UTILIZATION OF LATRINE AND ASSOCIATED FACTORS AMONG RURAL COMMUNITY IN MARAKWET EAST SUB COUNTY, ELGEYO MARAKWET COUNTY, KENYA

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DECLARATION AND APPROVAL

DECLARATION AND APPROVAL

Declaration by the student

This thesis is my original work and has not been presented for a degree in any other university or for any other award.

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DEDICATION

I dedicate this study to my parents, Mr. Peter Cheserek and Mrs. Juliana Kimoi, who nurtured and showed the value of education to me.

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ABSTRACT

A study on sanitation practices is an important contribution to the understanding of public health issues related to sanitation in rural areas. In Kenya, most diarrhoeal diseases in children are as result of poor utilization of latrine. This study highlights key factors that influence the use of latrines, such as household size, education level, and the type of latrine available. These insights are crucial for designing effective public health interventions. This research aimed to assess factors that played a role in influencing latrine utilization among people residing in the rural areas of Marakwet East Sub County, Elgeyo Marakwet, Kenya. The study objectives included determining the level of utilization on latrine, determining cultural and socio-demographic factors that influence latrine utilization and latrine designs associated with utilization of latrine. A community-based cross-sectional descriptive study was employed as well as quantitative data collection methods with the assistance of an observational checklist and questionnaire in the month of December 2023. The sample entailed 423 households in Marakwet East. Purposive sampling was used to select Marakwet East due to high number of diarrheal cases compared to other three sub counties. Moreover, random sampling was chosen as it allows making generalization on a specific population without bias. Collection of data was through a pretested standardized questionnaire. To find any statistical correlation between the latrine utilization and study variables, the chi square test was conducted. Logistic regression was done to determine the effects of variables on utilization of latrine among the respondents. On level of latrine in Marakwet east the study findings indicated 26% non-utilization. Based on the multivariable analysis, it was observed that households that had 1 to 3 persons, the level of education attained by the respondent, years passed since the latrine was constructed and the frequency of cleaning the toilet has a significant correlation with the latrine utilization. Cumulatively, Logistic regression model on socio demographic factors explained 41.2% of variation on latrine utilization. Chi square played a role in determining the existing relationship between culture and latrine utilization from the respondents. The Chi square test returned a significant result (X^2=42, df= 1, P= <0.001). The latrines under usage did not meet the structural requirements hence all the element of latrine designs influenced utilization of the latrines. Cumulatively, toilet design explained 93.6% of utilization on toilets by the respondents. The study concluded that latrine utilization is influenced by various variables. The study recommends multi-sectorial approach in designing and implementing community led total sanitation-policy as the most ideal method to reduce OD and improve on latrine utilization. The ministry of health to develop health promotion messages on social behavior change communication to create awareness and help address the cultural misconceptions associated with utilization of latrine. Moreover, the government to engage the community in coming up with a cost-effective latrine design and culture-abiding ways that nurture latrine ownership and sustainability.

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LIST OF ABBREVIATIONS AND ACRONYMS

BVIP Blair Ventilated Improved Pit latrine

CHV Community Health Volunteers

CLTS Community Led Total Sanitation

GOK Government of Kenya

HHs Households

HHH Household Head

JMP Joint Monitoring Programme

KDHS Kenya Demographic Health Survey

KESHP Kenya Environmental Sanitation and Hygiene Policy

KHIS Kenya Health Information System

MDGs Millennium Development Goals

MOH Ministry of Health

ODF Open defecation free

SSA Sub Sahara Africa

UN United Nation

UNDP United Nations Development Programme

UNICEF United Nations Children's Fund

CHAPTER ONE

INTRODUCTION

1.0 Background information

Human access to proper sanitation is considered a human dignity and basic necessity. Ensuring that all human beings have a proper access to sanitation reduces common illnesses, and death that has majorly been affecting the children (WHO/UNICEF, 2022). Worldwide it is estimated that 71% of people lacking access to enhanced sanitation are found in the rural localities, the same demographic areas where 91% of open defecation cases in the world are also recorded. There's a long way to go considering that 3.6 billion in the globe are exposed to unsafe sanitation facilities, with the number entailing 14% still practicing open defecation, and with most of the cases getting recorded from countries that are still developing (WHO/UNICEF, 2021).

The Sub-Saharan Africa countries are the ones mostly left behind in terms of the pace toward rising access to enhanced latrine facilities. Only 30% of the people in sub-Saharan parts of Africa have the chance to enhanced latrine facilities (UN, 2021). The use of latrine stems around the traditions and perceptions of a community. This is supported by different researches which show that different traditions have a corresponding impact to the levels of sanitation in a given community. For example, findings showed that the move to make it mandatory that men had to have a latrine in India so as to get married resulted to a 21% rise of latrine utilization. On the other hand, a study done in Ghana showed that traditions was a core factor that led to an increment in latrine utilization (Stopnitzky, 2017).

The total population of Kenya is approximately 47.5 million people and at least 7.5million people (14%) defecate in the open. The Kenyans who use open pit latrines that don't have a floor cover range from 35.9 to 37.9 and are most common in rural areas (Njuguna et al., 2019). According to Dery et al. (2020), utilizing the sanitation facilities properly goes a long way toward keeping water bodies and the surrounding nature in good sanitation and therefore ensure that the general population remains in good health. In a recent literature review incorporating good sanitation practices goes a long way toward reducing the risk of diarrhoeal morbidity by 25%, with the review pointing out that the results can further reduce by 45% when the sanitation cover is increased by 75%. Further, washing hands using soap was attributed toward lowering the risk of diarrhoea by 30% (Wolf et al., 2018).

In Elgeyo Marakwet County in Kenya, Rift Valley region, 76% of people have access to latrines. Nevertheless, diarrhoeal diseases continue to be a major health problem in the county. Annually for the past three years, more than 46,181 cases were reported on the system which indicates that proper use or success cannot be achieved only by having reliable infrastructure. Around 14,418 cases of diarrhoea occur each year in Marakwet East Sub-County during this period, according to KHIS (2022). The high numbers are of concern and hence the need to uncover the factors that may affect utilization of latrines by determining the influence of socio-demographic and cultural factors and latrine designs associated with utilization of latrine in Marakwet east.

Insights are crucial for designing effective mechanisms to improve public health especially those aimed at reducing open defecation and improving sanitation facilities. The study's comprehensive approach, using quantitative methods, adds to the robustness of its findings. Overall, this research provides valuable data that can help guide policy and community initiatives to enhance sanitation practices and public health outcomes.

1.1 Problem Statement

A large proportion of Kenyan communities use ordinary pit latrines. About 85% of the population who reside in these rural areas use simple latrines however majority does not conform to the international standards to be labeled as an improved facilities for sanitation purposes as stated under the JMP. What is of concern is that only 42% of Kenyans residing in the rural areas use enhanced latrines including those that share the latrine facilities (UNICEF/WHO, 2017). Especially in rural communities across the world the latrine cover is low since factors like culture and tradition may affect their believes hence resulting to a lower use (Ministry of Health, 2020). The way that a toilet has been designed, its condition and structure may impact proper utilization and ultimately result into people resorting to defecate openly (Busienei et al., 2019).

In Kenya most diarrhoeal diseases in children are as result of poor utilization of latrine. According to the WHO (2020), there are 1.5 million deaths of children every year that are caused by diarrhoea and often result from inadequate hygienic practices and inadequate sanitation (WHO 2020). In the past three years, it has been reported that there have been 14,418 cases of diarrhea each year in Marakwet east (KHIS). The number raise alarm and hence the researcher looked out to try and find the factors that may contribute to the rise of diarrheal diseases by assessing the ways the people in the Marakwet East Sub County, Elgeyo Marakwet utilized latrines.

1.2 Justification

Despite the fact that the Millenium Development Goals (MDGs) have tried to enhance global sanitation however it is estimated the number of people still exposed to poor sanitation facilities stand at 2.3 billion, and out of the number, 892 million defecate openly (Saleem et al.,2019). Developing countries have often presented lower cases of open defecation rates, with an exception of the Sub-Saharan region where the number of individuals practicing OD was 204 million people in the year 2015, and rose to 220 million in the year 2020 (Osumanu et al.,2019).

According to the WHO/UNICEF (2021), in Kenya, 47.3% of the people use improper sanitation facilities, while 29% access good sanitation, 26% lack a private sanitation facility, 5 million of the population (14%) practice open defecation and 31% use unimproved toilets (WHO/UNICEF,2021). In a study conducted by Njuguna, & Muruka in 2015, the mean rates of OD across the 47 counties in Kenya was found to be at 23.5% and the median standing at 6.9%. Among the 47 counties, the lowest county percentage was 0.1% and the highest rate of the counties was 88.4%. 15 of the 47 counties had an OD rate of 40% (Njuguna, & Muruka 2017).

Elgeyo Marakwet County lists diarrheal cases as its third most prevalent disease in Marakwet East Sub County. Among the four sub-counties, Marakwet East had the highest number of diarrheal cases, averaging 14,418 for the last three years (KHIS, 2022).

Table 1.1: Diarrhea per Sub County. Source: (KHIS, 2022)

in Appendix 10: Diarrheal cases that prompted an enquiry on utilization of latrine and associated factors in the study region of Marakwet East Sub County of Elgeyo Marakwet County.

1.3 Objectives of the Study

1.3.1 The General Objective

To assess utilization of latrine and associated factors among rural community in Marakwet East Sub-County, Elgeyo Marakwet County, Kenya

1.3.2 Specific Objectives

1. To determine level of utilization on latrine in rural community of Marakwet East Sub-County, Elgeyo Marakwet, Kenya.
2. To determine social demographic factors influencing utilization of latrine among rural community in Marakwet East Sub-County, Elgeyo Marakwet County.
3. To determine cultural factors influencing utilization of latrine among rural community in Marakwet East Sub-County, Elgeyo Marakwet County.
4. To establish latrine designs associated with utilization of latrine among rural community in Marakwet East Sub-County, Elgeyo Marakwet County.

1.4 Research Questions

1. What is the level of utilization on latrine in rural community of Marakwet East Sub-County?
2. What social demographic factors influence utilization of latrine among rural community in Marakwet East Sub County?
3. What cultural factors influence utilization of latrine among rural community in Marakwet East Sub-County, Elgeyo Marakwet County?
4. What latrine designs are associated with utilization of latrine among rural community in Marakwet East sub county, Elgeyo Marakwet County?

1.5 Significance of the study

To satisfy SDG 6.2(Sustainable Development Goals), there is a need to use enhanced sanitation facilities in Kenya. SDG has set a goal for everyone to have good sanitation by the year 2030 (WHO & UNICEF, 2017). Limiting the research to Marakwet East means that the key obstacles to using latrines are found and practical recommendations for improvement are offered that's beneficial to rural families in the area. Not only do these findings teach local residents, but they also give support to better decision-making by the people making policies. In addition, by focusing on latrine use in Elgeyo Marakwet County, this study expands the existing research because no studies had looked at this area before.

1.6 Study Limitation

Cultural beliefs and taboos exit in the rural communities that prevents members from talking about the way faeces is disposed. The respondents are therefore uncomfortable when asked this question by the interviewer. The researcher revealed that all information would be kept confidential and used only for studies. Having limited time and finance, the study zeroed in on one ward to represent the whole sub-county's situation.

HHHs above 18years was purposely chosen as respondents with the assumption that they had knowledge on what was going on in their households. There was a possibility that respondents gave honest responses due to ethical issues since consent was sought prior to participation. In addition, there was the assurance of anonymity in questionnaires and maintenance of confidentiality of the information from respondents.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

The chapter has a review of the existing literature on the independent variables. This section covers Level of latrine, Cultural factors, Social demographic factors and Latrine design. Ultimately, it is followed by planned behaviour theory and the conceptual framework.

2.1 Level of Latrine Utilization

2.1.1 Global Utilization of Latrine

An assessment of public health on latrine use typically associates cultural behaviors, socio-demographic factors and the kind of latrine design that has been implemented. The need for good latrine is particularly high in the underprivileged and rural communities. These regions suffer more than others from not having enough proper sanitation facilities. Hygiene improvements are acknowledged to help public health in such regions, but getting underprivileged group researchers and policymakers to work together has been a challenge. Arriving at decisions regarding sanitation normally entail tradeoffs between the technical, socio-demographic and cultural matters. The effort by the MDGs (Millennium Development Goals) has been significant to improve sanitation across the globe. However, reports show that 2.3 billion are still exposed to sanitation facilities that are poor, and that 892 million still do defecate in the open (Saleem et al.,2019).

Based on WHO/UNICEF (2021) reports, 71% of the global population that use improper sanitation live in rural parts, and it is those area that have recorded 90 % of cases who defecate in the open. Despite the efforts to push for safe sanitation across the globe, a report prepared by UNICEF & WHO (2021), points out that there are 3.6 billion across the globe that still lack proper access to safe sanitation facilities. The report found out that it is 14% of the population that defecate openly

and majority are still in the developing nations (WHO/UNICEF, 2021). The 14% of the population (494 million people) that practice open defecation are from the different geographical areas whereby it is reported that not more than 1% of individuals in Europe defecate in the open, 2% in the Caribbean and Latin America, and 18% of the cases is in Africa (WHO/UNICEF,2021).

Globally, 4.2 billion people (54%) were in 2020 using safe sanitation practices and the number of people with inadequate facilities for sanitation like latrines and private toilets being 1.7 billion. The findings further pinpointed that 2.5 billion (34%) people can access sanitation with privacy and proper connection to sewer that later proceed on to treat the wastewater; 20% which amount to 1.6 billion people in the globe use latrines that dispose the human excreta with safety in situ and 6.1 billion (78%) people used sanitation facilities meeting the requirements (WHO/UNICEF, 2022).

Further, according to a report by UNICEF and WHO (2019), 30% of the global population drink water that is unsafe, while 40% lack crucial facilities for handwashing like water and soap. More than 673 million people in the globe use latrines that are open-pit majorly as a result of lack of finances, misappropriation of designated funds for the purpose, and the lack of equality in the appropriation of the funds (WHO and UNICEF, 2019).

A review that was prepared by Evans and Mara (2018) that is titled Global South Sanitation and Hygiene Target of the MDG 6, the number of people in the globe who will need access to proper sanitation by 2030 stand at 6 billion, and one million people need a shift from ordinary pit latrine facilities to an improved hygienic latrine such as ventilated improved pit latrines (VIP). Some of the measures that may be leveraged to attain the goal include the use of container sanitation facilities especially in the urban slum areas and shared sanitation that has safety management.

Based on the review, the handwashing practices with soap and water often regarded as WASH have recorded significant popularity in Northern Africa, SSA, and the Western Asia.

2.1.2 Regional utilization of latrine

In Haiti 40% of the general population utilize latrines, with the fact that the latrines fail to have the needed slabs make an even further 20% of the population continuing to use open pit latrines. The country records the highest proportion of defecation in the open in the entire LAC region making the population vulnerable to diarrheal diseases that arise from poor sanitation (PAHO-WHO, 2022). A study conducted in Nepal uncovered that the residents there opted not to use latrines that was properly built with concrete but rather converted them to grain storage as it was considered an ideal option when compared to sanitation purposes. The study further pointed out that constructing in unideal places in households were a top cause for its lack of utilization and usage for open defecation. Open defecation exposes the residents of the given locality to an array of diarrhoeal-associated diseases and drag down the rural communities preventing it from attaining the desired sanitation levels (Bhatt et al., 2019).

