FACTORS INFLUENCING HOUSEHOLDS' WILLINGNESS AND ABILITY TO INVEST IN SANITATION FACILITIES IN BUSIA COUNTY, KENYA

BY

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DECLARATION

I hereby declare that this thesis is my original work. To the best of my knowledge, it has not been presented for any award at any university.

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DEDICATION

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ABSTRACT

Poor sanitation is associated with poor health outcomes in populations, loss of school days, low academic performance and stunting in children. Kenya loses 0.9% of its Gross Domestic Product, KES 27.4 billion, annually due to poor sanitation. This indicates that failure to invest in sanitation may be costly. Busia County is among the counties that currently require education on importance of using standard sanitation facilities. Despite the knowledge of the needs for efficient sanitation facilities, investment in sanitation is still low with sanitation coverage at 32% and over 15% of the population still practising open defecation. Investing in sanitation may be influenced by several factors including culture, cost, affordability, financial capabilities with disease prevention being the most potent motivator. The aim of this research was to establish factors that affect the willingness and ability to invest in sanitation by households in Busia County with a target population of 287,577 residents. A total of 421 residents were sampled for the study; 197 were from Butula and 224 from Teso South sub-counties. The assessment was done with a focus on demographic, socio-cultural, economic and financial factors in different households using quantitative methods that target the heads of households. The research adopted a cross-sectional design and used systematic random sampling to select residents to be administered with questionnaires. The variability of the responses is presented in charts and graphs and the variability's tested using the Z-scores. Logistic regression was used to identify factors influencing investment in sanitation where odds ratios were used to establish the strength of associations between critical variables and investment in sanitation. While 88.1% of the study population owned a latrine, the rest (11.9%) practiced open defecation. There was high willingness to invest in sanitation (87.5%). Twenty-three percent were able to invest in sanitation. Disease prevention (91%) and sanitation knowledge (98.3%) were the most significant social and demographic factors considered by the interviewees before investing in sanitation. Financial factors with great significance were household income and employment status. Findings from this study may be useful as a basis for informed sanitation intervention strategies for government and development agencies that target to enhance communities' willingness and abilities to invest in sanitation. It may be a driver of increasing the sanitation coverage in Busia County and beyond.

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LIST OF ABBREVIATIONS

ATP	Ability To Pay
CHV	Community Health Volunteer
CLTS	Community Led Total Sanitation
EA	Enumeration Area
FGD	Focused Group Discussion
GDP	Gross Domestic Product
GDP	Gross Domestic Products
HH	Household
IGA	Income Generating Activity
JMP	Joint Monitoring Programme
KIHBS	Kenya Integrated Household Budget Survey
MDG	Millennium Development Goals
MFI	Microfinance Institution
MOH	Ministry of Health
MoPH	Ministry of Public Health and Sanitation
MTP	Medium Term Plan
MUERC	Maseno University Ethics and Review Committee
OD	Open Defecation
ODF	Open Defecation Free
OR	Odds Ratio
PHO	Public Health Officer
PPS	Probability Proportional to Size
SWA	Sanitation and Water for All
TPL	Traditional Pit Latrine
TZS	Tanzanian Shilling
UDDT	Urine Diversion Drying Chamber
UNICEF	United Nations Children's Fund
VIP	Ventilated Improved Pit Latrine
WHO	World Health Organization
WTP	Willingness To Pay

OPERATIONAL DEFINITION TERMS

Ability to invest : The capacity of a community member to raise reasonable financial resource and pay for or construct safe sanitation facility for their household, also expressed as supply. A borrower's capacity to service a loan from his or her income or cash flow.

Access to sanitation: Refers to the population with at least adequate excreta disposal facilities, effectively preventing human, animal, and insect contact with excreta. Suitable facilities range from simple but protected pit latrines, to flush toilets with sewerage.

Bill of rights: A framework for social, economic and cultural policies as provided for in chapter 4 of the constitution of Kenya.

Choice: Picking one from the available sanitation options

Community Led Total Sanitation: This is a sanitation approach, an innovative methodology for mobilising communities to completely eliminate open defecation (OD). Communities are facilitated to conduct their own appraisal and analysis of open defecation and take their own action to become open defecation free (ODF)

Cost and affordability: The price attached to or that will be paid for a certain sanitation option or system, affordability is the means to overcome cost, a sanitation option that is within the household's financial means.

Cost of the service: The expenses that a household member has to incur to access financial credit for sanitation including interest

Culture: The behaviours, beliefs and characteristics of a particular social, ethnic, or age group.

Enumeration areas: Geographical areas of study conversed by data collection personnel during data collection.

External assistance: A household that was assisted to put up sanitation facility by an organization or persons not related to the household members.

Gross domestic product: The total value of goods produced and services provided in Kenya during one year, a measure of the country's economy.

Health education: Learning experiences or activities designed to help individuals and communities improve their health, by increasing their knowledge or influencing their attitudes.

Household income: Combined incomes of all people living in a study household

Human rights: Moral principles or norms that describe certain standards of human behaviour. The protected inalienable, fundamental rights "to which a person is inherently entitled simply because she or he is a human being"

Individual preference: The type of sanitation facility that an individual or household would like to have and use.

Intention: A mental state or commitment to construct a sanitation facility in the near future

Laws and regulations: All Kenyan and International rules, policies, standards and guidelines that affect sanitation

Legal requirements: Official documents i.e. National Identification card, passport, Personal Identification Number that one must produce to access sanitation credit.

Open defecation: It is the practice of passing out excreta in open field and indiscriminately, these excreta often find their way into sources of drinking water and food.

Perceived health risk: The fear of catching an illness that is as a direct result of poor sanitation.

Sanitation investment: Planned use of resources, both financial and otherwise to put up sanitation facilities.

Sanitation marketing: The application of the best social and commercial marketing practices to change behaviour and to scale up the demand and supply for improved sanitation, particularly among the poor.

Social marketing: The use of marketing techniques to promote the adoption of products or behaviours that will improve the health or well-being of the target audience or of society as a whole. It was biased towards Community Led Total Sanitation.

Triadic reciprocity/Reciprocal determinism: As used by Albert Bandura, refers to the mutual influence between three sets of factors: personal factors (e.g., cognitive, affective and biological events), the environment, behaviour.

Ventilated improved pit latrine: A type of a latrine that is fitted with vent pipe, fly screen, impervious floor, wall, roof and lockable door. It offers access to improved sanitation.

Willingness to invest: The quality or state of being prepared to do something; readiness. Also expressed as demand - an informed expression of desire for a particular service, measured by the contribution people are willing and able to make to receive this service. Also referred to in this study as the willingness to pay for sanitation

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CHAPTER ONE

INTRODUCTION

1.1 Background Information

The willingness by households to invest in sanitation is likely to be affected by a number of factors including; demographic, socio-cultural, economic and financial factors (Gordon, McDermott, Stead & Angus, 2006). Through Resolution 64/292, the United Nations General Assembly explicitly recognized the human right to sanitation and acknowledged it as essential to the realization of all human rights (United Nations, 2010). Safe drinking water, sanitation, and hygiene are fundamental to health, well-being, and poverty eradication and must be given a higher place in any agenda for future development (Vasilescu, 2013). The Millennium Development Goal number seven, targets three aspects aimed to reduce the proportion of the population without sustainable access to safe drinking water and basic sanitation by half by the year 2015. Globally, the safe water targets were met by 2015. On the on the hand the sanitation target were not be met. Lack of adequate sanitation is a serious health risk and an affront to human dignity. In 2008, an estimated 2.6 billion people globally lacked access to safe sanitation. The regions with the lowest coverage are sub-Saharan Africa (31%), southern Asia (36%) and Oceania (53%) (The MDG Report, 2013).

Willingness to invest in sanitation facilities is built upon an understanding of the importance of sanitation. A willing individual understands the need for a sanitation facility and possibly the challenges associated with the use of inadequate facilities. Some people feel comfortable with their current sanitation state and have no strain or efforts to come up with safe and healthy ways of handling sanitation. The level of commitment to building reliable sanitary facilities can, therefore, determine the proportion of willingness to invest in the same.

Access to improved sanitation continues to be a major challenge. In Kenya, sanitation coverage is at 32%. More than 6 million Kenyans still defecate in the open which leads to prevalence of diseases such as diarrhoea, typhoid and cholera (Nyaboro, 2011), in economic terms, Kenya loses 0.9% of its gross domestic product (GDP) annually due to poor sanitation (World Bank, 2012). By 2011, Nambale Sub County of Busia County had a sanitation coverage of 83.6%, the other sub-counties still practised open defecation (Odhiambo, 2012). In Busia County, poor sanitation accounts for over 40% of diarrheal illnesses and intestinal worm infestation, the Ministry of Health records indicate that cases of morbidity related to sanitation are unacceptably high, investing in sanitation facilities would reduce these cases by a big margin, yet many people do not prioritise sanitation on their investment agenda (MPH, 2016).

For most Kenyans, investing in sanitation is the last on the priority list, traditional community-led total sanitation (CLTS) approach as used in Busia proposes that once people are made aware of their sanitation problems, they can take action to improve their sanitation status; using locally available materials (Kar & Chambers, 2008), whether or not they construct these facilities depends on their willingness, preferences, access to finances and ability to pay for facility of choice. The approach to some extent attempts to adopt the social change model, showing communities where they are at the moment and where they should aspire to be in the near future in terms of their sanitation. It is however not known whether high levels of willingness result in high levels of ability to invest and consequently increasing sanitation coverage in Teso South and Butula Sub-counties of Busia.

The willingness of households to invest in sanitation is influenced by demographic factors such as gender, age, household head, education, religion and household size. According to a study that assessed willingness to pay for improved sanitation in rural Vietnam, gender, age, education was

significantly associated with willingness, 'people with better literacy were more willing to invest' (Van Minh & Nguyen-Viet, 2011). While considering religion for instance, the Muslim community's practice of anal cleansing together with the strict religious prohibition of contact with urine and faeces, something that is not strictly adhered to by the Christian community, this in turn has an impact on the sanitation options that people invested in (Nawab Nyborg, Esser, Jenssen, 2006). A study conducted in Busia reveal that culture has an influence on sanitation, where in-laws do not share sanitation facilities, hence opting for open defecation (Kakai, Akunga, & Onyango, 2017). The initial study was, however, conducted in Vietnam which has a different context from Busia, the results and methods may not be generalized to the Busia context. The study by Nawab was conducted among Muslim communities, hence there is likely to be differences with predominantly Christian communities as is the case of Busia. The present study conducted in Busia was to establish sanitation coverage hence its methods may not be used to determine how other factors interact to influence sanitation investment.

Economic and financial factors influencing willingness and ability to invest in sanitation, employment, higher household income and expenditure, asset ownership are associated with increased access to sanitation (Kema et al., 2012). Ownership of assets/property is a good measure of economic status; hence the influence on sanitation options (Mutunga, 2011). Cost of sanitation facilities, on the other hand, is a motivator or a deterrent to sanitation investment (Banerjee & Morella, 2011). The study by Kema focused on utilization of improved sanitation facilities while Mutunga's study focused on environmental determents of child mortality in Kenya. The latter study was conducted in Asia which has a different context and their conclusions may not apply to Busia. In Busia County, community-led total sanitation and social marketing for sanitation have been applied since 2007 through efforts by MOH and its partners.

In this regard, knowledge of sanitation already exists and the benefits of appropriate sanitation facilities well understood. This is reflected in the high proportion of willingness to have sanitation facilities as may be expressed in form of demand for sanitation goods and services (Chapman, 2004). A community member's willingness can be realised through the capacity to raise reasonable financial resources and pay for or construct a sanitation facility, which is the ability to invest. The willingness and ability are usually affected by access to resources to actualise this desire (Mansuri & Rao, 2004). Little knowledge is available on whether such a study has been conducted specifically for Teso South and Butula Sub-counties for such conclusion to hold true. The study examined the proportions of willingness to invest in sanitation, the demographic and socio-cultural, economic and financial factors that affect the willingness and ability to invest in sanitation facilities.

An understanding of how these factors interact and influence sanitation investment, hence coverage is key when designing community sanitation programmes. The study was done in Teso South and Butula Sub County, picking a third of the total number of sub-counties in Busia. The two sub-counties were specifically picked because of their proximity to Nambale County which was declared an open defecation free area in 2011 (Odhiambo, 2012). It is thus expected that Nambale would have some effects on the two bordering sub-counties in terms of sanitation practices.

1.2 Statement of the Problem

Poor sanitation is responsible for 10% of the global disease burden. Inadequate access to appropriate sanitation and hygiene practices largely impacts the health of communities leading to sanitation related illnesses such as diarrhoea, intestinal worms' infestation and upper respiratory tract infections. According to recorded literature, only 32% of Kenyans have access to safe

sanitation. Inappropriate disposal of excreta practices directly and indirectly expose humans to viral, bacterial, protozoal and parasitic infections. In Busia County, the Ministry of Health has applied efforts through community led total sanitation, sanitation marketing among other strategies. Despite all this effort, morbidity related to sanitation accounts for 40% of hospital admissions, with official records indicating safe sanitation coverage at 32%, although the sanitation hub based at the MOH indicates that Busia County could be having higher sanitation coverage than the recorded one.

Although the enjoyment of the right to sanitation is clearly articulated in Chapter 4 of the Kenyan constitution on the bill of rights, there is insufficient information on the amount of funds that the government allocates to support improvement of sanitation in Busia, Teso South and Butula. At household level, investing in sanitation is treated as least of priorities, and unfortunately the impacts of poor sanitation are costly, not just to the household, but to the community at large.

The effects of poor sanitation have far reaching public health impacts on the population. This is reflected in prevalence of illnesses such as cholera and typhoid, resources spent to treat such conditions, time lost due to sickness, loss of school days and poor performance that may result from time lost while away from school.

Some of reasons as to why sanitation levels remain low could be linked to willingness and ability to invest in sanitation which also could be influenced by a network of factors namely: Social demographic and cultural Economic and Financial. However, it appears that these factors have not been explored exhaustively in the context of willingness and ability to invest in sanitation. Following the above problem, this study therefore aimed to determine the factors influencing the willingness and ability to invest in sanitation facilities among households in Busia County.

The need to understand the reasons why people still fail to prioritize sanitation facilities in the household and their different ideas that bar them from investing in adequate sanitation creates a knowledge gap that requires research. Prior knowledge of the different views and life standards of households in Busia County is necessary to control the challenges associated with inadequate and lack of sanitary facilities.

1.3 Justification of the Study

In 2012, the World Health Organization estimated that the global economic return on sanitation spending was US$5.5 for every one dollar invested which is more than twice the economic return on water spending, US$2. This study agrees with a similar study conducted by Hutton, Haller, & Bartram (2007) in five developing countries stating that the return on a US$1 investment was in the range US$5 to US$46. The main contributor to economic benefits was time savings associated with better access to water and sanitation services. Lack of investing in sanitation has proved to be more expensive, yet households often do not prioritize investing their own resources in sanitation, and which leads to challenges for the whole society (World Bank, 2012).

Inadequate or total lack of sanitary facilities has been associated with many societal challenges including death as a result of diseases that can easily be controlled through proper sanitation. If the trends of not investing in sanitation continue, it will follow that both government and households are likely to continue spending more resources to treat the already increasing sanitation related illnesses, more school days lost when children are ill, increasing pressure on the available health facilities as poor sanitation accounts for more and more admissions. The study thus sought to contribute to the understanding of the factors that influence the willingness and ability to invest in sanitation in Busia County.

