, hygiene and sanitation education from health institution-centered to household-centered, and using interactive dialogue based methods of communication that thereby improved the manner of formulating the policy in general terms and allowed flexibility of policies.

4.8.2 Cross tabulation showing the extent policy formulation influence adoption of WASH practices

To further ascertain categorical responses as regards the decision model, to influence and not to influence adoption of water, sanitation and hygiene practices, the study conducted a cross tabulation and the results were as presented in table 4.74;

Table 4.74 Cross tabulation on the extent policy formulation as a component influences adoption of water, hygiene and sanitation practices

Decision	Measuring scale	The extent policy formulation influences adoption			Total
		Very great	to some extent	no extent	
Influence adoption	Count % within the extent policy formulation influences adoption	100 65.8%	67 66.3%	19 55.9%	186 64.8%
Does not influence adoption	Count % within the extent policy formulation influences adoption	52 34.2%	34 33.7%	15 44.1%	101 35.2%
Total	Count % within the extent policy formulation influences adoption	152 100.0%	101 100.0%	34 100.0%	287 100.0%

Results from table 4.74 indicate that respondents within very great category opined that policy formulation influenced adoption of water, sanitation practices at 65.8%, while in the same category, 34.2% denied its influence on adoption, 66.3% responses within to some extent category were of the opinion that policy formulation influenced adoption whereas in the same category 33.7% were of the contrary opinion, 55.9% within no extent category held the opinion that it inflicted adoption whereas in the same category 44.1% held a contrary view.

A chi test on policy formulation therefore showed little significance between association of other factors to the dependent variable by depicting a chi-value 1.355(a) at 2df yielding a p-value of .508, greater than the alpha of .05 thereby revealing a non-significant relationship to the dependent variable's decision.

4.8.3 Distribution showing extent of policy implementation at multiple level and influence on adoption of water, sanitation and hygiene practices

The study was interested in assessing the influence of policy implementation at multiple levels as a component and whether it influenced adoption of water, sanitation and hygiene practices among residents of Shivanga location, and the results were as presented in table 4.58;

Table 4.75: Distribution showing policy implementation at multiple levels and influence on adoption of water, hygiene and sanitation practices

Measuring scale	**Frequency**	**Percent**
Very great	150	52.3
To some extent	114	39.7
No extent	23	8.0
Total	**287**	**100.0**

Results from table 4.75 revealed that majority of the respondents 150 (52.3%) held the opinion that policy implementation at multiple levels to a very great extent influenced adoption, followed by 114 (39.0%) who opined that it influenced adoption to some extent, and lastly at no extent, the influence was seen as indicated by 23 (8.0%) response rate. Spratt, Kai (2009) assert that roll out of any policy often meets some level of community resistance or low engagement that thwarts effective implementation. The early engagement of all stakeholders is essential to resolving this kind of barrier. Barriers analysis serves to engage stakeholders and increase commitment and understanding of their roles during implementation, in addition to informing effective implementation. Full implementation of policies requires implementation at multiple levels: - national, state, district, and municipal. However, national policies are often broad framework documents that are not always accompanied by guidelines or plans that specify implementation mechanisms and the roles and responsibilities of specific agencies.

4.8.4 Cross tabulation showing the extent policy implementation at multiple level influence adoption of WASH practices

The study also conducted a cross tabulation to identify categorical responses within the decision to influence or not to influence as measured across elements in the measuring scale and the results obtained were as presented in table 4.76;

Table 4.76: Cross tabulation showing the extent policy implementation at multiple levels influences adoption of water, hygiene and sanitation practices

		The extent policy implementation at multiple levels influence adoption			Total
Decision	Measuring scale	Very great	To some extent	No extent	
Influences adoption	Count % within the extent policy implementation at multiple levels influence adoption	84 56.0%	85 74.6%	17 73.9%	186 64.8%
Does not influence adoption	Count % within the extent policy implementation at multiple levels influence adoption	66 44.0%	29 25.4%	6 26.1%	101 35.2%
Total	Count % within the extent policy implementation at multiple levels influence adoption	150 100.0%	114 100.0%	23 100.0%	287 100.0%

Results from table 4.76 show that within to some extent category in response on the influence on adoption, 85 (74.6%) respondents agreed on policy implementation influencing adoption of water, sanitation and hygiene practices whereas in the same category 29 (25.4%) were of the contrary opinion while in the very great category, 84 (56.0%) within the category acknowledged the influence of multiplicity in levels of policy formulation on adoption of the practice whereas in the same category 66 (44.0%) declined its influence and lastly within the no extent category, 17 (73.9%) opined that it influenced adoption whereas 6 (26.1%) held a contrary opinion. This is in line with Spratt, Kai (2009), who asserted that the lack of

role clarity in rolling out the program affected implementation timeliness. In addition, communities, including civil society organizations, service providers, and program beneficiaries also must be involved in implementation. As research in Vietnam showed, communities opposed integrating OVC into their communities. This finding indicates the need for broader consultations with various stakeholders at different stages of the policy development and implementation processes.