The latrine coverage, or rather ownership, will not mean that it will be utilized as even houses with such practice open defecation (WHO, Garn et al.,2017). However, there is little information yet on the houses which had not completed building their sanitation facilities in the course of CLTS. One of the presumed reasons that resulted to unclear results concerning latrine cover since there is slow increase in latrine cover and when implemented, there is less effort to minimize contact with the human excreta. An example, in an assessment done on a squatter areas in Mumbai with 71-99% latrine cover showed that they were most often in a bad state resulting to people often preferring open defecation (Biswas et al., 2020).

It is estimated that there are 1.5 billion people in the globe who lack even the most basic sanitation facilities (WHO, 2023). 2 billion of the worldwide population lack accessibility to the ideal sanitation standards whereby 21% (673 million) of them reside in SSA. Despite the world average of 13% in 2015 in regard to people who practiced open defecation on average the SSA still had a higher standing at 23% (UNICEF & WHO, 2017). Within the number, there are 570 million people that share improved sanitation facilities, 545 million use unimproved facilities, while 419 million practice OD. While the SSA is presently experiencing significant urbanization, there is no proper way to measure access to sanitation on such environments and hence there is the need to further develop metrics that could be used to measure the access to sanitation on such settings (Buckley & Kallergis, 2019).

2.1.3 Africa utilization of latrine

In a 2017 report by JMP it was established that as of the year 2015, 22.9% of Sub-Saharan Africans lacked basic sanitation and hence exposed to the dangers of practicing open defecation. A different report still conducted by JMP in 2000 found 31.9% of people in the region defecated in the open rather than into a latrine. The data thus point that only 9% of people had opted out of open defecation practices in those 15 years, and with data still suggesting that around 10% are based on the rural areas (WHO/UNICEF, 2017).

The SSA recorded significant differences in the sanitary facilities used, as well as the sources that individuals used for drinking water. For example, all the countries in the year 2017 found that the metropolitan areas had significantly higher records of latrine coverage when compared to the rural areas. A case example is in Rwanda where its population both in the urban and rural areas recorded an 80% access to enhanced sanitation facilities. On the other hand, countries like Malawi had 58% and DRC had 62% of its rural population using sanitation facilities which are not improved.

There's a big contrast between the rural and urban areas since while 85% used enhanced sanitation facilities in the urban setting, the rural areas recorded 76% of the people did open defecation. The highest rates for open defecation cases were observed in Nigeria and Ghana where 31% was recorded in the rural environments as compared to the 7-9% that is on the urban settings (WHO&UNICEF, 2017).

Developing countries have often presented lower cases of open defecation rates, with an exception of the Sub-Saharan region where the number of individuals practicing OD was 204 million people in the year 2015, and rose to 220 million in the year 2020 (Osumanu et al.,2019). Adopting and actively using sanitation facilities that are enhanced to ensure that humans have no contact with human excreta is crucial to ensure that there is a universal access to sanitation (WHO, UNICEF, 2021). In developing nations, specifically Kenya, UNICEF & WHO (2021) found out that 9% of the people continue to do open defecation, and the rate of people that can access good sanitation separating humans from contact with human excreta stands at 33 %. (WHO/ UNICEF, 2021).

According to WHO & UNICEF Joint Monitoring Program (2015) that aims to assess sanitation and water reported that the prevalence of OD in Kenya stands at 12%. The recorded number show the rate to compare well to neighboring Ethiopia whose rate stands at 29%. On the other hand, countries in the region have comparably lower levels of OD prevalence such as Rwanda (2%) and Uganda (7%). Further, the density of population in a given region is stated to influence open defecation most likely due to the issue of privacy often associated with the areas that have a high population reducing the likelihood of OD.

2.1.4 Kenya utilization of latrine

Population density as well has correlation with urbanization. In Kenya, for example, out of the 38 million in the country, 12 million of the population live in urban parts. A study conducted by

Njuguna, & Muruka in 2015 found that the mean rates of OD across the 47 counties in Kenya was found to be at 23.5% and the median standing at 6.9%. Among the 47 counties, the lowest county percentage was 0.1% and the highest rate of the counties was 88.4%. 15 of the 47 counties had an OD rate of 40% (Njuguna, & Muruka 2017). Studies have pointed out to CLTS as the ideal method that can be used to reduce the levels of OD though the initial goal of having the rates of sanitation at 75% is yet to be met, with additional issues of ensuring that there are long-term sustain abilities to have latrines (Mosler, 2018).

According to WHO & UNICEF (2021), 47.3% of the Kenyan people lack adequate latrine facilities, 29% access improved latrines, 26% do share the latrine facilities, 31% of the populations use latrines that does not meet the proper standards, and 5 million (14%) still practice OD (WHO & UNICEF, 2021). The total population of Kenya is approximately 47.5 million people and at least 7.5million people (14%) defecate in the open. The Kenyans who use open pit latrines that don't have a floor cover range from 35.9 to 37.9 and are most common in rural areas (Njuguna et al., 2019).

While 85% of the households in rural Kenya have been using simple pit latrines, the standards under which they are constructed fail to meet the target standards by the Joint Monitoring Program done by UNICEF & WHO that was set as the needed standards for developing a sanitation facility. What is of concern is that only 42% of Kenyans residing in the rural areas use enhanced latrines including those that share the latrine facilities. Therefore, there's need to accelerate the improvement of sanitation facilities in Kenya to satisfy the target set at 6.2 in the Sustainable Development Goals (SDGs) that aims to ensure that all people across the world have equal access to improved sanitation and hence ultimately meet the 2030 target (WHO & UNICEF, 2017).

According to Anna et al. (2020), the study conducted in Western Kenya identified the reasons for low latrine utilization as the lack of it, poverty and social acceptability of open defecation provided it's unobserved. On the other hand, the study pointed that the barriers to the disposal of child feces in Western Kenya is the belief that they were not harmful, the type of disposal practices, the lack of latrines and not having the knowledge concerning where the children had defecated. The levels of adequate sanitation in Turkana is 23% and Samburu is at 26% which are still on the lowest, with 70% of households in the region practicing open defecation. However, just like all parts of the country, the two counties has had significant gains between the year 2009 and 2019 with Turkana dropping the levels of open defecation by 14% and Samburu making a notable stride of a drop by 8%. Kitui County had 68% of households having latrines in the year 2019, and generally, the whole country had a latrine coverage of 74% accessibility to improved sanitation (Kenya National Bureau of Statistics, 2019). Despite national reports showing Kitui county to be certified by ODF, which is a definition for households in Kenya that are safe from open defecation sites, the 2019 census conducted nationwide pinpointed the county to be having 10% of the households under the exposure of defecating in the open

2.1.4 Elgeyo Marakwet utilization of latrine

In Kenya, it is recorded that there are 6250 disability adjusted life years (DALY) that stem from factors that are associated with age for every 100,000 from drinking unsafe water, lack of washing hands and sanitations. Diseases that are associated with diarrhoea caused an average of 244.2 years lost to disability (YLD) and a year of life lost (YLL) at 5689.9 years for every 100,000 (Achoki, 2018). Incorporating good sanitation measures through containment of human faeces in toilets with flush features that is connected to a latrine or sewer plays a core role toward reducing the reported cases of diarrhoea. Measures that are incorporated to enhance sanitation reduces the risk

of diarrhoeal morbidity by 25% with the figure having the potentiality of increasing to 45% when the latrines are increased to 75% (Wolf et al., 2018).

Having few latrines in the country leads to serious risks for both health and the environment. Peoples' health and the environment is badly harmed when food and water are contaminated due to poor sanitation and uncontained defecation (Njoroge et al., 2020). Besides these main results, Kariuki et al. (2019) stated that barriers such as poverty, poor infrastructure and government performance, strong cultural values that oppose using toilets and low involvement from communities are important contributors to the nationwide low sanitation coverage. Studies have found that limited resources and access to money pose serious problems in extending latrine availability across the country (Nyakoe et al., 2018).

Elgeyo Marakwet County has latrine coverage of 76%. Yet, the county has seen about 46,181 cases of diarrhea each year for the past three years. Diarrhea is one of the three most common diseases in Marakwet East sub-county (KHIS, 2022). Without the right steps to stop them, diarrhea and parasitic infections along with their consequences like slow growth are expected to affect communities in the area (WHO, 2018).

2.2 Social demographic factors influencing utilization of latrine

Many countries in SSA region struggle with high rates of open defecation. In a study done in Ghana by Osumanu (2019), things like the size of a household, educational level, income, employment and the traditional norms of a given society and latrine facility had a positive impact in determining whether there shall be cases of open defecation experienced or not. The size of a household can also affect the utilization of latrines as it was found that the larger families have high chances of using latrines frequently necessitating maintenance and proper use (Ndambuki et al., 2019).

The socio-economic status in a given household can affect or impact on latrine utilization. Onyango et al.(2018) found that houses that record bigger incomes and have attained higher educational level may as well have more potentiality to maintain and as well utilize latrines, a situation that is different in the low-income and education households. Some of the factors that affected latrine utilization include the educational level of the household heads, the amount of income generated by a family, behavioral factors like culture and the geographical factors since there were some areas that showed higher utilization than others (Leshargei et al., 2018). Therefore, having a pit latrine did not translate to latrine utilization. Dagnew (2019) noted that there is a correlation between the latrine utilization in a certain household and the amount of income that they generate more specifically, the research findings realized that higher income translated to higher latrine use and vice-versa.

OD cases are prevalent in poor communities and often end up resulting in diseases since people who are poor have a less likelihood of having the resources to spend on sanitation. More so, poor people are found in parts with bad infrastructure such as blockages, air pollution, bad water connectivity, overcrowding and bad drainage. This makes them to be in a position where they are susceptible to diseases that stem from poor sanitation that result to high expenditure on treatments and poor sanitation levels. Overall, there are 19.1 million people (38.6%) in Kenya living below the poverty levels (The Kenya National Treasury, 2021).

The female gender has got high chances of latrine utilization especially when different from those frequented by men and boys, when close to the same household. The roles of given genders as well as the way decisions are made in a given society also impact the construction of latrine and its usage. It is the women that have been identified to be spearheading the constructions of latrines, and in the nomadic communities such as the Samburu and Turkana, they are tasked with the

responsibility of constructing the facility. On the other hand, the male gender are the decision makers who determine whether a proposed latrine construction will proceed or not, and often found to see no need for latrine construction. This is because the male often fends for the cows which entail movement away from the household, from where they practice open defecation and hence don't see the necessity of constructing a latrine near the household. Hence, there's a clear need for education to sensitize the male and educate them to reduce the trend. Other factors that may contribute also include household endeavors that often see women travel over long distances to fetch water hence leaving less time for them to focus on constructing latrines (Kariuki et al., 2019).

Household occupation as well ultimately have an impact on latrine utilization (Mbae et al, 2021). Formal sector professionals have got higher chances of owning latrines as opposed to those working under the informal sectors. Further, places with the wealthy members of the society experience less defecation as opposed to poorest population. Therefore, there are signs that poverty contributes to defecating in the open (Busienei et al., 2019). Studies show that people in the urban settings are more likely to insist on the presence of latrines as opposed to those who are found and live in the rural parts (Njoroge et al, 2020).

Gam et al (2017) states that several factors like better maintenance, privacy, accessibility, the level of cleanliness, type of facility, time the facility was built and better access to hygiene resulted to a high level of latrine utilization, while on the other hand poor sanitation based on those factors resulted to lower latrine utilization. Furthermore, young children may fail to utilize pit latrines due to the heat, odor and concern of accidents that can make them fall into the pit (Tamene & Afework, 2021). The discrepancy could probably be as a result of the caution by households with children resulting to a higher vulnerability to diseases like diarrhea (Godana & Mengistie, 2017).

2.3 Cultural factors influencing utilization of latrine

From the perspective of culture, sanitation entail the customary beliefs regarding how people are required to dispose waste, act in the social setting, and the trait of materials specific to a race, social group or religious belief. Ideally, it implies to the particular traits of daily endeavors like the way of life or diversions given community or village share. Cultural factors are the practices, values, and common attitudes toward sanitation, and practices that can be used to uniquely identify a generation, community or a society (Dwipayanti et al., 2019).

According to (Eliud et al., 2022) cultural factors and the lack of capacity to incorporate effective sanitation systems have increased the cases of sanitation systems that does not meet the required standards and hence continually failing to have the capacity needed for tackling the challenges in rural settings which continue to overlap and interact. The belief that given societies hold in regard to impurities and pollution and whether they need rituals to cleanse or purify post-defection play a role in determining whether they shall defecate openly or not. Generally, the human excreta are often regarded to be impure ritually and as filthy physically (Bonu et al., 2017).

Vyas and Spears (2018), on their bid to explore how religion and sanitation relate, it's stated that rituals exist in the South Asia and that was done by Hindus who perceived the development of latrines close to households as a cause for pollution. This made the members of the households to be more susceptible towards opting to defecate in bushes. A different examination of the correlation between culture and the levels of sanitation in Indonesia, it was pinpointed that latrines may be regarded as contaminants when they are constructed in certain areas in households that are designated as home for certain spirits, and contaminating such sites with latrines can cause misfortunes. Similarly, the study pointed out that the traditional healers considered the diseases resulting from diarrhoea were caused by supernatural beings, rather than the rightful cause of

exposure to human excreta. Hence, when people believe in wrong information, it can cause the ignoring of their individual responsibilities regarding sanitation. This way, considering the significant role of religious leaders in the rural communities can be embraced on the bid to improve the adoption of latrines (Dwipayanti et al., 2019)

The availability of latrines and its utilization is associated with misconceptions and traditions. This is supported by different researches that show different traditions have a corresponding impact to the levels of sanitation of a community. For example, it was made mandatory for men in India to own latrines so as to marry. The necessity for the male to have a latrine before getting a hand in marriage ended up increasing latrine utilization in the general population led to a 21% increment in latrine utilization. Additionally, the traditions in communities in Ghana led to an increment in latrine utilization (Stopnitzky, 2017). The male gender was identified as the key decision makers when it comes to toilet construction in India, with 80% rate (Routray et al., 2017). The study findings highlighted limited role that women play when it came to making decisions concerning household sanitation because of the hierarchies and power dynamics. This factor often ended up leading to the construction of insecure facilities due to the failure to involve women.

Cultural factors play significant and determining roles in latrine utilization especially when it comes to the rural communities. For example, in Cambodia, a study found that people preferred high-quality flush latrines over the dry pit latrines and which was often stigmatized ending up impacting the latrine construction and its overtime utilization (Tribbe et al., 2021). It was found that households would rather withhold constructing a latrine and instead wait untill they have enough resources to construct a toilet that meets their standards which in the end ended up impacting latrine utilization. On the other hand, communities use locally available materials to construct latrines and received communal support from people such as their neighbors. It has been

found that involving the traditional leaders when it comes to country's enforcement of the by-laws and the involvement of women in construction has enhanced latrine utilization (Tribe et al., 2021).