The challenge of sanitation is easily controllable if every person in the community plays their role well (Acharya, Yoshino, Jimba, & Wakai, 2007). To control the adverse impacts of inadequate sanitation, there is need to understand the factors that reduce the commitment of the household heads and their willingness to invest in building the proper facilities required. This involves the study of their financial status that may affect their ability to implement the corrective ideas and their understanding of the need for sanitation. The information gathered may be used to educate them on the significance of implementing the construction of sanitary facility projects and the need to prioritise some of the ideas through the explanation of the risks associated with continued ignorance. Some factors such as culture can be eliminated or corrected to suit the recommended sanitary standards through education of the residents who seem most affected. The precise implementation of this study was one step in achieving a society that is free from sanitation-based illnesses and challenges.

1.4 Study Objectives

1.4.1 Broad Objective

To evaluate the demographic, socio-cultural and economic factor that influence the willingness and ability of households to invest in sanitation facilities in Busia County.

1.4.2 Specific Objectives

1. To assess the proportion of willingness and ability to invest in sanitation facilities by households in Busia County.

2. To determine the demographic and socio-cultural factors that influences the willingness and ability to invest in sanitation facilities by households in Busia County.

3. To determine the economic and financial factors that influences the willingness and ability to invest in sanitation facilities by households in Busia County.

1.4.3 Research Questions

1. What is the proportion of willingness and ability to invest in sanitation facilities by households in Busia County?

2. What are the demographic and socio-cultural factors that influence the willingness and ability to invest in sanitation facilities by households in Busia County?

3. What are the economic and financial factors that influence the willingness and ability to invest in sanitation facilities by households in Busia County?

1.5 Significance of the Study

Understanding the factors that influence the willingness and ability to invest in sanitation is critical in combating and reversing the impacts of inadequate sanitation both in Busia and in Kenya. The results from this study are therefore useful in informing decision-making process for future interventions that aim to enhance communities' willingness and ability to invest in sanitation. The results also point out opportunities and gaps for further research in investing in sanitation. Sanitation programmers may find the study results especially useful when designing various sanitation models that can be adopted and affordable to communities and households. Kenya currently does not have a sanitation act, which could be an anchor for counties to budget for sanitation. The results of the study are also helpful for Busia County as they develop budgets that are more responsive to sanitation investment at the county level.

CHAPTER TWO

LITERATURE REVIEW

2.1 The sanitation Practical Problem

The sanitation service ladder is categorised into five major levels. The first one is no service, where open defecation takes place. Unimproved sanitation is where unimproved facility does not hygienically separate excreta from human contact. Shared sanitation is where improved facility which hygienically separates excreta from human contact is shared with other households. Basic sanitation is where improved facility which separates excreta from human contact (private). Safely managed sanitation, which is an improved private facility where faecal wastes are safely disposed of on-site or transported and treated off-site plus a hand washing facility is provided with soap and water (Kar & Chambers, 2008). The choice of the sanitation service to use by a household is affected by different factors which are the focus for this study.

Gross & Günther (2014) studied the topic and argued that sanitation, good hygiene and safe drinking water are fundamental to health, survival, growth and development. They discovered a challenge with access to safe water and sanitation by most of the world's poor people. Sanitation refers to interventions for the safe management and disposal of excreta, with the principal safety mechanism being the separation of excreta from all future human contact (Seymour, 2013). A basic fact of life is that human beings need to get rid of their excreta (faeces and urine) every day. Inappropriate excreta disposal practices expose humans to viral, bacterial, protozoal and parasitic infections in their leaps and bounds based on the inferences of a study by Rukunga (2001). The ability of households to invest in the facilities is affected by different factors which include lack of knowledge on their importance and effects of having none.

2.2 Situational Analysis of Sanitation

In 2016, about 2.4 billion people lacked access to improved sanitation globally (Sintondji, Vissin, Dan, Dossou-Yovo, & Amouzouvi, 2017). Wide disparities also exist by region, with sub-Saharan Africa and South Asia continuing to lag behind. Recent data shows that 69% and 64% of Africa and South Asia's population's still lack access to proper sanitation respectively (United Nations, 2017).

Although about 1.8 billion people have gained access to improved sanitation globally since 1990, the Millennium Development Goal target for sanitation was missed (United Nations U. Resolution, 2017). A study by Ulrich, Salian, Saul, Jüstrich, and Lüthi (2016) shows that 1.1 billion people in the world still practice open defecation, and the highest levels of open defecation are found in South Asia (41%) and sub-Saharan Africa (25%). Some critics have however argued that the numbers given do not reflect the reality of the situation presented the disparities in indicators and definitions across regions (Sheeran & Abraham, 2005).

Access to sanitation in Kenya continues to be a significant challenge. The WHO/UNICEF Joint Monitoring Programme considers those using shared facilities as lacking access. The Joint Monitoring Program (JMP, 2015) puts the overall coverage at 32%. Another study further shows that over 6 million Kenyans still defecate in the open (Wangalwa et al., 2013). About half of the Kenyan population does not have access to proper sanitation facilities (UNICEF, 2012). Diarrheal and gastroenteritis diseases are among the highest causes of infant hospitalisation in Kenya today. This is responsible for 11.2% of hospital admissions (Tornheim et al., 2010). The Economic Impacts of Poor Sanitation in Africa, a study conducted in 18 countries in Africa by World Bank Water and Sanitation Programme reveals that Kenya loses 27.4 billion shillings

annually due to poor sanitation (World Bank, 2012). They also discovered that the most deprived quintile of Kenyans is 270 times more likely to practice open defecation than the richest.

In May 2011, the Ministry of Public Health and Sanitation (MoPHS) launched the ODF Rural Kenya 2013 Roadmap with an aim to eradicate open defecation from rural Kenya by the end of 2013 through community-led total sanitation (Odhiambo, 2012). Busia County has applied CLTS with the latest reports showing that Busia County is open defecation free. This is however difficult to ascertain given that the county has had various episodes of cholera in the last one year, a condition that is related to poor sanitation (WHO, 2015). Community initiated sanitation approaches do not emphasise safe sanitation (Kar & Chambers, 2008). Safe sanitation encompasses improved sanitation which includes the connection to main sewer, septic tank and cesspool as well as ventilated improved pit (VIP) latrine and covered pit latrine (Joint Monitoring Program, 2015).

According to the World Bank, the population with access to improved sanitation in Kenya was reported at 30.1 % in 2015 (WHO, 2015). Improved sanitation facilities refer to excreta disposal facilities that can effectively prevent human, animal, and insect contact with excreta. They range from ventilated improved pit (VIP) latrines to flush toilets with a sewerage connection. According to research by the Kenya National Bureau of Statistics (2010), only about 32% of the population in Busia have access to safe or improved sanitation. The rest of the community relies on traditional pit latrine and other lower versions which do not offer optimal benefits of improved sanitation (JMP, 2015). According to the Kenya Bureau of Statistic's report, enhanced sanitation options include; main sewer, septic tank, pour flush, cesspool and VIP, unimproved options include; pit latrine, bucket latrine and bush. Enshrined in Chapter 4 of the Constitution of

Kenya on the bill of rights is the right to reasonable standards of sanitation. To achieve this, the focus must shift towards investing in sanitation from the national level to the household level.

2.3 Factors Influencing Sanitation Investment

2.3.1 Demographic and Socio-cultural Factors Related to Sanitation Investment

Gross & Günther (2014) studied the demographic and socio-cultural factors affecting the will and ability to invest in proper sanitation. Factors studied included; gender, age, household head, education, religion and household size. The socio-cultural factors studied were limited to knowledge on sanitation/health education, perceived health risks due to poor sanitation, personal preferences for latrine options, awareness on sanitation laws and sanitation marketing in the community (Coffey et al., 2015). In their study, they argued that some factors had no significant effect on the willingness and ability to invest in sanitation in most households. Cultural factors the study found to have some impact on the issue of concern included the relationship with in-laws, children, visitors and chronically ill people that bar them from sharing sanitation facilities with the rest of the household members. Similar research by Van Minh & Nguyen-Viet (2011) focused on the economics of the target households and discovered a close connection between the income of the families and their choice of sanitation facilities. The studies, however, do not consider the aspect of proportions in the willingness and ability to build current and reliable sanitation facilities.

Another study conducted by Gross & Günther (2014) focused on rural education and cultural factors and found the two to be minor drivers of sanitation demand whereas the evidence for male versus female-headed households is mixed. According to a study that assessed willingness to pay for improved sanitation in rural Pakistan, gender, age, education was significantly associated with willingness, ‘people with better literacy were more willing to invest’ (Nawab,

Nyborg, Esser, &Jenssen, 2006). A study conducted in rural Uganda revealed that the populations displayed poor hygiene and sanitation behaviour mainly due to their low educational level and poor access to information (Mugabi, 2010).

A study conducted in Bulawayo indicated that the effect of religion on sanitation investment was minimal as 61% of the people in the study area lacked sanitation facilities and practiced open defecation although the population was predominantly Christian, 88% (Mugabi, 2010) This is not far from the situation in Kenya which is predominantly Christian at 84.8% (Kenya National Bureau of Statistics, 2010). A study conducted in rural DRC Congo indicated an increase in household size was significantly associated with an increase in diarrheal incidence in children under five, a condition that is related to poor sanitation (Subbarao, 2009). The above studies were however conducted in Asian Countries whose context is different, and thus their conclusion such as demographic parameters being minor drivers of sanitation may not apply to Busia County. Factors that affect the choice of sanitation facilities are similar when finance and economics of the households get considered.

The research by WHO (2015) discovered a significant role played by health education in increasing sanitation knowledge. WHO (2015) defines health education as any combination of learning experiences designed to help individuals and communities improve their health, by increasing their knowledge or influencing their attitudes. According to MoH (2016), provision of information about the health benefits of a particular behaviour is sometimes sufficient to change the behaviour. It becomes a challenge though to many especially when the promoted behaviour has a cost to it (Dupas, 2011). Busia County has fully embraced the Community Strategy Concept where over 80% of the community is covered by Community Units whose Community Health Volunteers promote sanitation through health education (Mugabi, 2010). Community

strategy mainly promotes prevention of childhood illnesses. Its influence on sanitation investment in the selected sub-counties is not well understood. The lack of knowledge is one of the most common factors that affect the willingness to invest in sanitation facilities.

The study by Gross and Günther (2014) discovered under-perceived health risk/ benefits related to sanitation and disease prevention as another major motivation and cue to sanitation action. The Health Belief Model postulates that people who undertake a subjective assessment of a likely health condition that may befall them for not taking or taking a particular action are likely to engage in health-promoting behaviour. The fear of illnesses that may arise due to poor sanitation is likely to influence communities' willingness to invest in sanitation (Jenkins & Scott, 2007). The study examined if this indeed was true for Busia County.

Personal preferences on sanitation options and their characteristics depend on the sets of assumptions related to ordering some alternatives, based on the degree of happiness, satisfaction, gratification, enjoyment, or utility they provide (Jenkins & Scott, 2007). Preferences may also differ among washers and wipers, while a washer will prefer a wet system of a toilet; the wiper may prefer a dry one (Fewtrell et al., 2005). According to Ekane, Weitz, Nykvist, Nordqvist, & Noel (2016), developing better sanitation facilities requires knowledge of latrine characteristics such as impervious slab, lockable doors, wall and roof are desirable. These characteristics also constitute of improved or safe sanitation and having them also points to increased cost of construction. The preferences may coincide with other factors such as income as reported by Jenkins & Scott (2007).

Awareness of sanitation laws has an impact on how people perceive sanitation investment (Musyoki, 2010) The Kenyan constitution provides that every Kenyan has a right to reasonable standards of sanitation. The Public Health Act, Cap 242 of the Kenya laws provides for various

types of sanitation facilities that should be provided depending on the premise in question. Such laws can be used to compel either government of the day or households to provide sanitation conveniences (Mutunga, 2011). Knowledge of the extent to which the Public Health Act has been applied in Busia remains limited. Information on whether or not communities were aware of the existence was also limited. The willingness to invest in sanitation facilities is affected by divergent perceptions of the knowledge by the households in Busia and less understanding of the needs for the same.

According to Chinyama, Chipato, & Mangore (2012), social marketing seeks to develop and integrate marketing concepts with other approaches to influence behaviours that benefit individuals and communities for the greater social good as opposed to commercial marketing. The goal of social marketing is always to change or maintain how people behave – not what they think or their level of awareness about an issue. The social marketer takes into consideration the 4Ps' of product, price, place, promotion for it to be effective (Breidert, Hahsler, & Reutterer, 2006). For sanitation/social marketing efforts to succeed, particular attention is required to address the needs and preferences of different consumer segments, most notably special needs groups, and households living in poverty, ethnic minorities and marginalised groups (Hutton, Haller, & Bartram, 2007).

The willingness of households to invest in sanitation is also affected by perceived behaviour, social marketing and sanitation marketing (Gordon, McDermott, Stead, & Angus, 2006). Use of social marketing approaches such as community-led total sanitation in Busia has been done since 2007 through efforts by MOH and partners. In this regard, knowledge of sanitation already exits and the benefits of having appropriate sanitation facilities well understood (Kakai, Akunga, & Onyango, 2017). It remains unclear whether the knowledge on sanitation as promoted through

social marketing resulted in the similar willingness and ability to invest in sanitation in the selected areas.

According to a previous study (Kema et al., 2012), culture regulates the behaviours and choices of the society using sets of ideas and skills transmitted socially from one generation to the next. Busia County is mostly inhabited by Bantu speaking natives whose culture opposes sharing latrines hence result in or reversion to open defecation. A study conducted in Busia indicated that 46.8% of respondents don't share latrines with their father or mother-in-law since it's culturally unacceptable (Banerjee & Morella, 2011). Moreover, when a mother or father-in-law visit their son or daughter-in-law, they are ushered to the nearest bush should they need to answer to the all-important call of nature (Kakai, Akunga, & Onyango, 2017). A similar study revealed that a given form of sanitation could also be viewed as a way of life that is influenced by culture, customs and beliefs (Manase, Mulenga, & Fawcett, 2001). It thus makes more practical sense if sanitation problems are addressed within the cultural foundation, to understand the realities of local circumstances of beliefs and values, than applying the logic of pure science (Akpabio, 2012). The studies mainly aimed at establishing sanitation coverage and not the association between culture and sanitation investment hence their methods may not be adequately used to determine how culture interacts with other factors to influence the level of investment in sanitation.

2.3.2 Economic and Financial Factors Related to Sanitation Investment

The study by Johnson & Nino-Zarazua (2011) focused on financial factors including; employment status, household income and expenditure, ownership of assets/property and cost of constructing sanitation facility. A similar study by Santos, Roberts, Barreto, & Cairncross (2011)

external assistance, financial knowledge/literacy, cost of financial services, physical distance to financial institutions, legal requirements for accessing financial credit for sanitation.

According to the 2017 Economic survey in Kenya, employment to population ratio for Kenya was 59.7 %. This population is composed of ages 15 and above. Being employed or self-employment is one of the surest ways of gaining some income that can be used to invest in sanitation at the household level. It contributes to increased levels of household income and expenditure. The ability to build a sanitary facility is affected by the availability of funds sourced from the jobs while willingness to invest in the facilities is improved when the household has relatively sufficient income (Chinyama, Chipato, & Mangore, 2012).

