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CURBING OPEN DEFECATION IN THE KEEA MUNICIPALITY IN THE CENTRAL REGION

BY

CLIFFORD SEMABIAH

(10351414)

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DEDICATION

I dedicate this work to my father; Patrick Semabiah, my mum; Dela Agbenyegah and my uncle, Dorlewodzi Samuel, for their love, support, and encouragement. Without you people, this journey would not have been possible. You people have been my inspiration.

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ABSTRACT

Unimproved sanitation such as open defecation practices has been a major sanitation problem in Ghana. The practice has been alarming due to the threat it poses to human health. Therefore, it has become an area of concern in the KEEA municipality since a lot of households do not have household toilet facilities. Addressing the unimproved sanitation practices to ensure a resilient community require comprehensive understanding of all underlying determinants of open defecation practices and factors that trigger the adoption of household toilet facilities. The study employed a mixed-method approach to explore means of curbing open defecation practices in the KEEA municipality. Specifically, the study investigated how the spatial distribution of public toilets influence the facility's usage, the socio-demographic predictors of open defecation, and the triggers for adopting a household toilet facility. A total of 373 respondents were used for the study; 320 household heads for the questionnaire survey, 42 focused group discussants, and 11 in-depth interviewees. The findings revealed that the most commonplace of attending nature's call is the public toilet. Spatial distribution of these public toilets do not influence the facility's usage irrespective of the unkempt status. The results also showed that females are more likely to open defecate as compared to males; those between 50-60 years are also likely to open defecate. Education and income status are also significant determinants of open defecation practices. Religion and ethnicity are, however, insignificant in predicting open defecation practices in the study area. Adoption of household toilet facility is also likely to be triggered by prestige, health and economic drivers. However, these drivers (excluding the economic driver), are influenced by marital status, education level and income status. Both short term and long term recommendations were suggested to curb open defecation practices. The study further calls for enactment of policy documents to safeguard tenets to invest in constructing their household toilet facility while sanitation.

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CHAPTER ONE

BACKGROUND AND GENERAL INTRODUCTION TO THE STUDY

1.1 Introduction

The last two centuries undeniably have realised an accelerated urban growth and urban concentration as more than half of the world's population now live in cities. According to World Urbanisation Prospect-WUP (2018), most population growth will take place in urban agglomerations for the next 30 years. The data showed that currently, urban areas have more people than rural areas. In 2018, about 55 per cent of the world's population was urbanised. It was also projected by WUP (2018), that by 2050, the urbanised population would account for 68 per cent of the world's population. There is an expectation that this growth will be very rapid in developing countries where some cites are expected to grow faster to absorb the rapidly increasing population (UNDP, 2014).

Urbanisation and population growth breed opportunity, but paradoxically, it also possesses environmental and humanitarian challenges (Cali, 2008; UN-Habitat, 2014). Unlike the Western world where urbanisation and economic development converge, developing countries are characterised by urban growth that is not accompanied by economic development. In Sub-Saharan Africa, this trend was called demographic urbanisation rather than economic urbanisation (see, for example, Songsore, 2009; UN-Habitat, 2014; Freire, Lall & Leipziger, 2014; Turok, 2016). For instance, the high population density of urban settlement bring challenges such as water scarcity, sanitation problems such as waste disposal, unplanned settlements which create slums and inadequate toilet facilities which exacerbate open defecation practices.

These urban dynamics and associated challenges are also the same in Ghana. Urban population in Ghana accounted for 55.3 per cent of the total population in 2017 with 3.07 per cent annual growth rates (CIA World Factbook, 2017). According to Oteng-Ababio *et al.* (2019), it was expected that the various urban centres would follow the footprints of their predecessors by absorbing the expected population growth together with the opportunities and challenges they present. Since we expect our communities to assimilate the ever-increasing population, we also hope that the communities will take advantage of the numerous opportunities that population growth present and be resilient to overcome the various challenges associated with population growth.

There is evidence that the global sanitation crisis persist in the developing countries despite fifteen years of global efforts into the framework established by the Millenium Development Goals (MDGs) (Hawthorne, 2017; UN-Water, 2008). The main target of Goal 7 was to ensure improved sanitation coverage. This Goal had a strong link to issues such as the environment and public health, economy and human dignity. However, this Goal was somehow never fully met (McMicheal, 2018). Hence, there was a need to further toughen-up measures to make the goal a reality and not a mirage. The goal was captured by Goal 6 of the Sustainable Development Goals (SDGs) to ensure that everyone is provided with adequate and equitable sanitation to end open defecation by 2030. However, according to the Joint Monitoring Program (JMP) (2019), 673 million people still practise open defecation.

WHO & UNICEF (2008) defined sanitation as the provision of facilities and services for the safe disposal and management of human faeces and urine. Mensah (2002) also added that sanitation is the state of cleanliness of a place, community or people. Here, he relates it to those aspects of human health, including the quality of life determined by physical, biological, social and

psychological factors in the environment. Additionally, Schertenleib *et al.* (2002) see sanitation as measures put in place to reduce people's exposure to diseases by providing clean living environment, with measures to break the cycle of disease. It is imperative to stress that diseases spread due to improper disposal and waste management, although access to improved sanitation facilities is likely to reduce the incidence of sanitation-related diseases.

Traditionally, sanitation has not received the priority it deserves (Mariwah 2018; Black & Fawcett, 2008). Increased investments in sanitation and hygiene promotion are required not only to realise the health and welfare benefits of sanitation but also to avert large economic losses (Mariwah, 2018). We expect our communities to be resilient against improper sanitation behaviours and at the same time, promoting and assimilating hygienic and healthy sanitation practices.

Therefore, identifying the causes of these unsafe conditions within the communities will aid in attempts to control such risks. Although major towns in the Komenda Edina Eguafo Abream (KEEA) Municipality are experiencing high population growth with the associated risks; can these settlements be made resilient? Is it possible to control open defecation to improve the resilience of these settlements?

1.2 Problem Statement

Poor sanitation is a major problem in many developing countries (Novotny *et al.*, 2017; Cordeiro Ortigara *et al.*, 2018). Despite global efforts into the Millennium Development Goals (MDGs) and the Sustainable Development Goals (SDGs) to curb open defecation, 673 million still defecate in the open (JMP, 2019). By the end of the MDGs era (2000 to 2015), open defecation in sub-Saharan Africa had increased from 204 million to 220 million people as a result of

population growth (JMP, 2017; World Bank, 2015). In 2012, due to inadequate sanitation, open defecation cost the poorest countries about $260 billion (Hutton & WHO, 2012) and an estimated loss of US$222.9 billion in 2015 (Lixil/Oxford economics/WaterAid, 2016). Moreover, about 842,000 people die each year from diarrhoea and other causes associated with inadequate sanitation in low- and middle-income countries, with the highest-burden on children under five years of age (WHO, 2018). However, the impact on people's health is far-reaching and is generally not discussed (George-Zapo, 2018). According to Abubakar (2018), eliminating open defecation, which is a component of poor sanitation, is critical to ensure community resilience.

According to WHO and UNICEF (2015) report, Ghana, like other countries in Sub Sahara Africa has had difficulty making significant progress in this area. There was only a 6 to 15 per cent increase in access to basic sanitation during the 15-year MDGs period. The country was ranked second after Sudan in African for countries practising open defecation (WHO & UNICEF, 2015). Currently, open defecation practices in Ghana are 22 per cent, where 11 per cent are in the urban centres, and 31 per cent been in the rural settlement (GSS, 2018). This signifies that about 6.6 million Ghanaians do not have access to any toilet facility. Moreover, JMP (2019) reported that 19 per cent of all households and 60 per cent of communities in Ghana practice open defecation. According to WHO & UNICEF (2017), Ghana lose averagely, 70 million dollars annually due to open defecation. In 2014 cholera outbreak, the Ghana Health Service (GHS) registered more than 28,975 cases,243 deaths with cases identified in the ten regions of Ghana, and 130 out of the 216 districts. Greater Accra reported the highest number of cases followed by Central Region (GHS, 2015). In 2016, 787 new cholera cases were also reported by the Ghana

Health Service (GHS, 2017). According to Kosoe & Osumanu (2018), children less than five years are the most affected.

One of the municipalities exhibiting this practice is the Komenda Edina Eguafo Abream (K.E.E.A) Municipality. Data from the 2010 Population and Housing Census showed that the population uses five main types of toilet facilities in the KEEA municipality. These are; public toilet (52.5 %), water closet (9.8 %), pit latrine (9.6 %), K.V.I.P (8.3 %), and bucket / pan latrine (0.5 %) (GSS, 2012). Inferences from the data show that 19 per cent of the population have no toilet facility and resort to the use of bushes, beaches, and open fields. The 19 per cent open defecation could be higher because the majority (52.5 %) of the population use public toilet. Studies have shown that high reliance on public toilet increases open defecation practices as a result of the unkempt status of public toilets and other socio-cultural perceptions of using public toilets. For instance, a study by Obeng *et al.* (2015a), revealed that high reliance on public toilets accounts for high open defecation practices in the country. Also, Peprah *et al.* (2015), stated that the status of many public toilets across the country are in questionable state.

There has been a nation-wide call to halt open defecation as the evidence as mentioned earlier, suggests that the impacts of the practice adversely affect societies. According to Guha-Sapir *et al.* (2014), if open defecation is uncontrolled, the practice may continue to increase since it has a relationship with population growth. Coffey *et al.* (2017:1) realised that open defecation is among the most captivating examples of how places influence health, especially in developing countries. According to GSS (2012), the relatively high proportion of dwellings without toilet facilities in the municipality also support the poverty-stricken nature of KEEA. The practice has negatively affected tourism, salt mining and fishing activities (Mensah, & Enu-Kwesi, 2019). In 2014, the municipality was one of the two municipalities in the country to suffer from cholera

outbreak with a high case fatality rate of 18.8 per cent (Ohene, Klenyuie, & Sarpeh, 2016). Residents in the municipality have resisted efforts to curb the practice and as such, the Central Regional Minister calling for a robust approach to control the practice (Nyako, 2018). There was an arrest of 40 open defecators by a sanitation task forces which was set-up by the municipal. However, these task forces have frequently been attacked with machete, sticks and stones by residents (Baah-Acheamfour, 2018).

Behaviour change in terms of sanitation practices is vital to ensure a resilient community. However, very often, we do not know what factors account for people's behaviour or which drivers play an essential role in their defecatory behavioural choices. The question such as (1) what socio-demographic; cultural and geographical or physical factors influence the consistent usage of toilet facilities?, (2) how spatial distribution and accessibility of public toilet influence peoples defecatory behaviours?, (3) why there has been a high resistance to the fight of ending open defecation in the municipality have remained unanswered. Hutton & Chase (2016) has opined that as the world enters the post-2015 era, there is the need to better understand the challenges the world faces in meeting the universal access to sanitation facilities. Taking into account the current sanitation coverage in the KEEA Municipality and the ambitious Goal 6 of the SDGs, it is necessary to explore the factors behind the low sanitation coverage, if the ambitious goal of the SDGs are to be achieved by 2030.

Open defecation has generated tremendous research interest in developing counties. For instance, in Nigeria, Abubakar (2018) looked at determinants of open defecation. Abubakar (2017) also researched on access to sanitation facilities among households in Nigeria. In Asia, Coffey (2014), studied on latrine adoption and ownership in India. Surya *et al.* (2017) also looked at what determines toilet usage. In Ghana, Obeng *et al.* (2015a) investigated the determinants of

toilet usage. Obeng *et al.* (2015b) also looked at latrine adoption and ownership. Allotey (2012), focused his study on the barriers of waste disposal while Peprah *et al*. (2015) paid particular attention to the public toilet and their customers. Mansour, (2017) also researched about the status of urban sanitation in Ghana while Osumanu *et al.* (2019) also focused on socio-cultural and economic characteristics of households to determine open defecation practices in Wa. Furthermore, Crocker *et al.* (2017) also did a comparative study between Ghana and Ethiopia in terms of sanitation practices.

Majority of these studies were on the provision of toilet facility while a few studies focused on demand-side factors (Novotny, 2017; Abubakar, 2018) which talk about the adoption of toilet facilities and the different social, cultural and environmental constraints of their consistent usage. In KEEA, except for Mensah, & Enu-Kwesi, (2019) who researched on implications of environmental sanitation management around Benya Lagoon catchment area for sustainable livelihoods in Elmina, little attention has been given to spatial distribution and accessibility of toilet facilities in the study area. Also, there is limited focus on the drivers that will motivate an individual to adopt a household toilet facility and the socio-demographic predictors of open defecation practices. Therefore, spatial distribution and accessibility of toilet facility, socio-demographic predictors of open defecation, and drivers of latrine adoption are the cruces of this research. Exploring this identified gap will give further understanding of what constraints and facilitate the switch from open defecation to using toilet facilities in the KEEA. When these drivers are identified, the necessary measures and policies can be undertaken as a breakthrough to ensure resilience.

This study explored the perceptions of open defecation and the motivational drivers for adopting a toilet facility. To fulfil the purpose of this research, a mix method research strategy was used to survey household heads, local and traditional authorities in the KEEA Municipality.

1.3 Objectives

The general objective of the study was to explore how to ensure a resilient community by curbing open defecation in the KEEA Municipality. Specifically, the study sought;

a. To map-out the spatial distribution of public toilets among the selected communities in KEEA.
b. To analyse the spatial accessibility of public toilets in the study area
c. To determine the socio-demographic factors that determine open defecation practices in the selected communities
d. To determine the drivers of latrine adoption and analyse the association that socio-demographic factors have on the drivers.