In Lodwar, Kenya, researchers found that lack of money is the biggest reason for not adopting latrines, but culture also plays a big role. As a result, they suggest putting special attention on cultural elements when coming up with solutions to eradicate latrine utilization (Busienei et al., 2019). Yet, the research was focused on the effect of culture on providing latrines, but less on how culture may change actual latrine use.

Mugo (2020) mentions that beliefs and rituals related to defecation in rural Kenya influence both the way latrines are built and used. A case is with communities that consider it's inappropriate to defecate near housing or water sources, so they keep doing it out in the open. Besides this, particular cultures have specific guidelines about sanitation sharing. A research team led by Kanda et al. in rural Zimbabwe reported that living with in-laws stops some households from sharing latrines. The study found out that sanitation facilities made to cater for the whole extended family was not suitable especially when they are all staying together. A study done in Western Kenya showed that the perception of it being unclean to defecate in closed spaces ultimately resulted to low latrine utilization (Mwaura, 2017). As well, the limited access to latrines in the rural areas was significant considering it is not all households that could be able to build or buy latrines (Ndiritu et al, 2018). The need for a safe and convenient place topped the preferred options in sanitation facilities for women as they want space that is safe from male. Hence, women would walk even for longer distances to the fields provided that they get privacy away from habitation where they can be seen utilizing the sanitation facilities (Routray et al., 2017).

In Tigania West Sub-County, sanitation facilities were often built by the male who did not allow the extended family and young children to utilize them. Hence, the fecal disposal of children was

thrown into the environment as an alternative strategy (Kendi et al., 2022). The beliefs that a community held regarding sanitation and hygiene was considered to be taboo, and failing to follow the norm and belief was feared to cause a curse. Bhatt et al. (2019) uncovered that some households may end up practicing OD despite having improved sanitation facilities because of their customs and beliefs. It can as well occur occasionally such as when in-laws visit a household and the culture of a community prohibits sharing of latrines with the in-laws. The study showed a case where the household heads opt for OD during in-law visitation.

According to a study by SNV (2020), there are some communities who belief it is inappropriate for one to defecate within a house with some people seeing latrine structures with such an impression. And while a household can opt to build a latrine, not all the members are allowed to utilize it (SNV, 2020). This is because they believe you will be breaking a taboo when you share a latrine with the in-laws such as the man's mother-in-law. Hence, generally, the male might opt not to share latrines with the female gender. As to quote a female FGD participant in the Samburu County, "It's a shame for the male to use the same toilets with female since there are sensitive things involved. An example is like them seeing a sanitary pad that can fall on the slab". Another case is with that of the morans that limit their potential of utilizing latrines. Considering that morans move livestock often, there is a set taboo within the community that prevent any member of the community, especially the female, from talking about the eating and defecation habits of the morans that end impacting the efforts to sensitize the community against open defecation. This also led to other members of the society opting to defecate far from the community on the bid to prevent getting contact with the moran. Also, as to quote a Female FGD participant in Samburu County, "it is considered abnormal for a moran to defecate and hence it's shameful if a woman encounters them coming out of a latrine".

Latrine utilization is often impacted by social-cultural factors. Socialization, sanitation practices, daily habits, and daily practices often impact the construction and use of latrines (Routray et al., 2017). From the study, it is recommended that in order to improve the sanitation levels of the communities then focus needs to be on the behavior. In a study by Nunbogu et al. (2019), special habits is a core determinant of a household's decision to complete constructing latrines. There is therefore the need to continue with social marketing and sensitization efforts.

2.4 Latrine designs associated with utilization of latrine

Kenya Environmental Sanitation and Hygiene Policy champion the use of slabs in latrine stating it's the most ideal way toward upgrading the pit latrines that are rather traditional. Provided that the latrine slabs enable a safe squat, easy to clean, and smooth hole, they meet the Government of Kenya's or the WHO/UNICEF JMP set standards of a sanitation facility that is improved (KESHP, 2016-2030). In a finding report by Coombes (2017), while there may be latrine slabs in Kenya, rural households have difficulties accessing them because of lack of the readymade products. This is because the target market of ceramic pans is within the urban areas for flush toilets, it is difficult to find concrete that are precast especially due to expensive transport, and the present latrine slabs are majorly aimed to provide aid-related endeavors or emergency relief to the donor community. The available options like mud and other materials that is common in the rural areas can construct structures that are less dependable, highly unsafe, and also hard to clean (Dagnew G., 2019).

According to O'Reilly (2017) that aimed toward assessing the behaviors of latrine utilization and OD in India, findings pointed out that making latrines with good floors as well as superstructure led to high latrine utilization. Further, the way a latrine is designed, its structure and conditions has a significant impact in its use. Factors that discouraged latrine use include the lack of a proper roof, bad odor and general incomplete latrines (Abramovsky, 2019). Olive (2019) found that

latrines should be constructed with a door, roof, wall and floor as part of the standards that are needed for well-functioning pit latrine. Findings reported in the coastal Odisha of India and specifically in the rural areas, financial challenges were cited as a major theme through all qualitative study and top reasons why individuals did not use a sanitation facility, used the ones that were not finished yet, or did not invest their resources to make a sanitation facility to meet the needed standards. Truly, a sanitation facility that is incomplete ends up exposing members of the society to either direct or indirect contact with the human excreta, which are likely to have pathogens that can cause diseases such as diarrhoea (Routray, 2017).

The way that a toilet has been designed, its condition and structure may impact proper utilization and ultimately result into open defecation. The effects of toilet design on utilization in Turkana Kenya, found that while there may be limited number of latrines in the area, those constructed with lower standards such as less cover experienced lesser utilization when compared to those that are constructed with higher standards. 20% of people living in Turkana had the fear that latrine could collapse while they're using it considering the poor quality and loose soil in the area (Busienei et al., 2019). The source of low latrine utilization could be a child frightened by the squat hole resulting to a circle of misuse with no one taking the responsibility (Jain et al., 2020). Latrines developed and being utilized in the Eastern parts of rural Nepal in the year 2017 showed that people in the area preferred to use flush latrines as compared to the pit latrines (Budhathoki et al., 2017)

Different households have different choices for latrines with the low-income ones opting for basic necessities leaving toilet construction as a non-priority (Kanda, 2022). In such areas, you find that the households opt to invest first in homes with latrine construction getting considered later. The BVIP latrine expense has made it exorbitant to the poor households. The incomplete BVIP had

concrete slabs making it harder to control odour and housefly as would have been the case with a conventional BVIP latrine. This made the households to end up sharing latrines with the neighbors, practice open defecation, or opt for the construction of alternative sanitations. The fact that households are willing to take loans to construct enhanced latrines, clearly point to the demand for sanitation and present opportunity of achieving the desired universally equitable access when it gets to 2030. From the qualitative study, there is the need of improving the providence of sanitation to communities in the rural areas through finding alternative options and different financial mechanisms in investments.

Constructing a good sanitation facility has the prerequisites of good space and soil. And while the presence of space for purpose of constructing toilets affects its adoption, the land will be ideal only when the kind of soil can assist in the construction of toilet. Limited space and soil without the capacity of allowing constructing stable toilets has been found in some regions. According to Degaga and Geleta (2022), the shortage of space for latrine construction was identified as a major cause for open defecation in the bush.

Orner (2018), found that in the Northern parts of Nigeria to determine latrine design construction in relation to their contamination to the groundwater, it was found that latrines solely aimed to collect human excreta as opposed to limiting the levels of pathogen concentration. The typical pit latrine consists of a hole to get the human waste. Further, slabs or floor cover, either concrete or bricks on the site of a sanitation facility. Further, the study showed that the construction of latrines my entail a variety of materials that a user prefers depending on the financial capability and the location. The hole on the ground to hold the human excreta is preferable at 1m wide and 3m high, and is covered with slabs and connected to a dropping hole of 0.25m (Nouban et al., 2020). Key determinant factors of how a pit latrine shall be built is determined by the financial capability and

preference of the owner. The practice of cat method that involve burying the fecal matter in short holes to curb OD has existed for long as it's simple not requiring any technical constructions with the practice still prevalent in the Northern parts of Nigeria. The idea of pit latrines was fronted by developed nations in the early 20th century to control disease outbreaks and infections that resulted from contamination with the human excreta (Thomas & Gold, 2021).

A pit latrine should be constructed in a place that limits any form of contact with the water beneath especially for those using for daily consumptions. Experts recommend that there should be a distance of 2 meters at least set between the bottom of the latrine pit and where the groundwater level is at. The said distance should depend on a site and determined by hydrogeological situations of a site. And if the site does not have a stable soil, it is necessary to line the pit with concrete, timber, bricks or mortar. While using water for cleaning the anus increase the moisture contents in pit latrines, using dry cleaning increases the concentration rates of solid annually to 90 liters per individual (Orner,2018). Recent studies have shown that the volume of accumulated waste with each individual from 40 to 60 liters in a year, and will vary from the practices of household management such as the way cleaning has been employed (Jouhara et al., 2022). Thus, a volume of the range ≥ 1,000 L offers sufficient time for the pit latrine to fill (Orner, 2018).

Constructing pit latrines to meet the required standards prevents the chances of the users coming in contact with pathogens in the process of sanitation. Other areas that are different from the pit and have an effect on the pathogen transmission are the slabs, roof and where the hand touches. Hence, it's a good idea to opt for a slab that cleans easily as opposed to a dirty one to limit the pathogen transmission. A softer slab made from concrete that slopes slightly to the hole makes it easier to clean and greatly reduces chances of diseases transmitting from the faecal-oral route. The slabs should be strong enough to withstand stormy weather. In places like the urban areas where

the pits are the same places, they should be lined and constructed to provide an avenue for cleaning. When constructing pits in new places, the slabs should be constructed to allow it to be lifted or moved when they fill. Further, the strength of concrete should be sufficient enough and hence calling for an appropriate mix. It is advisable not to construct pit latrines in places with lower groundwater like coastal areas or the flood prone places as the contents can overflow, mix with the groundwater or offer an avenue for insects breeding (Orner, 2018).

In Kenya, the poverty-stricken households lead in open defecation and they are the once more likely to get back to it (Odagiri et al., 2017). This is because they construct latrines of poor quality that fill faster or get destroyed when they are exposed to extreme weather like floods or heavy rains considering that according to the KNBS (2018), the Kenyan population that are very poor is 8.6%. Other places are extremely rocky making it harder to excavate pits as Thitu & Augustine (2017) stated considering there is shortage of artisans and skilled labor who have the experience and tools to circumnavigate such barriers.

Constructing pit latrines on top of loose soils makes them vulnerable to collapse during rainy seasons or flooding (Karanja et al., 2018). The present latrines in the region lack the capacity to withstand extreme weather. The latrines especially those constructed using poor materials often last shortly, at times just for a few months because of the loose soil, termites as the cases with those made of wood, or heavy winds or rains. In some cases, especially those residing in nomadic areas, partial damage may result to the communities failing to use latrines at all as there are concerns with privacy or collapse. The fact that the buildings collapse frequently can be disheartening especially with the costs entailed.

2.5 Theoretical Framework

The study on the utilization of latrines and associated factors in Marakwet east Sub County was actualized using a model known as the theory of planned behavior which was developed to comprehend the way humans make decisions. Over the past decade, the model has underwent refinement incorporating new empirical insight and applications in behavioral research. Studies continue to validate its relevance, pinpointing new strides in its methodological approaches highlighting behavioral intentions and the actual practices (Hagger & Hamilton, 2025). The theory continues to be refined and now accommodates the perceived behavioural control as a main determining factor for action from the earlier Theory of Reasoned Action (Bosnjak et al, 2020). The added findings offer a clear outlook toward the factors affecting latrine utilization reinforcing the essence of intention, social norms and the perceived control when it comes to public health interventions.

The theory of planned behaviour (TPB) thus pointed out that proximal determinants for a given behaviour involve having the intent of doing it and how one perceives their capacity to control it. Intent is what motivates a person such that they decide to make an effort or make a conscious plan to do a given behavior. On the other hand, the act of an individual to expect that behaviors are within their control is called termed as perceived behavioral control. TPB intent was towards finding an explanation to the behaviors over which individuals have got self-control. The core element found on the model is the intent of behavior since it's the attitudes toward a certain behaviour that in the end have a chance to produce a given output and also subjective evaluation of the risks to be encountered and potential benefits of the outcomes. After coming to limelight, TPB has been integral in predicting and interpreting an array of intentions and behaviors in the

health sector like substance use, smoking, breastfeeding, latrine utilization, drinking, and the use of health facilities.

Based on the theory of planned behavior, the behavior of an individual is determined by the attitude towards behaviors they practice, the norms they have been subjected to and the perceived behavioral control (Hagger & Hamilton, 2025). TPB theory presents a number of factors that impact whether an individual will proceed on with a given behavior or not. According to theory, there are three deferent beliefs that is the normative, behavioral and control and hence able to create a link between the behaviors and beliefs of a person. The behavior of an individual undergoes three considerations; the normative, behavioral and control beliefs. In their correlating roles, behavioral roles determine whether the attitude to a behavior shall be positive or not, the normative beliefs are the norms a person has been subjected on, while the control is the perception as to whether one can control their behaviors. Specifically when it comes to latrine utilization then TPB would point out that people will have higher chances of utilizing latrines when they embrace a positive perception towards the latrine utilization, embrace the social norms that aim toward using latrines and consider that they can manage to control and get the resources to utilize the latrines.

Theory of planed behavior (TPB) proposes that behavioral attitude stems from the beliefs of an individual concerning behavior and its accompanying outcome. In the case at hand concerning latrine utilization, a person that beliefs latrine should be clean and it is healthy to be using it will have good attitude towards them. Subjective norm implies to what a person does since it is known to be accepted socially or considered an appropriated or likely behavior. TPB finds it more likely for person to do a given behavior when people close to them accept it. Individuals would therefore prefer to use latrines when their family, friends and community members from where they belong

support latrine use. Based on the theory, people have a high likelihood of doing a given behavior when they feel that they possess both the control and resources that are needed. Individuals may use latrines even highly when they feel that they have accessibility and the required resources for the maintenance

The behavioral attitude, norms that have been normalized over time, and the perceptions on the capacities to control behaviors result in creation of a behavioral intention. Specifically, the perceived behavioral control has a direct effect to a given actual behavior as well as indirect impact through having the intention of doing a behavior. When a person has a favorable attitude toward a certain behavior, the said attitude complements with norms, and the person considers themselves to have a high control over their behaviors, then intent to do the said behavior is highly anticipated (i.e. utilization of latrine). Finally, considering that the person has a strong control over their behavior, it is anticipated that the person will proceed on with their intention so long as opportunity of doing so is available. Hence, the theory of planned behavior shall be a crucial anchor in this study since its variables like the perceived behavioral control, intentions, attitudes and the subjective norms will be integral in determining the socio demographic, cultural and latrine design factors that affect latrine utilization.