Household income and expenditure also influence sanitation investment. A study conducted in Mtwara District, Tanzania indicates that people who earned more than 50,000 Tanzanian Shillings (TZS) were more likely to own a ventilated improved pit latrine (Kema et al., 2012). In a similar study in China, Yang, Sangthong, Chongsuvivatwong, McNeil, and Lu (2009) suggest that village income had a more significant influence on sanitation than household income, the point of convergence is that level of income has a direct impact on sanitation choices for families. The studies by JMP (2015) also indicate that sanitation coverage is lowest in less developed countries where the overall household income is low. The study was based on family income and expenditure in Mtwara district mainly focused on the utilisation of improved sanitation facilities and not the influence of household income and expense, employment on sanitation investment (Kema et al., 2012).

Ownership of assets/property is a good measure of economic status and poverty influences because it largely determines an individual's exposure to environmental risks (Mutunga, 2011). According to WHO, of the ten identified leading mortality risks in high-mortality developing

countries, unsafe water, sanitation and hygiene ranked second (WHO, 2008). The wealth of families in Kenya is calculated through household assets collected through demographic and health surveys. Such factors as type of house, source of water, access to sanitation, connection to electricity, ownership of television, mobile phone, car, motorbike, land are considered (Kenya National Bureau of Statistics, 2014) The poorest resident is 270 times more likely to practice open defecation than the richest (World Bank, 2012). Few researchers have examined the kind of property communities own in Busia and whether such have an association with their sanitation options. Households lying in a better state of property ownership have been in a better state of having the ability to invest in sanitary facilities.

Cost is a powerful trigger or deterrent for investments in sanitation, and affordability is one of the means to overcome cost (Banerjee & Morella, 2011). Jenkins and Scott (2007) conducted research on sanitation consumer market research from 12 developing countries in Africa, Asia and Latin America. They found that affordability of existing latrine designs on the market, difficulty and complexity for households to collect and arrange purchase and transport of the materials, components and services to build these existing designs were among the top factors that prevent households from investing in improved latrines (Jenkins & Scott, 2007). There is limited literature that demonstrates the cost of constructing a sanitation facility in the study area. Besides, the said studies were however conducted in countries with a different contextual background that may not apply to Busia County.

Most of the rural communities in Kenya are beneficiaries of aid programmes whether health-related or otherwise (JMP, 2015). Water and sanitation programmes operating in communities have an overall aim of improving communities' hygiene and sanitation practices. Some programmes can directly assist household members to construct sanitation facilities. Such actions

increase demand hence the ability to invest in sanitation facilities (Manase, Mulenga, & Fawcett, 2001). However, the existence and influence of such programmes on sanitation investment in Busia are yet to be well understood.

A survey conducted by Njuguna, Mutanu, Otsola, and Thuku (2011) in Kenya indicated that financial literacy among Kenyans was low, 43.5% with over 60 percent of the adult population lacking access to formal financial services including banking, insurance and mobile money transfer services. The survey further reveals that those with less financial literacy have challenges managing their finances, especially in debt management. Busia County has a literacy level of approximately 67%, but this has not translated to similar levels of financial inclusion (Kenya National Bureau of Statistics, 2006). Low level of financial literacy in the general population has a negative impact on individual decision making, hence sanitation investment (Wachira & Kihiu, 2012).

According to Claessens (2006), some hindrances to accessing financial credit for sanitation do exist such as the cost of financial services, physical distance to financial institutions, legal requirements. In a survey, the World Bank (2012) pointed out that the high cost of financial credit in Kenya impedes the growth of the small and medium enterprise. Similar research by Kimuyu & Omiti (2000) discovered that high interests and other bank service costs are likely to deter communities from accessing financial credit for sanitation. For one to access finances from available microfinance institutions, physical distance has to be overcome. In rural areas where physical distance is great and often with limited form of transport, the distance to financial institutions can influence ones to access to financial credit, formation of savings and lending groups, savings and credit cooperative organizations, table banking have recently gained acceptance among rural folk as a way of overcoming distance (Mugabi, 2010). The information

on the improvement of ability to build latrines through loans or other aids by financing bodies also fails to reach the rural areas. A study by Honohan (2007) estimates that only 25% of Sub-Saharan Africans have access to financial services, and this happens to be the elite, business people and those employed (Honohan & Beck, 2007).

Standard requirements hinder access to financial credit for sanitation. They include legal age, national identification cards, some form of security (Dupas, Green, Keats, & Robinson, 2012). While demand creation innovations such as community-led total sanitation are providing an opportunity to start changing sanitation and hygiene behaviour of rural people, evidence shows that behavioural change will not be sustained unless a number of critical supporting conditions are met. One of these is access to financial credit for sanitation (Johnson, Malkamaki, & Niño-Zarazua, 2010) There is limited knowledge on the financial literacy status in Busia County, the role of financial institutions, savings and lending groups on sanitation investment.

2.4 Summary of Gaps in Factors Influencing Sanitation Investment

Some studies have been done but focusing on the importance of proper sanitation, this study showed the line of events, factors and correlations that interact leading to the construction of such adequate sanitation facilities. The Kenya Demographic Health Surveys reveals low sanitation coverage, especially in rural areas. This study aimed at revealing the actual proportions of people willing to invest in sanitation. Often, agencies charged with the provision of sanitation services do so without going deep into demographic characteristics of the communities they serve because every person has a right to a reasonable standard of sanitation, some studies have also claimed that demographics are minor drivers of sanitation investment. The study thus revealed the importance of demographics in sanitation provision. Majority of the available studies were done in areas or countries that are contextually different from Busia

County hence their conclusions may not be fully applicable to the Busia County context. For communities to enjoy the full benefits of improved sanitation, they have to be willing to use their resources to invest in sanitation, hence the need to understand the influence of economic and financial status on sanitation; the study attempted to delineate these factors while also opening up opportunities of further inquiry.

2.5 Theoretical Framework

Various models have tried to explain what motivates an individual to change their behaviour. The Trans-theoretical model argues that for a change to occur, an individual has to go through five distinct stages: pre-contemplation (not ready), contemplation (getting ready), decision (ready), action and maintenance (Starkl, Brunner, & Stenström, 2013). However, this is a circular and not linear model since people donot go through the stages and graduate but they can enter and exit or have a relapse at any particular point hence it is not best suited for influencing a person's choice of sanitation investment.

The Social Cognitive Theory by Bandura explains behaviour regarding triadic reciprocity ("reciprocal determinism") in which behaviour, cognitive and other interpersonal factors, and environmental events all operate as interacting determinants of one another (Bandura, 2001). One of the key concepts of this theory is the environmental variable: observational learning. The social cognitive theory views the environment as not just a variable that reinforces or punishes behaviour, but one that also provides a milieu where an individual can watch the actions of others and learn the consequences of those behaviours. This model is not the best fit for this study since, whereas households' perceptions on sanitation can be based on the actions of other households, the consequences of poor sanitation may not be so pronounced to act as an impetus for investment.

This study, therefore, adopted the health belief model since it provided the best fit. This is a psychological model developed by Rosenstock for studying and promoting the uptake of services offered by social psychologists (Sheeran & Abraham, 2005). The model was advanced by Becker in 1970s and 1980s. Subsequent adaptations were made in 1988 to accommodate evolving evidence generated within study communities on the role of knowledge and perceptions in personal responsibility.

Originally, this model was designed to predict behavioural responses to treatment received by acutely or chronically ill patients, but in more recent years, the model has been used to predict more general behaviour (Ogden, 2007). The original health belief model was based on the core beliefs of individuals, based on their perceptions, for example, perceived susceptibility; perceived severity; and perceived benefit. Constructs of mediating factors were later added to connect the various perceptions with the predicted health behaviours: Cues to action; health motivation; and perceived threat. The prediction of this model is the likelihood of the individual to undertake recommended health action such as preventive and curative health actions.

The relevant constructs from the theory include; modifying variables (age, gender, race, economy, characteristics), perceived severity, plus perceived susceptibility, perceived benefits minus perceived barriers, cues to action, all summed up to taking action or no action by an individual. People's perception of sanitation determines their uptake or investment in the facilities. Individuals' perception of severity, susceptibility, cost and benefits of adopting a new practice or behaviours can influence their acceptance and ability to pay for the service. The health belief model thus resonates well with social marketing and community-led total sanitation approaches to sanitation proportion which fairly demonstrates that, once people are made aware

of the effects of open defecation on their health, they are likely to act to improve their sanitation (Kar & Chambers, 2008).

2.6 Conceptual Framework

The conceptual framework is based on scientific facts that have been studied in the past and proven to work. The framework has majored on the strengths of the Health Belief Model to influence better and desired outcome. The framework attempts to delineate factors that influence the willingness and ability to invest in sanitation and puts them into three major categories; demographic, socio-cultural characteristics, economic and financial factors related to the willingness and ability to invest in sanitation as independent variables. The studied factors operate within a compendium of legal, political and governance systems (Figure 2.1).

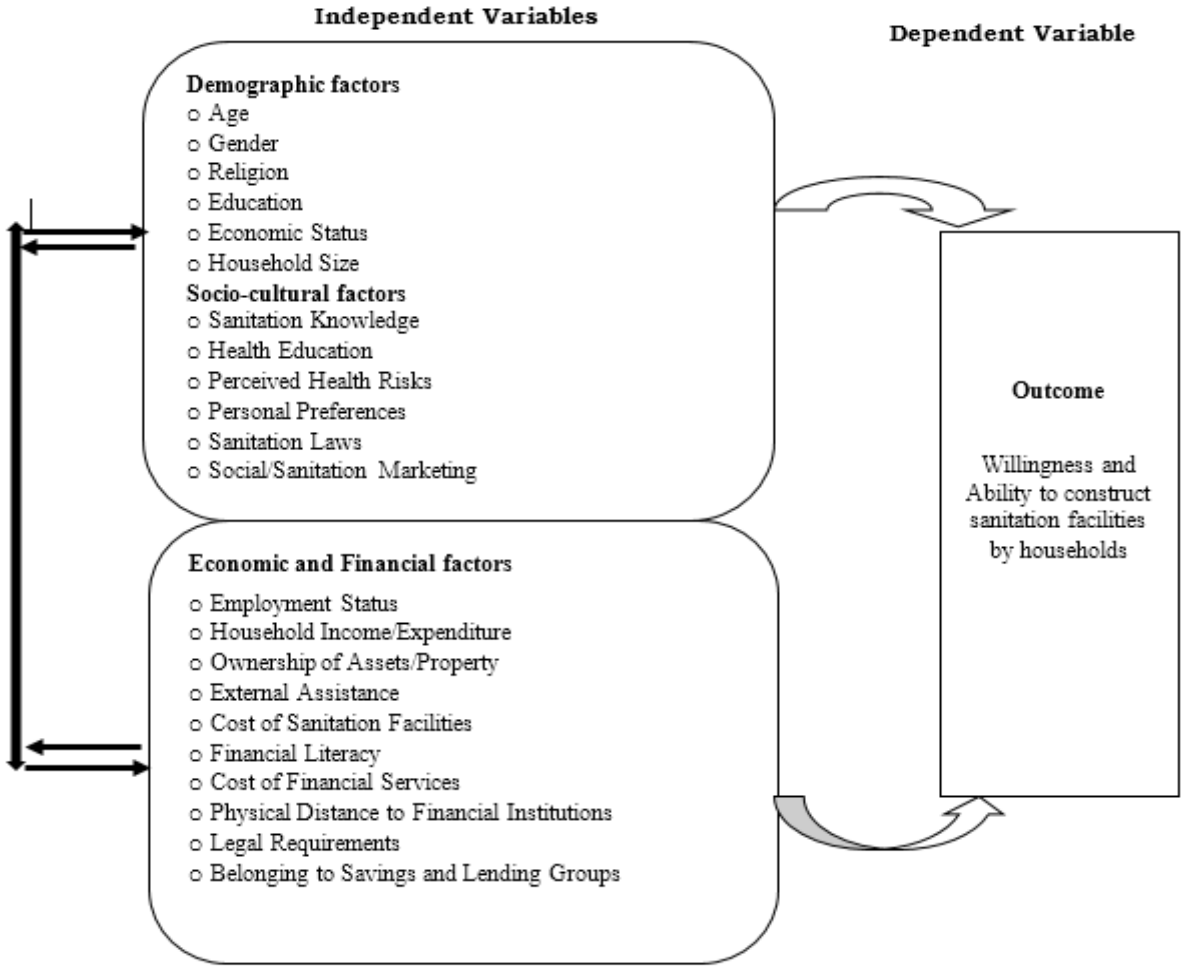

Figure 2. 1: Conceptual Framework showing the factors influencing the willingness and ability to invest in sanitation facilities in Busia County

Variable Definitions:

Dependent Variables: These include demographic, socio-cultural economic and financial factors which interact to produce the desired outcome

Independent Variable: The willingness and ability to construct sanitation facilities through mobilization of resources at household level.

CHAPTER THREE

METHODOLOGY

3.1 Study Design

The study adopted a cross sectional design with quantitative methods to get an accurate description of variables relevant to the study and demonstrate their relationship. The approach was the best in eliciting accurate responses from the respondents.

3.2 Study Area

The study was conducted in Butula and Teso South Sub-counties of Busia County in Western Kenya (Figure 3.1). Busia County lies between 0.4333° N and 34.1500° E (Latitude: 0.4530; Longitude: 34.1250). It consists of seven administrative sub-counties namely: Busia, Nambale, Butula, Bunyala, Samia, Teso North and Teso South. It borders the Republic of Uganda on the West and Siaya County on the South. In the North lies Bungoma County while the eastern border is shared between Bungoma and Kakamega Counties, both in the former Western Province.

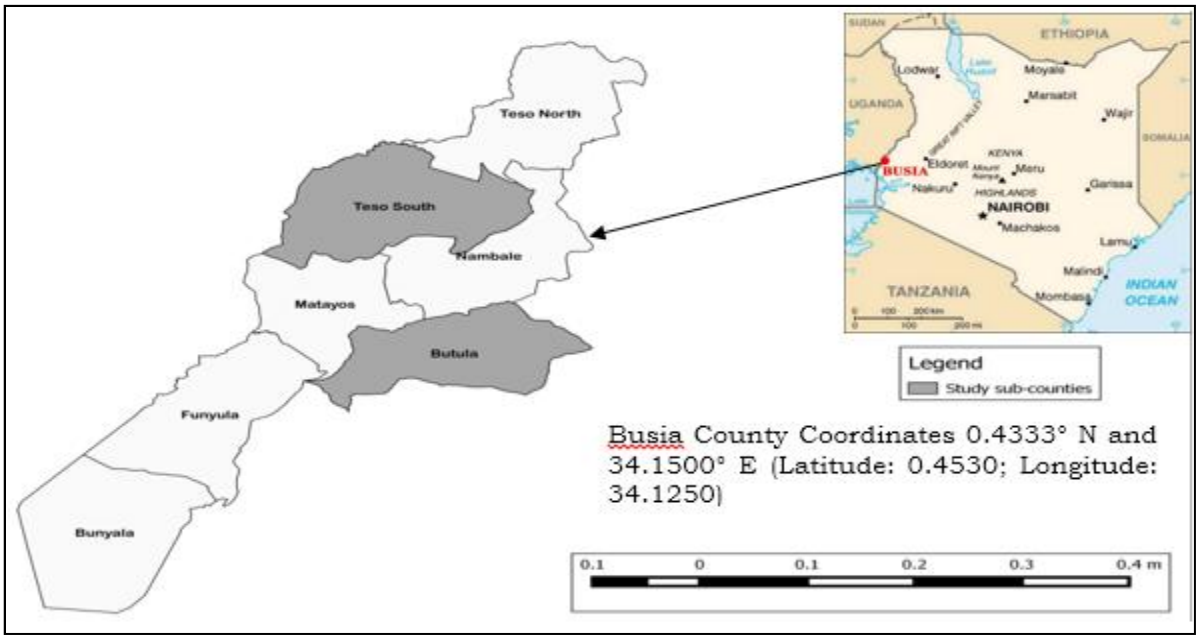

Figure 3.1: Map of Busia County showing studied sub counties

The Southern tip of Busia County borders Lake Victoria. Busia County has to 823,504 residents distributed in the 164, 701 households (Kenya National Bureau of Statistics, 2010). Butula Sub-County is located 29 kilometres West of Busia town with a total population of 134,903 people in the 4 locations. Teso South Sub-County on the other hand is located 26 kilometres south of Busia town. It is divided into two major divisions: Amukura and Chakol. Teso South has an approximate population of 152,674 people in the 38 sub-locations.