Therefore to further outline significance in association to the dependent variable, the study conducted a Pearson chi – test and the results depicted a chi-value 10.693(a) at 2df obtaining a p-value .005 thus posting a significant association to the dependent variable.

Table 4.77: Binary logistic regression summary showing levels of association of variables in the equation within all factors to the dependent variable.

		Score	df	Sig.
1.	Male roles influencing adoption	9.476	1	.002
2.	Female roles influencing adoption	9.500	1	.002
3.	Level of education influencing adoption	9.303	1	.002
4.	Information sharing influencing adoption	8.608	1	.003
5.	Community level planning of project activities influencing adoption	9.112	1	.003
6.	Availability of surface water influencing adoption	8.793	1	.003
7.	Utilization of local resources influencing adoption	8.411	1	.004
8.	Life-straw sieve for treatment influencing adoption	8.260	1	.004
9.	Availability of latrines influencing adoption	8.259	1	.004
10.	Proper maintenance influencing adoption	8.260	1	.004
11.	Religion on water and fecal disposal	7.745	1	.005
12.	Community control over project development influencing adoption	8.024	1	.005
13.	Assessment at the end of project influence adoption	7.861	1	.005
14.	Training and capacity building influencing adoption	7.738	1	.005
15.	Attitude influencing adoption	7.501	1	.006
16.	Frequent assessment influencing adoption	7.412	1	.006
17.	Community involvement influencing adoption	7.225	1	.007
18.	Hand washing practices before and after meals influencing adoption	7.226	1	.007
19.	Beliefs influencing adoption	7.105	1	.008
20.	Identification of community needs by projects influencing adoption	7.123	1	.008
21.	Water guard for water treatment influencing adoption	6.418	1	.011
22.	Proper use of latrines influencing adoption	6.403	1	.011
23.	Chlorine for water treatment influencing adoption	5.839	1	.016
24.	Acquisition of relevant knowledge influencing adoption	5.409	1	.020
25.	Security of dispensers influencing adoption	5.189	1	.023
26.	Hand washing with soap after fecal contact influencing adoption	4.634	1	.031
27.	Cleaning water storage facilities influencing adoption	4.645	1	.031
28.	Availability of borehole water influencing adoption	3.484	1	.062
29.	Availability of rain water influence adoption	1.969	1	.161
30.	Proper maintenance and care of the water sources influence adoption	1.255	1	.263
31.	Distance to water sources influencing adoption	1.066	1	.302
32.	Water storage modes influencing adoption	.271	1	.603

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter gives a summary of the study findings based on the themes of sociocultural practices, community participation, accessibility and water sources, the conclusions of the main findings, and recommendations.

5.2 Summary of findings

The first objective of this study was to establish how socio-cultural aspects influence adoption of water, sanitation and hygiene practices, and the results from the study show that within socio-cultural aspects, female roles influenced adoption of water, sanitation and hygiene practices in the Shivanga community at 167 (58.2%) respondents as shown in table 4.11. Female roles also posted a p-value of 0.005 on the Chi-Square test which depicts a significant association with the dependent variable. Belief also influenced adoption of water, sanitation and hygiene practices. It posted a p-value of 0.015 on the Chi-Square test. In this category, 109 (65.3%) strongly agreed that belief influenced adoption of the water, sanitation and hygiene practices. This is against 58 (34.7%) on the strongly agreed category did not think belief influenced adoption of this practices. Acquisition of relevant knowledge influenced significantly adoption of water, sanitation and hygiene practices. It posted a p-value of 0.031 on the Chi-Square test. 167 (58.2%) of the respondents who were the majority strongly agreed that acquisition of relevant knowledge influenced adoption of water, sanitation and hygiene practices. On the cross tabulation to analyze relationship between acquisition of relevant knowledge and adoption of the practices, majority of the respondent strongly agreed that acquisition of relevant knowledge influenced

adoption of the practices. This was against 57 (34.1%) respondents who did not think it influenced.