Therefore, the TPB elements will be used as a guide to help assess the influence that independent variables have on latrine utilization. The TPB suggests that to increase utilization of latrine, interventions should aim to improve attitudes towards latrine use, increase perceptions of social norms that support latrine use and increase perceived behavioral control through increasing access to latrines and providing the necessary resources for maintenance. The Theory of Planned Behaviour (TPB) therefore provides the foundation for this study to explore how cultural and socio demographic factors and latrine design influence latrine utilization. The TPB framework will be

employed to examine the role of attitudes, norm beliefs, and perceived control over behavior in latrine use across various population groups. In the field, the model suggests interventions should focus on creating positive attitudes towards latrine usage, facilitating enabling community norms, and removing structural barriers such as inaccessibility or lack of maintenance to develop sustained and widespread usage

Here is a table of people that have used TPB as well as the example applications (Table 2.1)

Table 2.1: **Application illustrating health behaviors**

Area of research	**Person**	**Example of how it's applied**
Smoking rate	Godin et al. (1992)	Smoking prevalence in a pop
Drinking alcohol	Johnston and White (2003)	High alcohol intake
Drug abuse	McMillan and Conner (2003)	Amphetamine usage
Using condoms	Agnew (1998) In adults	In adults
Physical exercise	Sparks et al. (2004)	Health clubs' attendance
Balanced Diet	Armitage and Conner (1999)	Consuming healthy food
Attending screenings	Norman and Conner (1993)	Cervical screening
Self-examining breasts or testes	Steadman et al. (2002)	Self-examining breasts
Following prescriptions	Abraham et al. (1999)	Anti-malarial prescriptions

2.6 The Conceptual Framework

Variables

Independent variables Dependent variables

Latrine use and its associated factors

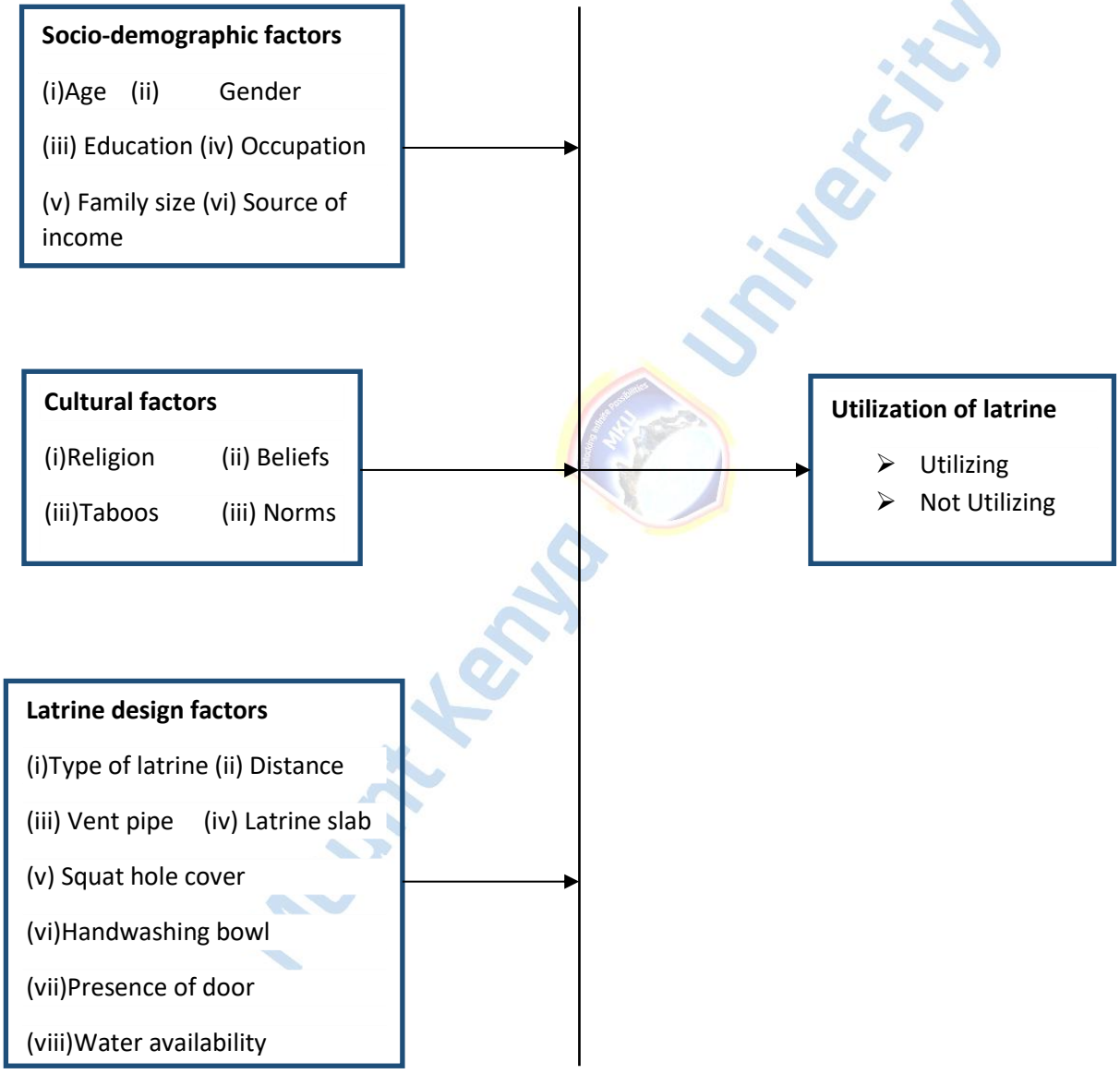


Figure 2.1: The figure points out the conceptual framework that have been modified and adopted for the study from different literature.

To get a clear picture of the independent and dependent variables the conceptual framework was used. For this study, independent variables consist of socio demographic, cultural and latrine design factors. Utilization of latrine is the type of dependent variable studied. In the conceptual framework, the independent variables are believed to shape whether or not people in the Marakwet east Sub County use latrines. We measure socio demographic factors using age, gender, education, occupation, family size and source of income, while Cultural factors involve Religion, Beliefs, Taboo and Norms. The latrine design involve the type, position, vent, slab, covers, water source, handwashing bowl, door and water.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This part highlights methods that made the study successful. It involves covering the research design, target population, study area procedures used in sampling, determining the sample size, constructing research instruments, sampling methods, pilot testing methods, data collection methods, analyzing data and the ethical concerns.

3.1 The Research Design

In the study area of Marakwet East Sub County, a cross-sectional descriptive study design was used with a quantitative data collection method using a structured questionnaire prepared to determine latrine utilization in the rural community. It is useful to use quantitative methods to collect and assess data from the TPB model (Ajzen, 2004). The TPB model links our beliefs to behavior hence the influence of the independent variables on latrine utilization was examined using the TPB elements as a guide.

3.2 Study Location.

Elgeyo-Marakwet County is located in the former Rift Valley province. Its geographical position includes a Northern border with Trans-Nzoia County, Baringo County as well borders with the county to the South, its Western border is with Uasin Gishu County and borders West Pokot County to the North. The county consists of four sub counties, which is Marakwet West and East, and Keiyo North and South.

Generally, there are 103,186 households and a population of 503,019 in the county hence translating to 4.5 people in each household and a population density of 150 people in every km

square. For purposes of this research, the main focus was in Marakwet east sub-county that spans more than 853.2km^2 and 114 km^2 density person. It is characterized by steep escarpments and flat plateaus spanning from an altitude of 1200m to 3350m above the sea level. The annual rainfall range in the area is 800mm to 2300mm, and records an average temperature of 27°C. The Elgeyo Marakwet County is divided into 20 wards, with the study area of Marakwet East sub-county consisting of only four wards.

Residents of the county do mixed farming entailing both subsistence and livestock farming. Some economic activities being conducted in the county include mining of fluorspar in the Kerio Valley, tourism at Kapnarok game reserve and at kolol campsites. On socio economic status, while 38.6% of Kenyans live below the poverty line, 57% of the county residents fall under the poverty range with the level of poverty along the escarpment standing at 67%. On education, the county has got five hundred and fifty-four (554) ECD centers, one (1) teacher training college, four (4) vocational colleges and one (1) technical training college. Also, it has one hundred and twelve (112) secondary schools and four hundred and eighteen (418) primary schools.

In the whole county of Elgeyo Marakwet, the latrine cover is 76%, whilst in Marakwet is at 71%. This shows that open defecation rate in Marakwet east is at 29% hence sanitation is still a big challenge. One of the top ten diseases in Elgeyo Marakwet County is diarrhoea from poor sanitation and it ranks third in Marakwet East Sub County. During the past three years, the county has reported 46,181 cases of diarrheal illness each year. The average number of diarrhoeal cases each year in Marakwet East for the past three years exceeds that of the other sub counties which is 14,418 (around 31%). The reason Marakwet East was chosen by using purposive sampling.

3.3 Study Variables

3.3.1 Dependent variable

Utilization of Latrine is defined by this study as a behavior of using available latrines from time to time to safely dispose human excreta by all household members

3.3.2 Independent variables

Cultural factors include Religion, Beliefs, Taboos and Norms

Socio demographic includes the level of education, sex, age, household size, marital status and the rate of income.

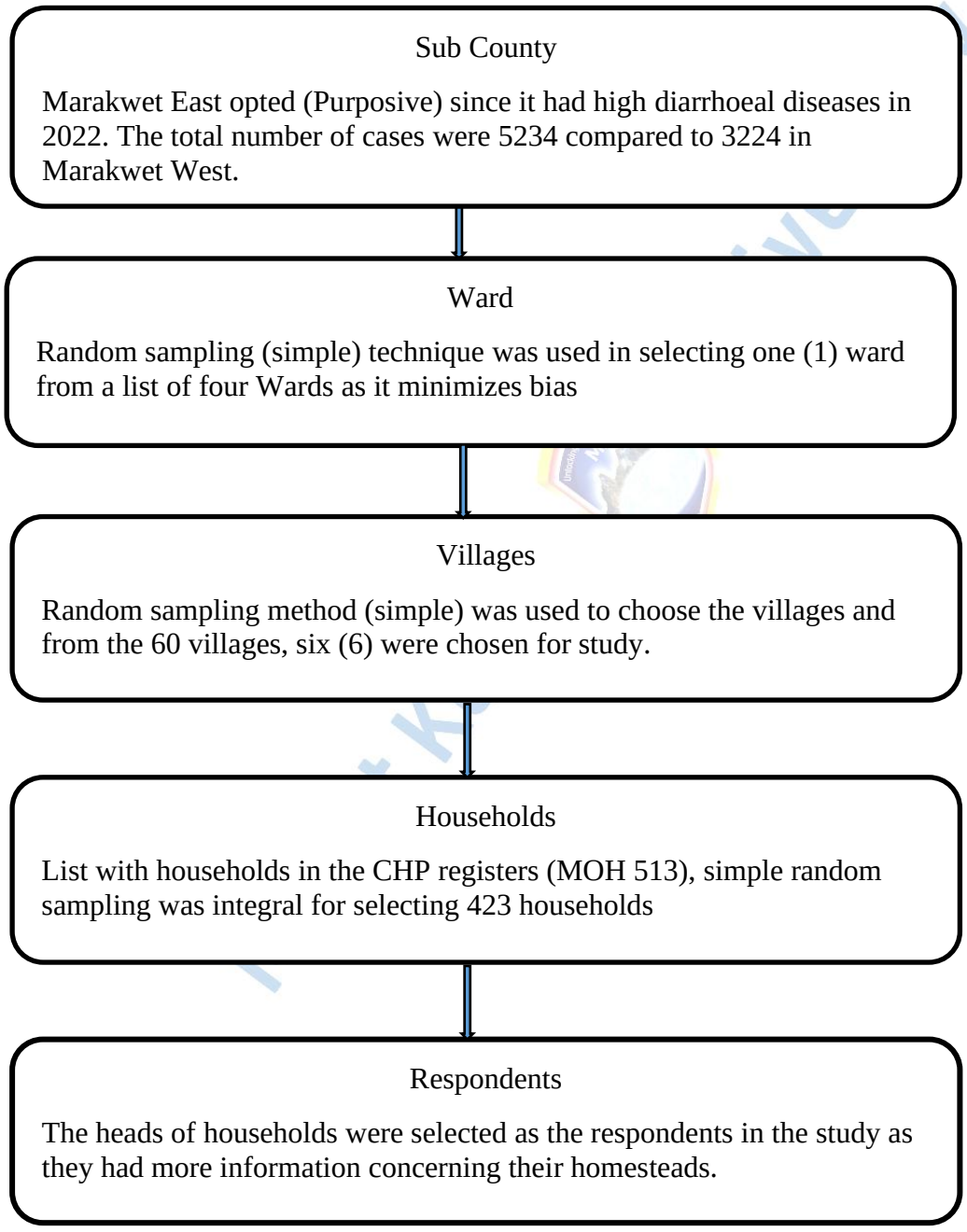
Structural factors consist of the location of the latrine and distance, the latrine type such as the squatting hole, latrine superstructure with a door, roof, walls and a facility to wash hand.

3.4 Target Population

According to the 2019 Kenyan National Bureau of Statistics report, Marakwet East Sub- County had about 97,041 people, spread across roughly 21,362 households. In the study, households were chosen as the unit of data collection and either the head of household or an adult aged 18 or more gave the responses.

3.5 Sampling Procedures and Techniques

Purposive and random techniques were utilized during sampling in the study. Simple random was preferred as it reduces bias and allow to make generalizations. The sampling was done as demonstrated below.



3.6 Sample Size Selection

The population of study was over 10,000 people; and the sample size was determined using the Andrew Fishers exact formula of 1998.

$$n = \frac{Z^2 PQ}{d^2}$$

n – Respondents interviewed.

z - Standard Normal Deviation (1.96)

p – Target pop portion -50% (0.50) latrine utilization

q - 1.0-p

d – SE / margin error- 5%

$$\text{Thus } n = \frac{1.96^2 \times 0.5 \times 0.5}{0.05 \times 0.05} = 384.16$$

Therefore, it was found that 384 was the minimum sample size in the study. For purposes of catering for the non-respondents, a value of 10% was added hence resulting to 423 respondents. To get proportionate sample size per village, the number of HHs in the village was divided by the total target number of HHs multiplied by sample size e.g. the sample size for Chukor was (106/577) x423 = 78. The name of the ward, population distribution per sub location and the sample size per village is as tabulated in table 3.1 below;

Table 3.1: Sample size distribution

Ward	Sub-locations	HHs	Population	Villages	HHs	Sample size
Sambirir	Chukor	224	1066	Chukor	106	78
	Maina	423	1786	Komolwo	83	61
	Nyirar	517	2478	Kapsara	99	73
	Metipso	322	1455	Kipsacha	77	56
	Tuturung	451	2003	Katuturung	100	73
	Chesiyo	489	2432	Chesiyo	112	82
Total	6	2,426	11,220	6	577	423

3.6.1 Inclusion and exclusion criteria

The heads of households who were above 18 years and in the study area were interviewed whereas those below 18 years were excluded from the study as they are deemed under parental care. HHHs were chosen mainly because they understood their household matters.

3.7 Construction of Research Instruments

3.7.1 Questionnaires for Household.

In December 2023, standard questionnaire was relied upon to collect the quantitative data from the heads of households. The structured questionnaire touched on the level of latrine utilization, socio-demographic factors, latrine design and cultural factors which are the four main parts in the study objectives. The questions were then specific and unique to houses that had latrines and those without. To find the underlying cultural factors a set of seven questions that include beliefs, religion, norms and taboos that was specifically correlated to socio cultural factors was given to

the respondents. On social demographic factors a set of six items on social demographic characteristics such as education, age, occupation, gender, source of income, family size was identified. For latrine design a set of nine items was administered to the respondents. The existing questionnaires were then translated to the local languages to cater for those who were comfortable and would prefer it.