3.3 Target Population

The target population for the study was the 287,577 people: 134,903 in Butula and 152,674 in Teso South Sub-counties of Busia County.

3.4 Study Population

The population studied included 421residents, 197 of the residents were from Butula while the rest 224 were from Teso South Sub-county. Households were used as the sampling unit. The household heads were interviewed based on the assumption that household heads make most of the financial-decisions for the entire household.

3.4.1 Inclusion Criteria

The study included adults, aged 18 and above who are household heads and are residents of Butula and Teso South Sub counties and willing to give information required for the study.

3.4.2 Exclusion Criteria

Household heads who are mentally challenged, found to be under the influence of alcohol and other substances, minors, and those unwilling to give informed consent were excluded from the study.

3.5 Sample Size Determination and Sampling Procedures

3.5.1 Sample Size Determination

The sample size, (n_0) was obtained using the Cochran's sample size formula for infinite populations. The population to be studied was large and geographically dispersed. This called for a sampling technique that would retain the high-level precision and the desired confidence level. In this study, a 95% confidence interval and a significance level of ±5% was considered. $$n_0 = \frac{Z^2pq}{e^2}$$

Where,

n_0 = sample size

Z = standard normal variant represented by statistical constant 1.96

P = is the estimated proportion of population with the attribute in question.

The estimated sanitation coverage in Busia is 32% which makes P=0.32.

q = 1- P n_o

e = is the required level of precision (margin of error), in this case 0.05

$$n_o = \frac{1.96^2 x\ 0.32(1-0.32)}{0.05^2} = 334.37$$

$$n_0 = 334$$

A 15%margin of the sample population was considered in both sub-counties to ensure that the selected population does not fall below the sample size due to problems with communication,

literacy and unwillingness to undertake the exercise. The final population sample size studied was421, which was well above the calculated sample size of 384 inclusive of 15%.

3.5.2 Sampling Procedure

The two sub-counties, Butula and Teso South, were purposively sampled. The two sub-counties border Nambale on the West and East, respectively. The sampling of enumeration areas (EAs) was done independently within each stratum using the probability proportional to size (PPS) method with households being the sampling unit. The first step was to determine the number of households to be interviewed in each of the two sub-counties as a fraction of the whole county based on the total county population. This was done by calculating the population proportions for each of the two sub-counties to ensure that the selected sample is a representation of the whole population with no bias.

Secondly, the number of locations (11) and subsequently villages (62) from each sub-county were randomly selected using computer-generated numbering system. The approximate number of households in the study areas was 57,515; of which 26,980 were in Butula and 30,535 in Teso South. Fifteen percent of the number (334) was added on Butula and Teso South samples making a total of 384. This was important to provide for withdrawals or any spoiled tools. During data collection, 421 households were interviewed (197 Butula, 224 Teso South), in order to increase the power to test the hypothesis in the population.

Households for the study were selected using random numbers for the total number of households required as per the determined sample size in each sub-county. In each household, its head was interviewed. Forty-six households were available for the exercise in Kujakito, 39 in Kaliwa, 33 in Aremit and 32 in Kwang'amor. The rest of the sub-locations had less than thirty respondents apart from Akoret which with 30. In Butula, Bumala had seventy-five respondents

willing to take the questionnaire, fifty-nine in Marachi Central, forty-two in Bujumba and twenty-one in Bumala A (Table 3.1).

Table 3.1: Sampling frame

Sub County	Sub-location	Respondents
Teso North	Akoret	30
	Amukura	18
	Aremit	33
	Kaliwa	39
	Kaujakito	46
	Kotur	26
	Kwang'amor	32
Butula	Bujumba	42
	Bumala	75
	Bumala A	21
	Marach Central	59
	Total	**421**

3.6 Data Collection

3.6.1 Pre-test

Before the main study, the questionnaires were pre-tested in Nambale Sub-county which was selected due to its proximity and presence of similar characteristics to the study Sub-counties. A total of 50 respondents (13% of the main study sample) were sampled. The questionnaire was assessed through expertise and literature validation to ascertain its validity. The study participants were asked for feedback to identify ambiguities and difficult questions. All additional, difficult or ambiguous questions were refined to reduce the strains by the respondents (Radhakrishna, 2007). The time taken by each respondent to complete the questionnaire was recorded. It was estimated that an average of 30 minutes was needed to answer all the questions and this was considered reasonable.

Reliability of the study tools was ascertained by use of the test-retest method to determine whether the questionnaire consistently gives the same results. The questionnaire was administered to 20 of the 50 households in the pilot in a weeks' time. The difference between the first and second scores of the 20 households was calculated, yielding a correlation coefficient value of 0.83. The correlation coefficient obtained led to the conclusion that there was no significant difference; hence the tool was considered reliable.

3.6.2 Main Study Data Collection

Quantitative methods were applied to collect data on the willingness and ability to invest in sanitation. Interview Schedules (Household questionnaires – Appendix I) were used to collect information on the willingness and ability to invest in sanitation and the factors that influence them. Working with the Sub-county Public Health Officers, the study recruited ward level public health officers to be the team leaders in each of the Sub-county. This team was taken through the study protocol to understand what was required of them. The team leaders then recruited enumerators from each of the study wards proportionate to sample size. The 15 enumerators were taken through a one-day training session covering all aspects of the study protocol before data collection. They were then allocated some sampled units within the same or nearby locations for ease of data collection and logistics. A total of 421 respondents were interviewed concurrently from the two sub-counties. The respondents' details required for demographic studies were also collected. The first few minutes were used to brief the respondents on what was required of them and to develop means to handle those who could not read or write.

3.6.3 Study Variables and Measures

The study involved several variables that were studied to help in achieving the objectives. Factors thought to affect the decision and willingness to build a latrine included financial capabilities, demographics, knowledge of sanitation, financial knowledge and the economic status of the household. To ensure each variable was completely studied, a respondent was considered ready for the questionnaire when they accepted to take all the questions that examine their status, economic status, and their knowledge of sanitation and its needs. The financial knowledge was studied together with the willingness to invest when building a latrine and the rate at which each household desired to build. This included the willingness to take up a loan to build the latrine and their views on their ability to get enough funding for it.

Knowledge of sanitation was tested through the examination of the types of latrines opted by most households found to own at least one and the costs used up when building the latrine. The economic status concerning ability and willingness to invest in the building of a latrine was studied through evaluation of the employment status of the household members, their total income per month, assets owned by the family and types of houses owned. Other factors studied included religion and levels of education which were also found to affect the needs for a latrine in the population studied. The variables were measured as a fraction of the total and the effect of each tested later after observation of the whole data.

3.7 Data Management and Analyses

Data collection took three days. Each day, the supervisors collected and checked the questionnaires from the enumerators. At the end of data collection, all filled questionnaires were checked for completeness, accuracy, consistency and uniformity of the answers given and coded. The questionnaires were entered into EPI Data software, then transferred to and analysed using

SPSS V19. The data collected through the questionnaires was well organized, and its management only required a transfer from the questionnaires to the EPI Data Software.

Different factors among different people trigger the decision to invest in sanitation. This study elicited the different choices the respondents make as a result of diverse economic factors. Social-cultural factors also affect the willingness of investing in sanitation. The data collected ensured that any aspect of economics and finance, culture or demography affecting the household heads' decision to build proper latrines among other proper measures of enhancing sanitation had been captured. Charts and graphs were used to show the variability of responses given by respondents, while cross-tabulations were also used to show the level of significance of one variable over the other. Objective one was analysed through Z-cores to test differences in expected levels in normally distributed populations. Frequency tables were used to describe the different variables.

Objectives two and three were analysed using logistic regression to identify factors influencing investment in sanitation. Odds ratios were used to establish the strength of associations between critical variables and investment in sanitation. The proportion of willingness and ability to invest in sanitation was examined by collecting of first-hand data with all the explanations required from the respondents that would enhance the study and data collection. P-values ≤ 0.05 were considered statistically significant.

3.8 Ethical Consideration

Scientific approval for the study was obtained from the Maseno University School of Graduate Studies (SGS) (Appendix II). Ethical clearance was sought from Maseno University Ethical Review Committee (MUERC)(Appendix III). The County Director of Health of Busia County was briefed on the study and she provided permission (Appendix IV). In carrying out the study,

informed consent was obtained from the study participants with full information being provided and comprehension being affirmed (Appendix V).Confidentiality was ensured through anonymity (using unique numbers); privacy during interviews and withdrawal at any point was allowed.

3.9 Study Delimitations and Potential Biases

The study was delimited to two sub-counties in Busia County hence generalization to other Sub-counties may be done with caution. Since this study is cross-sectional, it cannot, infer causality, in that the selected independent variables cause households to be willing and eventually invest in sanitation. Rather, the study can only make the inference that the selected independent variables are associated with an increase or decrease in the willingness and ability to invest in sanitation facilities among the study sample.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1 Characteristics of the Studied Population

A total of 421 respondents were interviewed for this study. Two hundred and thirty-four (55.6%) were male, and 187 (44.6%) were female. Table 4.1 shows that majority, 198 (47%) of the respondents had primary school education while a small proportion 7(1.7) had the university education. They were predominantly of the Christian religion 399 (95.7%) with a small percentage being pagan 4 (1.0%). The population had a mean age of 44.5 years (SD=13.83), meaning the majority of the population sampled was in the adult category. The average household size was six persons.

Table 4.1: Demographic characteristics of respondents

Variable n=421	Frequency (n)	Percentage (%)
Level of Education		
No education	100	23.8
Primary	198	47.0
Secondary	94	22.3
College	22	5.2
University	7	1.7
Religion		
Christian	399	95.7
Muslim	14	3.4
Pagan	4	1.0
Age Group		
18-and below	2	0.5
19-29	50	12.0
30-39	123	29.5
40-49	108	25.9
50-59	57	13.7
61-69	56	13.4
70 and above	21	5.0

4.2 Proportions of Willingness and Ability to Invest in Sanitation

The proportion of willingness and ability to invest in sanitation was assessed based on Z-scores for single proportion concerning expected frequencies which were established as an average percentage of the number of categories under measurement. Table 4.2below shows that majority, 361(85.7%) of the respondents were willing to invest in sanitation with a Z score of 14.65(CI = 0.4522 – 0.5478). The population willing to invest was significantly different from that which was not willing and above the expected frequency in that category (P-value = 0.001).

When further subjected to willingness categories (very much willing, willing and not willing), those willing were significantly different from the other two categories at Z-score of 12.42(CI=0.2851 – 0.3749). This means that the general willingness to invest in sanitation was high among the study population. Similarly, those who self-reported as able to invest, 352(83.6%) in sanitation was significantly different from the expected frequencies in that category with a Z-score 13.79(CI=0.4522 – 0.5478). The general self-reported ability was therefore high among the study population. The average amount the respondents were willing to invest in sanitation was KES 18, 925, with the lowest amount at KES 100 and highest at KES 80,000. This shows that the respondents had the willingness to invest in proper sanitation facilities but were hampered by other factors.

Table 4.2: Levels of willingness and ability to invest in sanitation

Variable n=421	Frequency (n)	Percentage (%)	Z-Test	CI
Willingness				
Willing to invest	361	85.7	14.6501***	0.4522 – 0.5478
Not willing to invest	60	12.5		
Willingness rate				
Very much willing	65	15.4	-7.68***	0.2851 – 0.3749
Willing	259	61.5	12.4363***	0.2851 – 0.3749
Not willing	97	23.0	-4.3636***	0.2851 – 0.3749
Willingness to take loan				
Willing to take loan	253	60.1	4.1447***	0.4522 – 0.5478
Not willing	168	39.9		
Ability to invest				
Able to invest	352	83.6	13.7883***	0.4522 – 0.5478
Not able to invest	69	16.4		

*** P≤0.001

4.3 Demographic and Socio-cultural Factors Influencing Willingness and Ability to Invest in Sanitation

The study sought to establish the demographic, social and cultural factors likely to influence the willingness and ability to invest in sanitation. Demographic; gender, age, household head, education, religion and household size were considered.

4.3.1 Willingness and Ability to Invest in Sanitation

The results show a significant prediction of willingness to invest in sanitation in household size as shown in Table 4.3 below. Based on OR, one unit increase in household size would decrease the willingness by 0.95 times at crude level (OR=0.95, CI=0.89-0.99, P<0.05). The other factors did not have any significant association with the proportion of willingness at a rudimentary level. When adjusted OR was established, the factors under this category demonstrated insignificant association with the proportion of willingness. The demographic factors were thus not critical in determining willingness to invest in sanitation and could easily be dropped from the

model.Gender was the only factor that significantly contributed towards the ability to invest. At a crude level, gender was likely to increase ability by 1.19 times (OR=1.19, CI=1.01-2.49, P<0.05). A similar association was demonstrated at adjusted level with the higher ability of association where gender was more likely to increase the ability to invest in sanitation by 2.02 times (OR=2.02, CI=1.02-4.00, P<0.05). All other factors did not demonstrate any significant association both at a crude and adjusted (Table 4.3)

Table 4.3: Demographic factors influencing sanitation investment

Factors	Willingness to invest				Ability to invest			
	95.0% Confidence Crude odds ratio		95.0% Confidence Adjusted odds ratio		95.0% Confidence Crude odds ratio		95.0% Confidence Adjusted odds ratio	
	OR	CI	OR	CI	OR	CI	OR	CI
Demographic Factors								
Gender	1.77	0.97-3.06	1.89	0.78-4.62	1.19*	1.01-2.49	2.02*	1.02-4.00
Age	0.99	0.97-1.01	0.99	0.97-1.01	0.99	0.97-1.00	0.99	0.97-1.01
Household head	1.11	0.66-2.16	0.56	0.23-1.38	0.97	0.62-1.53	0.54	0.27-1.08
Education level								
No Education	(Ref)							
Primary	0.67	0.32-1.39	0.60	0.27-1.37	0.96	0.56-1.66	0.83	0.45-1.52
Secondary	0.77	0.33-1.82	0.64	0.237-1.71	1.02	0.54-1.95	0.76	0.37-1.60
College	0.56	0.16-1.94	0.47	0.120-1.86	1.19	0.40-3.56	0.92	0.29-2.95
University	0.74	0.08-6.75	0.39	0.038-4.00	n/a	n/a	n/a	n/a
Religion								
Christian	(Ref)							
Muslim	2.89	0.38-22.15	2.61	0.31-21.9	1.19	0.38-3.69	1.12	0.34-3.74
Pagan	0.51	0.05-4.99	0.40	0.04-4.13	0.11	0.01-1.10	0.11	0.01-1.13
Household size	0.95*	0.89-0.99	0.96	0.91-1.00	0.99	0.95-1.03	0.99	0.95-1.04

* =P≤0.05

4.3.2 Socio-cultural Characteristics of the Respondents

When asked why they owned a latrine, the majority of the respondents as shown in Figure 4.1 indicated disease prevention as main reason or motivator for them owning a latrine, 379(90.9%) with few indicating safety as their main motivator, 7(1.7%).