1.4 Research Questions

To be able to measure the objectives of the study, this study sought answers to the following questions;

a. What influence do socio-demographic factors have on the availability of household toilet facility?
b. What are the preferences of users and non-users of toilet facility in K.E.E.A?
c. Which factors limits households from building household toilet facility?
d. Which factors renders public toilet facilities inaccessible to users?
e. How does the spatial distribution of public toilets influences open defecation practices?

f. What influences do socio-demographic factors have on drivers of latrine adoption?

1.5 Hypothesis

The assumption that guided the study were;

a. Null Hypothesis (H_o): There is no significant relationship between socio-demographic statuses such as age, sex, marital status, education, religion, household size and income and open defecation behaviours.

   Alternate Hypothesis (H_A): There is a significant relationship between socio-demographic statuses such as age, sex, marital status, education, religion, household size and income and open defecation behaviours.

b. Null Hypothesis (H_o): There is no significant relationship between people's open defecation behaviours and their proximity to a public toilet facility.

   Alternate Hypothesis ($H_{A)}$: There is a significant relationship between people's open defecation behaviours and their proximity to a public toilet facility.

1.6. Significance of the Study

Open defecation has generated tremendous research interest because of its impact on global health. Open defecation practices are regarded as unimproved sanitation by WHO (2014). While the availability of toilet facilities does not guarantee the consistent usage of the facility, the unavailability of the toilet facility also encourages indiscriminate disposal of faeces such as defecating in open spaces like beaches, bushes etc. This practice significantly contributes to the spread of diseases. To achieve the universal sanitation target of the sustainable development goals, there is the need to intensify the efforts to end open defecation.

Most urban areas feature in sanitation research because of population increase and its attended problems. Therefore, understanding the various risk of practising open defecation will aid in the efforts to curb the practice and as well, build resilient settlements. The reasons being that attempts have been made locally, nationally and internationally to curb open defecation. However, the practice continues to be a major challenge in developing countries, especially in Sub-Sahara Africa. This study therefore explored and brought to light, the reasons why the various attempts of ending open defecation are taking a slower pace than expected.

This research will inform policy decisions in terms of efficient and suitable distribution and location of toilet facilities and their accessibility. Additionally, this study will add to the knowledge of people's sanitation and defecatory behaviours and preferences. It is also expected that the study will serve as a reference for other future studies on sanitation and open defecation studies.

1.7. Organisation of the Thesis

Chronologically, this thesis was organised into five chapters. The first chapter provided the background information to the search topic and the problems the study identified and sought to solve them. The chapter also includes the objectives and the research questions as well as the hypothesis the study tested. The chapter ended with the significance of the research and how the study was organised.

Chapter two embodies the reviewed literature about the study topic, objectives and the hypotheses. The chapter also included the theoretical frameworks and the conceptual theory adapted for the study.

Chapter three contains the study area and methodology adapted to attain the research goals. The chapter specifically touched on the study area, the research paradigm adapted and their

philosophical underpinnings, the data collection methods, sampling technique, sampling size, data sources and research instruments. It also highlights on method and tools used for data analysis and how results were presented.

Chapter four embodies presentation of results, analysis and discussion of the study objectives. Chapter five gave a summary of the entire study as well as various conclusions drawn from the study, followed by recommendations based on the outcome of the study.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

The introductory remarks in chapter one revealed that open defecation practices have generated tremendous research interest since the practice is a threat to economic development in developing counties. This chapter reviews some of the empirical studies relevant to this present study. The chapter begins by explaining the meaning of open defecation vis-à-vis sanitation practices. This is followed by a review on some of the risk associated with open defecation practices. Moreover, the chapter also captured the history of sanitation practices and sanitation policies in Ghana. The chapter further reviews determinants of open defecation practices as well as the drivers of toilet facility adoption. The concluding part of the chapter discussed the FOAM framework for the study and how the study was conceptualised.

2.2. Understanding Open Defecation vis-a-vis Sanitation Practices

Open defecation is a practice of defecating outside and not into a designated toilet (WHO & UNICEF, 2014), and it falls under the broader perspective of sanitation. UNICEF defined sanitation as a process whereby people demand, effect, and sustains a hygienic and healthy environment by creating barriers to check the transmission of disease agents (UNICEF, 1997). Currently, sanitation is defined as access to and use of facilities and services for the safe disposal of human urine and faeces (WHO 2018).

For monitoring purposes, the JMP (2014) which is a Joint Programme by WHO and UNICEF to monitor the water and sanitation targets of the SDGs, categorised sanitation into two; improved and unimproved sanitation facilities. The JMP (2014) defined improved sanitation as a facility that hygienically separates human excreta from human contacts. According to the JMP (2014),

improved sanitation includes facilities such as flush toilet, piped sewer system, septic tank, flush/pour flush to pit latrines with a slab, ventilated improved pit latrine (VIP) and composting toilet. The JMP also regarded unimproved sanitation as a type of facility that does not prevent human contact with excreta. Examples of facilities under this category include pit latrine without a slap, public or shared toilet, flush / pour flush to elsewhere (not into a pit, septic tank, or sewer), pit latrine without a slab, bucket latrines, hanging toilet, and no facilities/bush/field (open defecation). Open defecation falls into the category of unimproved sanitation.

According to the JMP (2014), in terms of global initiatives on sanitation, water-related interventions dominated while little attention was given to unimproved sanitation practices such as open defecation. The nature of the problem itselfmakes it an unpopular subject that people prefer to avoid, as some have argued (Srinivas, 2002). According to Bohman (2010), till the 1980s, donors such as the Bretton Woods Institution regarded investment in sanitation as social investment, which is unrewarding and uneconomic. This was tantamount to the core pillars of the Structural Adjustment Programs (SAPs) which called for member countries to withdraw investment in the health or sanitation sector. The World Bank stated that investment in the health sector does not yield any profit (World Bank, 1972). Sanitation was only added to the MDGs, following lobbying at the 2002 World Summit on Sustainable Development in Johannesburg (Black & Fawcett, 2008).

In 2013, the World Toilet Day was celebrated as an official UN day for the first time (UN, 2014). The term ‘open defecation’ was used in high-level speeches that helped to draw global attention to the issue. The then UN Deputy Secretary-General Jan Eliasson powerfully made a case for addressing open defecation, saying: "I am moved by the fact that a child dies every two and a half minutes from diseases linked to open defecation. Those are silent deaths – not reported

by the media, and not a subject of public debate. Let's not remain silent any longer" (UN, 2014). He further added that, if we could end open defecation in just ten countries, we would see the number of affected people drop by 80 per cent. If we end open defecation, we would see a direct reduction of 36 per cent of deaths due to diarrhea on children under 5, with the consequences of improved sanitation reaching even further" (UN, 2014). The then UN Secretary-General regarded sanitation is a sensitive issue'. The urgency of this issue is so great that consideration has been made to eradicate open defecation (OD) as a separate UN development goal for the period 2015-2030 (Mollins, 2012).

A study by Osumanu *et al.* (2019) in the Wa municipality of Ghana identified 'cat method, flying methods, and free-range' as the three main types of open defecation practices. According to the authors, the cat method is where defecators dig holes on the ground to either defecate or bury their excreta. They emphasised that this method is prevalent in rural communities. They also explained that flying method which involves defecating in polythene bags and throwing or disposing it at open spaces or refuse dumps is not only prevalent in the urban and peri-urban settlement but also rural communities. The authors also explained that the fly method is mainly practised at night and disposed of early morning. The free-range method, according to the authors, involves the practice of defecating in open space like the beach, bush, refuse dumpsite, uncompleted buildings, etc.

2.3. Risks of Open Defecation Practices

Several studies by Liu *et al.* (2012), Pickering *et al.* (2012), Baker *et al.* (2016), and WHO (2018) have shown that open defecation practices pose severe threat to human health, most notably in developing countries. According to WHO (2018), open defecation perpetuates a vicious cycle of disease and poverty. According to WHO (2018), unimproved sanitation such as

open defecation is linked to transmission of diseases such as cholera, diarrhea, dysentery, hepatitis A, typhoid and polio and exacerbates stunted growth. The WHO (2018) reported that in countries where open defecation is widespread, such countries have the highest number of deaths of children under-5 years as well as the highest levels of malnutrition and poverty. A study by Pickering *et al.* (2012) opined that open defecation practices in sub-Saharan Africa expose faecal pathogens into the environment.

Unimproved sanitation, according to WHO (2018), is estimated to cause 432 000 diarrhea and cholera deaths annually**.** Despite significant progress over the past 20 years, the diarrhea disease remains the second leading cause of death among African children and the third leading cause of child deaths worldwide (Liu *et al.,* 2012). The frequent occurrence of diarrhea in childhood is associated with increased stunting and an increased likelihood of pneumonia infection. This increases child mortality as well as having a long-term effect on the child's development and nutritional status (WHO, 2018; Dangour *et al.,* 2013; Spears *et al.,* 2013). A study on a cholera outbreak in Tanzania by Acosta *et al.* (2001) established that household members practising open defecation were 11.4 times more vulnerable to contract cholera than household members with toilet facility. Baker *et al.* (2016) identified from their study in seven countries in Asia and Africa that children practising open defecation were highly likely to contract diarrhea than those households using latrines.

A study by Asoalu *et al.* (2002) in rural Nigeria, found that Ascaris disease is 1.35 times more likely to be contracted by households practising open defecation than those who use pit latrines for defecation. The authors added that such open defecators have a 2.86 higher disease incidence as compared to those who use flush toilets for defecation. According to DPD, (2004) cited in Stenstrom *et al.* (2011), Ascaris is a parasitic worm which can infect small intestine of humans,

causing abdominal pains, slower growth, and breathing problems. Animals such as pigs can also spread this infection to humans.

Studies by Polack *et al.* (2005) and Rotondo *et al.* (2009) in Niger, Ghana, Mali, and Nigeria also observed that open defecation practices cause trachoma which is the leading causes of blindness. Emerson *et al.* (2004) explained the mode of transmission. The authors explained that the trachoma vector, Musca sorbens, which is an eye-seeking fly, spread the infection by contacting ocular discharge from infected people. The authors suggested that the Musca sorbens only breeds in human faeces which are left exposed on the ground. Hence, reducing their breeding places will be very useful in reducing the fly population. The authors emphasised that the transmission of the trachoma can be reduced through adoption and usage of toilet facility, which will reduce the fly population.

Furthermore, open defecation practices have been identified to contaminate soils with microbes, and helminthic eggs from faeces of infected defecators, and these eggs may remain in the soil for a very long time (WRC, 2014). Consequently, such soil poses the risk of helminthic infections when consumed; a practice, popularly known as geophagia. According to Steiner-Asiedu *et al.* (2016), this practice is common among several cultures in Ghana, and also common in South Africa, as stated by Woywodt & Kiss (2002) . In Ghana, the consumption of such non-food substances is called ‘‘ehyire’’ by the Akans; ‘‘fefe’’ by the Ewes; ‘’ayilo’’by the ‘Gas’ and ‘’ farankese’’ by the Northerners (Steiner-Asiedu et al. (2016).

Another infection is Hepatitis A which can be acquired through the practice of open defecation as a result of faecal-oral transmission and geophagia. According to CPWR (2012) cited in WRC, (2014), the disease causes liver problems with symptoms such as abdominal pains, nausea, tiredness and jaundice.

Another risk associated with open defecation practice is Dysentery Syndrome (Stephenson *et al.* 2000). According to the authors, Dysentery Syndrome causes long-lasting dysentery, anaemia, rectal prolapse, clubbing of the fingers and poor growth. The authors added that such infections which result in cognitive and development deficiency might be incurable unless there is a psychosocial intervention.

It has also been identified that the effects of open defecation practices are gendered. According to O'Reilly (2016), women tend to be more affected than men. A study by Padhi *et al.* (2015) observed that poor sanitation practices such as open defecation could result in adverse pregnancy outcome (APO). The authors attributed the APO to the exposure of pregnant women to disease and bacterial infections as well as stress during pregnancy. Campbell, (2015) replicated the same study, and he added that women who practice open defecation are more likely than those who used latrine to experience APO, including preterm birth and low birth weight. O'Reilly (2016) further added that lack of toilet facility poses a daunting task on pregnant women since pregnancy results in less mobility, frequent urination and constipation and practising open defecation which involves squatting is a vulnerable physical position.

In addition to the gender dynamics of the effects of open defecation practices, women and girls living in low-income communities are faced with the fear of violence, harassment and other psychosocial stress (Winter *et al.*, 2018; O'Reilly 2016; Corburn & Karanja 2016). According to Khanna & Das, (2016), Sahoo *et al.* (2015) and UNESCO (2014), in schools or homes where there are no decent toilet facilities, girls become embarrassed and uncomfortable as they are exposed to any form of physical and verbal threats. UNESCO (2014) concluded that, during their menstrual periods, they miss a class or drop out, especially in sub-Sahara Africa, where about ten in a hundred girls miss a class during their menstrual periods. O'Reilly (2016) and Alhassan &

Anyarayor (2018) further opined that toilet insecurity is even worse in communities in which family honour is embodied in women or girls. According to the author, in such societies, leaving the house to open defecate results in repercussions in the form of sexual attack or rape, and forced marriage. O'Reilly (2016) further added that to cope with such circumstances, most female students refrain from eating and drinking during the day, making it difficult for them to concentrate in class.