3.7.2 Observational checklist

Further, it was necessary to document all the relevant observations on latrine utilization and the observation method was important for it. Linkert scale that had 5 points was used. To determine this a set of observations that includes cleanliness of latrine slab, squat hole cover, overgrown vegetation on paths, presence of flies, fecal human contact was checked. Also, the compound was checked for any signs of open defecation. The researcher was required to score the item in a score of one (1) to five (5) presented in form of a Likert scale where strongly agreed had a score of 5 and neutral a score of 1. The observational checklist was constructed based on research questions from the study. The observational checklist was used in Households with latrine and HHs without latrines were excluded. The data on observational checklist was aligned with the HH tool by comparing the collected data.

3.8 Conducting a Pre-test

The researcher made arrangements to do a pretest using the structured questionnaire with the help of the local administration at Korkitony (kapngoriom) village from the bordering county of Uasin gishu. The study used 10% of the questionnaire that's 43 questionnaires in total during the pretest & findings in both the time periods came out as highly correlated >0.7. This area has the same topography and characteristics similar to HHs in the area of study and hence suitable when it comes

to pretesting so that the respondents were ensured to have been interviewed only once. Any issues that required for it to be modified were as well handled and addressed before the actual data collection process.

3.9 Reliability and Validity Tests

3.9.1 The Validity of the Instruments

The purpose of validity is to show the way results obtained from the participants have accuracy when used as a representation for those out of the study scope. When it comes to quantitative research, validity shows the extent a selected tool measure what it's intended to achieve or accomplish (Thatcher, 2010). The researcher designed a tool after various reviews on relevant studies and literature that concerns the study topic to ensure validity on the research instruments. To make structured questionnaires understandable to the local community, it was translated into the local language for consistent questioning and answering. Research assistants underwent a 5 days training to understand the study objectives with the way the tools shall be administered. There was a need to also ensure the validity of the tools and hence a pretest of it was conducted in the neighboring county of Uasin Gishu.

3.9.2 Instrument Reliability

The purpose of reliability is to imply consistency levels of a chosen method that provides a measure for a variable. According to Kimberlin and Winsterstein (2008), reliability evaluates how stable the measurements that were applied to the same respondents at different times are. A check for reliability was completed on 43 out of the 423 questionnaires which accounted for a portion of 10% of all the records examined. The test and retest technique was used to check for reliability. A similar group of respondents were questioned at two different points then their responses were compared. Results of both sessions were studied together and it was found that the correlation was

high, with most of the correlation coefficients going beyond 0.7. Besides, Cronbach's alpha was used to support the reliability of each factor, indicating that the assessment tool was suitable for study (Table 3.2). During the data collection time, the researcher continuously monitored the work by holding daily review meetups with those assisting in the field. Each day the completed questionnaires were collected, cleared up any errors present in them and made sure any issues were resolved quickly to ensure the data was accurate.

Table 3.2: **Cronbach alpha**

	Independent variable	**Type of data**	**Alpha score**
1	Socio demographic factors	Quantitative	0.91802
2.	Cultural factors	Quantitative	0.8218
3.	Latrine design	Quantitative	0.8252

3.10 Methods of Collecting the Data

Both an observational checklist and a developed standard questionnaire was used in the total collection with the total number of questionnaires being 423. The target of the questionnaire being a household head or a suitable respondent. 6 research assistants were hired and then underwent a 5 days training to comprehend the interviewing and data collection methods. They were also polished on their communication skills and the ideal ways that they could use to present the questionnaire.

3.11 Analysis of Data

Data analysis was done from the collected quantitative findings and the obtained results were then presented in the form of tables and histograms. The software called EPI version 7.2 was then used

to enter and clean the data, for further exporting to SPSS version 23 for an array of statistical tests to be done on it based on the desired independent variables (Table 3.2).

Table 3.3: **Statistical testing**

	Independent variable	Data Type	Statistic tests
1.	Level of latrine	Quantitative	Descriptive statistics
2.	Socio demographic factors	Quantitative	Multiple logistic regression, chi square
3.	Cultural factors	Quantitative	Multiple logistic regression, chi square
4.	Latrine design	Quantitative	Multiple logistic regression, chi square

3.12 Ethical Considerations

Ethical issues were vital to ensure quality of research is maintained and the data collection process respected the rights and privacy of individual and its proper use. The research study was approved by Mount Kenya University Ethics Review Committee REF: MKU/ISERC/3272. This was followed by seeking a Research Permit (License) from the National Commission of Science, Technology and Innovation (NACOSTI) Ref No: 961791. Finally, a research authorization letter was obtained from the ministry of Interior and National Administration, Elgeyo Marakwet County Ref PUB.CC.24/2VOL.III/187 that allowed collection of data in households of Marakwet East. Before interviews, respondents were given an overview of the study and that it was voluntary and therefore they could choose to drop out before or during the interview process without being necessitated to offer explanation. Before administering the questionnaire then a written consent was sought from the respondent (appendix 1). With informed consent the questionnaire was administered. Participants not having latrine had their own part in the questionnaire to answer & were assured of confidentiality. Research assistants had to be trained on the need to maintain confidentiality. The completed questionnaires were only accessible to the researcher who kept

them safely in a lockable box. As well, names were hidden in the questionnaire for assurance of anonymity and confidentiality to the respondent

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSIONS

4.0 Introduction

Findings and Discussion chapter starts by providing information on response rate, then the socio-economic characteristics of the respondents. After this, findings on each of the study objectives are presented.

4.1 Response rate

The study aimed to assess the utilization of latrine and some factors related to it in the rural parts of Marakwet East Sub County. A sample size of 384 participants was statistically determined as minimum but for the purpose of non-respondents 10% was added resulting to 423. Ultimately, the response rate was 100%.

4.2 Socio Demographic Characteristics of Respondents

In regard to respondent's socio-demographic characteristics, the study participants were asked to show their gender, occupation, age, religion, marriage status and education level. The distribution of their responses is indicated in table 4.1 below.

Table 4.1: **Socio-demographic characteristics of the respondents**

	Frequency	**Percentage**
Age of the respondents		

18 – 27	81	19.1
28 – 37	55	13.0
38 – 47	221	52.3
⩾48	66	15.6
Total	423	100.0
Gender of the respondents		
Male	281	66.4
Female	142	33.6
Total	423	100
Marital status		
Single	80	18.9
Married	326	77.1
Widowed	17	4.0
Total	423	100.0
Education status		
Primary	245	57.9
secondary school	90	21.3
College	65	15.4

None	23	5.4
Total	423	100.0
Occupation of the respondents		
Farming	332	78.5
Civil servant	49	11.6
Businessman	42	9.9
Total	**423**	**100.0**
Income levels		
1000-12000	365	86.3
more 12000	58	13.7
Total	**423**	**100.0**

Moreover, majority of the respondents 391(92%) were Christians. 28 (7%) Muslims, and 4(1%) were from other religions including African traditional religion and Hindu.

In regard to household size the mean house hold size was 5.2 members per household with 1.61 Standard deviation. The following pie chart shows the distribution of the household membership among the respondents.

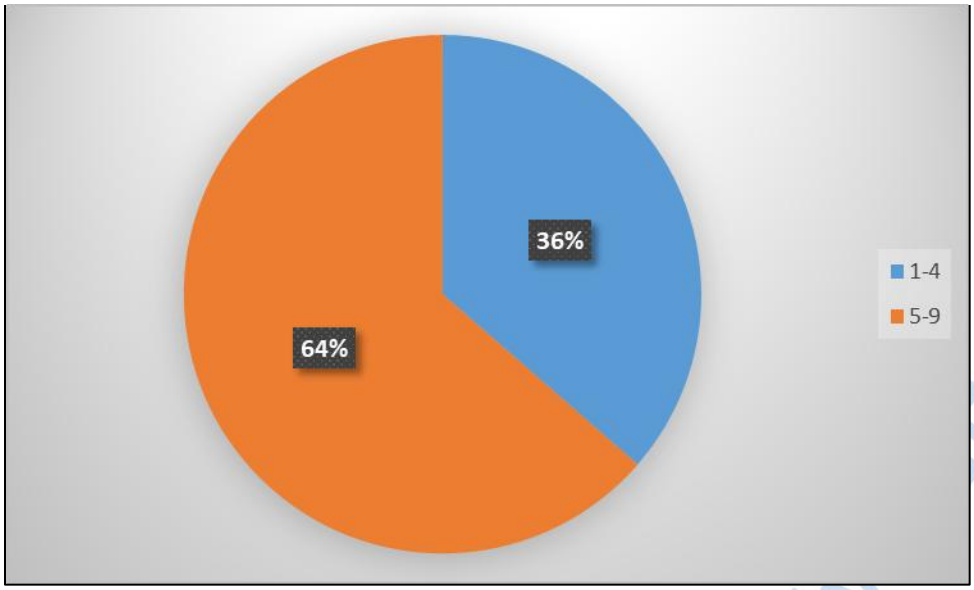


Figure 4.1: The distributions of the members in the households.

4.3 Level of latrine utilization among the rural community

The target population were asked whether they had access or owned toilets. In this regard 317(75%) indicated that they owned (were able to accessible) to toilets. 106(25%) of the respondents indicated that they did not own or were able to access a toilet. From the respondents who had the ownership of a toilet, 241(76%) used an ordinary pit latrine while 76(24%) owned a VIP type of toilet. Nonetheless, this corresponds with WHO & UNICEF (2017) that a large proportion of Kenyan communities use ordinary pit latrines. About 85% of the population who reside in these rural areas use simple latrines however majority does not conform to the international standards to be labeled as an improved facilities for sanitation purposes as stated in the WHO/UNICEF under the JMP Joint Monitoring Program (UNICEF/WHO, 2017).

In regard to usage of latrine 314(74%) used for defecation, 109(26%) of the respondents indicated that they did not always utilize latrines during defecation. This finding is in line with Osumanu et

al., (2019) that there are presence of people who still practice OD despite efforts set toward enhancing latrine availability. The rates of OD in the developing nations is reportedly low with an exception of the Sub-Saharan region where the number of individuals practicing OD is rising from 204 million people in the year 2015 to 220 million in 2020. It has been found that latrine coverage does not necessarily mean all households will be utilizing it since even in places that already have latrines still practice open defecation (Garn et al., 2017). A case is with an assessment that was done in Mumbai where squatters reside and it was noted that latrines there were significantly in a bad state, that's amounting to 71-99% majorly leading to open defecation since individuals would prefer to defecate openly (Biswas et al., 2020). In a study conducted by Njuguna, & Muruka in 2015, the average rate of OD across all the 47 counties in Kenya was 23.5%, and a median of 6.9%. Further, the study findings highlighted that the highest case of OD among the counties stood at 88.4% and the lowest of the counties had OD rates of 0.1%. From the findings, a total of 15 counties recorded a prevalence rate of over 40%.

Moreover, a question to the respondents on the number of household members who used latrines (or its equivalent) every time they needed to relieve themselves. From those who responded, 314 (74%) households reported using toilets consistently whereas 109 (26%) did not use the toilets every time that they wanted to relieve themselves. The chart below shows the distribution of the responses.

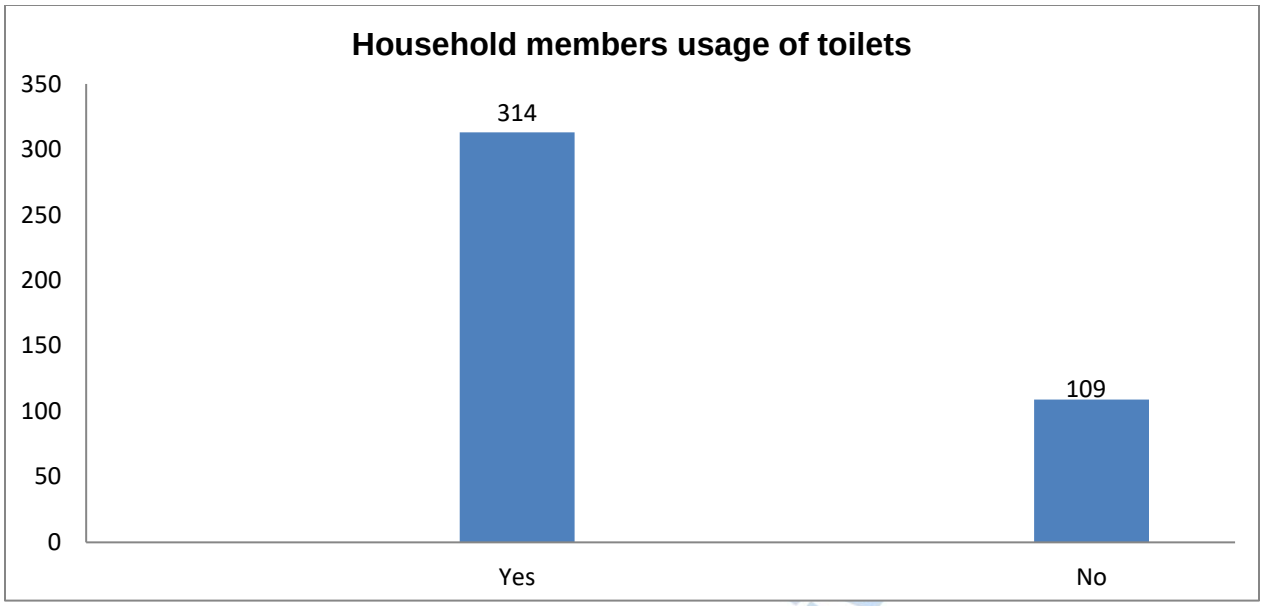


Figure 4.2: Household member utilization of Toilets

Figures from the Joint Monitoring Program (JMP) by the World Health Organization (WHO) and the United Nation Children's Fund (UNICEF) for water and sanitation stated that 12% of the Kenyan population practiced OD as of the year 2015. The Joint Monitoring Program findings compare well to Ethiopia whose figure stands at 29%. Differently, countries from the Eastern Africa region had low rates of OD since the rate at Rwanda was 2% and Uganda has only 7%. Generally, the density of population in a given region has an impact on the prevalence of OD since when the density rates are high, the chances are high that the privacy for wanting to practice OD is low and hence making people cease from the practice. Population density is often higher in the urban areas and it's estimated that 12 million of the 38m people in Kenya as of the year 2017 resided in the urban areas (Njuguna, & Muruka 2017).

4.4 Social demographic factors influencing latrine utilization

On the bid to find the social demographic factors, a set of items on social demographic characteristics were identified as tabulated in table 4.2. Findings from the study point that many of the respondents, 365 (86.1%) indicated that they earned less than 12000 per year and majority are farmers in occupation. Poverty has been identified as a high predictor of the likelihood for OD and diseases correlated significantly with the recorded cases of OD. The main concern for this is due to the reason that those living in poverty often fail to have the resources for sanitation needs hence end up living in places with neglected drainage, air pollution and bad water connection. Hence, they end up being susceptible to diseases that stem from poor sanitation causing a decline in productivity due to higher cost in health expenses. Nationally, 38.6% of Kenyans live below the poverty line with 19.1 million Kenyans classified as poor (Kenya National Treasury, 2021). To see whether there was any association between the sociodemographic characteristics of the respondents and the open defecation, bivariate analysis using Chi Square test were conducted.