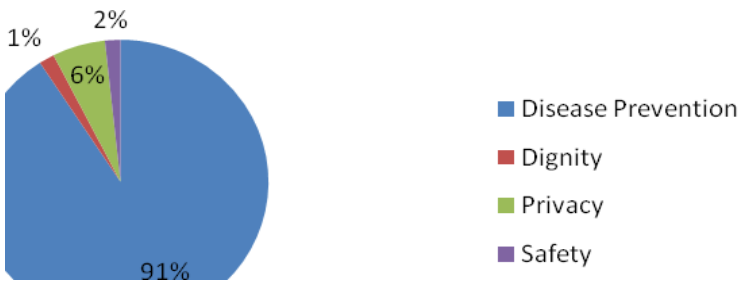

Figure 4.1: Reasons for investing in sanitation

On culture and traditions, Figure 4.2, majority of the respondents 305(72.4%) reported that in-laws did not share latrines, 95(22.6%) indicated that children do not share with adults while 62(14.7%) were positive that people with chronic illnesses were not allowed to share latrines with the rest. A smaller percentage of 43(10.2%) indicated that visitors did not share latrines with the rest of the household members.

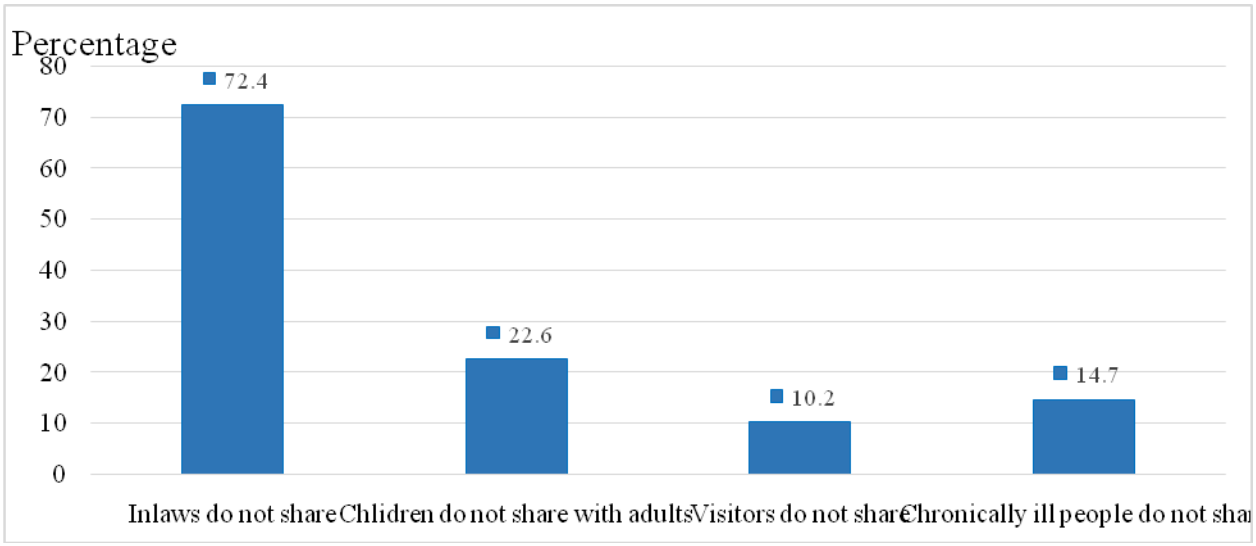

Figure 4.2: Cultural practices affecting sanitation investment

Under the social factors, the study examined knowledge on sanitation/health education, perceived health risks due to poor sanitation, personal preferences for latrine options, awareness of sanitation laws and sanitation marketing in the community.

Table 4.4 below shows that the community health volunteers were the most influential sources of sanitation information. As compared to public health officers and media, information by CHVs was significantly associated with increased willingness both at the crude and adjusted level (OR=2.22, 95% CI=1.24-4.01; adjusted OR=2.06, 95% CI=1.02-4.15, P<0.05). The fear of the spread of disease or perceived health risk was likely to increase the ability to invest (OR=1.96, 95% CI=1.03-3.71, P<0.05), while open defecation was also likely to reduce ability by 0.5 times.

Table 4.4: Social factors influencing sanitation investment

Factors	Willingness to invest						Ability to invest					
	Crude odds ratio	95% Confidence		Adjusted odds ratio	95% Confidence		Crude odds ratio	95% Confidence		Adjusted odds ratio	95% Confidence	
	OR	CI		OR	CI		OR	CI		OR	CI	
Social Factors												
Source of information on sanitation												
PHO	(Ref)											
CHV	2.22*	1.24	4.01	2.06*	1.02	4.15	1.77	1.00	3.13	1.66	0.87	3.18
Media	2.93	0.36	24.2	5.56	0.62	49.8	1.32	0.27	6.57	1.90	0.35	10.2
Consequences of not using latrine												
Low Dignity	(Ref)						(Ref)					
Spread of Dse	1.89	0.97	3.70	1.98	0.86	4.60	1.96*	1.03	3.71	2.05	0.97	4.30
No privacy	4.6E	N/A	N/A	N/A	N/A	N/A	0.68	0.06	8.02	N/A	N/A	N/A
Insecurity	4.6E	N/A	N/A	N/A	N/A	N/A	5.4E	N/A	N/A	N/A	N/A	N/A

* =P≤0.05. Dse=disease; OR=Odd Ratio, CI=Confidence Interval; N/A=Not applicable.

4.3.3 Personal Preferences

Personal preferences on various latrines feature influenced levels of willingness and ability as shown in Table 4.5. Having a clean floor/slab (OR=0.34, 95% CI=0.12-0.99, P<0.05), wall and roof (OR=0.34, 95% CI=0.15-0.77, P<0.05), and lockable door (OR=0.37, 95% CI=0.16-0.84, P<0.05), as part of latrine requirements was likely to reduce willingness. However, this did not have a significant association at the adjusted level. Having a squat cover hole on a latrine was significantly associated with increased ability at adjusted level (OR=2.39, 95% CI=1.02-5.59, P<0.05).

Table 4.5: Latrine preference features influencing sanitation investment

Factors	Willingness to invest						Ability to invest					
	95% Confidence			95% Confidence			95% Confidence			95% Confidence		
	Crude odds ratio			Adjusted odds ratio			Crude odds ratio			Adjusted odds ratio		
	OR	CI		OR	CI		OR	CI		OR	CI	
Latrine preference features												
Clean floor/slab	0.34*	0.12	0.99	0.63	0.16	2.47	1.01	0.55	1.36	1.62	0.68	3.83
Covered squat hole	0.47	0.21	1.10	1.77	0.54	5.80	1.00	0.58	1.71	2.39*	1.02	5.59
Wall and roof	0.34*	0.15	0.77	0.32	0.08	1.30	0.38*	0.21	0.70	0.16*	0.06	0.42
Lockable door	0.37*	0.16	0.84	0.47	0.12	1.84	0.59	0.34	1.03	0.79	0.29	2.16

* =P≤0.05. OR=Odd Ratio, CI=Confidence Interval.

4.3.4 Sanitation Knowledge, Latrine Ownership and Awareness on Sanitation Laws Sanitation Investment

Table 4.6 below shows that majority of the respondents knew what sanitation is 414(98.3%), mostly indicating having received this information from Community Health Volunteers, 309(73.4%).

Table 4.6: Knowledge on sanitation

Variable n=421	**Frequency (n)**	**Percentage (%)**
Knowledge on sanitation		
Know what sanitation is	414	98.3
Source of sanitation information		
Public Health Officer	96	22.8
Community Health Volunteers	309	73.4
Media	11	2.6

Majority, 371(88.1%) of those interviewed owned a latrine for their households while the remaining practiced open defecation. The most common latrine owned was the traditional pit latrine 286(67.7%) while few had the water closet 12(2.9%). On the cost of latrine, majority reported to have spent up to a maximum of KES 10,000 on construction, 218(51.8%) (Table 4.7).

Table 4.7: Latrine ownership by respondents

Variable n=421	Frequency (n)	Percentage (%)
Latrine ownership		
Own latrine	371	88.1
Type of latrine owned		
Traditional Pit latrine	286	67.7
VIP	68	16.2
Water Closet	12	2.9
UDDT	5	1.2
Cost of latrine owned		
00000 – 10000	218	51.8
10001 – 20000	77	18.3
20001 – 30000	30	7.1
30001 – 40000	21	5.0
Above 40000	16	3.8

In Table 4.8, awareness on sanitation laws was likely to increase willingness by 3.28 times (OR=3.28, 95% CI=1.51-7.12, P<0.05) and presence of sanitation marketers was expected to increase willingness by 2.21 times (OR=2.21, 95% CI=1.26-3.90, P<0.05), when adjusted, presence of sanitation marketers had a significant association with willingness, it was likely to increase willingness by 4.89 times (OR=4.89, 95% CI=2.19-10.9, P<0.05).

On the ability to invest in sanitation, awareness of laws that encourage communities to construct sanitation facilities was likely to increase ability by 2.17 times (OR=2.17, 95% CI=1.38-3.43, P<0.05). At adjusted level, awareness of sanitation laws was likely to increase ability by 2.17 times (OR=2.17, 95% CI=1.17-4.02, P<0.05).

Table 4.8: Awareness on sanitation laws and sanitation marketing

Factors	Willingness to invest				Ability to invest			
	95% Confidence Crude odds ratio		95% Confidence Adjusted odds ratio		95% Confidence Crude odds ratio		95% Confidence Adjusted odds ratio	
	OR	CI	OR	CI	OR	CI	OR	CI
Awareness on sanitation laws	3.28*	1.51-7.12	0.19	0.08-0.42	2.17*	1.38-3.43	2.17*	1.17-4.02
Sanitation Marketers	2.21*	1.26-3.90	4.89*	2.19-10.9	0.91	0.58-1.42	0.56	0.35-0.89

* =P≤0.05. OR=Odd Ratio, CI=Confidence Interval

As shown in Table 4.9 below, a small proportion of the respondents were aware of any financial institutions that gave loans for sanitation or general purposes, 109(25.9%), an almost similar percentage belonged to savings and lending groups with financial transactions, 105(24.5%). When asked whether they had ever taken a loan for general development purposes, 144(34.2%) were positive although 253(60.1%) were willing to take a loan for sanitation of which majority, 201(47.7%) would repay the loan from sale of animals or farm produce while a small percentage, 6(1.4) considered repaying by using contribution from family and friends.

Table 4.9: Financial knowledge

Variable n=421	Frequency (n)	Percentage (%)
Knowledge on financial institutions that give sanitation loan		
Aware	109	25.9
Membership to groups with financial activities		
Belong to savings and lending group	105	24.5
Access to financial services		
Ever taken a loan before	144	34.2
Willing to take loan for sanitation	253	60.1
Sources of loan repayment		
Salary/wages	53	12.6
Sale of animals/farm produce	201	47.7
Sale of assets	20	4.8
Contributions from family	6	1.4

4.3.5 Cultural Practices

Some cultural practices amongst the study population also influenced the willingness and ability to invest in sanitation (Table 4.10). In-laws not sharing (OR=2.12, 95% CI =1.20-3.73, P<0.05) visitor not sharing (OR=7.77, 95% CI =1.05-57.5, P<0.05), the chronically ill people not sharing (OR=11.9, 95% CI=1.63-88.3, P<0.05) sanitation facilities was likely to increase the willingness. At adjusted level, however, chronically sick people not sharing was likely to increase willingness by 20.4 times (OR=20.4, 95% CI=1.14-363, P<0.05).

When considered in relation to the ability to invest in sanitation, the four cultural practices significantly contributed towards the ability to invest. At adjusted level, in-laws not sharing (OR=2.43, CI=1.36-4.34, P<0.05) and chronically ill people not sharing (OR=9.86, CI=2.10-46.2, P<0.05) were significantly associated with increased ability to invest in sanitation.

Table 4.10: Cultural practices affecting sanitation investment

Factors	Willingness to invest						Ability to invest					
	95% Confidence Crude odds ratio			95% Confidence Adjusted odds ratio			95% Confidence Crude odds ratio			95% Confidence Adjusted odds ratio		
	OR	CI		OR	CI		OR	CI		OR	CI	
Cultural practices affecting use of latrine												
In-laws do not share	2.12*	1.20	3.73	1.32	0.64	2.72	2.44*	1.53	3.88	2.43*	1.36	4.34
Children do not share with adults	1.77	0.84	3.75	0.58	0.19	1.77	2.89*	1.51	5.53	1.86	0.74	4.66
Visitors do not share	7.77*	1.05	57.5	2.09	0.12	37.5	3.70*	1.29	10.6	0.55	0.11	2.66
Chronically ill people do not share	11.9*	1.63	88.3	20.4*	1.14	363	8.13*	2.49	26.5	9.86*	2.10	46.2

* =P≤0.05. OR=Odd Ratio, CI=Confidence Interval

4.4 Economic Factors Influencing Willingness and Ability to Invest in Sanitation

Several factors were examined under this category. These included employment status, household income and expenditure, ownership of assets/property, external assistance, financial knowledge/literacy, cost of financial services, physical distance to financial institutions, and legal requirements for accessing financial credit for sanitation.

Table 4.11 shows that a small proportion of those interviewed was employed, 58(13.8%) while the rest were either unemployed, 132(31.4%) or self-employed, 231(54.9%). Of these, majority, 390(92.7%) reported to have a total monthly income of <KES 1000. On asset and property ownership, the majority of the respondents owned land, 335(79.6) and cattle, 199(47.3) while a few of them owned a vehicle, 17(4.0%). A small percentage lived in a permanent house, 62(14.9%) while the rest lived either in a semi-permanent, 245(58.8%) or mud walled house with thatched roof, 110(26.4%).

Table 4.11: Self-reported economic status

Variable n=421	Frequency (n)	Percentage (%)
Employment status		
Employed	58	13.8
Unemployed	132	31.4
Self employed	231	54.9
Household income ranges		
0000 – 1000	152	36.1
1001 – 3000	146	34.7
3001 – 6000	63	15.0
6001 – 10000	29	6.9
Above 10000	31	7.4
Ownership of assets		
Own land	335	79.6
Own vehicle	17	4.0
Own cattle's	199	47.3
Type of house owned		
Permanent house	62	14.9
Semi-permanent house	245	58.8
Mad wall with thatch	110	26.4

To determine the economic and financial status of the respondents, they were assessed on their employment status, asset ownership, and financial literacy among other indicators as shown in the subsequent tables.