It can therefore, be concluded that, per the above risks associated with open defecation practices, adoption and usage of improved sanitation facilities which hygienically prevent human contact with excreta will undoubtedly help to control open defecation practices. Controlling the practices will help to overcome the challenges that the practice poses to the economy and on human dignity.

2.4. History of Sanitation Practices in Ghana

2.4.1. Pre-colonial and colonial period

To have a clear understanding of the present, one needs to trace it to its historical perspectives (Burgar, 1975). Therefore, it is worth exploring Ghana's present sanitation problems historically, starting from the colonial era till present. Before the colonial era, towns such as Cape Coast, Accra, and Kumasi had pit latrines.

There was also a history of provision of sanitation facility during the colonial period. Such periods (before and during colonisation) were characterised by unimproved sanitation practices such as open defecation (Addae, 1996). This necessitated for a safer place to defecate or to dispose off human excreta. Traditional pit latrines, were then built at the outskirts of communities, especially in Cape Coast, which was the then Capital of Gold Coast, present-day Ghana (Ackun, 2015). The author added that the construction was through communal labour

with indigenous knowledge and materials such as mud, slabs, and wood. When the old pit latrine gets filled-up, new ones are constructed, and the old ones are covered with some of the old materials being re-used for the newly constructed ones.

The issue of sanitation attracted more attention as a result of the outbreak of bubonic plague in 1908 in Accra, which killed 127 people (Petterson, 1979). This marked the genesis of the focus on sanitation by the colonial government. As a result, a British medical professor; Simpson, was sent by the Colonial Office to visit Freetown, Accra and Lagos as well as some small but vital trading centres in West Africa Colonies; ‘‘to assess the existing situation about sanitation and health’’(Bohman, 2010:62). In his assessment of the situation in Accra, he remarked that the Town Council have failed in its role as a sanitation board. He recommended that the supply of water and sanitary administration should be taken upon by the colonial government for properly focused attention (Simpson 1909; cited in Agyei-Mensah *et al.*, 2010). Before this, in Gold Coast, such responsibility was vested in the Accra Municipal Council in 1896, but the Council failed in such endeavour (Petterson, 1979).

Bohman (2010) further emphasised that before that period, most towns which were developed, had insufficient household toilets. This resulted in high dependence on manually emptied pan latrine. Additionally, there were pressure on the few septic tanks available, and most of them did not function (Petterson, 1979). This led to mass OD practices. Also, there were latrine construction plans by the Colonial Governor; Allan Burns, but such plans never materialised. For instance, between 1920 and 1922, the sewage system and flush system were introduced. However, such types of facilities were less adopted because they were perceived cost intensive (Petterson, 1979). As a result, the people preferred their old types of latrines even though they were uncomfortable with the bad stench and potential risks. In consonance with the then British

government sanitation policy, in the 1930s, public toilets (PTs) were constructed in Kumasi and Accra. The situation, as mentioned above, indicates that since the colonial period, inadequate sanitation infrastructure had been a challenge.

2.4.2. The post-colonial era

During the post-colonial era, the administration of sanitation was vested back in the municipal government. Ayee & Crook (2003) reported that between 1957 and 1983, about 68 per cent of Accra's population had no household toilets. Ackun (2015) added that during that period, the commonly used toilet facilities were public toilets. There were no levies charged for latrine usage, although personnel involved in collecting the faecal sludge to the treatment plants were paid. The early 1980s coincided with the inception of the Structural Adjustment Programmes (SAPs), and as such, the IMF disallowed the local government but the private entities to run the public toilets. According to Ayee & Crook (2003), in the mid-1980s, Accra had 384 PTs while 400 were constructed for Kumasi. According to the authors, the newly commissioned PTs were managed by the Committee for the Defence of the Revolution (CDRs). In contrast, others assumed the management of the existing ones and introduced user fees for the facility's proper management. However, these funds were diverted to other ventures, and this left the conditions of the PTs in deplorable states as they were handed over to the Metropolitan, Municipal and District Assemblies (MMDAs). Further efforts such as public-private partnership by the MMDAs to maintain the facilities failed (Ayee & Crook, 2003). This account for why people prefer OD to consistent usage of the provided PT facilities.

The rigorous decentralisation policy of 1989 reverted the management of the public toilets to the municipal government. They also stated that the various Sub-Metropolitan District Councils were charged with the management of the public toilets which contributed about 60 per cent of

the municipal's revenue. During such periods, the District Councils were denied commission returns on the fees, rates and property tax which have been collected on behalf of the Metropolitan Assembly (Ayee & Crook, 2003). Additionally, enough funds were not re-allocated for building new toilets and maintaining the old facilities as a result of the country's compliance with the SAP (Whittington *et al.*, 1993). It is important to stress that,usage of public toilet usage has evolved since the colonial era. Even before colonisation, towns such as Cape Coast, Accra, and Kumasi had pit latrines. However, because of population growth and its associated health hazards, the pit latrines usage became obsolete. This was followed by the introduction of household bucket latrines.

There have been numerous efforts to control OD practices as well as increase the usage of PTs. Among these include the introduction of Ventilated Improved Pit (VIP), Water Closet (WC), Aqua Privy, Kumasi Ventilated Improved Pit (KVIP), etc. However, these efforts did not receive the expected responses from the general public. For instance, a study in Kumasi by Whittington *et al.* (2003) cited in Ayee & Crook, (2003) to ascertain the popular attitudes to sanitation and the possible cost of sanitation improvements, they found that most poor households which depended on PTs were unwilling to pay for anything more than upgrading KVIP's for each dwelling and this even required further public subsidy. There was an agitation that PTs should be wiped out in favour of home-based toilets (Ayee & Crook, 2003). However, this did not materialise as there was an insufficient fund to pilot such programs. To a large extent, Ayee & Crook, (2003) stated that household-based toilets policy never happened due to the interest of using public toilets as a means to generate income by the local or the city government. This position was further bolstered up by King *et al.* (2001). They emphasised that poor households are not sufficiently interested in the privacy benefits of a household toilets facility and

willingness to pay anything. He further added that the best policy should have been the provision of more and better quality PTs.

Currently, about 55 per cent of the Ghanaian population do not have toilet facilities (JMP, 2017; GSS, 2018). Among the total population that live in urban centres, only 53 per cent have toilet facilities as compared to 65 per cent of those in rural centres and most of these facilities are shared (JMP, 2017). The GSS (2018) also estimated that there is only 21 per cent total access to basic sanitation. The rural areas had 17 per cent coverage, while the coverage in urban areas was 25 per cent (GSS, 2018). Moreover, at the household level, only one out of every five households have basic sanitation facility (GSS, 2018). The water sector over the years has realised tremendous access (79 %) to basic drinking water against the 21 per cent in the sanitation sector (GSS, 2018). This disparity is attributed to the fact most efforts were skewed towards the water sector. It is therefore not shocking that 22 per cent of Ghanaians still practise open defecation (GSS, 2018).

Table 2.1 shows open defecation practices in Ghana since 1990. Unimproved sanitation practices such as OD has been a problem for both current and past governments. Manifestos of successive government had captured issues on sanitation, but such promises turned into a mirage when they assumed political offices. A perfect example includes that of the National Democratic Congress (NDC) in 2004 which promised to increase latrine construction by providing materials as well as extending subsidies on latrine construction and to enforce district assemblies and committees' law on sanitation (NDC Manifesto, 2004, cited in Ackun, 2015). The NDC also promised full implementation of the Community-Led Total Sanitation (CLTS) strategy under the umbrella of the National Sanitation Authority (NDC Manifesto, 2004, cited in Ackun, 2015). The New Patriotic Party (NPP) in 2008 also promised to ensure the improvement of environmental

sanitation and enforcement of bye-laws (NPP Manifesto, 2008). According to Smith-Asante (2012), such promises were pushed down the scale of preferences on the various campaign platforms. Most of these promises were unfulfilled, although some efforts were made (MLGRD, 2011).

Table 2.1: Sanitation Coverage in Ghana since 1990

Year		**1990**	**2000**	**2010**	**2012**	**2015**	**2017**
Pop(million)		14,629	18,825	24,392	25,355	27,410	28,834
% Urban pop.		36	44	51	53	54	55
Improved (%)	**RURAL**	12	16	19	20	19	12
Shared (%)		44	59	73	57	66	38
Other unimproved		33	16	2	1	7	19
OD (%)		11	9	6	7	8	31
Improved (%)	**URBAN**	4	6	8	8	9	24
Shared (%)		20	31	43	44	45	60
Other unimproved		47	32	16	15	14	8
OD (%)		29	31	33	33	31	7
Improved (%)	**NATIONAL**	7	10	14	4	14	18
Shared (%)		19	43	58	59	57	50
Other unimproved		42	26	9	8	10	13
OD (%)		22	21	19	19	19	18

Source: Compiled from JMP series report on sanitation in Ghana.

2.5. Policy Framework of Sanitation in Ghana

In 1999, Ghana formulated the Environmental Sanitation Policy with the sole purpose of developing and maintaining a clean, safe and hygienic physical environment in all human settlements as well as promoting the socioeconomic and physical well-being of all aspect of the population (Republic of Ghana, 1999). This policy was embodied in Ghana's Vision 2020 document - The 2003 Ghana Poverty Reduction Strategy and the National Environmental Action

Plan for 1991 to 2000 (Ayee & Crook, 2003). Some of the core components of the policy included ‘‘the construction and maintenance of sanitation infrastructure and the provision of other public services’’ (Republic of Ghana, 1999). The policy also spelt-out the ‘‘collection and sanitary disposal of waste, which included human excreta, solid waste, liquid waste, industrial waste, clinical and other hazardous waste’’(Republic of Ghana, 1999). It was expected that if these services were provided reliably and regularly, then the negative impacts of unimproved sanitation on socioeconomic activities could be mitigated (Republic of Ghana, 1999). In the same year (1999), the National Sanitation Policy and the National Environmental Strategic Action Plan were formulated by EHSD. However, these policies and plans were dormant until it became active after its revision in 2009 as a measure to attain the sanitation target of the MDGs.

The key components of the revised sanitation policy (2010) seek to ‘‘(1) recognise the need to provide inclusive sanitation services, especially to protect the vulnerable; women, and children; (2) allocate responsibilities between ministries and local governments; (3) promote private sector participation and NGOs’ involvement in the delivery of sanitation services; (4) acknowledge the challenge of urban sanitation (including excreta management, referred to as ‘liquid waste’) and the lack of planning, and (5) make households responsible for financing their own household facilities’’ (MLGRD, 2010; Mansour & Esseku, 2017: 14).

In terms of the policy revision, the Environmental Health and Sanitation Division was upgraded into a Directorate (EHSD) of the Ministry of Local Government and Rural Development (MLGRD). At the same time, the National Environmental Sanitation Policy was also endorsed. The revised policy (MLGRD, 2010) emphasised the need to provide inclusive sanitation services as well as incorporating both the private sector participation and NGOs’ in the delivery of sanitation services. Although the policy acknowledged the various obstacles encountered by the

1999 policy in ensuring urban sanitation, yet, provision of household sanitation facility was considered as a responsibility of the household. Therefore, sanitation was perceived as a private good (Sijbesma, 2011). A review of the Action Plan by Appiah-Effah *et al.* (2019) showed that there was the need for continual usage of public toilet facilities for excreta management as well as a franchise system for managing the facilities.

The review of the Sanitation policy in 2010 necessitated the inception of the Community-Led Total Sanitation (CLTS), where households were expected to meet the full cost of sanitation hardware. These expectations were not met since households lacked the financial mechanisms to construct their household toilet facility (Appiah-Effah *et al.,* 2019). External donors such as UNICEF, WHO, DANIDA, EU, the Dutch Government and other local and international NGOs, for more than a decade, have been promoting the construction of household latrines through subsidies (DANIDA, 2010). However, according to Forson *et al.* (2015), aids from these donors have been reducing by half since 2013. Forecast by ADB/ OECD /UNDP (2016) showed that very soon, Ghana will move out of the International Development Assistance (IDA) member countries. Given the above, a Strategic Environmental Sanitation Investment Plan was enacted to address the above challenge. According to WSUP (2017), the Plan sought to provide a financial plan to avert any drawbacks of implementing the NESSAP. Also, funds from the DACF to the MMDAs intend to be increased from 7.5 per cent to 15 per cent so that the MMDAs could implement their sanitation policies. The Plan also proposed the establishment of a national revolving fund for household sanitation management by microfinance institutions.

Due to how critical the issue of sanitation has become, in 2017, the Ministry of Sanitation and Water Resources was created by the government to ensure nationwide improvement in access to basic and improved sanitation. In this regards, the government established ‘one house one toilet’

mantra. Prior to this, the Local Government Act (Act 462) includes by-laws that oblige landlords to provide toilets for their tenants, for which defaulters were to be prosecuted. Such directives were vital to achieving nationwide sanitation targets. However, such laws were rarely enforced and in instances where they were enforced, the process was slow to produce any significant result. Obstacles preventing landlords from providing their tenants with toilet facilities had to do with financial constraints, lack of technical supports, lack of space and poor soil conditions (Mansour & Esseku, 2017). Lawfully, while tenants can demand toilets from their landlords, issues such as fear of eviction by the landlords if they are reported, unwillingness to contribute to cost, and low priorities to attached toilet facility when choosing a rental property, prevent them frok doing so. All these problems both at the side of landlords and tenants were also compounded by the popularity of public toilet usage across the country (Mansour & Esseku, 2017).