Table 4.2: **Social demographic factors influencing utilization on latrine**

	Household members use of latrine				
	Frequency	**Percentage**	$\chi 2$	df	P-Value
Age of the respondents					
18 – 27	81	19.1	50.65	3	<0.001
28 – 37	55	13.0			
38 – 47	221	52.3			

⩾48	66	15.6			
Total	423	100.0			
Gender of the respondent			$\chi 2$	df	P-Value
Male	281	66.4	14.6	1	<0.001
Female	142	33.6			
Total	423	100			
Marital status			$\chi 2$	df	P-Value
Single	80	18.9	37.4	2	<0.001
Married	326	77.1			
Widowed	17	4.0			
Total	423	100.0			
Education status	**Frequency**	**Percentage**	$\chi 2$	df	P-Value
Primary	245	57.9	74.4	3	<0.001
secondary school	90	21.3			
College	65	15.4			
None	23	5.4			
Total	423	100.0			
Occupation of the respondents			$\chi 2$	df	P-Value

Farming	332	78.5	37.4	2	< 0.001
Civil servant	49	11.6			
Businessman	42	9.9			
Total	423	100			
Income levels			$\chi 2$	df	P-Value
1000-12000	365	86.3	93.7	1	<0.001
more 12000	58	13.7			
Total	423	100.0			

All the social demographic characteristics of the respondents returned a significant p values implying that they had a role in determining whether household members utilized latrines or not. According to findings from multivariable analysis, households that had 1 to 4 people, education level of the respondent, frequency of toilet cleaning and whether a latrine has been used for more than 3 years had effects on whether the individuals could utilize latrines or not. The household size of between 1 and 3 recorded were 1.25 more times likely to utilize latrines (AOR: 1.25, 95% CI [1.2–3.2]), different from the households that had more than 6 people. Education also played a role since those that had attained either the secondary or tertiary education levels were 1.6 times more likely (AOR: 1.6, 95% CI [1.42–3.83]) to use latrines when compared to those that failed to complete either the primary or secondary education levels.

Further, the multivariable analysis highlighted those latrines that had been constructed and utilized for a period of more than 3 years had 1.82 higher chances (AOR: 1.82, 95% CI [1.12–2.95]) of getting utilized when assessed against those that were constructed for a 3-year lesser period. More so, cleanliness is integral for latrine utilization since those that were cleaned on a daily basis

recorded a 2.19 more likelihood (AOR: 2.19, 95% CI [1.12–4.28]) of getting utilized when compared to the houses that were not cleaned frequently. Another finding that had an impact on latrine utilization was the type of the latrine, since VIP latrines had 1.3 times more likelihood (AOR: 1.32, 95% CI [1.15–3.18]) of getting used when compared to the ordinary toilets or latrines.

To see the contribution of the social demographic characteristic to the outcome (toilet usage) a hierarchical multiple logistic regression model was executed with toilet use acting as a dependent variable and all the 8 social demographic characteristics entered at different levels. The regression model is shown in table 4.3 below.

Table 4.3: **The effects of the socio demographic characteristic to toilet usage**

Summary of the Model

	R	R Square	R Square (Adjusted)	The Estimate on the Std. Error	Change Statistics				
					Change on R Square	F Change	df1	df2	Sig. F Change
1	.290[a]	.084	.082	.40325	.084	38.725	1	421	.000
2	.334[b]	.111	.107	.39768	.027	12.872	1	420	.000
3	.340[c]	.115	.109	.39727	.004	1.870	1	419	.172

4	.438[d]	.192	.184	.38012	.077	39.675	1	418	.000
5	.627[e]	.393	.386	.32990	.201	137.94	1	417	.000
6	.633[f]	.401	.393	.32803	.008	5.759	1	416	.017
7	.636[g]	.404	.394	.32765	.003	1.956	1	415	.163
8	.642[h]	.412	.400	.32595	.008	5.345	1	414	.021

a. The variables included: (Intercept), age

b. Variables included: (Intercept), respondent's age, sex

c. Variables included: (Intercept), respondent's age, sex, marital status

d. Variables included: (Intercept), respondent's age, sex, marital status, education

e. Variables included: (Intercept), respondent's age, sex, marital status, education, occupation

f. Variables included: (Intercept), respondent's age, sex, marital status, education, occupation, religion

g. Variables included: (Intercept), respondent's age, sex, marital status, education, occupation, religion, income

h. Variables included: (Intercept), respondent's age, sex, marital status, education, occupation, religion, income, household membership size

From the logistic regression model above, all the social demographic factors except for marital status and religion, influenced the decision to utilize latrine while defecating. Cumulatively, the

model explained 41.2% of variation on latrine utilization. This finding aligns with Osumanu (2019) which found out that things like the size of a household, educational level, income, employment and the traditional norms of a given society and latrine facility had a positive impact in determining whether there shall be cases of open defecation experienced or not. It is necessary to maintain and properly use latrines for large households since the latrines are getting increasingly used (Ndambuki et al., 2019). The socio-economic status in a given household can affect or impact on latrine utilization. For example, houses that record bigger incomes and have attained higher educational level may as well have more potentiality to utilize and ensure latrine is in a good state always, when compared to households with limited education and lower earnings (Onyango et al., 2018). Moreover Leshargie et al. (2018) noted that some of the factors that affected latrine utilization include the educational level of the household heads, the amount of income generated by a family, behavioral factors like culture and the geographical factors since there were some areas that showed high utilization than others. Notably, owning a pit latrine does not directly imply its utilization with cases of OD still getting reported regardless.

4.5 Cultural factors influencing utilization on latrine

To find the underlying cultural factors that could affect latrine utilization in Marakwet East sub-county a set of seven questions touching on cultural factors were given to the respondents. The researcher was required to score the design item in a score of one (1) to five (5) presented in form of a Likert scale. Where strongly agree had a score of 5 and neutral a score of 1. In total 109(26%) of the study population failed to utilize latrines every time they needed to relieve themselves. Distribution of the responses is shown in table 4.4 below;

Table 4.4: **The cultural factors that influence latrine utilization**

	Strongly agree	Some what Agree	Neutral	Disagree	Completely disagree	Total
Choice of continuing to openly defecate is as a result of cultural beliefs	32%	23%	22%	12%	11%	**100%**
Traditional beliefs that it is not clean to defect in confined spaces affect latrine use	27%	25%	22%	12%	14%	**100%**
Sharing sanitation facilities with in laws is not accepted in the community	24%	19%	26%	9%	22%	**100%**
Taboos associated with the defecation and disposing facces has effect on latrine use	37%	21%	22%	13%	7%	**100%**
Women use latrines when they are separate from those used by men	21%	19%	20%	27%	13%	**100%**
Children are prohibited to use sanitation facilities since they are for adults	5%	3%	28%	52%	12%	**100%**

Women don't like to be seen defecating hence walk long distance from HHs for privacy	34%	23%	19%	12%	12%	**100%**

On the question as to whether the respondents shared a toilet with other extended household majority of those who gave no to the question, indicated that they do not do that because it is a taboo to do so. Moreover, regarding the question as to whether the respondent shared toilets with children, many respondents used their toilets alone as opposed to sharing together with children. Reasons being that it was a taboo to do so, others indicated that children were not able to keep the toilet clean.

The findings correspond with the one that was earlier conducted in Tigania West Sub-County, which found out that sanitation facilities were often built by the male who did not allow the extended family and young children to utilize them (Kendi et al.,2022). Hence, the fecal disposal of children was thrown to the environment as an alternative strategy (Kendi et al., 2022). Moreover, the communal beliefs as well as norms govern toilet use was observed regarding to hygiene and sanitation, with any change from the norms and believes regarded as a taboo as it attracted a curse. On the question as to whether the respondent shared a toilet with their in-laws, those who indicated to not sharing said that this was against their culture.

Chi square was find the relationships on statistics between culture and utilization of latrine among the respondents at 95% confidence level. The Chi square test returned a significant result (X^2=42, df=1, P=<0.001). Further, it was found that there was 1.23 times more odds of utilizing latrine for every defecation when the respondents felt culture did not influence utilization of latrine (AOR: 1.23, 95% CI [1.0 -- 2.1]). This implies that respondents who felt culture did not influence

utilization of latrine had a higher likelihood of utilizing the pit latrines (1.23 more likely) as opposed to the respondents who felt that culture had a role to play.

Socio-cultural factors have an impact on latrine utilization with things like the daily routine of an individual, common habits, sanitation rituals and socializations had an impact on the way a society could adopt the use of latrines (Routray et al., 2022). The study thus recommended an emphasis focusing on addressing behavioral issues when it comes to enhancing latrine utilization. In a study that was done by Nunbogu et al (2022), social context played a role in determining the capability of a household to complete constructing a latrine. From this study, it was necessary to continuously sensitize and do social marketing to improve latrine utilization amongst communities. The communal beliefs as well as norms that govern the use of toilets was evident in the hygienic and sanitation practices and any change from such norms and beliefs came out as a taboo as it could led to a curse. The findings aligned with the one that was done by Bhatt et al (2019) who concluded that beliefs and customs had a significant impact on latrine utilization despite the presence or absence of improved sanitation facilities. This is often occasional such as when the in-laws visit a household making the head to practice OD since the culture prohibits sharing of latrines with such family members.

4.6 Influence of latrine design on utilization of latrine

To find the ways that latrine design can affect latrine utilization, a set of observations were done relating to the toilets. The researcher was required to score the structural item in a score of one (1) to five (5) presented in form of a Likert scale. Where strongly agreed had a score of 5 and neutral a score of 1. The items were distributed as in Table 4.5 below.

Table 4.5: **Scorers for the different latrine design requirements**

	Strongly agree=5	**Somewhat agree=4**	**Somewhat disagree=3**	**Completely disagree=2**	**Neutral=1**	**Total**
The pit latrine has a good structure that makes it private	23%	11%	10%	34%	22%	**100%**
Latrine had got the vent pipe that comes from the pit to the top of the superstructure	10%	9%	28%	38%	15%	**100%**
It is likely to upgrade the pit latrines by fitting slabs	14%	8%	33%	28%	17%	**100%**
The pit latrine has got a cover on the squat hole	4%	2%	43%	33%	18%	**100%**
The slab on the latrine has been	7%	16%	37%	23%	17%	**100%**

made such that it drains fluid to the hole						
Presence of urinal attachment	3%	2%	58%	17%	20%	**100%**
Distance from the household to the latrine is >30m	5%	6%	67%	4%	18%	**100%**
To provide privacy latrine should have door & height above 1.5m	67%	9%	10%	34%	14%	**100%**
There is a hand washing facility near attached to the toilet	3%	1%	53%	33%	10%	**100%**

As it can be seen in Table 4.5 above, most of the latrine under usage did not meet the structural requirement. A further analysis was done on how latrine designs can be influencing its utilization. In this regard each of the identified elements of the latrine was entered in a hierarchical regression model in the Table 4.6 below.

Table 4.6: **How the toilet design impacted the latrine utilization**

Model Summary of the Multiple logistic regression

					Change Statistics			
R	R Squared	R Square (Adjusted)	The Estimate Std. Error	Changes of R Square	F Change	df 1	df2	Sig.F Change
.391[a]	.153	.151	.35827	.153	71.848	1	398	.000
.659[b]	.434	.432	.29311	.282	197.623	1	397	.000
.718[c]	.515	.512	.27164	.081	66.233	1	396	.000
.733[d]	.538	.533	.26563	.022	19.123	1	395	.000
.780[e]	.609	.604	.24469	.071	71.498	1	394	.000
.804[f]	.647	.641	.23286	.038	42.073	1	393	.000
.820[g]	.673	.667	.22436	.026	31.321	1	392	.000
.868[h]	.753	.748	.19532	.080	126.251	1	391	.000
.967[i]	.936	.934	.09987	.183	1105.554	1	390	.000

a. Predictors: (Constant), presence of a superstructure on the latrine offering privacy.

b. Predictors: (Constant), presence of a super structure system that offer privacy, vent pipe running from the pit to the top of the superstructure

c. Predictors: (Constant), latrine has got a superstructure that offer privacy, a vent pipe from the pit to the top of the superstructure, the chances of upgrading pits by simply fitting slabs to it.

d. Predictors: (Constant), latrine has got a superstructure that offer privacy, a vent pipe from the pit to the top of the superstructure, the chances of upgrading pits by simply fitting slabs to it, a covered squat hole

e. Predictors: (Constant), latrine has got a superstructure that offer privacy, a vent pipe from the pit to the top of the superstructure, the chances of upgrading pits by simply fitting slabs to it, a covered squat hole, floor on the latrine designed in a way that drains liquid to the hole

f. Predictors: (Constant), latrine has got a superstructure that offer privacy, a vent pipe from the pit to the top of the superstructure, the chances of upgrading pits by simply fitting slabs to it, a covered squat hole, floor on the latrine designed in a way that drains liquid to the hole, presence of a urinal attachment

g. Predictors: (Constant), latrine has got a superstructure that offer privacy, a vent pipe from the pit to the top of the superstructure, the chances of upgrading pits by simply fitting slabs to it, a covered squat hole, floor on the latrine designed in a way that drains liquid to the hole, presence of a urinal attachment, >30m length from the latrine to the household

h. Predictors: (Constant), latrine has got a superstructure that offer privacy, a vent pipe from the pit to the top of the superstructure, the chances of upgrading pits by simply fitting slabs to it, a covered squat hole, floor on the latrine designed in a way that drains liquid to the hole, presence of a urinal attachment, >30m length from the latrine to the household, a door on the latrine with an height of over 1.5m.

I. Predictors: (Constant), latrine has got a superstructure that offer privacy, a vent pipe from the pit to the top of the superstructure, the chances of upgrading pits by simply fitting slabs to it, a covered squat hole, floor on the latrine designed in a way that drains liquid to the hole , presence of a urinal attachment, >30m length from the latrine to the household, a door on the latrine with an height of over 1.5m, Hand washing facility

All the elements of latrine design influenced the extent to which respondents utilized the toilets to relieve themselves. Cumulatively, in this study, toilet design explained 93.6% of utilization of latrine by the respondents.

These findings on the influence of latrine design are similar to studies done elsewhere. A study that sought to determine the effects of toilet design on utilization in Turkana Kenya, found that sanitation facilities that fail to incorporate some important feature such as the uncovered pit latrines will be used less even when there are fewer latrines as individuals would rather opt to use sanitation facilities that are improved (Busienei et al.,2019). Moreover, a research that was done in a rural Nepalese village uncovered that people preferred to use flush toilets as opposed to pit latrines with the people from the villages having no preferences over the latrines since there was an equal use for both the pit and flush latrines (Budhathoki etal.,2017).

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The chapter summarizes the study findings, gives conclusions and what are the recommendations after the study.