Table 4.12 shows that those unemployed were 3.55 times (OR=3.55, 95% CI=1.61-7.80, P<0.05) more likely to be willing to invest in sanitation than those who indicated that they were self-employed as shown.

Those with monthly income categories of KES 1001-3000 (OR=3.22, 95% CI=1.59-6.50, P<0.05) and KES 3001-6000 (OR=8.79, 95% CI=2.04-37.8, P<0.05) were more likely to be willing to invest in sanitation than those who had an average income of less than KES 1000 a

month. A similar association was also made at an adjusted level for the two categories (OR=2.94, 95% CI=1.21-7.12, P<0.05) and (OR=10.0, 95% CI=1.98-50.6).

On the ability to invest in sanitation, those with an average income of between KES 1001-3000 were 1.7(OR=1.7, 95% CI=1.01-2.85, P<0.05) times more likely to be able to invest in sanitation than those who had had an income of below KES 1000. There was an even stronger association at adjusted level where those with an average income of between KES 1001-3000 and above KES 10000 were 2.3 times (OR=2.30, 95% CI=1.18-4.48, P<0.05) and 6.86 times were (OR=6.86, 95% CI=1.73-27.3, P<0.05) more likely to be able to invest in sanitation than those who had had an income of below KES 1000.

An increase in average household expenditure was likely to decrease the levels of willingness and ability both at the crude and adjusted levels as in Table 4.12 below. External assistance by organisations to provide sanitation facilities was likely to increase willingness by 2.67 times (OR=2.67, 95% CI=1.22-5.81, P<0.05). In relation to the ability to invest in sanitation, external assistance from organisations that help communities construct sanitation facilities was likely to increase ability by 2.58 times (OR=2.58, 95% CI=1.44-4.62, P<0.05).

Table 4.12: Employment, income/expenditure related factors influencing sanitation investment

Factors	Willingness to invest						Ability to invest					
	95% Confidence Crude odds ratio			95% Confidence Adjusted odds ratio			95% Confidence Crude odds ratio			95% Confidence Adjusted odds ratio		
	OR	CI		OR	CI		OR	CI		OR	CI	
Employment and income/expenditure related factors												
Employment status												
Employed	1.25	0.57	2.73	1.49	0.40	5.61	1.84	0.88	3.85	1.29	0.49	3.41
Unemployed	3.55*	1.61	7.80	2.27	0.92	5.60	1.11	0.68	1.79	0.66	0.38	1.15
Self employed	(Ref)						(Ref)					
Household monthly income ranges												
0000 – 1000	(Ref)						(Ref)					
1001 – 3000	3.22*	1.59	6.50	2.94*	1.21	7.12	1.70*	1.01	2.85	2.30*	1.18	4.48
3001 – 6000	8.79*	2.04	37.8	10.0*	1.98	50.6	1.52	0.78	2.98	2.17	0.91	5.12
6001 – 10000	1.38	0.49	3.90	2.89	0.81	10.3	1.50	0.60	3.74	2.64	0.90	7.77
Above 10000	0.99	0.39	2.49	3.48	0.73	16.7	2.47	0.90	6.83	6.86*	1.73	27.3
Household monthly expenditure												
0000 – 1000	(Ref)						(Ref)					
1001 – 3000	1.41	0.47	4.22	0.79	0.23	2.67	0.73	0.36	1.49	0.35*	0.15	0.83
3001 – 6000	1.84	0.44	7.65	0.58	0.12	2.82	0.58	0.26	1.28	0.22*	0.08	0.60
6001 – 10000	0.19*	0.07	0.53	0.13*	0.04	0.43	0.40*	0.17	0.95	0.16*	0.06	0.45
Above 10000	0.09*	0.04	0.25	0.06*	0.02	0.18	0.20*	0.09	0.42	0.07*	0.03	0.17
External Assistance	2.67*	1.22	5.81	0.32	0.18	0.59	2.58*	1.44	4.62	0.94	0.59	1.50

* =P≤0.05. OR=Odd Ratio, CI=Confidence Interval

Table 4.13 shows that ownership of cattle did not influence willingness. However, it was more likely to increase the level of ability to invest in sanitation by 1.19 times (OR=1.19, CI=0.72-1.97, P<0.05) at the adjusted level. Ownership of goats was likely to increase the willingness to

invest in sanitation by 2.42 times (OR=2.42, 95% CI=1.18-5.22, P<0.05). The ownership of all other assets and property did not seem to have any significant association with willingness and ability both at crude and adjusted levels.

Table 4.13: Asset ownership and sanitation investment

Factors	Willingness to invest						Ability to invest					
	95% Confidence Crude odds ratio			95% Confidence Adjusted odds ratio			95% Confidence Crude odds ratio			95% Confidence Adjusted odds ratio		
	OR	CI		OR	CI		OR	CI		OR	CI	
Ownership of assets/property												
Asset owned												
Land	1.59	0.86	2.94	1.38	0.72	2.65	0.87	0.50	1.50	0.95	0.53	1.68
Mobile	1.61	0.81	3.17	1.56	0.75	3.26	1.56	0.89	2.76	1.78	0.97	3.27
Radio	1.25	0.71	2.20	1.21	0.63	2.33	0.96	0.61	1.53	1.02	0.60	1.75
Television	0.88	0.44	1.75	0.76	0.35	1.66	1.161	0.65	2.07	0.90	0.47	1.72
Bicycle	1.03	0.60	1.78	0.83	0.45	1.53	0.71	0.46	1.16	0.67	0.41	1.10
Motorcycle	0.67	0.30	1.46	0.60	0.25	1.41	1.52	0.71	3.26	1.42	0.63	3.22
Vehicle	2.74	0.36	21.0	1.85	0.21	15.9	2.668	0.60	11.9	2.60	0.52	12.9
Cattle	1.66	0.95	2.92	1.43	0.77	2.68	1.054	0.68	1.63	1.19*	0.72	1.97
Goats	2.42*	1.18	5.22	1.96	0.89	4.35	0.914	0.57	1.48	0.95	0.55	1.62
Pigs	0.95	0.53	1.69	1.44	0.51	4.12	0.574*	0.37	0.90	0.87	0.44	1.74

* =P≤0.05. OR=Odd Ratio, CI=Confidence Interval

Factors related to finances are likely to influence the willingness and ability to invest in sanitation such as financial awareness, membership to savings and lending groups with financial transactions, uptake of loan for development purposes, hindrances to accessing finances for sanitation, willingness to take loans for sanitation and repayment modes.

In Table 4.14, financial awareness was likely to increase willingness to invest in sanitation by 3.59 times (OR=3.59, 95% CI=1.50-8.61, P<0.05) at the crude level and by 4.12 times (OR=4.12, 95% CI=1.41-12.0, P<0.05) at adjusted level. In relation to ability, people who had financial knowledge were more likely to be able to invest in sanitation than those who did not, both at crude (OR=3.23, 95% CI=1.73-6.06, P<0.05) and adjusted (OR=3.59, 95% CI=1.70-7.61, P<0.05) levels.

Belonging to a savings and lending group was likely to increase willingness to invest in sanitation by 2.82 times (OR=1.19, 95% CI=1.24-6.42, P<0.05) at crude level but had no significant association at adjusted level. When examined in relation to ability, it was likely to increase the ability to invest by 3.04 (OR=3.04, 95% CI=1.62-5.70, P<0.05) at the crude level and by 2.51 times (OR=2.51, 95% CI=1.20-5.27, P<0.05) at adjusted level. Having accessed a financial loan before seemed to reduce levels of willingness at the adjusted level, it, however, did not have any significant association at the crude level and with the ability to invest in sanitation.

Several hindrances to accessing financial services for sanitation existed. The high cost of service was likely to reduce levels of willingness by 0.40 times (OR=0.4, 95% CI=0.23-0.69, P<0.05), this, however, did not have a significant association at adjusted level nor with ability. Physical distance to the financial facility was likely to reduce the ability to invest by 0.37 (OR=0.37, 95% CI=0.21-0.67, P<0.05) times at crude and by 0.22 (OR=0.22, 95% CI=0.11-0.45, P<0.05) times at adjusted levels.

Employment status was significantly associated with increased willingness, meaning people who were employed were more likely to access financial services for sanitation, or loans in general as opposed to those who were not (OR=5.21, 95% CI=1.21-21.9, P<0.05).

Those willing to take a loan for sanitation were also more likely to be willing to invest in sanitation than those who did not. This was true both at crude (OR=11.8, 95% CI=5.63-24.8, P<0.05) and adjusted level (OR=3.89, 95% CI=1.35-11.2, P<0.05). Willingness to take a loan for sanitation was also significantly associated with the ability to invest in sanitation facilities at crude (OR=3.15, CI=2.07-5.12, P<0.05) and adjusted levels (OR=4.24, 95% CI=2.06-8.74, P<0.05). Loan repayment by salary/wages was significantly associated with an increased willingness at the adjusted level (OR=6.29, 95% CI=1.41-28.1, P<0.05). Similarly, this mode of

payment was significantly associated with increased ability at a crude level (OR=3.73, 95% CI=1.45-9.64, P<0.05) and adjusted level (OR=3.05, 95% CI=1.03-9.01, P<0.05).

Sale of animals had a strong influence on levels of willingness. It was likely to increase willingness by 13.1 (OR=13.1, 95% CI=5.11-33.4, P<0.05) times at crude level and by 12.9 (OR=12.9, 95% CI=03.78-43.7, P<0.05) times at adjusted level. A similar association was noted in relation to ability, where the sale of animals was likely to increase the ability to invest by 1.80 times (OR=1.80, 95% CI=1.15-2.82, P<0.05). There was, however, no significant association at adjusted level. Other modes of repayment like the sale of household assets were significantly associated with a decrease in ability to invest in sanitation (OR=0.24, 95% CI=0.08-0.78, P<0.05) when adjusted, it, however, had no significant association with willingness to invest in sanitation. Income and the overall financial status of the household, therefore, impacts significantly on the willingness and ability to invest in sanitary facilities.

Table 4.14: Financial related factors influencing sanitation investment

Factors	Willingness to invest				Ability to invest			
	95.0% Confidence Crude odds ratio		95.0% Confidence Adjusted odds ratio		95.0% Confidence Crude odds ratio		95.0% Confidence Adjusted odds ratio	
	OR	CI	OR	CI	OR	CI	OR	CI
Financial factors								
Financial awareness	3.59*	1.50-8.61	4.12*	1.41-12.0	3.23*	1.73-6.05	3.59*	1.70-7.61
Belonging to savings and lending groups	2.82*	1.24-6.42	2.41	0.88-6.58	3.04*	1.62-5.70	2.51*	1.20-5.27
Accessed a development loan	0.59	0.34-1.02	0.29*	0.13-0.65	1.25	0.78-1.99	0.88	0.50-1.54
Hindrances to accessing financial services								
Financial knowledge	2.21*	1.154-2.35	1.53	0.60-3.92	1.83*	1.12-2.97	1.22	0.64-2.30
Cost of services	0.40*	0.23-0.69	0.79	0.36-1.77	0.82	0.52-1.27	1.03	0.58-1.84
Physical Distance	1.38	0.56-3.38	0.54	0.17-1.69	0.37*	0.21-0.67	0.22*	0.11-0.45
Legal requirements	0.97	0.55-1.71	1.46	0.66-3.19	0.69	0.44-1.08	0.78	0.45-1.35
Employment status	5.21*	1.24-21.9	5.07	0.95-27.1	1.20	0.62-2.32	0.77	0.35-1.73
Willing to take sanitation loan	11.8*	5.63-24.8	3.89*	1.35-11.2	3.15*	2.07-5.12	4.24*	2.06-8.74
Mode of repayment								
Salary/Wages	3.06	0.92-10.1	6.29*	1.41-28.1	3.73*	1.45-9.64	3.05*	1.03-9.01
Sale of animals	13.1*	5.11-33.4	12.9*	3.78-43.7	1.80*	1.15-2.82	1.19	0.59-2.44
Sale of assets	3.28	0.43-24.9	3.59	0.38-34.3	0.50	0.20-1.25	0.24*	0.08-0.78

* =P≤0.05. OR=Odd Ratio, CI=Confidence Interval

CHAPTER FIVE

DISCUSSION

The factors that influence willingness and ability of communities in Busia to invest in sanitation facilities were examined under various categories namely; demographic and socio-cultural, economic and financial factors. The proportions of willingness and ability to invest in sanitation were initially established among the study population to help determine the associations.

5.1 Proportion of Willingness and Ability to Invest in Sanitation

A significant number of the respondents knew about sanitation, its benefits and consequences and as such were willing to invest in sanitation. This was in line with Chapman (2004) who concluded that communities are likely to show high levels of willingness when knowledge of sanitation already exists and the benefits of having appropriate sanitation facilities well understood. Some community members develop an instant desire to have proper sanitation facilities after realising the health problems that face them due to poor sanitation but may not have resources to invest accordingly. The source of knowledge on sanitation was attributed to the community health volunteers and public health officers working in the community.

The self-reported ability to invest was however low among the respondents. For this study, an actual ability was considered as one having a ventilated improved pit latrine and above. This was true for a third of the respondents who owned sanitation facilities of the various categories. Contrary to the expectations, the high proportion of willingness did not result in similar levels of ability. From the results, it is possible to assert that once people know about sanitation, they are likely to start by investing in basic facilities then later move on to more improved facilities. However, this study was a desk-based review, and its assumptions may not be entirely

conclusive. This would thus imply that access to financial resources becomes not only important but also vital to the realisation of the full benefits of improved sanitation.

5.2 Demographic and Socio-cultural Factors that Influence the Willingness and Ability to Invest in Sanitation

Household size had a significant prediction of willingness to invest in sanitation than the rest demographic and socio-cultural factors. The change is expected since an increase in the household size calls for priorities shift to buying food, clothing, and education among others perceived to be pressing needs amidst limited resources. The inference is similar to that of Fewtrell *et al.*,(2005) in a similar study which argued that an increase in household size increased diarrheal incidences in children under five, a condition that is related to poor sanitation. People with better literacy were more willing to invest. Education impacts the willingness to invest in sanitation by making the households aware of the challenges associated with continued use of traditional and unhealthy sanitation. Some households benefited from education by having some of their members employed. From the study, all the other indicators under demographic factors were not critical in determining willingness and ability to invest in sanitation.

Social factors such as knowledge on sanitation/health education perceived health risks due to poor sanitation, personal preferences for latrine options, awareness on sanitation laws, sanitation marketing in the community and sharing of sanitation information by CHVs was associated with high levels of willingness and ability. The CHVs reside within those communities, hence a stronger association as they spend more time with communities as compared to PHOs and media who are not constantly available in the villages. Under perceived health risk due to poor sanitation, the fear of the spread of disease was likely to increase the ability to invest while open

defecation was likely to reduce ability. Disease prevention was demonstrably the strongest cue and motivation for investment in sanitation. Moreover, awareness of sanitation laws and sanitation marketing in the community was also likely to increase willingness and ability to invest in sanitation. The laws and policies, however, should be coherent and supportive by reflecting the needs and preferences of people.