Legislative interventions such as the Rent Control Law (1989) PNDCL 138 and amended by Law 163 all seem to put tenants in a safer side in terms of evictions and rental pricing. As a result, tenants could rightfully demand toilet facilities from their landlords. However, these laws are rarely enforced and this makes the situation dicey (Mansour & Esseku, 2017). Per the Reforms of the Ghana Rent Act (220) and the housing deficit in the country where housing demand exceeds supply, landlords are at an advantage.

2.6. Determinants of Open Defecation

2.6.1. Socio-demographic determinants

2.6.1.1 Material/ financial constraints.

Studies have shown that the feasibility and levels of adoption of household toilet facility are dependent on the socio-demographics of the household understudy. Studies by WHO and

UNICEF: JMP (2015) and Connell, (2014) found that the social and wealth status of household influences whether the household adopts a household toilet facility or not. The authors contended that usually, wealthier households which are more educated are more likely to adopt or use improved toilet facility unlike the low income and less educated households. The authors further added that low income and less educated households usually adopt and use unimproved types of toilet facility.

Other studies have demonstrated that, since wealthier households are not financially constrained, they are more likely to spend more of their income on the construction of their household toilet than low- income households. A study by Anand (1999) confirmed that higher income or wealthier households are more likely to spend more than 5 per cent of their income on faeces or excreta disposal whiles only 2-5 per cent of income is likely to be spent by low-income households. In agreement to Anand, (1999), Osmanu & Kosoe, (2013) added that financial constraints in terms of building improved toilet facility always present two major challenges. Firstly, it prevents household heads or owners to provide or construct a toilet facility. Secondly, it causes the unaffordability of levies charged by public toilet operators. These constraints were also confirmed in a study at Benin by Gross & Gunther (2014). Moreover, Novotny *et al.* (2018) and Jenkins & Scott (2007) also realised that affordability constraints such as lack of access to credit, inadequate finance or perceived cost of latrine and poverty, has been the barrier for household toilet construction.

Studies conducted by Joshi *et al.* (2011) and Robinson (2006) have opined that poor communities already know about good hygiene behaviours but lack the means and incentives to build or use the facilities. In that, using improved sanitation facility portrays good hygiene behaviours which avert the various risk that is associated with unimproved sanitation practices.

Such benefits are likely to be missed by poor or low-income households who are unlikely to invest in their household toilet facility.

In adition to financial constraints, studies have also shown that cultural perceptions have more substantial influence on latrines adoption than household socio-demographics. For instance, a study in India by Coffey *et al.* (2014) concluded that cultural installed perceptions about toilet facilities influence the adoption and usage of such facilities. The authors opined that culturally, building a household toilet is perceived as a luxurious asset. However, the ability to afford or access these luxurious toilet facilities depends on whether the facility can be afforded or not.

To overcome the issue of affordability, there has been subsidy driven global effort to aid households to afford household latrines. However, studies have shown that such interventions did not yield the expected outcomes. For instance, availability and access to loan or credit facility were highlighted as a significant factor that aided households to access and adopt the various types of quality toilet facility in Indonesia and Tanzania (Mukherjee *et al.*, 2012; WSP, 2009). On the contrary, studies by Lawrence *et al.* (2016), Coffey *et al.* (2014), Whaley & Webster (2011) and Shrestha *et al.* (2017), posited an adverse effect of subsidy- driven or hardware provision interventions on sanitation outcomes. This means that the extent to which financial and material constraints can be overcome by offering external support to boost the supply or usage of the toilet facility is yet to be established.

A study by Santos *et al.* (2011) in Brazil ranked the cost of toilet facility as the least determinant for latrine adoption. The authors suggested that attitudes and perceptions towards latrine usage, gender, age and number of children directly influence decisions to adopt and use a latrine. Additionally, a study by Banda *et al.* (2007) in rural India confirmed that open defecation is traditionally encouraged without any stigma attached. They emphasised that these people placed

less value on building a toilet facility although they could afford. Instead, they prefer to satisfy wants such as such buying televisions, mobile phones and weapons for protection.

Most at times, the desire to build or not to build a latrine is influenced by the various preferences that are attached to the building of the toilet facility amidst the unlimited human wants. Though resources might be available, the building of a household toilet depends on the priorities attached to it. Hence, irrespective of availability and non-availability of finance and material constraint, changes in behaviour and attitude in terms of consistent latrines usage and open defecation practice as well as valuing the building of toilet facility is paramount.

2.6.1.2. Sex.

Sex of a household is also considered to influence household ability to construct a household toilet. According to Gross & Gunther (2014), in Benin, a toilet facility is likely to be built in households headed by a female. This argument is further confirmed in Bangladesh in a study by Hanchett *et al.* (2011). The authors emphasised that women are more likely to use toilet facilities more frequently than men. Therefore, they are likely to construct their household toilet facility to avoid the stigma attached with open defecation practices by women. Studies by Robinson (2009) in Nigeria, Kema *et al.* (2012) in Tanzania, Pedhi *et al.* (2014) in Cambodia, and Shrestha *et al.* (2017) in Nepal, hold exception to the findings in Benin and Bangladesh. They reported worse sanitation outcomes in households headed by females. To explain the reason behind this contrast, Novotny *et al.* (2017) demonstrated that women are marginalised in terms of material and resource allocation and as a result, they are less likely to afford the cost of constructing the household toilet facility. Coffey *et al.* (2014) disagreed to the view of women being marginalised. They stressed that, because of the stigma and shame attached to open defecation practices by women, women turn to have a high propensity to adopt and use toilet

facility. Coffey *et al.* (2014) further added that even in households that have a toilet facility, men are more likely to practise open defecation than women. The authors also added that women tend to use toilet facilities more frequently than men. They emphasised that although women are least likely to have the intra-household power to allocate resources for building a toilet, their frequent need to use the facility will influence the household to construct the household toilet facility.

As a result, in Haryana state in India, there is a policy of ‘‘No Toilet, No Bride’’. According to Stopnitzky (2017), parents in this state always resist their daughters to be married into a home that does not have a toilet facility. This programme therefore, encourages women and their families to demand that the man has a household toilet or construct a household toilet before they consent to their daughter being married to the male suitor (Stopnitzky, 2017). Augsburg *et al.* (2015) had confirmed that it is more likely that a household invests in toilet construction if one male household member is close to the legal marriage age.

2.6.1.3 Age.

Age is also considered as a determinant factor for latrine adoption and usage. According to Coffey *et al.* (2014) and Routray *et al.* (2015), in India, there is high OD practices and low latrine adoption among older people. According to WHO (2018), the facilities may not be adequately accessible to intended users, particularly women and older people or people with disabilities. The study by Coffey *et al.* (2014) found that at all age categories, the likelihood to practice open defecation is higher for males than females. The authors found that open defecation decreases quickly in childhood and teenage years for young women with access to latrines than males. They however, found that open defecation practices increased with age for those within the adult age range, and these were attributed two factors. The first reason is the ability of older people to move around without restrictions. They related the second reason to the

fact that older people are members of earlier cohorts, born into earlier years when open defecation was even more common than it is today. For the aged age group, the authors emphasised that open defecation practices decrease since the mobility of people within this age is restricted.

The influence of age on sanitation uptake also varies across space. According to Gross & Gunther (2014), Pedhi *et al.* (2014),Kema *et al.* (2012) and Amin *et al.* (2011), there is a strong relationship between age and latrine ownership. The study in Benin by Gross & Gunther (2014) posited that age is a significant determinant of open defecation practices. In sub-Saharan Africa, as precautionary measures, children under the age of five are not allowed to use latrines for defecation. In rural communities, these children are allowed to defecate in chamber pots, refuse dumps or at the backyard.

2.6.1.4. Educational status.

Studies have established that levels of education influences sanitation practice. According to Dreibelbis *et al.* (2013) and Golden *et al.* (2012), the educational inclination can bring about an improvement in safe hygienic practices as well as practices that will integrate good health/hygienic behaviour with health-related information. In the same vein, Briceno *et al.* (2015) added that educated people mostly appreciate the benefits and positive effects of proper sanitation practices. This means that educational inclination lead to sustained healthy behaviour and practices. The influence of educational level on toilet adoption and open defecation practices was also investigated in Wa, Ghana, by Osumanu *et al* (2019). From this study; the authors found that, 65 per cent of uneducated household heads were likely to practise open defecation since they do not have a household toilet facility. Contrary to the uneducated, the authors found that about 18.5 per cent of educated households were less likely to open defecate. The authors

attributed this to the fact that there is higher knowledge on the effects of defecating openly and the need to build household toilet facilities among educated households. The authors opined that the ability of the educated household to adopt a toilet facility is because of the higher educational inclination which positioned such households within higher income groups where they can afford the cost of building household toilet facilities.

Further studies also showed that while open defecation is most likely to be practised by the uneducated, the opposite can also happen. According to the JMP (2014) report, there is an inverse relationship between open defecation practices and education status. Thus, with an increasing level of education, the percentage of people practising open defecation keeps decreasing. There is, however, a disparity in countries such as Cambodia, Ethiopia, Nepal (JMP, 2014). According to the report, about 34 per cent of the open defecators had attained secondary education status. For instance, Ethiopia had 9 per cent of its open defecators educated up to the tertiary or the university level.

2.6.1.5. Household size.

Household size is an important factor that influences household toilet adoption. However, the level of influence depends on the size of the household. A study in India by Augsburg *et al.* (2015) indicated that larger households would be more likely to own or construct a household toilet facility. According to the authors, larger household size means higher demand and usage of a toilet facility in a household. Earlier before, a study in the Amhara District of Ethiopia by O'Loughlin *et al.* (2006) established a similar relationship. According to O'Loughlin *et al.* (2006), for a household that does not have a toilet facility, those with larger household sizes of more than five members were more likely to adopt or use a toilet facility than smaller household sizes of less than five members.

However, other studies have also established that household size as a driver of toilet adoption and open defecation does not hold in all circumstances. A study in rural India concurred that a larger household is a barrier or constraint for not owning a latrine (Pedhi *et al.,* 2014). The authors explained that larger family sizes are always faced with limited resources. A similar study was replicated in Wa, Ghana, by Osumanu *et al* (2019). Findings from their research showed that the size of a household determined the practice of open defecation. According to the authors, larger household sizes are 40 per cent more likely to defecate in the open than those with smaller sizes. According to the authors, households of more than nine members are likely to practice open defecation. The authors asserted that heads of such households perceived the costs of building toilet facilities as high. It can therefore, be inferred that leaders of larger household sizes may be burdened with the need to cater for basic needs of all members of the household. This may therefore, reduce their capacity to construct toilet facilities at home. Landlord-tenant relations in Ghana can also explain this inference. In Ghana, it is expected that landlords who rent their apartments to tenants, will also provide household toilet facilities and other basic household facilities.

2.6.1.6. Religion and cultural barriers.

Open defecation practices in the DR Congo show disparities according to the religion of the household head. The traditional animist religions of DR Congo tend to be more likely to practice open defecation than fellow Christians, Muslims and other established religions (Miles, 2014). The author emphasised that open defecation practices in the country are correlated to belief systems, of which 30 per cent of households headed by Animist believers practice open defecation, while 9 per cent of households headed by Jehovah's Witnesses also practice open defecation.

Additionally, religious beliefs in terms of the location of a toilet facility also affect the facility's usage. In Islamic countries, according to Cotton *et al.* (1998), constructing or putting up a toilet facility in the northern corner of the community is unacceptable since it's against the value of Islam since the latrine faces the direction of Mecca. These beliefs were also confirmed among Muslims in Bangladesh latrine by Allan (2003).

A study conducted by Nawab *et al.* (2006) on cultural preferences for designing toilet facility in Pakistan's Northwest Province, showed that Islamic practices of anal cleansing the strict religious prohibition of contact with urine and faeces have resulted in hesitation to use toilets that separate urine. The authors emphasised that most of the Islamic people in the region prefer flush toilets while they regard any other type of toilet as archaic and as a taboo. According to the authors, there was a preference for WC toilet type since it immediately carries away excreta from their environment. Their choice is also attributed to the fact that they could also perform ablution after defecation (Nawab *et al.*, 2006).

The same can be said of the Hindu caste system where handling of human waste and disposal of human excreta is a labelled job for the 'untouchables' (Ramaswamy, 2005). Moreover, containing faeces in the latrine pit inside the compound is also presumed to be 'impure' and regarded as 'disrespectful' to the shrine where they worship at home (Routray *et al.*, 2015). For instance, personal hygiene in the form of private and body purity is given much attention to by the Kolkata's of India, but they are unconcerned about environmental filthiness. To them, ''once the waste is out of the physical boundaries of the house, it belongs to the public domain'' (Mukhopadhyay, 2006).

A study by Lawrence *et al.* (2016), revealed that in Zambia, specifically in communities such as Choma, Lundazi and Lufwanyama, culturally rooted taboos have exacerbated open defecation

practices. Lawrence *et al.* (2016) found that in such communities, there is a long-standing taboo that people should never use the same toilets as their in-laws, members of the opposite sex, or with different generations within a family. The authors concluded that such cultural beliefs had made behavorial change challenging in such communities.