5.1 Summary

The general objective entailed assessing the latrine utilization and the factors that are associated with it in Marakwet East Sub County, Elgeyo Marakwet, in Kenya. Furthermore, four specific objectives guided the study, including on the aim to find the level of latrine utilization among rural community in Marakwet East Sub County, to determine the social demographic factors that influence latrine utilization in the rural community, to determine the cultural factors that influence latrine utilization in the rural community and to establish latrine designs that are associated with utilization of latrine in Marakwet east.

Specifically, regarding the level of latrine utilization in rural communities of Marakwet East, the study findings indicated that 317(75%) of the respondents owned toilets whereas 106(25%) of the respondents did not own. Nevertheless, the usage of latrine for defecation evidenced 109(26%) of the respondents indicated that they did not always utilize latrine every time they needed to defecate. The study findings shows that latrine ownership does not necessarily mean all households will be utilizing it since even in HHs that already have latrines still practice open defecation. In a study conducted by Njuguna et al. (2019) the average rate of OD across all the 47 counties in Kenya was 14%. This study finding therefore indicate that Marakwet East performance in terms of fighting the open defecation vice is below the Kenya's average. Further it shows that the initial goal of CLTS on having the rates of sanitation at 75% is yet to be met with additional issues on sustainability of latrines.

On determining social demographic factors influencing utilization of latrine; the majority of the respondents 365 (86.1%) indicated that they earned less than 12000 per year. In Kenya poverty has been identified as a high predictor of the likelihood for OD and diseases correlated significantly with the recorded cases of OD. Nationally, 38.6% of Kenyans live below the poverty line with 19.1 million Kenyans classified as poor. Moreover, the study found that all the identified sociodemographic characteristics returned significant p values implying that they had a role in determining whether household members utilized latrines or not. The logistic regression model revealed that all the social demographic factors except for marital status and religion, influenced the decision to utilize latrine while defecating. Cumulatively, the model explained 41.2% of variation on latrine utilization.

Chi square was integral in determining the statistical relationships between latrine utilization and culture. To determine the factors that influence latrine utilization among the rural community at 95% confidence level, the Chi square test returned a significant result (X^2=42, df=1, P=<0.001). The study found that cultural factors including cultural belief to being dirty to defecate in enclosed areas, belief prohibiting sharing of toilet with in-laws, taboo associated with disposal of faeces, prohibition on women to sharing toilets with men and prohibition on children against sharing toilet with adults. The study found that these influenced whether or not a member of the household utilized a toilet when relieving themselves or not.

Finally, on latrine designs the results point out that developing rural sanitation programs should take design into account. A lot of work in sanitation previously emphasized latrine construction without ensuring equal importance for usability, access or acceptability, particularly in rural regions. It is clear from the popularity of squat hole covers and superstructures that people in the community care about being safe and protected. As a result, implementers ought to consider how

their designs will fit the tastes of local people and suit both the local culture and the environment. Holding a latrine at a distance from the house (such as 30 meters or more) can impact how often it is used, reflecting women's and children's safety, land matter and how people are grouped. Resolving these subtle problems will play a big role in bringing about permanent improvements in behaviour and health.

5.2 Conclusion

In regard to latrine utilization among rural community in Marakwet East Sub County, the performance in terms of fighting the open defecation vice is below the Kenya's average. The current rate of OD in Kenya is at 14% whilst in Marakwet east the study findings indicated 26% non-utilization of latrine. This shows that the initial goal of CLTS on having the rates of sanitation at 75% is yet to be met with additional issues on sustainability of latrines.

On social demographic factors influencing utilization of latrine among the community of Marakwet east, the study concluded that all the social demographic characteristics except for marital status and religion influenced utilization of toilets among the respondents. The study findings on income indicated that 86.1% of the respondents earned less ksh.1000 per month which is below the Kenya's average rural household expenditure of ksh.4101 per month. This study concludes that most HHs of Marakwet east live below the poverty line.

On cultural factors influencing utilization of latrine among the rural community, the study concluded that culture has an influence on toilet utilization among the respondents. The study found that cultural factors including cultural belief prohibiting sharing of toilet with in-laws, taboo associated with sharing toilets with men and prohibition on children against sharing toilet with adults was evident.

Finally, the study on latrine designs associated with utilization of latrine among the rural community found that most of the latrine under usage did not meet the toilet design requirements. All the elements of latrine design influenced utilization of the latrines. This study concludes that most latrines in Marakwet east does not meet the set standards of a sanitation facility that is improved. Cumulatively, in this study, toilet structure explained 93.6% of utilization of toilets by the respondents.

5.3 Recommendation

- This study recommends that a needs assessment should be done before planning intervention measures on sanitation for sustainability purposes in the targeted community. Moreover, the study recommends a multi-sectoral approach in designing and implementing community led total sanitation (CLTS) as the most ideal method to reduce OD and improve on latrine utilization.
- The government should engage stakeholders to support the vulnerable members in rural communities to have latrine ownership. Likewise, the county government should support the community through financing public participation to have improved sanitation facilities.
- The ministry of health to develop health promotion messages on social behavior change communication to create awareness on utilization of latrine. This will help address the cultural misconceptions associated with utilization of latrine for defecation. This study recommends continuous sensitization and social marketing to improve latrine utilization in communities.
- The government to engage the community in identifying a relevant latrine design that is cost effective and acceptable to community members. The most ideal way is upgrading the pit latrines that are rather traditional by latrine slabs as per KESH Policy to meet the Government of Kenya's set standards of a sanitation facility that is improved

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APPENDICES

Appendix 1: Consent Letter

Hello;

I am ……. MPH student (Community Health and Development) in Mt. Kenya University. I am doing a research study on factors affecting latrine utilization in Marakwet east Sub County. The information collected in the survey will be used by the government & stakeholders to guide planning of intervention programs on utilization of latrine in rural households. I wish to inform you that i would like your household to participate in this important survey through responding to questions touching on this study topic. The questions majorly take 20 minutes at most. If you feel uncomfortable responding to some of the questions in the interview, feel free to tell me so as to move to the next. Also, you can opt out during the interview in case you don't wish to continue without giving reasons. The information obtained from the survey will strictly be kept confidential.

Contacts to be reached for further enquiry about the survey, kindly contact:

Principal Investigator -Mobile-0722931085 Or MKU research office; research@ mku.ac.ke

Do you have any question before the interview? Yes ☐ No ☐

Can I start the interview? Yes ☐ No ☐

If YES proceed with interview and if NO thank him/her and end the interview.

Signature of Interviewer ……. date ……

Appendix 2: Household Questionnaire

DATE ……INTERVIEWER…….

SUB LOCATION……. VILLAGE ……

HH CODE NO. ……QUESTIONAIRE NO…….

Please pick the most appropriate and Tick in the brackets (√)

SECTION I: CULTURAL FACTORS

Questions 1-8 are for <u>Households with latrines</u> to answer. If the household is without a latrine skip to number 9 to 12.

1. Do all your family members defecate in latrine always? **Yes ( ) No ( )**

2. If <u>NO</u> in no.1 above, why are they not using the latrine? **(It's dirty ( ) It has a big squat hole ( ) some cultural beliefs ( ). It's collapsed ( )**

3. Do you use the same latrine with your children? **Yes ( ) No ( )**

4. If <u>NO</u> in no.3 above, why are you not using with children? **(Children can't keep it clean ( ) It is a taboo to share with children ( ) others specify…**

5. Do you share the same latrine with your in-laws when they visit? **(Yes ( ) No ( )**

6. If <u>NO</u> in no.5 above, why don't you share with them? **(Knowledge gap ( ) Cultural beliefs ( ) It's a taboo ( )**

7. How many times do you clean the latrine slab per week? **(Daily ( ) Rarely ( ) No cleaning ( )**

8. If the latrine slab is not cleaned in no.7 above, why? **It's dirty ( ) It's a taboo ( ) Lack of water ()**

Questions for Households without Latrine

9. Why doesn't your household have a latrine? **Lack of money ( ) Rocky ( ) Taboos ( ) Lack of skill ( ) others specify…….**

10. Where do your family members defecate? **Bush ( ) Neighbor's latrine ( ) Others specify**

11. If Open defecation in no.10 above, why do you prefer to defecate in the bush? **No money for construction ( ) Culturally accepted ( ) Many bushes ( )**

12. What behavior do you think can cause diarrhoea in your community? **(Practicing OD ( ) Witchcraft ( ) Boiled water ( ) Curse ( )**

SECTION II: SOCIAL DEMOGRAPHIC FACTORS:

Questions for All Households (with or without latrines)

13. How old are you now? **18 – 27 ( ) 28 – 37 ( ) 38 – 47 ( ) More than 48 ( )**

14. What is your Sex **Female ( ) Male ( )**

15. Current marital status **(Single ( ) Married ( ) Divorced ( ) Widowed ( )**

16. Highest level of education **Primary ( ) Secondary ( ) College ( ) Non ( )**

17. Occupation Farming **( ) Civil servant ( ) Businessman ( ) others specify...**

18. Religious affiliation Christian **( ) Muslim ( ) Traditionalist ( ) None ( ) Others specify….**

19. What is your average income per year? **Less than 1,000 ( ) 1,000 - 12,000 ( ) More than 12,000 ( )**

20. How many people live in your Household? **1 – 4 ( ) 5-9 ( ) More than 10 ( )**

SECTION III: LATRINE DESIGN

Questions for Households with latrines

21. What is the type of your latrine? **Ordinary Pit latrine ( ) VIP latrine ( ) Pour Flush ( ) others specify...**

22. Are the doors labelled for each sex (Male and Female)? **(Yes ( ) No ( )**

23. How many years has the latrine been used? **Less than 3 years ( ) More than 4years ( )**

24. Who advised you to construct the latrine? **Healthcare worker ( ) Self initiation ( ) Chief ( )**

25. Do you have the required skills to construct a latrine? **Yes ( ) No ( )**

26. If NO in no.25, who constructed it for you**? Hired Artisans ( ) Government ( ) Community ( ) Partner support ( )**

27. Does the Latrine Super structure offer privacy by providing the following? Tick **(√)** appropriately.

Condition	**Yes**	**No**
Doors		
Roof		

Walls		

28. What is the type of floor slab for the toilet? **Cemented ( ) Earthen ( ) Timbered ( ) Tiled ( )**

29. What is the distance of latrine from water sources? **Less than 30m ( ) More than 30m ( )**

SECTION IV: LATRINE UTILIZATION

30. Do health extension workers visit your Household? **Yes ( ) No ( )**

31. If Yes in no.30 above do they health educate on utilization of latrine? **Yes ( ) No ( )**

32. Do you have children under five years? **Yes ( ) No ( )**

33. If Yes in no.32, where do you dispose Baby's faeces? **Throw away into the compound ( ) Put in a latrine ( ). Others specify……..**

34. Do each family member clean hands with soap after using the latrine? **Yes ( ) No ( )**

Appendix 3: Observational Checklist

On a scale of 1-5, go through the sentences and rate your agreement level for each section;-

SECTION 1: Cultural Factors

Likert Scale					
Rating	**1**	**2**	**3**	**4**	**5**
	Strongly agree	**Some what Agree**	**Neutral**	**Somewh at Disagree**	**Complet ely disagree**
The choice to continue defecating in the open is as a result of cultural beliefs					
Traditional beliefs that it is unclean to defecate in a confined space affects the use of latrines					
Sharing sanitation facilities with in laws is not accepted in the community					
Taboos associated with defecation and disposal of feces affects the adoption and use of latrines					
Women use latrines when they are separate from those used by men					

Children are prohibited to use sanitation facilities since they are for adults					
Women don't like to be seen defecating hence walk long distance from habitation for privacy					
Total					

SECTION 2: Latrine Design

Five-point Likert Scale					
Rating	**1**	**2**	**3**	**4**	**5**
	Completely agree	**Some what Agree**	**Neutral**	**Somewhat Disagree**	**Completely disagree**
The pit latrine has a super structure system that offers privacy					
The latrine has a ventilation pipe from the pit to above the superstructure					
You can upgrade the pit latrine through the use of latrine slab					

The pit latrine have a squat hole cover					
Latrine floor slab is constructed so fluid drain into the hole					
The latrine have a Urinal attachment					
Distance of latrine from the household is > 30m					
To provide privacy latrine should have a door and height above 1.5m					
Hand washing facility attached to toilet					
Total					

SECTION 3: Utilization of Latrine

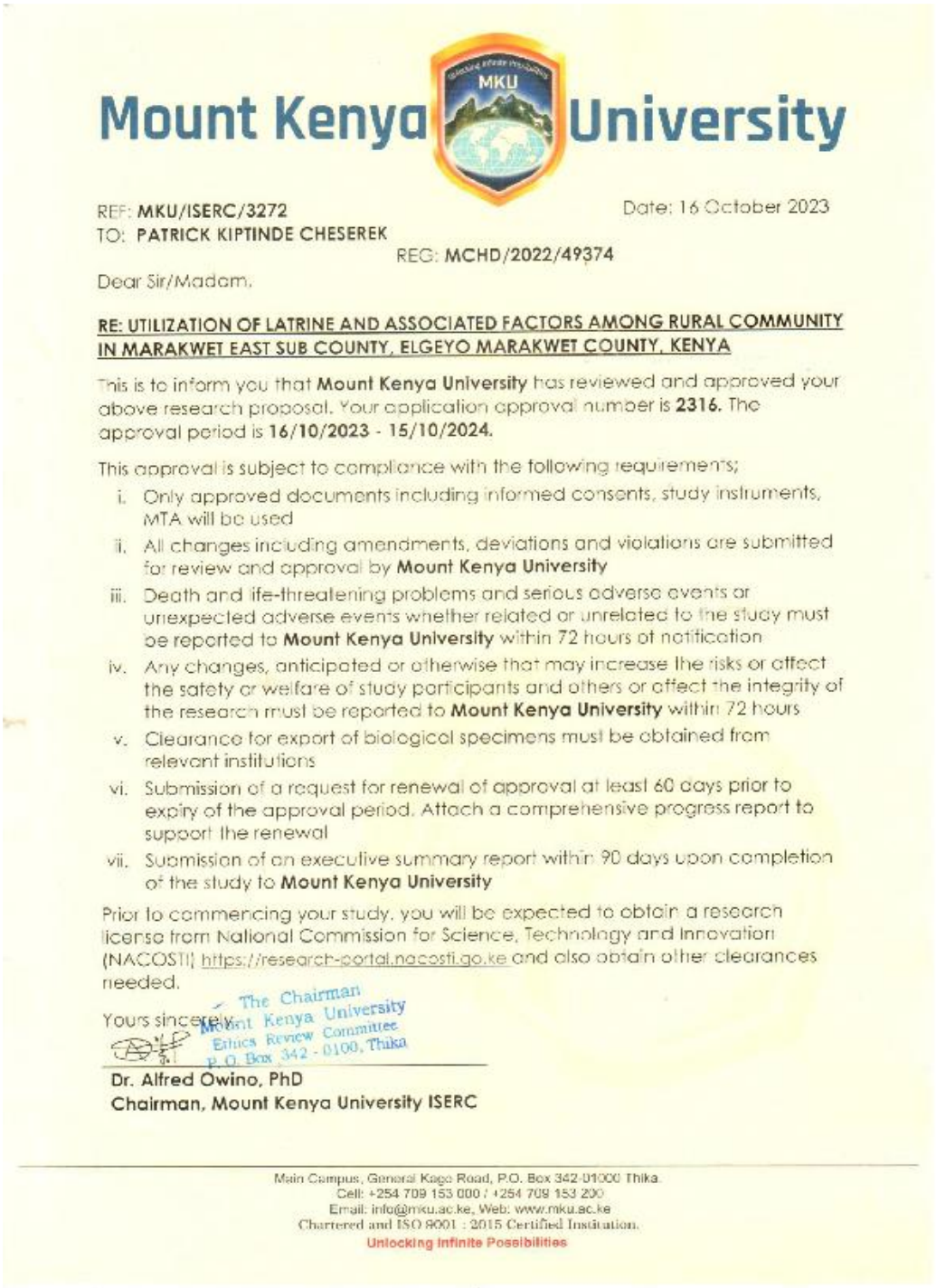
The checklist is designed to gather data in HHs visited. You are required to make observations at every household you visit and tick **(√)** where appropriate in the table below;