The second objective of the study was to determine the extent which community participation influenced adoption of water, sanitation and hygiene practices, and the results shows that 169 (58.9%) strongly agreed that community involvement influenced adoption of the practices. This represented the majority of the respondents. When cross tabulation was conducted to analyze relationship between community involvement and whether it influenced the practices, majority respondents who were 111 (65.7%) in table 4.30 strongly agreed that community involvement influenced adoption of the practices. This was against 58 (34.3%) who did not think it influences. A Chi-Square test depicted a p-value of 0.021 which revealed a significant association. Utilization of local resources influenced adoption of water sanitation and hygiene practices. This was represented by the majority of respondents who were 169 (58.9) as shown in table 4.31 who strongly agreed with the statement. When cross tabulation was conducted to analyze relationship majority of the respondents strongly agreed that local resource utilization influenced adoption of the practices. Table 4.32 depict that 110 (65.1%) strongly agreed that utilization influenced adoption while 59 (34.9%) in the same category did not feel utilization influenced adoption of the practices. Chi-Square test revealed a p-value of 0.010 which implies a significant association. Frequent assessment influenced adoption of water sanitation and hygiene practices. Table 4.36 shows that 172 (59.9%) respondents representing the majority strongly agreed that frequent assessment influenced adoption of the practices. When cross tabulation was conducted to analyze relationship 113(65.7%) respondents who were the majority strongly agreed that frequent assessment influenced adoption of the practices. 59 (34.3%) in the same category did not think frequent assessment

influenced adoption of the practices. Chi-Square test depicts a p-value of 0.019 depicting a significant influence of frequent assessment on adoption of the practices.

The third objective of the study was to assess how accessibility to intervention influence adoption of water, sanitation and hygiene practices, the results show that 170 (59.2%) respondents who were majority strongly agreed that chlorine for water treatment influenced adoption of the practices. This is as shown in table 4.42. When cross tabulation was conducted to analyze relationship as shown in table 4.43, 112 (65.9%) strongly agreed that chlorine for water treatment influence adoption whereas 58 (34.1%) didn't think chlorine for water treatment influenced the practices of water sanitation and hygiene. When Chi-Square test was conducted, it revealed as p-value of 0.028 symbolizing a significant association. Water guard for water treatment influence adoption of water sanitation and hygiene practices. Majority of the respondents strongly agreed with this statement. Table 4.44 details this, 171 (59.6%) represented the majority. Cross tabulation was conducted where 113 (66.1%) strongly agreed that water guard for water treatment influenced adoption, whereas 58 (33.9%) respondents did not think so. When Chi-Square test was conducted, it revealed a p-value of 0.032 depicting that availability of water guard for water treatment influenced significantly adoption of water sanitation and hygiene practices. Hand washing practices before and after meals influenced adoption of water sanitation and hygiene practices. Majority of the respondents strongly agreed with this. This was represented by 172 (59.9%) respondents as shown in table 4.48. Cross tabulation showed that majority of respondent felt that hand washing practices influenced adoption of this practice. This was represented by 113 (65.7%) respondents who strongly agreed whereas 59 (34.3%) in table 4.49 did not think so. Chi-Square test depicted a value of 0.019 symbolizing a significant association between hand washing

process before and after meals influencing adoption of water sanitation and hygiene practices.

The fourth objective of the study was to determine the extent which water sources influence adoption of water, sanitation and hygiene practices, and the results from the study showed that majority of respondents in Shivanga location strongly agree that availability of surface water influenced water sanitation and hygienic practices. This was represented by 169 (58.9%) respondents who strongly agreed. This was as shown in table 4.58. When cross tabulation was conducted, 111 (65.7%) strongly agreed that availability of surface water influenced adoption of the practices. In the same category, 58 (34.3%) did not think so. When Chi-Square test was conducted it depicted a p-value of 0.012 signifying that availability of ground water significantly influenced adoption of water sanitation and hygiene practices. Availability of rain water influenced adoption of water sanitation and hygiene practices. This was represented by 168 (58.5%) respondents in table 4.60 who strongly agreed with this statement. When cross tabulation was conducted to analyze relationship, 114 (67.9) respondents strongly agreed whereas 54 (32.1%) did not think so. When Chi-Square test was conducted, a p-value of 0.187 was realized depicting moderate significance of association between availability of rain water and adoption of the practices. Availability of borehole water influenced adoption of water sanitation and hygiene practices. Majority of the respondents strongly agreed with this statement. This was represented by 158 (55.1%) respondents who strongly agreed that availability of borehole water influenced adoption of water sanitation and hygiene practices within which 107 (67.7%) strongly agreed to its influence, posting a p- value 0.175. Majority of respondents also strongly agreed to the statement that cleaning water storage at 179 (62.4%) within which 122 (68.2%) strongly agreed to its