Moreover, the influence of cultural factors were also confirmed in a study at four countries in Africa by Dittmer, (2009). The author found that in Burkina Faso, within the Bwaba ethnic groups, one has to reciprocate to a farmer or a food giver by defecating in the food givers farm as a way to fertilise the crops and the land. According to the author, the Idoma's of Nigeria and the Malians perceived open defecation as an ancestral practice. The author posited that these people believed that open defecation is a way of respecting and maintaining their ancestral traditions. As a result, and per the culture setting, the Idoma's are encouraged to open defecate, especially the older people who perceived defecating in buildings (enclose facility) as a taboo (Dittmer, 2009).

Furthermore, in Uganda, a study by Belcher (1978) confirmed that due to the fixed location of toilet facilities, many people were afraid to use these facilities. The author posited that the non-usage is because of a cultural belief that, the fixed location will provide easy access to their excreta by sorcerers for devilish purposes. According to Belcher (1978), there is a believed of spiritual contamination when one's faeces come in contact with another person's faeces. As a result, defecating openly in bushes, beaches, and other open spaces are preferred to toilet facility usage.

It can therefore, be deduced that people's defecatory preferences and practices are dependent on their own cultural and religious lenses. We should not also dispute the fact that the dangers we cause to our immediate environment tend to accumulate risks which, with time, will affect the said community in general.

2.6.2 Preferences for Open Defecation

Studies have shown that there have been persisted preferences for open defecation practices to latrine usage because the practice is perceived as advantageous. In rural India, Coffey *et al.* (2014) sought to explore the perceptions of open defecation and latrine usage. Their study revealed that 47 per cent of open defecators stated pleasure, comfort, and convenience as a preference for their practice. According to the authors, these reasons were also cited by 74 per cent of open defecators who had access to toilet facilities in their homes. Aside from these reasons, the practice is also seen as an opportunity to take a morning walk to take in fresh air, and as such, walking for long distances to defecation sites is not regarded as an inconvenience (Coffey *et al.,* 2014; Routray *et al.,* 2015). These findings correlate to earlier studies in Benin by Jenkins & Curtis (2005), who emphasised that health outcomes are not important factors for latrine adoption.

Moreover, the practice is preferred because it offers more easiness since there are no queues, and one is not under pressure to '*finish early'* (Nawab *et al.,* 2006). The authors added that the practice is seen as a way to avoid smelling the stench from other people's excreta. A study in Ghana, Mali, and Nigeria by Dittmer (2009) also found that public toilet users feel ashamed and embarrassed when they are seen using the facility and as such people prefer open defecation to the usage of the public toilet.

Also, there may be persisted preferences for open defecation practices if the toilet facilities are not available at the time the users need them, such as when individuals are away from home or may be locked at night (Caruso *et al.,* 2017). Moreover, such preferences may be that sanitation options are unappealing and hygienically unkempt (Dreibelbis *et al.,* 2015). Additionally, shared

and public facilities may be located at a long distance and queues present may also discourage their usage (Kulkarni, O'Reilly & Bhat, 2017).

According to Carter *et al.* (2017) Hammer & Spears (2016), health benefits are the main drivers behind the improvement in sanitation, but these benefits are only realised over time. They added that such benefits are confounded and dependent on various socio-cultural and environmental parameters. The perception of health-related risks and benefits were found to enhance emotional satisfaction with current sanitation practice in south Ethiopia (Novotny *et al.*, 2017). In the context of sanitation, these variables are, in no small extent, subject to the process of social construction. By contrast, the perception of non-health risks and benefits (including risks and benefits related to privacy, smell, cleanliness, comfort, and convenience), is more determined by respondents' own experience (Novotny et al. 2017).

According to Water-Aid (2008), attitudinal deficiencies such as carelessness, disrespect for traditional authority and community norms have rendered many OD laws and order redundant. Jenkins & Scott (2007) added that adoption and usage of toilet facility in a poor community are based on three behavioural patterns: preference, intention, and choice. The authors emphasised that an individual's financial status determines the decision. Moreover, social norms and rules that have failed to control people's behaviour in society have contributed to open defecation practices (Connell, 2014). It is not untrue to stress that open defecation has become a common practice and behaviour that is rooted in culture and traditions. Evidently, in many societies across the country, community members, peers, and family members defecate openly as the practice is seen as natural. In Peru for instance, open defecation is regarded as the most natural thing because the practice is habitual, traditional, and an inseparable daily routine by the defecators (Connell, 2014).

2.7 Spatial Location and Accessibility to Public Toilets

Accessibility as a concept is very essential to physical planners and it can be traced to its usage in regional economic planning and location theory since the 1920s (Batty, 2009). According to Mitchell and Rapkin (1954), the concept was widely applied in transport planning and trip distribution patterns. The concept was further applied in land use by Hansen (1959), in his work ‘‘how accessibility shapes land use’’. Batty (2009) further emphasized that, although the concept was used casually, it was frequently used for measuring relative closeness or proximity of a place to a person. This measure estimates how easy or difficult it is to have access to a facility or a place in question. It is important to stress that such a measure does not give a definite distance in terms of accessing a place or a facility, since, there are other intervening factors (Batty, 2009). The author posited that accessibility to a destination is measured as the cost of getting to the destination, traded-off against the benefits received once the destination is reached.

In this regards, if the toilet facility is located far away from a user who is without consistent toilet usage behaviour, such a user may see the distance as an unbearable cost. As such, intervening opportunities such as closeness to beach, open field, or bush, may force the person to prefer open defecation. Batty (2009) emphasised that such preferences can be linked to behaviour and other social economic and cultural factors. Moreover, the unhygienic status of the facility and the satisfaction the user gains by using the facility also influence the facility’s accessibility and the preferences for open defecation.

According to Alhassan & Anyarayor (2018), hygienic status and accessibility to a toilet facility is a driver for maintaining toilet usage behaviour. Alhassan & Anyarayor (2018), further posited that distance to the toilet facility influences the adoption and usage of the facility. The authors attributed this to the risk perceptions such as sexual harassment of women. The authors

explained that if the distance to the toilet facility is farther from their homes, the higher the risk for women who are likely to be raped or attacked on their way to and from the toilet site. The women will therefore prefer the sanitation facilities to be closer to their homes to facilitate continuous usage. A study by Osumanu and Kosoe (2013) in Wa, has also stipulated that one of the main challenges confronting households from accessing a public is distance. According to the UN-HABITAT (2005), cited in Osumanu and Kose (2013), the likelihood to open defecation is even higher especially at night if the proximity to a toilet facility is more than 100 meters.

The location of a public toilet facility is also essential in estimating the facility's usage and accessibility as demonstrated by de-Barrows (2008). A study by Inyand and Enuoh (2009), captured location as an external factor that influences the usage of a public facility and for that matter, public toilet. This assertion was further strengthened by an earlier study by Arowomolo (2000), who emphasised that external factors such as location can be a barrier to the effective usage of a facility in question. On the contrary, a study by Wakaba (2013) found that users of toilets are more concerned about the hygienic condition of the toilet facility and not proximity.

2.8. Drivers of Latrine Adoption

A successful toilet adoption and usage, according to O'Reilly & Louiss' (2014), is when household members make usage of toilet facilities a habit. The authors posited that three factors influence the formation of such practice: (1) proximate social pressure; (2) governmental and nongovernmental organizations (NGOs) multi-scalar political will; and (3) political ecology, which involve changing land use, assured access to water, and compatible soil type. Cameron *et al.* (2013) reported that the most important reasons for not building toilets are the high cost and the fact that the family has another priority spending. Gross & Gunther (2014) added that people have a greater need and demand for roads, water, and education than for sanitation. In addition to

the constraints for latrine adoption, lack of desire to build and use a latrine also contribute to primary reasons people chose not to build a latrine (Jenkins & Curtis, 2005).

According to O'Reilly & Louiss' (2014), supply-driven interventions have not helped with the MDG targets. Such efforts have been criticised by Mara *et al.* (2010), Jenkins & Scott (2007) and Jenkins & Sugden (2006) that aside the rich being advantaged over the poor, the latrines are not culturally compatible and are poorly designed. The attention on creating demand for toilet facility has resulted in findings which relate to motivations to build and use toilets. Such motives have more to do with privacy, convenience, dignity, and comfort than with perceived public health benefits (Jenkins & Curtis, 2005; Jenkins & Sugden, 2006; Jenkins & Scott, 2007; Peal *et al.*, 2010).

According to Jenkins & Curtis (2005), to increase the rate of latrine coverage and usage, it is first important to understand what generates demand and motivate households to adopt latrines or use a public toilet. Also, Galan *et al.* (2013) added that stopping open defecation is not just a matter of access to sanitation facilities, and that it also involves motivational drivers that will trigger households to invest in the construction of their household toilet. Intensive research by Jenkins & Curtis (2005) in Benin identified the drivers for latrine adoption. They broadly categorised these drivers in three perspectives, namely; prestige, well-being, and economic-related reasons.

The prestige related drivers according to Jenkins & Curtis (2005) contains elements of self-expression and pride. They emphasised that one would be willing to install a toilet facility to be ascribed with or be identified with the urban elite. Here, it is perceived that open defecation is solely a rural practice and adopting and using latrines, portrays an expression of an urban lifestyle. This view was reinforced by Routray *et al.* (2015), who posited that open defecation practices are uncommon in towns and urban dwellings. Routray *et al.* (2015) explained that

when urban dwellers return to their villages after retirement, they become the first to invest in building their own toilet facilities. Jenkins & Curtis (2005) also added that the desire to face-lift the household or family clan status also drives for the installation of a toilet facility. According to the authors, households that have toilet facility are able or will be able to provide a decent place for their visitors to attended nature's call. According to the authors, this helps the households to properly receive their visitors and to avoid any form of shame if their visitors need to attend to nature's call. The authors therefore, posited that, households that have a toilet facility perceive their household or home to be properly established.

Moreover, well-being drivers are as a result of household's consciousness of the importance of living a healthy life and the consequences of been exposed to diseases. According to Jenkins & Curtis (2005), one will be motivated to install a toilet facility to either protect family health as well as to ensure personal health as a precaution against any risk of infectious diseases. Here, it is perceived that open defecators are exposed to the various risks that are associated with open defecation practices and having or using household toilet facility prevents the exposure to such risks. Moreover, the authors also found that having household toilet facility provides comfort and convenience as compared to open defecation practices.

Aside from the well-being and prestige motives, Jenkins & Curtis (2005) further added that household heads would be triggered to build a latrine for economic reasons. It can be deduced from the authors' findings that, landlords that have constructed household toilet facilities will be able to charge their tenants higher cost for rent than those houses without toilet facilities. Given this and for economic gains, landlords might probably be triggered to install a household latrine to increase rental charges.

There is no doubt about the relevance of the triggers in influencing household toilet adoption. However, the relationship that exist between these drivers and the socio-demographic characteristics of the society under study are missing. It is important to emphasise that societies in general, are dynamic across space, and these variations are as a result of other external factors. These external factors could be geographical or cultural characteristics. Due to the interwoven nature of how geographic and cultural factors influence socio-demographic and economic factors, the overall impacts of these drivers will also depend on the prevailing socio-economic and demographic characteristics of the society under-study.

2.9. Theoretical Framework

To unpack the objectives of this study, the Focus, Opportunity, Ability, and Motivation (FOAM) Framework by Coombes & Devine (2010) was chosen. According to the authors, many variables influence an individual's choice, and the framework allows researchers to hypothesise about the factors or determinants of that particular behaviour. According to the authors, the framework draws on a range of models, including the Health Belief Model (Rosenstock 1974), the Theory of Reasoned Action/Planned Behaviour (Ajzen & Fishbein, 1980), Health Locus of Control (Conner & Norman, 1996), Stages of Change Model (Prochaska & DiClemente, 1984) and Social Learning Theory (Bandura 1986).

2.9.1. Overview of the Foam Framework

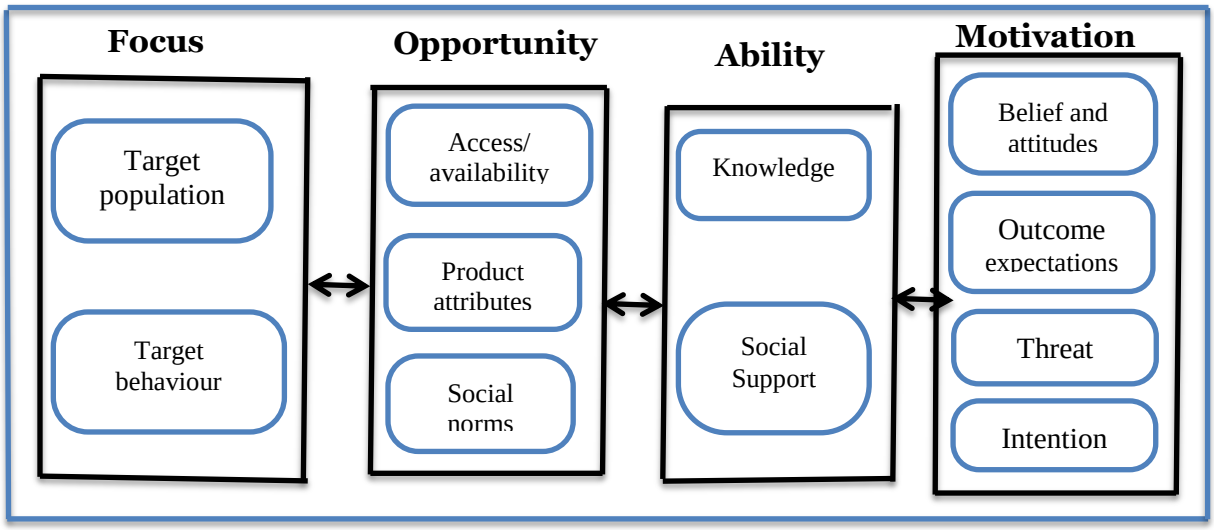
The Focus Opportunity Ability and Motivation (FOAM) Framework can be used to understand the determinants of open defecation (OD). The Framework was initially designed to "help develop, monitor, and evaluate hand-wash behaviour change programs" (Coombes & Devine, 2010:1). The authors, however, emphasised that the FOAM Framework (Figure 2.1) is not static. The

framework therefore, consists of four behavioural categories that influence whether a person engages in OD or not.