Options	**Yes**	**No**	**Remarks**
Observable signs of open defecation (faeces) in the compound			
Presence of overgrown vegetation on foot path and around the latrine			
Availability of Soap or Ash on wash hand facility			

Observable fresh faeces inside latrines squat hole			
Fly availability in the latrine			
Cobwebs inside the superstructure			
Floor slab littered with faeces & urine			
The pit latrine is filled up			
The pit is collapsed			
The type of floor slab for the toilet is cleanable			
Good latrine superstructure that offers privacy			
The latrine separates human excrements from human contact			
Total			

THANK YOU

Appendix 4: Ethical clearance



Mount Kenya University

REF: **MKU/ISERC/3272** Date: 16 October 2023
TO: **PATRICK KIPTINDE CHESEREK**
REG: **MCHD/2022/49374**

Dear Sir/Madam,

RE: UTILIZATION OF LATRINE AND ASSOCIATED FACTORS AMONG RURAL COMMUNITY IN MARAKWET EAST SUB COUNTY, ELGEYO MARAKWET COUNTY, KENYA

This is to inform you that **Mount Kenya University** has reviewed and approved your above research proposal. Your application approval number is **2316.** The approval period is **16/10/2023 - 15/10/2024.**

This approval is subject to compliance with the following requirements;

i. Only approved documents including informed consents, study instruments, MTA will be used
ii. All changes including amendments, deviations and violations are submitted for review and approval by **Mount Kenya University**
iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to **Mount Kenya University** within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affect the safety or welfare of study participants and others or affect the integrity of the research must be reported to **Mount Kenya University** within 72 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal
vii. Submission of an executive summary report within 90 days upon completion of the study to **Mount Kenya University**

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://research-portal.nacosti.go.ke and also obtain other clearances needed.

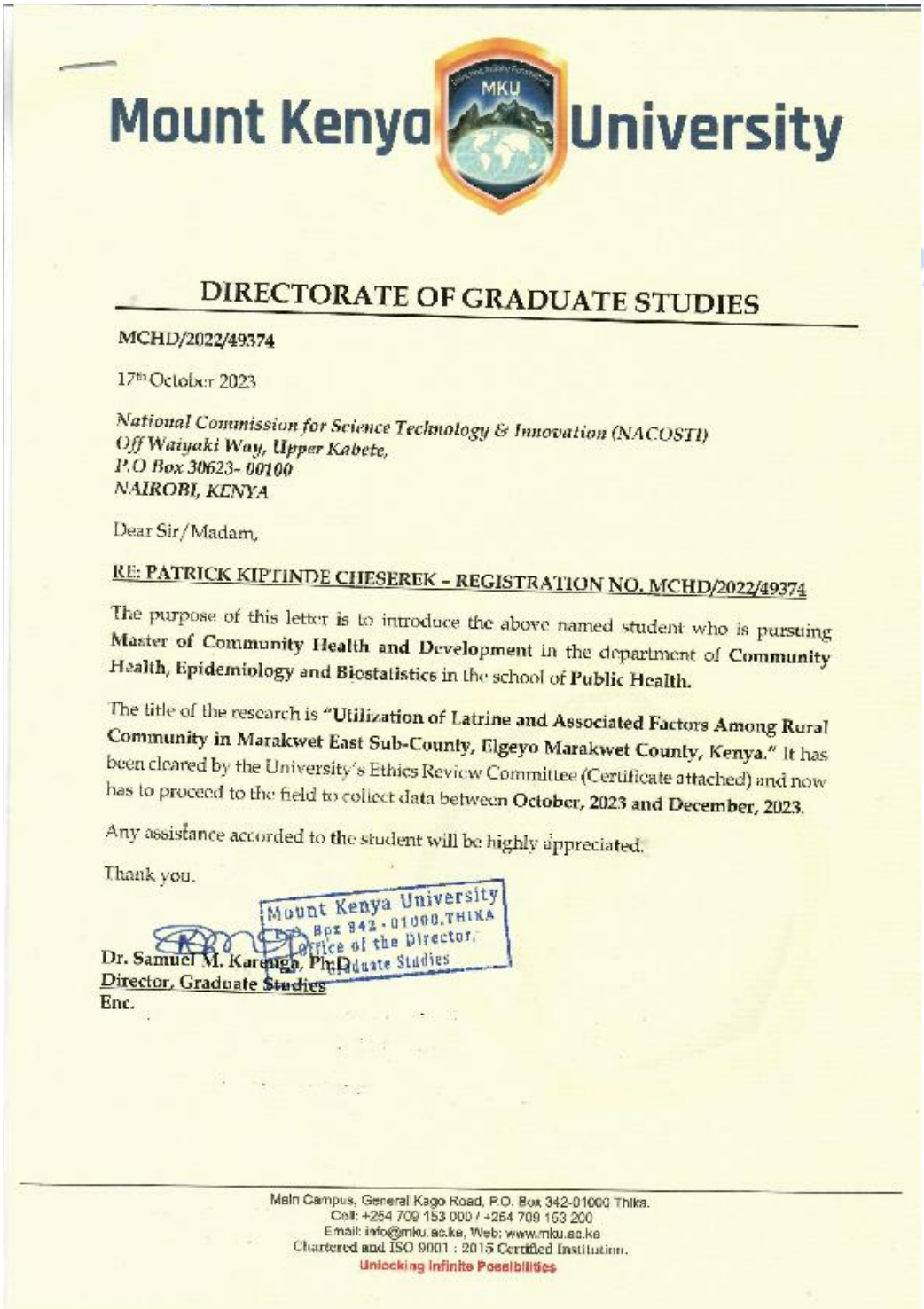
Yours sincerely,

The Chairman
Mount Kenya University
Ethics Review Committee
P. O. Box 342 - 0100, Thika

Dr. Alfred Owino, PhD
Chairman, Mount Kenya University ISERC

Main Campus, General Kago Road, P.O. Box 342-01000 Thika.
Cell: +254 709 153 000 / +254 709 153 200
Email: info@mku.ac.ke, Web: www.mku.ac.ke
Chartered and ISO 9001 : 2015 Certified Institution.
Unlocking Infinite Possibilities

Appendix 5: Introduction Letter



Mount Kenya University

DIRECTORATE OF GRADUATE STUDIES

MCHD/2022/49374

17th October 2023

National Commission for Science Technology & Innovation (NACOSTI)
Off Waiyaki Way, Upper Kabete,
P.O Box 30623- 00100
NAIROBI, KENYA

Dear Sir/Madam,

RE: PATRICK KIPTINDE CHESEREK – REGISTRATION NO. MCHD/2022/49374

The purpose of this letter is to introduce the above named student who is pursuing **Master of Community Health and Development** in the department of **Community Health, Epidemiology and Biostatistics** in the school of **Public Health.**

The title of the research is **"Utilization of Latrine and Associated Factors Among Rural Community in Marakwet East Sub-County, Elgeyo Marakwet County, Kenya."** It has been cleared by the University's Ethics Review Committee (Certificate attached) and now has to proceed to the field to collect data between **October, 2023 and December, 2023.**

Any assistance accorded to the student will be highly appreciated.

Thank you.

Mount Kenya University
P.O. Box 342 - 01000, THIKA
Office of the Director,
Graduate Studies

Dr. Samuel M. Karanja, PhD
Director, Graduate Studies
Enc.

Main Campus, General Kago Road, P.O. Box 342-01000 Thika.
Cell: +254 709 153 000 / +254 709 153 200
Email: info@mku.ac.ke, Web: www.mku.ac.ke
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Appendix 6: Research License

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Ref No: 961791

Date of Issue: 31/October/2023

RESEARCH LICENSE

This is to Certify that Mr.. PATRICK KIPTINDE CHESEREK of Mount Kenya University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Elgeyo-Marakwet on the topic: UTILIZATION OF LATRINE AND ASSOCIATED FACTORS AMONG RURAL COMMUNITY IN MARAKWET EAST SUB COUNTY, ELGEYO MARAKWET COUNTY, KENYA for the period ending : 31/October/2024.

License No: NACOSTI/P/23/30878

961791

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

See overleaf for conditions

Appendix 7: Research Authorization

OFFICE OF THE PRESIDENT
MINISTRY OF INTERIOR AND NATIONAL ADMINISTRATION
State Department for Internal Security and National Administration

COUNTY COMMISSIONER'S OFFICE,
ELGEYO-MARAKWET COUNTY,
P.O. BOX 200-30700
ITEN

Telephone: (053) 42007
Fax : (053) 42289
E-mail: ccelgeyomarakwet@yahoo.com
ccelgeyomarakwet@gmail.com
When replying please quote

Ref.....PUB.CC.24/2 VOL.III/187 Date: 2nd November, 2023

TO WHOM IT MAY CONCERN

RE: RESEARCH AUTHORIZATION

PATRICK KIPTINDE CHESEREK.

This is to confirm that the above named has been authorized to carry out a research on "UTILIZATION OF LATRINE AND ASSOCIATED FACTORS AMONG RURAL COMMUNITY IN MARAKWET EAST SUB COUNTY, ELGEYO MARAKWET COUNTY, KENYA." for the period ending 31st October 2024.

Please accord him the necessary assistance.

Adrine Nyaoke
For: County Commissioner
ELGEYO MARAKWET COUNTY.

CC,

Deputy county commissioner
Marakwet East Sub County

Appendix 8: Thesis Paper Plagiarism Report

submission

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University

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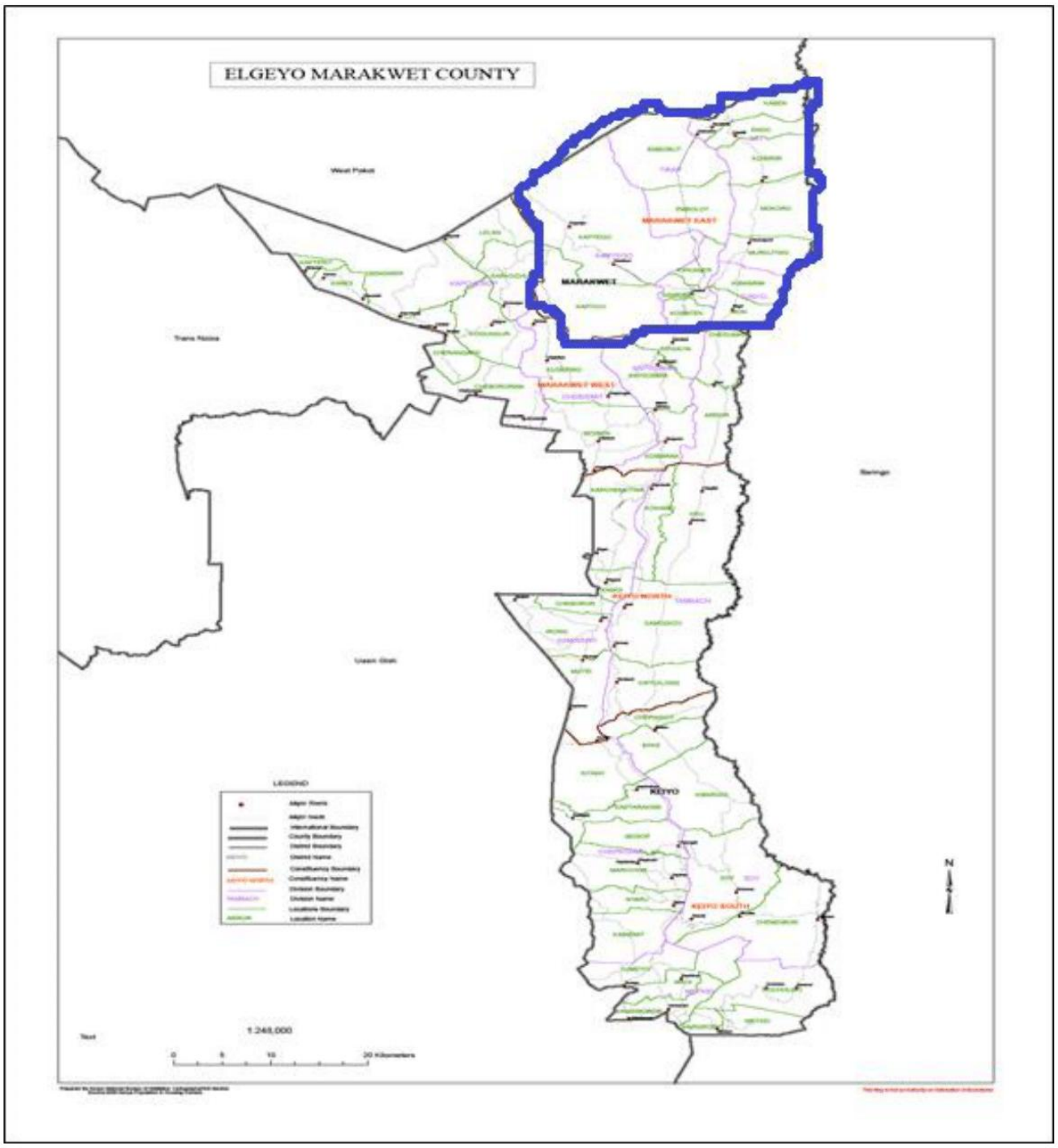
A Flag is not necessarily an indicator of a problem. However, we'd recommend you focus your attention there for further review.

Appendix 9: Elgeyo Marakwet County Map Showing the Study Area



Appendix 10: Diarrheal cases

Elgeyo Marakwet County lists diarrheal cases as its third most prevalent disease in Marakwet East Sub County. Among the four sub-counties, Marakwet East had the highest number of diarrheal cases, averaging 14,418 for the last three years (KHIS, 2022).

Table 1.1: Diarrhea per Sub County. Source: (KHIS, 2022)

County/Sub County	HHs	Total pop.	Diarrheal cases			Total
			2019	2020	2021	
K/ North S C.	20,558	109,794	8,172	5,724	5,131	19,027 (14%)
K/ South S C.	30,442	133,382	16,215	9,111	8,785	34,111 (25%)
M/ East S C.	21,962	107,569	18,021	11,714	13,523	43,258 (31%)
M/ West S C.	30,224	152,274	18,777	11,117	12,254	42,148 (30%)
E/Marakwet C.	103,186	503,019	61,185	37,666	39,693	138,544 (100%)