influence, posting a p-value 0.076. The influence of water storage mode was also studied and majority of respondents at 183 (63.8%) strongly agreed to the statement among which 134 (73.2%) strongly agreed to its influence on WASH practice posting a p-value 0.689. Majority of respondents represented by 158 (55.1%) agreed to the statement that distance to water source influence adoption and within the category 118 (74.7%) strongly to its influence posting 0.462. Security of the dispensers was also seen to have a significant association to the dependent variable by yielding a p-value of 0.075 and finally proper maintenance and care of the water source posted a p-value 0.514 which indicated no significant association to the dependent variable.

Other factors that the researcher thought would be affecting water, sanitation and hygiene post project sustainability in a significant way were also identified and this included policy formulation and policy implementation at multiple level. The results on policy formulation revealed that among the respondents of Shivanga 152 (53.0%) thought that policy formulation very greatly influenced adoption of water, sanitation and hygiene practices, followed by 101 (35.2%) who had the opinion that policy formulation influenced adoption to some extent, and lastly those who had the opinion that to no extent did it influence the practice were at 34 (11.8%). The responses were further cross tabulated and the results showed that respondents within the category of very great extent, 100 (65.8%) opined that policy formulation influences adoption of water, sanitation and hygiene practices while, in the same category 52 (34.2%) denied it's influence on adoption, 67 (66.3%) responses within the category to some extent were of the opinion that policy formulation influenced adoption whereas, in the same category 34 (33.7%) were of the contrary opinion, 19 (55.9%) within no extent category held the opinion that it influenced adoption whereas in the same category 15 (44.1%) held a contrary view. A chi-statistics of

.508, greater than a table constant .05 was revealed indicating a non-significant relationship to adoption of water, sanitation and hygiene practices.

Policy implementation at multiple level was also studied and the results revealed that majority of the respondents 150 (52.3%) held the opinion that policy implementation at multiple levels to a very great extent influenced adoption, followed by 114 (39.0%) who opined that it influenced adoption to some extent, and lastly to no extent, the influence was seen as indicated by 23 (8.0%) response rate. The results after they were cross tabulated showed that within to some extent category in response on the influence on adoption, 85 (74.6%) respondents agreed on policy implementation influencing adoption of water, sanitation and hygiene practices whereas in the same category 29 (25.4%) were of the contrary opinion while in the very great category, 84 (56.0%) acknowledged the influence of multiplicity in levels of policy formulation on adoption of the practice whereas in the same category 66 (44.0%) declined its influence and lastly within the no extent category, 17 (73.9%) opined that it influenced adoption whereas 6 (26.1%) held a contrary opinion. A chi-test derived a p-value of .005, much lower than the table constant implying a very significant relationship between policy implementation at multiple level and adoption of water, sanitation and hygiene practice.

5.3 Conclusion

The study was designed to shed light on factors influencing adoption of water, sanitation and hygiene practices under four major themes, the study results concludes that awareness of social cultural aspects is an influential factor on changing the mindset of the community members and thus adoption of water, sanitation and hygiene practices. People should therefore change their attitude towards the use of

sanitation facilities and treatment of drinking water and also change the attitude that it is the duty of the government to provide water and sanitation services to every individual in order to avert diseases.

Community participation at all stages of project implementation is important to the adoption of water, sanitation and hygiene practices, it has also proved to be an influential factor as it enables the community to assume responsibility, authority and control over the development of the project. However, as suggested by the study, responsibilities of the community should be present at every stage of the project. This could be community owning the project and having the right attitude to allow for the project to succeed in its objectives.

Other factors influencing adoption of the practice included policy implementation at multiple levels by stakeholders who structured programs affecting the day to day lives of a majority that were of the opinion that such implementation to a very great extent influenced adoption and therefore implying that early engagement of all stakeholders is essential in resolving any kind of barrier or community resistance and synching of activities promoting adoption of WASH behavior.

5.4 Recommendations

On the basis of the findings of the study:

The county government should ensure that consultative process on policy implementation at multiple levels be discussed and refined by representatives from the ministry, local government, private sector, donors and civil society in order to give a broad participation to all groups a voice in the reform process of water, sanitation and hygiene projects.