These categories include internal factors such as beliefs or knowledge that occur within one's mind, or external factors such as the availability of toilets or social pressures beyond personal control (Coombes & Devine, 2010). Given that these factors are not only at the heart of understanding the causes of OD, they also help to identify drivers and barriers to access sanitation (Sara & Graham, 2014; O'Reilly *et al.*, 2017).

The Focus is the first category, and it involves identifying the target behaviour (OD) that needs to be changed and the target population (open defecator or household heads) engaged in the practice. This involves identifying and understanding the socio-economic, demographic and cultural and physical and geographical characteristics of open defecators. According to UNICEF/WHO (2017), this is inevitable in terms of formulating and implementing policies to curb OD practices. As Park *et al.* (2016:1) pointed out, "to prevent diseases associated with inadequate sanitation and poor hygiene, people who need latrines and behavioural interventions must be identified".

Figure 2.1: The FOAM Framework



Source: Coombes & Devine (2010).

The Opportunity factors according to Coombes & Devine (2010), also relate to factors that impact OD practices such as structural and institutional arrangements as well as social norms and accessibility to toilet facilities. It is important to stress that social norms are highly impacted by ethnicity and religion (Kirigia & Kainyu, 2000). Additionally, other OD influencing factors may include vegetation, rural lifestyle, convenience, comfort, privacy, cleanliness, and protection (Hulland et al., 2015). This means that the opportunity factors influence the probability of the behaviour to be performed.

The ability category checks or examines the person's propensity to practice the OD and reveals the actual or perceived ability of the person to perform the said action. According to Coombes & Devine (2010), there are two capacity determinants; (a) the individual's belief in the ability to practice OD, influenced by religion, tradition, and education; (b) social support, which encompasses family, friends, or colleagues' emotional and physical comfort, such as supporting children to use the toilet (physical), being praised for not practising OD (emotion); or helping neighbours to build a toilet facility (practical).

Finally, the motivation being the last component of the framework involves drives, impulse, and desire that determine whether a person wants to practice OD or use toilet facility. Coombes & Devine (2010) highlighted four factors that can trigger a person to OD. Firstly, the beliefs and attitudes which represent a person's perception of OD, which might be incorrect, may hinder the adoption of a toilet facility. Secondly, the expectations related to the perceptions of the outcomes of OD practices. Here if the open defecator perceives the practice as convenient and comfort, then the likelihood to use toilet facility becomes less. This perception also depends on the prevailing subjective social norm. The third factor deals with the persons' knowledge about the risks concerning the adverse outcome of practising OD and their consequences to health, dignity

and privacy and safety (Gross & Gunther, 2014; Hulland *et al.*, 2015). Lastly, if a person plans to defecate in the open deliberately and not being forced by circumstances, then there is a habit formation. According to Abubakar (2018), repeated deliberate actions which are strong predictors of behaviour change leads to habit formation. While the focus and motivation categories have been considered as drivers to latrine adoption that discourage OD practice, the opportunity and ability categories are regarded as constraints to latrine adoption that encourage OD. All four categories vary from one socio-economic group to another (Noor & Ashrafee, 2004). According to Sara & Graham (2014), if people have the opportunity, ability, and motivation to practice OD, the practice will be difficult to stop. The author, however, posited that policies and interventions that inhibit these practices might help to end OD.

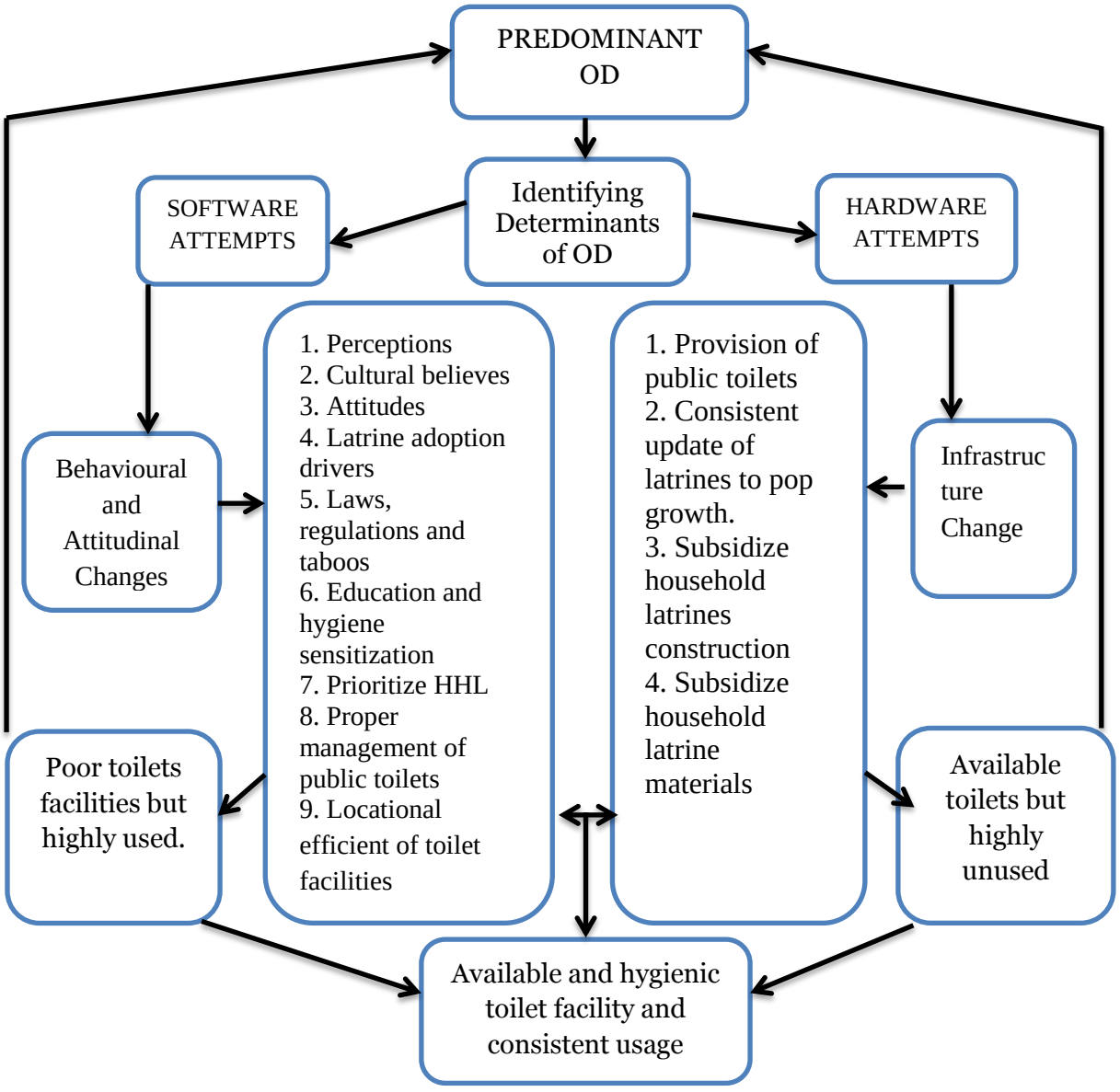
2.10. Conceptual Framework

Achieving the goals of this thesis requires understanding the conceptual basis of the research and the key variables that influence OD practices based on existing literature and the successful pathways for consistent usage and adoption of a toilet facility. Ending open defecation and improving sanitation requires an increase in access and usage of toilets facility that prevents human contacts with faeces or excreta (Bartram & Caincross, 2010; Spears *et al.*, 2013). This will be the best possible way to ensure a healthy lifestyle as well as generating social, economic and environmental transformation (Jewitt, 2011; O'Reilly, 2016).

The conceptual framework (Fig. 2.2) adapted for the study emphasises that equilibrium should be established between the hardware (provision and construction of toilet facility) and software (behavioural factors or consistent usage) sanitation interventions. Other than that, toilet facilities may be provided, but they might not be used. According to Novotny *et al.* (2017), neglecting issues related to various social, cultural and environmental constraints of their consistent usage

are known to pose a risk. Baetings *et al.* (2012) added that the importance of behaviour change in-terms of sanitation is that the benefits of the hardware will only be realised if the facility is used and properly used.

Figure 2. 2: Pathways of Attaining a Better Hygienic and Improved Sanitation Status



Source: Author's own construct; adapted with inspiration from Novotny et al., (2017).

The conceptual framework (Fig.2.2) shows pathways of shifting from open defecation practices to toilet facility usage. The software aspect deals with changes in people's behaviour and

attitude. Factors and variables that influence behaviour and habit formations must to understood as demonstrated by FOAM framework by Coombes & Devine (2010). The hardware sides deal with interventions such as subsidising and provision of hygienic toilet facilities (Abubakar, 2018; Novotny *et al.*, 2017; Lawrence *et al.*, 2016; Coffey *et al.*, 2014).

Regardless of the hardware efforts for many years, open defecation persisted as toilet facilities were not consistently used because little attention was given to issues relating to their consistent usage education (Novotny *et al.*, 2017; Coffey *et al.*, 2014; Jenkins and Curtis, 2005). Moreover, open defecation will persist if there is a positive behaviour change but an unmatched provision of toilet facilities. Currently, a new paradigm shift in the effort of curbing open defecation is paying equal attention to increasing and providing latrine infrastructure and a change in people's behaviour to adapt and use a toilet for defecation consistently. This is conceptualised in the framework, as illustrated in Figure 2.2 above.

2.11. Conclusion

A change in attitudes towards latrine and sanitation as well as a shift in old or previous sanitary habits is attainable if people are sensitised on the adverse effects or impacts of open defecation. Efforts and approaches intended to stimulate these changes in attitudes and thinking should be given the maximum attention. Moreover, the direct link between a latrine usage and its benefits should be made clear over the practice of open defecation. This is because; open defecation in some communities has been an acceptable cultural practice that has persisted over a long period. Therefore making the culture of latrine adopting and usage attractive and spelling-out its benefits can trigger a change from culturally persisted open defecation practices to the usage of latrines. This, in the long run, will build a resilient community against open defecation attitudes and perceptions.

CHAPTER THREE

STUDY AREA AND RESEARCH METHODOLOGY

3.1. The Introduction

This chapter provided an overview of the study area and methods through which the objectives were achieved. This was organised into two sections. The first section described the profile of the study area (KEEA). This included the municipal's location, the physical characteristics, its demographics, the socio-economic dynamics and a profile of the five study towns. The other section of the chapter also focused on the research approaches that were used in gathering the relevant data for the study and the justification of the materials and the procedures used for the study. This included research paradigm and design, data sources, target population and the sampling strategy as well as the reliability and the validity of the research instruments. It also highlighted the technique through which the data was analysed.

3.2 Description of the Study Area

3.2.1 Origin and Locational Characteristics of the Study Area

The Komenda Edina Eguafo Abream (KEEA) Municipality was carved out of the Cape Coast Metropolis in 1988 and elevated to a Municipality in 2008 in pursuance to LI 1857. The KEEA is made of four Traditional Municipal Areas (Komenda, Edina, Eguafo and Abream) which have been put together to constitute a political Municipality. The Municipalilty is bounded on the south by the Atlantic Ocean (Gulf of Guinea), the east by the Cape Coast Municipality, the north by the Twifo Hemang - Lower Denkyira District and the west by the Wassa East District. It is located between longitude 1^0 20'West and 1^0 40'West and latitude 5^0 05'North 15 ^{0} 'North. The municipality covers an area of 372.45 kilometres square (919.95 square miles) (GSS, 2012).

The Municipality has a fantastic assemblage of culture, such as Edina Bronya and Bakatue, and Nyeyi. These festivals attract a large number of visitors from home and abroad. Elmina, the municipal capital, prides itself as the first point of contact by the Europeans on their exploration tour of Africa. It had the first contact with the Portuguese in 1471. It has the oldest Castle in Africa and the St. George d'Elmina fort (KEEA, 2019). A historical account of Elmina shows that the name; Elmina, was derived from the Portuguese —La Mina, for *The Mine*. The Portuguese named the town as such when it became the centre of commerce in gold after the Portuguese settled and built the St. George's Castle in the town in 1482 (KEEA, 2019).

Figure 3. 1: Map of the Study Area.

Source: Authors own construct (2019).

3.2.2. Demographic Dynamics of the Study Area

According to the 2000 population census, the municipality had a population of 112,435 which accounted for 7.1 per cent of the Central Region's total population. The 2010 population census also gave the municipal's population as 144,705; representing 6.6 per cent of the region's total population (GSS, 2012). The males constituted 69,665 (48.14 %) and Females were 75,040 (51.8 %). The municipality has a sex ratio of 92.8 which means that there are 92.8 males for every 100 females within the municipality (GSS, 2012). The municipality's sex ratio is lower than that of the national (95.2). This could be attributed to higher male mortality or out-migrants than that of females. The municipal has a youthful population (40.2 % of the population below 15 years) and elderly persons accounting for 8.6 per cent of the total population (GSS, 2012). The municipality's dependency ratio (86.8) is higher than that of the regional (81.4). This means that there is a lot of non-working or non-active population than the economically active population. The dependency ratio shows that every 100 persons aged 15-65 years support about 87 dependents.