5.3 Economic and Financial Factors Influencing Willingness and Ability to Invest in Sanitation

Finances were found to play a vital role in determining the state of affordability of different households to invest in sanitation. To arrive at concise results, different aspects defining the financial status of the households were considered. The results of the study display a close relationship between the overall income of a household and their ability to invest in sanitary facilities. Families with low employment status had less concern for better latrines among other sanitary facilities. Essentially, the expenditure is also a significant factor in evaluating the ability of a household to invest in sanitary facilities. Families with low income had few or now members employed. This minimised their surplus after acquiring basics such as food. The concern for better sanitary facilities was also not properly welcomed due to the less income and consequent low will to invest in sanitation. Increasing the number of employed people in each household would increase the will and ability to invest in sanitation. The research concluded that higher income levels could increase the affordability of the households similar to the inferences by Kema et al. (2012) in similar research. Cost is a powerful deterrent to investing in sanitation. Affordability is one of the means of overcoming cost. Increasing the employment status of the families would increase their income and redefine their affordability.

Asset ownership was also used in the valuation of the economic and financial status of the households. Some of the respondents were found to own cattle and goats. The affordability of proper sanitation for these households was better due to the availability of funds based on willingness through the sale of the animals. Presence of organisations that help communities in the region construct sanitation facilities was associated with increased willingness and ability. Most people found with assets such as cattle had sanitation facilities. Implementing behaviour change for the communities in Busia County as described by Kar and Chambers (2008) would greatly improve the sanitary facility ownership based on the results from this study.

Financial and economic factors affecting the willingness and ability to invest in sanitation were found to be influenced by lack of knowledge. Some of the respondents had no idea that some banks and other microfinance institution develop loans for different products such as sanitation. A small percentage of the respondents belonged to savings and lending groups with financial transactions but with little knowledge of saving and lending funds. Such a group of people, having the correct information could easily access financial resources for sanitation either from financial institutions of or the savings and lending groups they belonged. Another significant group had no information about the possible means of sourcing funds to implement the projects while others had fewer assets that could act as security if the firms were to fund them.

Given the impact of financial knowledge and belonging to savings and lending groups have, government policies and projects focusing on sanitation should thus have some component of financial literacy and empowerment for communities. Lack of financial knowledge, the high cost of service, physical distance, and legal requirements and unemployment were associated with reduced willingness and ability to invest in sanitation. Based on the results of the study, the high cost of service was likely to reduce willingness by 0.4 times, while the physical distance to the

service provider was likely to reduce the ability by 0.37 times. Being employed, however, was likely increase access to finances hence willingness. If the communities were made aware with great focus on the importance of proper sanitation, the number of households safe from sanitation-related challenges would be significantly minimised since some could easily source funds.

CHAPTER SIX

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

6.1 Summary of Findings

The aim of the study was to determine the factors that influence the willingness and ability of households to invest in sanitation facilities in Busia County, Kenya. This was first done by establishing the proportions of willingness to invest in sanitation by study participants then linking it to associated factors.

> Objective 1: To assess the proportion of willingness and ability to invest in sanitation facilities by households in Busia County.

The knowledge and awareness of sanitation was high among the study participants. Majority, 88.1% of study population owned a latrine, while 11.9% practiced open defecation. The majority, 87.5% of the study population, were willing to invest in sanitation, though this high proportion of willingness did not translate into similar levels of ability, with only 23% of the study population had a ventilated improved latrine and other higher options. This is the proportion that had access to improved sanitation. Actual ability to invest in sanitation was measured as having a ventilated improved latrine and higher options such as urine drying and diversion chambers, poor flush or water closet. These options provide optimum benefits of improved sanitation.

> Objective 2: To determine the demographic and socio-cultural factors that influence the willingness and ability to invest in sanitation facilities by households in Busia County.

Demographic and socio-cultural factors that influence the willingness and ability to invest in sanitation, gender (being female) and household size were significantly associated with willingness and ability to invest in sanitation. The other demographic factors were not critical. Social factors such as knowledge of sanitation/health education perceived health risks due to

poor hygiene, awareness on sanitation laws and sanitation marketing in the community were likely to increase willingness and ability to invest in sanitation. Personal preferences on various latrines features such asclean floor, wall, roof and lockable door were likely to reduce the willingness to invest in sanitation as they tended to increase cost. Cultural practices such as in-laws, children, visitors and chronically ill people not sharing sanitation facilities with the rest of household occupants existed within the study community and were likely to increase both willingness and ability to invest in sanitation

> Objective 3: To determine the economic and financial factors that influences the willingness and ability to invest in sanitation facilities by households in Busia County.

Economic and financial factors such as employment status, higher household income, ownership of assets/property, external assistance, financial knowledge/literacy, presence of financial institutions that give sanitation loans, willingness to take a loan for sanitation and belonging to savings and lending groups (chamas) were associated with increased levels of willingness and ability to invest in sanitation. On the flip side, the high cost of sanitation facilities, increased household expenditure, the high cost of financial services, increased physical distance to financial institutions, and legal requirements for accessing financial credit for sanitation were possible hindrances of investing in sanitation.

6.2 Conclusions

i. The proportion of willingness to invest in sanitation was high among the study population (87.5%). However, this did not translate into similar levels of ability. The high proportion of willingness was attributed to high levels of awareness on sanitation, the key source of such information being the Community Health Volunteers who are readily available within the community.

ii. Contrary to other studies, female gender had an influence on willingness to invest in sanitation, while various socio-cultural factors were significantly associated with willingness and ability to invest in sanitation.

iii. Economic and financial factors were significantly associated with willingness and ability to invest in sanitation.

6.3 Recommendations

From the results, it can be recommended that;

i. There is need for government and other agencies involved in sanitation to take advantage of the high proportions of willingness to push communities up the sanitation ladder, towards improved sanitation; promote other appropriate sanitation options in addition to the predominant traditional pit latrine which is in line with the first objective of the study.

ii. Government and all other agencies implementing sanitation promotion interventions should have a proper understanding of the demographic and socio-cultural practices of the target communities and use this to promote sanitation, conduct more awareness on sanitation laws and support social and sanitation marketing efforts which handles the second objective of the study.

iii. The government and agencies involved in promotion of sanitation should incorporate and work with financial institutions, and the readily embraced savings and lending groups, co-operative SACCOs to increase financial literacy thereby increasing access to finances for sanitation. The financial institutions that give loans for general development and sanitation should work closely with government and communities to reduce the cost of borrowing, reduce the complexity of requirements, and reduce physical distance. This can be achieved through promotion of group lending mechanisms, mobile or table banking, use of

telephony services among other innovations solving our issue in the third objective of this research. Community members, on the other hand, should be involved in a variety of livelihood activities and income generating activities that will enable them to have sufficient income to invest in sanitation facilities.

6.4 Suggestions for future research

i. Studies on the role and use of culture, customs and traditions in community sanitation promotion.

ii. Studies that will explore the relationship between willingness and ability to invest in sanitation.

iii. Studies that will help develop and establish a suitable model of willingness and ability to invest in sanitation.

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APPENDICES

Appendix I: Household Questionnaire

Maseno University School of Public Health and Community Development

Research Questionnaire

Study Title: Factors Influencing Households' Willingness and Ability to Invest In Sanitation Facilities in Busia County

Study Unit: Household

Name and contact of Research Assistant	
Date of interview	
Interview start time	Interview end time
Household number/code	

Section A: Background Information	
County:	Location
Sub-County:	Village

Section B: Social - Demographic Characteristics of the Respondent		
S/N	**Question**	**Responses**
1	Gender *(jinsia)*	1. Male 2. Female
2	Age of the respondent*(Umri)*	*Insert age in complete years*
3	Who is the head of this household? *(Nani mkuu wa nyumba hii?)*	1. Male 2. Female
4	What is your highest educational qualification? *(Kiwango chako cha juu cha masomo ni kipi?)*	1. No education 2. Primary 3. Secondary 4. College 5. University
5	What is your religion? *(Dini yako ni gani?)*	1. Christian 2. Muslim 3. Other*(specify)*

6	What is the number of people living in this household*(Idadi ya wanaoishi kwenye nyumba hii ni wangapi?)*	*Insert Complete household size number*
Section C: Socio-Cultural Factors Affecting Willingness and Ability		
1	Do you know what sanitation is? (*probe for their understanding of sanitation*) *(Je wajua usafi ni nini ?)*	1. Yes 2. No
2	Where do youmainly get information on sanitation? *(Je habari kuhusu uasfi wewe hupata kupitia njia ipi?)*	1. Public Health Officers 2. Community Health Volunteers 3. Media 4. NGO Workers 5. Local Marketers 6. Others *(specify)*
3	Do you have a latrine for your household? (*if no skip to question 6*) *(Je unachoo katika boma lako?)*	1. Yes 2. No
4	What is the type of latrine owned by the respondent? (*observe*) (*Mtahiniwa* ana choo aina gani?)	1. Traditional pit latrine 2. Ventilated Improved Pit (VIP) latrine 3. Water Closet/Pour flash 4. UDDT(Urine Diversion Dilution Toilet) 5. Other (specify)
5	What motivated you to construct the latrine you have?*(mark all that apply)* *(Ni nini kilicho kupa motisha ya kejenga choo ulicho nacho?)*	1. Disease prevention 2. Dignity 3. Privacy 4. Safety 5. Prestige
6	Where do your household members defecate?*(mark all that apply)* *(Ni wapi jamii yako huenda haja kubwa)*	1. In the bush (OD) 2. Household latrine 3. Share with neighbour 4. Public latrines
7	How many households in your village have and use latrines *(if all, skip to question 9)* *(Ni majumba mangapi katika kijiji chako*	1. All 2. Most

	wako na choo na wanavitumia?)	3. Few 4. None
8	Where do the rest defecate? *(Hao wengine huenda haja kubwa wapi?)*	1. In the bush (OD) 2. Household latrine 3. Share with neighbour 4. Public latrines
9	Do you think it is beneficial for people to use latrines? *(Je unadhani ni muhimu kutumia choo?)*	1. Yes 2. No 3. Don't know
10	What are the consequences of not using latrines?*(mark all that apply)* *(Ni madhara yapi yanayo weza kusababishwa na kuto tumia choo?)*	1. Lowered dignity 2. Spread of diarrhoea diseases 3. No privacy 4. Low prestige 5. Lack of safety
11	What characteristics would you like to see in your latrine of choice? *(mark all that apply)* *(Ni vitu gani unafikiri muhimu ungependa kuviona katika choo chako?)*	1. Clean floor and slab 2. Covered squat hole 3. With wall and roof 4. Lockable door 5. Other (specify)
12	What would make you want to invest in a sanitation facility/latrine? *(mark all that apply)* *(Ni nini kingefanya utake kutengeneza Choo?)*	1. Disease prevention 2. Dignity 3. Privacy 4. Safety 5. Prestige
13	What cultures do exist in your community that affect owning and use of latrines? *(mark all that apply)* *(Kuna tamaduni zipi katika kijiji chako zinazoadhiri ujenzi na utumizi wa vyoo?)*	1. In laws do not share 2. Children do not share with adults 3. Visitors do not share 4. People living with chronic illnesses do not share
14	Are you aware of any laws in your county that encourage households to have sanitation facilities? *(Je uko na ufahamu wowote wa sharia zinazo*	1. Yes 2. No

	shughulikia ujenzi wa vyoo katika eneo bunge lako?)	
15	Are there people or organizations in your area who sell/market sanitation/toilets *(Je kuna watu au vikundi katika sehemu yenu wanao uza au kueneza ujumbe wa usafi wa choo?)*	1. Yes 2. No
Section D: Economic FactorsAffecting Willingness and Ability		
1	What is your current employment status? *(Njia ya mapato yako ya sasa ni ipi?)*	1. Employed 2. Un-employed 3. Self-employed
2	What is the range of your household income per month? *(Kiwango chako cha mapato kwa mwezi ni kipi?)*	1. 0000 – 1000 2. 1001 – 3000 3. 3001 – 6000 4. 6001 – 10000 5. Above 10000
3	What is your household average monthly expenditure? *(Kiwango chako cha matumizi kwa mwezi ni kipi?)*	1. 0000 – 1000 2. 1001 – 3000 3. 3001 – 6000 4. 6001 – 10000 5. Above 10000
4	Do you own land? *(if no skip to 7)* *(Je unamiliki sehemu yeyote ya ardhi)*	1. Yes 2. No
5	What size is the piece of land you own? *(Kipande chako cha ardhi unacho miliki ni kiasi gani?)*	*Insert size of land in acres*
6	Which of the following assets do you own?*(mark all that apply)* *(Kati ya hivi vitu ni vipi unavyo miliki?)*	1. Mobile phone 2. Radio 3. Television set 4. Bicycle 5. Motorcycle 6. Vehicle
7	Which of the following animals do you keep? (*mark all that apply*)	1. Cattle 2. Goats

	(Kati ya mifugo hawa ni wepi unaofuga?)	3. Sheep 4. Pigs 5. Chicken 6. Others (specify)
8	What type of a house does the respondent own *(observe)* *(Ni nyumba aina ipi mtahiniwa anaishi?)*	1. Permanent house 2. Semi-permanent house 3. Mad wall with thatch
9	How much did the latrine you have cost you? *(if owns latrine)* *(Choo ulicho nacho kiligarimu pesa ngapi?)*	1. 0000 – 10000 2. 10001 – 20000 3. 20001 – 30000 4. 30001 – 40000 5. Above 40000
10	Are you willing to invest in sanitation? *(Je uko tayari kujihusisha katika ujenzi wa choo?)*	1. Yes 2. No
11	Would you be willing to use your money and other resources to invest in a sanitation facility/latrine? *(Je uko tayari kutumia fedha zako na garama yeyote ile katika ujenzi wa choo?)*	1. Willing 2. Very much willing 3. Not willing
12	Are you able to invest in sanitation? *(Je una uwezo tayari kuwekeza katika ujenzi wa choo?)*	1. Yes 2. No
13	How much would you invest in a latrine of your choice? *(Kiwango kipi cha pesa ungependa kutumia kitika ujenzi wa choo?)*	*(Insert the amount)*
14	Are there organizations in your area that assist people to build latrines? *(Je katika eneo lako kuna mashirika yanayo saidia katika ujenzi wa choo?)*	1. Yes 2. No
15	What latrine options do you know that exist in the market?*(mark all that apply)* *(Choo aina zipi zingine unazo zi fahamu zilizoko kwenye soko?)*	1. Traditional pit latrine 2. Ventilated Improved Pit (VIP) latrine 3. Water Closet/Pour flash 4. UDDT(Urine Diversion Dilution

		Toilet) 5. None 6. Other (specify)
Section E: Financial Factors Affecting Willingness and Ability		
1	Are you aware of any financial institutions that give sanitation loans? *(Je wajua wafadhili wowote wanaopeana mikopo ya ujenzi wa vyoo?)*	1. Yes 2. No
2	Do you belong to any savings and lending group*(chamas)* with financial transactions? *(Je wewe ni mwana chama katika kikundi chochote kinacho wekeza na kukopa?)*	1. Yes 2. No
3	Have you ever taken a loan before for any development project? *(Je umewahi chukua mkopo apo awali wa kujiendeleza?)*	1. Yes 2. No
4	What hinders you/people from your community from accessing financial services?*(mark all that apply)* *(Ni nini kinacho kuzuia wewe au jamii yenu kutochukua mkopo?)*	1. Financial knowledge 2. Cost of service 3. Physical distance to service point 4. Legal requirements 5. Employment status
5	Would you be willing to take a loan to construct a latrine for your household? *(Je waweza taka kuchukua mkopo wa kujenga choo cha familia yako?)*	1. Yes 2. No
6	How much would you be able to repay per month? *(Je ni kiwango gani unaweza lipa kwa mwezi?)*	*(Insert amount)*
7	From what sources would you repay the loan?*(mark all that apply)* *(Ni njia gani utatumia kulipa mkopo?)*	1. Salary/Wages 2. Sale of animals/farm produce 3. Sale of assets 4. Contributions from family/friends *5.* Other *(specify)*

----------END----------

Appendix II: Scientific Approval

Daily

MASENO UNIVERSITY
SCHOOL OF GRADUATE STUDIES

Office of the Dean

Our Ref: EL/ESM/00369/2013

Private Bag, MASENO, KENYA
Tel:(057)351 22/351008/351011
FAX: 254-057-351153/351221
Email: sgs@maseno.ac.ke

Date: 22nd September, 2016

TO WHOM IT MAY CONCERN

RE: PROPOSAL APPROVAL FOR VINCENT OUMA —EL/ESM/00369/2013

The above named is registered in the Master of Public Health programme, in the School of Public Health and Community Development, Maseno University. This is to confirm that his research proposal titled "Factors Influencing Households' Willingness and Ability to Invest in Sanitation Facilities in Busia County, Kenya" has been approved for conduct of research subject to obtaining all other permissions/clearances that may be required beforehand.