The county government should prioritize education and awareness promotions on the influence of socio-cultural aspect on water sanitation and hygiene behaviour and through the use of cheaply available material like latrine construction material for better sanitation which also provide greater privacy, convenience, safety and dignity.

Water, sanitation and hygiene must be given greater priority in the community, which presently puts too much focus on curative approaches and there should be involvement of health professionals in hygiene, sanitation and water practices in the community.

5.5. Suggestion for further research

This study is not complete and there is need for further research within the area of socio-cultural aspects and their influence on water, sanitation and hygiene behavior because the study was conducted for a short period in Shivanga location in Kakamega county and thus extensive study is needed which can also look at other areas where the socio-cultural situation is different.

This study has identified focus on implementing policies at multiple levels, further research should therefore focus on government policies that enable multiple stakeholders' involvement in alleviating water, sanitation and hygiene and other community related issues.

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Appendix 1: INTRODUCTION LETTER

Appendix II: Informed consent

Informed Consent Form: Household Representatives

Research title:	Factors influencing adoption of water, sanitation and hygiene practices in Shivanga location, Kakamega County.
The Researcher:	Lucy Nachaki Mukadi, University of Nairobi, lucynachaki@yahoo.com
Interviewees:	Household representatives
Ethical clearance, permission and acceptance	National Council for Science Technology and Innovations and Letter from the university

About the study

I am conducting an academic study to establish extent to which socio-cultural aspects, community participation, accessibility to interventions and water sources influence adoption of water, sanitation and hygiene practices among the residents of Shivanga location in Kakamega County. The goal of this study is to gain insight into adoption of water, sanitation and hygiene programs for program sustainability.

Being in the study is your choice

This consent form gives you information about the study and any risks will be explained to you. Once you understand the study, and if you agree to take part, you will be asked to sign your name on this form. When we are done you will receive a copy of the signed form.

What we will ask you to do

If you agree to be part of this study we will ask you to respond to the survey questions by giving your honest responses to the questions. There is no right or wrong answers. We just want your views. We want to learn from your

experiences about what does and does not work for the WASH implementers so that we can add on the existing body of knowledge because this research is purely for academic purpose. Each survey or interview will take from 30minutes to 45 minutes to complete.

Data security and confidentiality

All the information will be used for research purposes only. No one will be able to access this data except the researchers. The data forms will not have your name on them and we will make it impossible to identify you in any report on this study.

Risks and benefits of the study

There are no serious risks for participating in this study. We will only be asking for your opinion and experiences related water, sanitation and hygiene.

What you say will be kept confidential. The results of this study will be used to improve water, sanitation and hygiene programs and contribute to the body of knowledge in Kakamega County.

Cost To You

You will not incur any cost for participating in the study. However, we will take some of your time (1 hour or less each time) during the interview. If you may feel some discomfort about sharing some of the information, you have the right to decide not to answer any question.

Do you have any questions about this study?

REMEMBER

- ☐ Participating is completely voluntary.

☐ You can decide not to answer questions or can withdraw from the study at any time.

If you ever have questions about this study, you should contact the researcher at: lucynachaki@yahoo.com, 0725010839.

1. **I agree to participate in this interview: YES_____NO**

Your signature or mark _____ Date

Your Name:

NOTE: You are not giving up any of your legal rights by signing this informed consent document.

Signature and name of person obtaining consent…….

Date……..

Appendix III: Questionnaire

SECTION A: DEMOGRAPHIC INFORMATION

Demographic Information	
Q1. Gender of respondent	
Q2. Marital Status	
Q3. Age of respondent	
Q4. Number of people living in household	
Q6. Number of children in the household	
Q7. Occupation of male head of household	
Q8. Occupation of female head of household	
Q9. Education level of respondent	
Q10. Religion of the respondent/household *(please specify)*	

SECTION B: SOCIAL CULTURAL ASPECT

Instructions: Please tick appropriate box.