According to the 2010 population and housing census, 29.2 per cent of the municipality's population are migrants out of which 55.2 per cent migrated from other regions while 44.8 per cent were born elsewhere in the Central Region (GSS, 2014). For migrants born in another region, international migrants constituted the highest (16.7 per cent); signifying the municipal's long-standing historical interaction with the outside world, especially Europe. This was followed by Western (15.2 %) and Eastern (3.8 %) regions. In terms of ethnicity, the census figures indicated that a large proportion of the population is Akan (Fantis) (93.4%) followed by Ewe (3.9%), Ga-Dangme (0.8%) and other ethnic groups including Guans. The Fantis are the indigenous people of the Municipality. The major religions in the municipality are Christianity (93.6%) and Islam (5.3%). (GSS,2014).

3.2.3. Socio-Economic Dynamics of the Municipality

The Municipality has a household population of 139,056 with 35,402 households living in 38,308 houses (GSS, 2012). The average household size is 3.9 persons. Out of the household population, 47.2 per cent are males, and 52.8 per cent are females. It is common to find households with male headship (31.3%) compared to female headship (20.2%) in the municipality owing to the Ghanaian cultural settings which put men as the heads of households. According to Tanle (2010), circumstances such as migration or travel of the husband, divorced, separated, widowed or not-married could only permit females to become household heads. Children constitute the largest proportion of the household structure; accounting for 39.5 per cent and a quarter, (25.5%) are household heads. Housing characteristics in the municipality shows that majority of the people live in compound houses while the rest live in mud houses and separate housing units made of different materials, depending on the household's income level. In all, about 65.0 per cent of dwellings in KEEA are made from concrete or blockhouses, while 27.1 per cent are made from mud bricks and earth (GSS, 2012).

Of the population 11 years and above, 63.7 per cent are literate, and 36.3 per cent are non-literate. The proportion of literate males is higher (82.4%) than that of females (66.2%). About 41.0 per cent of the population aged 12 years and older is married, 39.0 per cent have never married, and 4 per cent are in consensual unions (GSS, 2012). Those who are widowed, and those who are divorced each constitute 7.0 per cent and 2.0 per cent are separated. Among the married, 33.4 per cent have no education, while 80.2 per cent of the married population is employed. Also, 66.5 per cent of those who have never married are economically not active, with 4.4 per cent being unemployed (GSS, 2012).

Generally, the municipality has a low unemployment rate as 6.4 per cent of persons 15 years and older were recorded as unemployed (GSS, 2012). The predominant economic activities in KEEA include fishing, crop and livestock farming, trading, salt production, growing hospitality, and tourism industry. The beaches also serve as a tourist destination sites. However, tourism, salt mining and fishing in the municipality is under threat due to open defecation practices (Mensah & Eni-Kwesi, 2019).

While majority (87.8%) of the employed population working in the private informal sector, agriculture, forestry, and fishing-related trade alone employ 42 per cent of the working population. The proportion of females in the private informal sector is higher (92.2%) than males (82.5%) (GSS, 2012). On the contrary, there are more males in the formal sector while more females are in the informal sector. This could be attributed to the low educational level of females, which makes it difficult for them to be engaged in the formal sectors. Many enter sales because of the small capital outlay for self-employment often in the form of petty trading. Household income is low, as are individual income. This low-income situation may be explained by a lack of diversified opportunities that has forced many people into informal sector activities, such as small-scale trading, small-scale production, fisheries and agriculture. For instance, WASH (2014), estimated that about 80 per cent of the households in the municipality earns a monthly income of less than GHC 500. The coastal portions of the municipality have a very dense population (urban), mainly due to fishing activities while communities in the northern section are sparsely populated and scattered (rural). According to the 2010 population and housing census, the entire population is made up of about 35.7 per cent urban and 64.3 per cent rural.

3.2.4. Sanitation Facilities

3.2.4.1 Methods of Waste Disposal.

Sanitation is generally at its minimal in the KEEA municipality, and this sometimes poses a health risk to individuals (GSS, 2012). The KEEA municipal is estimated to generate about 82 tons/day of solid waste with an estimated generation rate of 0.5 kg/capita/day. This leads to an annual amount of 30.000 tonnes of solid waste (KEEA, 2020). The public mostly dispose-of their solid waste into a free container for solid waste (Wash, 2014). The dumping of waste in these containers is free of charge due to the unwillingness of residents to 'pay as they dump' (WASH, 2014). Solid waste is also collected by door-to-door service by private service providers. However, a very small proportion of the population makes use of the doorto-door refuse collection. Only the high-income segment of the municipality has access to this service (WASH, 2014). The final disposal site for solid waste is Edina Essaman. The landfill or open dump is fenced and is levelled regularly (KEEA, 2020). The refuse is also burnt occasionally. Though in principle, the municipal should charge tipping fees, no such costs are currently collected, for the fact that Zoomlion provides equipment for managing the site, and is the only entity that dumps waste in the landfill. The site is jointly managed by Zoomlion and the Municipal (WASH, 2014). Liquid wastes in the municipality are disposed-off by throwing it onto the compound, throwing onto the street/outside or throwing into the gutter (GSS, 2012).

3.2.4.2. Types of Toilet Facilities.

The availability of household facilities within the municipality shows that about 19 per cent of the population in the municipality has no toilet facility (GSS, 2012). According to the 2010 population and housing census, the public toilet is the most common toilet facility used by 52.5 per cent of the households in the Municipality. Other types of toilet facility that is used in the

municipality include WC, KVIP and Pit-latrine. According to WASH (2014), problems that plaque the municipality such as open defecation, and poor waste management will be the thing of the past, as people's standard of living increases as a result of better incomes.

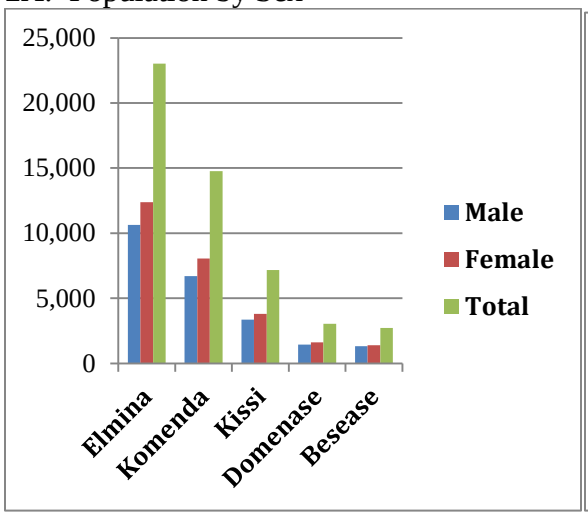
3.2.5. Profile of the Study Communities

The study communities included five towns, namely; Elmina, Komenda, Kissi, Besease, and Domenase. These communities were selected due to their varied socio-economic and demographic characteristics and their spatial locations. This was to appreciate their varied spatial dynamics of open defecation practices. These communities have various characteristics in terms of environment, sanitation, patterns of building structures, economic activities, and level of education, among others.

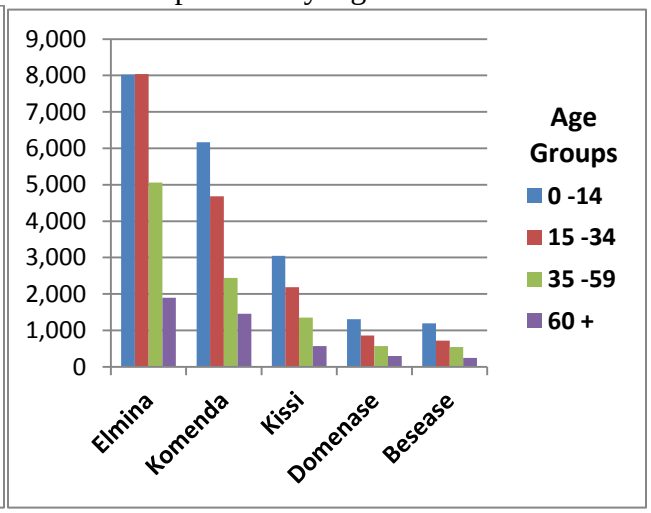
Elmina, followed by Komenda and Kissi are the three of the four urban settlements with larger population sizes within the municipality (GSS, 2012). Elmina, being the municipal capital and Komenda is located along the coast and with a dense population**.** The location of these communities is shown on the study area map (see Figure 3.1). Altogether, the five communities have a total population of 50,671. The municipal capital; Elmina has a population of 23,012; Komenda also has a population of 14,754 while Kissi's population is 7,160. The other two communities; Domenase and Besease, also have a population of 3,039 and 2,705, respectively (GSS, 2012).

Figure 3. 2: Population Distribution by Sex and Age in the Study Communities.

2A: Population by Sex



2B: Population by Age



Source: GSS, 2012 (PHC, 2010)

The distribution of the population by sex and age is depicted in Figure 3.2. The dynamics of the population of the five communities show a young population as the majority of the population is below 15 years. Aside from their demographic composition, these communities also differ in terms of their socio-economic characteristics such as economic activities, patterns of the building structure, levels of education, sanitation practices etc.

In 2010, Elmina's population was 23,012 (GSS, 2012). This shows that within a space of ten years, 1,910 people were added to the population of Elmina. This growth was, however, a decrease as compared to the earlier census. For instance, the municipal's capital had a population of 11,401 in 1970, and it grew by 5,569 in 1984. After fourteen years, the growth decreased to 4133 in the year 2000. The decreasing growth rate of the municipal capital could be explained either an increased out-migration or low birth rate. Each of the study communities has a more female population than males, as shown in Figure 3.2A. The age dynamics also show that, except for Elmina which has 34.8 per cent of its population under 14 years, all the other study communities have at least 41 per cent of their respective population under-14 years (see Figure 3.2B). An inference from the data also shows that those under 34 years account for at least 69 per

cent of the population in each of all study communities. In terms of the labour force in each of these communities, Elmina has 21.9 per cent of its population within the ages of 35 and 59 years followed by Besease (20.2%) and Kissi (18.9%). Komenda is ranked the lowest with 16.5 per cent while Domenase is better-of then Komenda by 2.1 per cent.

The coastal location of Elmina makes it the most populated in the municipality, mainly because it is the centre of an essential economic activity such as fishing and mongering which contributes about 15 per cent of the total fish production in Ghana (Aheto et al., 2012). Elmina is fundamentally a cosmopolitan area since it receives migrants from other places who drift in search of job opportunities in the fisheries industry (Koranteng et al., 2012). Other vital economic activities include tourism, salt mining, boat making, and small and other medium scale enterprises. Moreover, Elmina is more developed in terms of infrastructure. It has more high schools, better-equipped health facilities etc. Although Komenda is also a coastal town with educational and health facilities, economic and social activities are not as vibrant as compared to the municipal capital. The main economic activities of Kissi and the other two rural communities are farming. Kissi also serves as a central market for all the rural communities in its environs such as Besease and other nearby villages.

Although the Municipality capital settlement is densely populated, the pattern is relatively planned with proper layouts as compared to other communities. Except for a few households that have a household latrine, majority of the people use a public toilet (GSS, 2012). Within these communities, children are allowed to defecate at the refuse dump. It was also realised through observation that, the most common means of disposing of solid waste is by the public dump, either open space or container. Moreover, routine collection of garbage from houses was hardly

practised. Elmina is a perfect example where only 1.4 per cent of the waste generated is collected from homes (GSS, 2012).

3.3. Research Paradigm and the Philosophical Underpinnings

Researchers use appropriate techniques to gather and analyse data to be able to explain or answer their research questions (Polit & Beck, 2004). These techniques have changed over time since their conception and until recently, have been categorized into three broad perspectives: quantitative, qualitative and mixed methods which emphasize the combination of both qualitative and quantitative techniques in a single research. According to Clarke (2009), each of these approaches is underpinned by philosophical and ontological assumptions.

Quantitative research approach employs a numerical measurement for collecting and analysing data to make predictions and generalisations about phenomena. This is done using bigger sample sizes (Pring, 2000). Quantitative results are drawn through descriptive and inferential statistics. The quantitative techniques work within a positivist paradigm and are directed at explaining relationships (Creswell, 2014). It also assumes an objectivism position. It embodies a view that ‘‘social reality as an external and objective reality’’ (Bryman, 2012: 37) or independent objects existing without the knower (Cohen *et al.,* 2007) and where ‘‘discoverable reality exists independent of the researcher’’ (Pring, 2000: 57). Here, all social properties are considered as an outcome of the interactions between individuals, rather than phenomena. According to Teye, (2012); Mikkelsen (2005), quantitative methods are seen as appropriate for making predictions and generalizations. This approach is also good for model specification and the establishment of the nature of correlations between different variables (Castro *et al.*, 2010). Notwithstanding these strengths, this method has been criticised on the basis that it is not an efficient measure of social

and cultural relations such as behaviour and perceptions (Brannen, 1992). Moreover, Moghaddam *et al.* (2003) added that this approach separates findings from real-world context.