Prof. J.O. Agure
DEAN, SCHOOL OF GRADUATE STUDIES

MASENO UNIVERSITY DIRECTOR 27 SEP 2016 SCHOOL OF GRADUATE STUDIES

Maseno University *ISO 9001:2008 Certified*

Appendix III: Ethical Clearance

MASENO UNIVERSITY ETHICS REVIEW COMMITTEE

Tel: +254 057 351 622 Ext: 3050
Fax: +254 057 351 221

Private Bag – 40105, Maseno, Kenya
Email: muerc-secretariate@maseno.ac.ke

FROM: Secretary - MUERC

DATE: 5th January, 2017

TO: Vincent M. Ouma
EL/ESM/0369/2013
Department of Public Health
School of Public Health and Community Development
Maseno University
P.O Box Private Bag, Maseno, Kenya

REF:MSU/DRPI/MUERC/00341/16

RE: Factors Influencing Household's Willingness and Ability to Invest in Sanitation Facilities in Busia County, Kenya. Proposal Reference Number: MSU/DRPI/MUERC/00341/16

This is to inform you that the Maseno University Ethics Review Committee (MUERC) determined that the ethics issues raised at the initial review were adequately addressed in the revised proposal. Consequently, the study is granted approval for implementation effective this 5th day of January, 2017 for a period of one (1) year.

Please note that authorization to conduct this study will automatically expire on 4th January, 2018. If you plan to continue with the study beyond this date, please submit an application for continuation approval to the MUERC Secretariat by 5th December, 2017.

Approval for continuation of the study will be subject to successful submission of an annual progress report that is to reach the MUERC Secretariat by 5th December, 2017.

Please note that any unanticipated problems resulting from the conduct of this study must be reported to MUERC. You are required to submit any proposed changes to this study to MUERC for review and approval prior to initiation. Please advice MUERC when the study is completed or discontinued.

Thank you.

DIRECTORATE OF RESEARCH PUBLICATION & CONSULTANCIES 05 JAN 2017 MASENO UNIVERSITY

Yours faithfully,

Dr. Bonuke Anyona,
Secretary,
Maseno University Ethics Review Committee.

Cc: Chairman,
Maseno University Ethics Review Committee.

Appendix IV: Research Approval

COUNTY GOVERNMENT OF BUSIA
County Health Director
Health & Sanitation Dept
P.O. BOX 1040 – 50400
BUSIA, KENYA

Ref: CG/BSA/H/ADM/1/56Vol.1/(46) **Date**: 2nd February, 2017

To
Mr. Vincent Ouma
vincelon@gmail.com

Dear Sir,

REQUEST FOR PERMISSION TO COLLECT DATA IN NAMBALE, TESO SOUTH AN BUTULA SUB COUNTIES

Following your clearance by the Maseno University Ethics Clearance Committee to carry out a study on ***"Factors Influencing Household's Willingness and Ability to invest in Sanitation Facilities in Busia County, Kenya"*** and your subsequent request to this office for permission, I wish to inform you that the permission is granted.

You are requested to liaise with the relevant authorities in the said sub counties as you carry out the data collection.

Yours faithfully,

Dr. Lutomia Melsa,
COUNTY HEALTH DIRECTOR,
BUSIA COUNTY.

c.c. C.E.C.M. – Health & Sanitation,

Chief Officer – Health & Sanitation.

Appendix V: Informed Consent

INFORMED CONSENT

Study Title	**FACTORS INFLUENCING HOUSEHOLDS' WILLINGNESS AND ABILITY TO INVEST IN SANITATION FACILITIES IN BUSIA COUNTY**
Institution	Maseno University, School of Public Health and Community Development P.O Box P.O. Box 3275 – 40100, KISUMU, Kenya
Principal Investigator	**Vincent M. Ouma** Masters of Public Health Student, Maseno University, School of Public Health and Community Development T: +254 (0) 708046604, Email: vincelon@gmail.com
Supervisors	**Prof. Rosebella Onyango** Director, School of Public Health and Community Development Maseno University. **Dr. David Okeyo Omondi** Head, Kenya Nutritionists & Dieticians Institute

Introduction

My name is Vincent Ouma, a Masters of Public Health student from Maseno University School of Public Health and Community Development. I am doing research on the factors influencing the willingness and ability to invest in sanitation among households in Busia County. I am going to give you information and invite you to be part of this research. This consent form may contain words that you do not understand, feel free to ask me to explain.

Study Purpose:

Lack of access to appropriate sanitation is a major cause of diarrheal disease in your County affecting both children and adults. Children and women suffer most due to poor sanitation as they get sick, miss school days and exposed many other health risks.

Through this study, we would like to learn about what which factors make people in this community choose to or not invest their resources in constructing sanitation facilities. We would like to know if people are willing and able to put up sanitation facilities, and if they have access to finances to do so.

Procedure

In this study we will visit many households in Butula and Teso South sub counties of Busia County, in order to learn from you, you will be expected to answer questions on issues such as sanitation systems uptake and usage, costs for putting them up, access to financial credit for sanitation among other characteristics. The interviews will take about an hour.

Participant Selection

You are being invited to take part in this study because we feel that your experiences and knowledge, especially concerning your household's welfare decisions, are very valuable for this study. We also feel that being the at the household level, you understand and are able to make decisions concerning financial matters for your household

Participation is Voluntary

Participation in this study is entirely voluntary. You will make a choice whether to participate or not. If you chose not to participate, you shall not be discriminated against in any way and your decision shall be respected.

Confidentiality of Information

The research being done in the village may draw attention and you may be asked questions by other people in the community. Utmost confidentiality will be observed in handling the information given. The information you give us will only be used for the purposes of this study. Names of the participants will not in any way be produced in analysed information and raw data will be safely kept under lock and key, only accessible to study team.

Study Results

The results of this study will be presented in the thesis. They will be seen by my supervisor, a second marker and the external examiner. The thesis may be read by future students on the course. The study may be published in a research journal in the future.

Benefits from the study

Participation in this study will not translate into any direct benefits, monetary or otherwise. However the results from the study may be used by the Ministry of Health and other players to improve sanitation standards in your area.

Risks of Participating

There will be no risks in participating in this study although some questions may involve your personal matters such finances. Your identity will not be revealed.

Right to Withdrawal or Refuse

You do not have to take part in this research if you do not wish to do so .While participating in this study you may withdraw from it at any time if you feel uncomfortable.

Questions

In case you have any questions, comments or complain regarding the study, kindly contact the investigator on the above address.

Participant's Consent

I declare that I have read the above information, or it has been read to me. I have had the opportunity to ask questions about it and any questions I have been asked have been answered to my satisfaction. I therefore consent voluntarily to be a participant in this study.

Name of Participant	
Signature/Thumbprint of Participant	
Date (DD/MM/YY)	

Contacts:

If you have any questions or concerns about this survey you may contact the Study investigator:

Vincent M. Ouma, MPH Student, Maseno University at T: +254 (0) 708046604, Email: vincelon@gmail.com

For questions regarding study participants' rights please contact:

For any questions pertaining to rights as a research participant, contact person is: The Secretary, Maseno University Ethics Review Committee, Private Bag, Maseno; Telephone numbers: 057-51622, 0722203411, 0721543976, 0733230878; Email address: muerc-secretariate@maseno.ac.ke; muerc-secretariate@gmail.com

INFORMED CONSENT/RIDHAA

Study Title	**FACTORS INFLUENCING HOUSEHOLDS' WILLINGNESS AND ABILITY TO INVEST IN SANITATION FACILITIES IN BUSIA COUNTY** ***(Sababu Zinazoadhiri Kujitolea na Uwezo wa Kujenga Vyoo Katika Jamii Katika Kaunti ya Busia)***
Institution	Maseno University, School of Public Health and Community Development P.O Box P.O. Box 3275 – 40100, KISUMU, Kenya
Principal Investigator	**Vincent M. Ouma** Masters of Public Health Student, Maseno University, School of Public Health and Community Development T: +254 (0) 708046604, Email: vincelon@gmail.com
Supervisors	**Prof. Rosebella Onyango** Director, School of Public Health and Community Development Maseno University. **Dr. David Okeyo Omondi** Head, Kenya Nutritionists & Dieticians Institute

Utangulizi:

Kwa Majina ni Vincent Ouma, mwanafunzi wa somo la shahada ya Uzamili ya Afya ya Uma katika Chuo Kikuu cha Maseno. Nafanya utafiti kuhusu Sababu zinazo adhiri Kujitolea na Uwezo wa kujenga vyoo katika jamii katika Kaunti ya Busia. Nitakupa ujumbe na kukukaribisha ujiunge nami katika utafiti huu. Fomu hii inaweza kuwa na lugha ambayo haieleweki, tafadhali jisikie huru kuniuliza swali lolote, nitakufafanulia.

Madhumuni ya Utafiti:

Ukosefu wa upatikanaji wa usafi wa mazingira sahihi ni njia kuu ya magonjwa ya kuhara katika kata yako yanayoathiri watoto na watu wazima. Watoto na wanawake huathirika zaidi kutokana na usafi duni wa mazingira kama kupata wagonjwa, kukosa shule na wazi yoyote nyingine hatari ya afya.

Kupitia utafiti huu, tungependa kujifunza juu ya nini vipengele kufanya wakaazi katika jamii kuchagua kuwekeza au kutowekeza rasilimali zao katika Kujenga vituo vya usafi wa mazingira au vyoo. Tungependa kujua kama watu wako tayari na kuweka vifaa vya usafi wa mazingira, na kama wanapata fedha ya kufanya hivyo

Utaratibu:

Katika utafiti huu tutatembelea Kaya nyingi katika eneo la Butula na Teso Wilaya ndogo ya Kata la Busia County, ili kujifunza kutoka kwenu, utakuwa unatarajiwa kujibu maswali juu ya masuala kama vile mifumo ya usafi na matumizi, Gharama kwa ajili ya kutengenezwa, upatikanaji kwa mikopo ya fedha kwa ajili ya usafi, miongoni mwa sifa mengineo. Mahojiano itachukua takribani saa moja.

Mshiriki Uteuzi:

Unaalikwa kushiriki katika utafiti huu kwa sababu tunahisi kwamba uzoefu wako na maarifa, hasa maamuzi yako kuhusu ustawi wa Kaya yako, ni muhimu sana kwa ajili ya utafiti huu. Pia tunahisi kwamba wewe kuwa katika kaya, unaelewa na uko na uwezo wa kufanya maamuzi kuhusu mambo ya kifedha kwa ajili ya Kaya yako

Kushiriki ni Kwa hiari

Kushiriki katika utafiti huu ni kwa hiari kabisa. Utakuwa unafanya uchaguzi kama ungependa kushiriki au la. Kama hutaki kushiriki, hakuta kuwa na kubaguliwa kwa namna yoyote na uamuzi wako utabaki kuheshimiwa.

Usiri wa Habari

Utafiti unaofanywa katika kijiji unaweza kuteka mawazo na unaweza kuulizwa maswali na watu wengine katika jamii. Ujumbe utakao tolewa utawekwa na kushughulikiwa pasipo na maelezo yeyote kutolewa. Maelezo utakayotupa yatatumika tu kwa madhumuni ya utafiti huu. Majina yako kwa njia yoyote ile hayatachapishwa na kutolewa bali yatawekwa chini ya kufuli na ufunguo, kupatikana tu na timu ya utafiti.

Matokeo ya Utafiti:

Matokeo ya utafiti huu yatawasilishwa katika tasnifu. Yataonekana na msimamizi wangu, msahilishaji wangu wa pili na mtahini wa nje. Tasnifu linaweza kusomwa wanafunzi watakaochukua somo hilo kwa miaka yajayo. Utafiti inaweza kuchapishwa katika jarida la utafiti katika siku zijazo.

Faida ya Utafiti:

Kushiriki katika utafiti huenda lisilete fedha au manufaa sasa hivi. Hata hivyo matokeo ya utafiti unaweza kutumiwa na Wizara ya Afya na waegezaji wengine ili kuboresha usafi wa mazingira katika eneo lako.

Hatari ya Ushiriki:

Hakutakuwa na hatari katika kushiriki utafiti huu ingawa unaweza kuhusishwa maswali yanayo gusia matumizi yako ya fedha yaki binafsi. Utambulisho wako hautatambulishwa kwa wengine

Haki ya Uondoaji au kukataa kushiriki:

Hulazimishwi kuwa na kuchukua sehemu katika utafiti huu kama hutaki kufanya hivyo. Ukishiriki katika utafiti huu unaweza kujiondoa wakati wowote utakavyo.

Maswali:

Ukiwa na maswali yoyote, maoni au malalamishi kuhusu utafiti huu, wasiliana na mpelelezi kupitia anuani hapo juu.

Ridhaa ya Mshiriki:

Ninatangaza kwamba nimesoma habari hapo juu, au nimesomewa. Nimekuwa na fursa ya kuuliza maswali na maswali yeyote wametakiwa kuniuliza nimewajibu kadri ya uwezo na kuridhika kwangu. Sasa na tia ridhaa kwa hiari kuwa mshiriki katika utafiti huu.

Majina ya Mshiriki	
Sahihi ya Mshiriki	
Tarehe (DD/MM/YY)	

Contacts:

Kama una maswali yeyote kuhusu utafiti huu, unaweza wasiliana na mtafiti kupitia:

Vincent M. Ouma, MPH Student, Maseno University at T: +254 (0) 708046604, Email: vincelon@gmail.com

For questions regarding study participants' rights please contact:

For any questions pertaining to rights as a research participant, contact person is: The Secretary, Maseno University Ethics Review Committee, Private Bag, Maseno; Telephone numbers: 057-51622, 0722203411, 0721543976, 0733230878; Email address: muerc-secretariate@maseno.ac.ke; muerc-secretariate@gmail.com