Gender roles

Tick to indicate the extent which you agree with the following statements

	Strongly agree	Agree	Disagree
Male roles influence adoption of WASH practices			
Female roles influence adoption of WASH practices			
Level of education influence adoption of WASH practices			

Religion and Beliefs

Tick to indicate the extent which you agree with the following statements

	Strongly agree	Agree	Disagree
Religion influence adoption of WASH practices			
Belief influences adoption of WASH practices			
Level of income influence adoption of WASH practices			

Attitude and Knowledge

	Strongly disagree	Agree	Disagree
Acquisition of relevant knowledge influence adoption of WASH practices			
Attitude influence adoption of WASH practices			
Information sharing influence adoption of WASH practices			

SECTION C: COMMUNITY PARTICIPATION

Identification and planning stage

	Strongly disagree	Agree	Disagree
Identification of community needs by projects influence adoption of WASH practices			
Community level planning of project activities influence adoption of WASH practices			
Community involvement influence adoption of WASH practices			

Implementation stage

	Strongly disagree	Agree	Disagree
Utilization of local resources influence adoption of WASH practices			
Community control over project development influence adoption of WASH practices			

Monitoring and evaluation

	Strongly agree	Agree	Disagree
Frequent assessment of project			
Assessment at the end of the project			
Training and capacity building			

SECTION D: ACCESSIBILITY TO INTERVENTIONS.

Instructions: Please tick one

Water treatment reagents

	Strongly agree	Agree	Disagree
Chlorine for water treatment influence adoption of WASH practices?			
Water guard for water treatment influence adoption of WASH practices?			
Life-straw sieve for treatment influence adoption of WASH practices?			

Hand washing times

	Strongly agree	Agree	Disagree
hand washing with soap before eating influence adoption of WASH practices			
hand washing with soap after eating influence adoption of WASH practices			
hand washing with soap after fecal contact influence adoption of WASH practices			

Latrines

Tick to indicate the extent which you agree with these statements

	Strongly agree	Agree	Disagree
Does availability of latrines influence adoption of WASH practices			
proper use of latrines influence adoption of WASH practices			
proper maintenance influence adoption of WASH practices			

SECTION E: WATER SOURCES

Tick to indicate the extent which you agree with the following statements

Water source type

	Strongly agree	Agree	Disagree
Availability of water sources			
Availability of rain water			
Availability of boreholes			

Water storage

	Strongly Agree	Agree	Disagree
cleaning of storage facilities and sources of water influence adoption of WASH practices			
installation of chlorines dispensers at water sources influence adoption of WASH practices			

Proximity

Please tick to indicate the extent which you agree with these

	Strongly Agree	Agree	Disagree
distance to water sources influence adoption of WASH practices			
security of the dispensers influence adoption of WASH practices			
proper maintenance and care of the water sources influence adoption of WASH practices			

Other factors

	Very great extent	Some extent	No extent
Policy formulation			
Policy implementation at multiple level			

Appendix IV: Key Interview Guide
Date of interview: _____

Name of key informant: _____

Title: _____

Gender: _____

Key Informant Interview Guide for Nursing Officers in Charge

1. In your own opinion how would social cultural practices determine adoption of water, sanitation and hygiene practices among this community?
   ……
   ……
2. Are there any religious beliefs that hinder people in this community from seeking medical attention?
   ……
   ……
3. How would knowledge and attitude determine adoption of water, sanitation and hygiene practices among this community?
   ……
   ……
4. How can community participation determine adoption of water, sanitation and hygiene practices in the community
   ……
   ……
5. How would accessibility to water, sanitation and hygiene interventions influence adoption of water, sanitation and hygiene practices among this community?
   ……
   ……
6. What are the commonly used water sources used in this community
   a. ……..
   b. ……..
   c. ……..
   d. ……..
7. In your own opinion how safe are this water sources for drinking water?
   ……
   ……
   …….
8. How often do people in this community seek medical care when they suffer from Water, Sanitation and Hygiene related diseases?

……
……
……....

9. In your own opinion, how best are the community members informed about the risks associated with Water, sanitation and Hygiene related diseases?
……
……
…….
10. What is the average number of cases of under 5 children reported to be suffering from diarrhea diseases in a month in this health facility?
……
……
……
11. What is the average number of cases of adults reported to be suffering from diarrhea diseases in a day in this health facility?
……
……
…….

Thank you for your time.

Appendix V: RESEARCH BUDGET

Item	**Cost (Kshs.)**
Binding and Photocopying	20,000
Printing and Typing	50,500
Transport and subsistence	20,500
Stationery and preparation of the copies	10,000
Miscellaneous	12,000
Training of research assistants and facilitation	20,000
Total	**133,000**

Appendix VI: TIME SCHEDULE

ACTIVITY 2015-2016	SEP	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE
Proposal development, presentation & correction	XX	XX	XX						
Data collection				XX	XX				
Data analysis						XX	XX		
Final Report writing								XX	
Presentation									XX

Appendix VI: LETTER OF TRANSMITTAL

Appendix VIII: RESEARCH PERMIT