On the other side, qualitative research is often concerned with unstructured data, which usually involves the usage of words and pictures (Denzin & Lincoln, 2011, cited in Ritchie et al., 2013:3). This approach is naturalistic and interpretative, with much focus on exploring phenomena 'from the interior' (Flick, 2009, cited in Ritchie *et al.,* 2013:3) and the respective research participants views are taken as a starting point (Ritchie *et al.,* 2013). This approach is distinguished since it involves generating hypotheses from the analysis of the data rather than stated at the beginning of the research (Silverman, 2011, cited in Ritchie *et al.,* 2013:3). The qualitative approach stresses an adoption of interpretivist epistemological position with emphasis on extracting the meaning of the social world through an in-depth understanding of the participant's perceived meaning of the social world, their interpretations and behaviours (Bryman, 2012). More emphasis is placed on the interactive process and event. Unlike quantitative approaches, in qualitative technique, few cases are used as sample sizes, and the researcher is involved.

The research paradigm adopted for this study was a mixed-method approach of inquiry which incorporates both quantitative and qualitative techniques. This approach attempts to consider multiple viewpoints, perspectives, and standpoints of a phenomenon to enable confirmation or corroboration of each other through triangulation. This helps to develop analysis to provide richer data (Johnson & Onwuegbuzie, 2004; Johnson, Onwuegbuzie & Turner, 2007).

This view has been questioned by Meetoo and Temple (2003) on the grounds that, even if there is a match in results from different data sources, it is not also a guarantee that the inferences

drawn from that data are valid. Meetoo and Temple (2003) further pointed out that it is wrong to assume that the use of different methods will automatically enhance validity. They strongly argue that because social reality is multifaceted, the use of different methods may be more based on the desire to explain all aspects of the problem, rather than just cross-validating one method with another Moreover, this approach also requires time-intensive analysis since it involves extensive data collection (Creswell, 2014).

Although, according to Bryman (2012) and Clarke (2009) the credibility of this method has been highly contested since the approach emanates from different epistemological and ontological paradigm, now the mixed-method approach is commonly been accepted as a research approach (Johnson & Onwuegbuzie, 2004). Tashakkori & Teddlie (2010) also captured this assertion and added that mixed methods which emanated in response to the much debate about the strengths and weakness of both quantitative and qualitative are now advocated. This method is advocated because it offers multi-interpretation and construction of reality, and this helps to further explain complex problems (Sharan, 2002).

Due to the social and humanistic nature of the research problem (habitual open defecation) and the outlined objectives, a mixed-method approach was deemed necessary, and the pragmatist philosophical assumptions inspired it. According to Creswell (2014), "pragmatism arises out of the actions, situations, and consequences rather than the antecedent conditions in post-positivism." Those who support this philosophy agree that researchers do not focus on methods, but instead emphasise research problems and use all available methods to understand problems. The pragmatist research approach employed both interpretivist and positivist approaches. The interpretivist philosophy was employed to get a better understanding of the drivers that facilitates usage or non-usage of toilet facility and open defecation practices. This was done through

focused group discussion, in-depth interviews with household heads, policymakers and opinion leaders in the study area. Moreover, to ensure objectivity to complement the interpretivist approach, the study also employed a positivist quantitative approach by administering questionnaires to household heads in the study area. Given this, the strength and weakness in each approach were complemented to avert the challenges in using a single approach. Hence, all important information which might have been missed if only one approach had been used was captured.

3.4 Research Design

A research design constitutes a blueprint for the collection, measuring and analysing data. This involves developing strategies as a guide for the research process. It provides a specific framework and direction for procedures in terms of data collection and analysis in a research study.

The study used the convergent parallel mixed method approach as outlined by Creswell (2014:190)‘‘ as a strategy in which a researcher collects both quantitative and qualitative data, analyses them separately, and then compares the results to see if the findings confirm or disconfirm each other’’. This method of triangulation was considered appropriate because it provided a detailed and complete understanding and description of the phenomena in question (open defecation practices) as the results from both qualitative and qualitative perspectives was merged. According to Sharan (2002), the combination of both quantitative and qualitative data in a single research complement and cross-validate each other because quantitative evidence serves as a check to qualitative statements.

3.5 Target Population

For this work, households in KEEA were considered as the target population. According to Berman *et al.* (1994) cited in Curtis (1998), in sanitation and hygiene studies, households should be considered as target population because it merges both external and internal factors relating to health and sanitation. According to GSS (2014:11), a household is ‘‘a person or a group of persons who lived together in the same house or compound and shared the same house-keeping arrangements. In general, a household consisted of a man, his wife, children and some other relatives or a house help who may be living with them’’.

The target population constituted 12,977 households. This comprised of three urban communities (Elmina, Komenda and Kissi, which are the three of the four major urban settlements) and two rural communities (Domenase and Besease.). Urban settlement in Ghana’s perspective is any settlement with a population of 5,000 or more (GSS, 2014). According to the Population and Housing Census –PHC (2010), Elmina had 6,353 households, Komenda-3,466, Kissi-1,739, Domenase-779 and Besease- 640. The rural settlements were also selected to be able to do a comparative analysis between the practice of open defecation by rural and urban settlers.

Open defecation is more prevalent in rural areas than urban areas (GSS, 2018; JMP, 2019). However, in the KEEA municipality, the practice is more alarming in the urban areas than in the rural areas because, the number of people and households that engage in the practice in the urban areas are more than those in the rural communities; which are mostly farming communities. Due to this, the study selected three urban and two rural settlements.

3.6 Sampling Size Determination Procedure

A sample, according to Bryman (2012), is a part of an entire population that reflects attitudes, opinions or characteristics that one wishes to investigate or study. It is a procedure a researcher

uses to gather people, places or things to study. This is necessary because I cannot investigate the entire population.

The sampling frame that was used comprised the total number of households in the selected communities. To be able to select or sample out the required number of households to be engaged in this study, the Krejcie & Morgan (1970) sampling size determination formula was used. This is given as

$$S = \frac{X^2 NP\,(1-P)}{d^2\,(N-1) + X^2\,P\,(1-P)}$$

Where;

S= the required sample size for the study.

$\mathbf{X^2}$= the value of chi-square for one degree of freedom at a confidence interval of 5%= 1.96

N= the target population which is 12977 households

P= the target population proportion which is assumed to be 0.50 since this will provide the maximum sample size

d- Degree of accuracy or precision which is also expressed as 0.05

Therefore the sample is calculated as;

$$S = \frac{1.96^2 \times 12977 \times 0.5(1-0.5)}{0.05^2\,(12977-1) + 1.96^2 \times 0.5(1-0.5)}$$

S= 12463.1108 / 33.4004

S= 373.14

This is rounded to 373 respondents or households. This represents the total sampled respondents from the five communities needed for the study. However, due to the unavailability and unwillingness of respondents to be interviewed, the study interviewed 326 respondents for the questionnaire survey. Some of the participants approached perceived the researcher to be an agent of the municipal's sanitation taskforce who needed their information for prosecution. With

this number, six questionnaires were incomplete and could not be included in the total analysed data. Hence, only 320 completed questionnaires were used for the analysis.

According to the research by High (2000), the size of a research sample is essential to produce meaningful results. Although, including too many subjects in research leads to time and resource wasting, however, according to Chuan & Penyelidikan (2006), when there are too few subjects, it might be difficult to detect the effect or phenomenon understudied, thus providing inconclusive inference-making. Given this, and the values for the precision and target population proportion of the Krejcie and Morgan's (1970) formula, the study deem it necessary to use this formula so that maximum respondents could be sampled from each community; especially for communities with the smaller target population.

3.6.1 Determination and Distribution of Questionnaires to each Community

To ensure that each of the five study communities is proportionally represented, a stratified sample method was used to stratify the sample size, using the formula: $\boldsymbol{n = (P / TP)\, S}$

Where;

n= the stratified household sample of the community understudy

P= total households of the community understudy

TP= total households of the five communities under study (which is 12,977)

S= sample size (which was 373 households).

Going by the above formula, the sample size for each of the community is supposed to be: Elmina (183 households), Komenda (100 households), Kissi (50 households), Domenase (22 households) and Besease (18 households)

Details of how these sample sizes were calculated for each study community is as follows;

Elmina: $n = \frac{6353}{12977}$ **X 373= 182.6, approximated to 183 households.**

Komenda: $n = \frac{3466}{12977}$ **X 373 = 99.6, approximated to 100 households.**

Kissi: $n = \frac{1739}{12977}$ **X 373 = 49.9, approximated to 50 households.**

Domenase: $n = \frac{779}{12977}$ **X 373 = 22.4, approximated to 22 households.**

Besease: $n = \frac{640}{12977}$ **X 373 = 18.3, approximated 18 households.**

3.6.2 Sampling Procedure

For each of the selected communities, the researcher employed probability sampling to select respondents for the questionnaire survey. The probability sampling is necessary because according to Bryman (2012:195), ‘‘probability sampling makes it possible to make inferences or generalizations from information about a random sample to the population from which it was selected’’. Specifically, the multi-stage sampling technique was employed for the study. This technique helped the researcher to break the target population into groups and subgroups that aided in getting fair representatives from each group (Bryman, 2012). This method is also distinguished as the most appropriate techniques for selecting sample sizes from the heterogeneous population (Barreiro & Albandoz, 2001). It, therefore, takes into account the heterogeneous nature of the people in terms of culture, attitudes and behaviour.

At the first stage, the researcher divided the community into four clusters by using the major street in each of the community. With this, sample sizes for each of the community were also divided proportionality into four to reflect the size of the clusters.

The second stage deals with the selection of households from each cluster. During the pre-test, it was realized that some of the houses in the community were clustered and very difficult to

systematically be countered whiles some housing units had more than a single household. Hence, with a single household, the researcher employed a simple random sampling method where every 3rd household was interviewed. For houses that have more than one household, the researcher employed a convenient sampling to select the household in circumstances where some of the households are unwilling to be interviewed. In a situation where in the same housing unit, two or more household is willing to be interviewed, the researcher employed a lottery method sampling technique to select a respondent for the survey.

The final stage involved the selection of respondents from households. The questionnaire administration was aimed at the heads of the selected households. However, in their absence, any adults 18 years of age and older were interviewed.

3.7 Types And Source Of Data

3.7.1. Quantitative Data Source and Instrument

Quantitative data was gathered by administering 326 questionnaires to the sampled respondents. The questionnaires were a combination of both well-structured open and closed-ended questions. The open-ended questions were intended for respondents to explain their views or opinions further. According to Bryman (2012), open questions reveal unfamiliar responses which might not be anticipated by the researcher. The close-ended questions provided multiple answers to which the respondent selected the suitable one. The close-ended questions limit the extent of variability in the recording of answers (Bryman, 2012). Moreover, the questionnaires were categorised into sections based on the objectives of the study (see Appendix D).

Additionally, a GIS-based technique was also used to generate spatial data to complement the quantitative data. Here, the GPS tool was used to map out the spatial location of public toilet facilities in the study area. This aided in analysing the spatial distribution and accessibility of

toilet facilities to ascertain whether distance walked to access toilet facility influences people's defecation behaviours.

Table 3. 1. Summary of Target Population and Sample Size

Community	Sample Frame (Households)- DHS (2010)	Projected Sample Size	Share of Projected Sample (%)	Sample Size	Share of Sample Size (%)
Elmina	6353	183	49.1	164	50.3
Komenda	3466	100	26.8	72**	22.1
Kissi	1739	50	13.4	50**	15.3
Domenase	779	22	5.9	22	6.8
Besease	640	18	4.8	18	5.5
Total	**12,977**	**373**	**100**	**326****	**100**

Source: Authors own construct.

** Six questionnaires (two from Komenda and four from Kissi) were incomplete, so they were not included in that data analysis.

3.7.1.1. Pre-test of Quantitative Research Instrument.

Piloting study was conducted on twenty-four household heads before embarking on the actual study. Administration of the piloting instruments was as follows: Elmina (10), Komenda (5), Kissi (5), Besease (2) and Domenase (2). The piloted samples were not included in the main data analysis of the study. The piloting was done to ascertain how valid and reliable the instruments of measurement were. This aided in averting any hiccups that might be encountered during the actual administration of the questionnaires for the study. It has been recommended by Connelly (2008) that, a pilot study sample should be 10 per cent of the projected samples. However, Hertzog (2008) cautions that this is not a simple or straight forward issue to resolve because a lot of factors may influence the studies. Nevertheless, Isaac & Michael (1995) and Treece & Treece (1982) suggested 10 to 30 participants while Julious (2005) and van Belle (2002) suggested 12

participants. This suggests a minimum of 10 participants and a maximum of 30 participants for piloting a research instrument.

3.7.1.2. The Validity of the Research Instrument.

The validity, according to Bryman (2012), refers to whether an adapted instrument or indicator for measurement measures the intended concept. The study adapted face validity to ensure that the research instruments were sufficient to measure and can draw conclusions on the aforementioned objectives. According to Bryman, (2012), with face validity, the instruments of measurement are submitted to a supervisor or an expert for editing and correction. The researcher, therefore, sought expert advice and guidance from the supervisors in designing the instruments. Moreover, after designing the instruments, the instruments were further edited and corrected by the supervisors.

3.7.1.3. Reliability of the Research Instrument.

Reliability measures how the instrument of measurement is internally consistent and whether when the particular technique is applied repeatedly to the same object, yields the same result each time. This was checked through the use of the Cronbach Alpha in the Statistical Package for Social Sciences (SPSS) software. To ensure internal consistency of instruments of measurement, it is required that the coefficient of the Cronbach's Alpha is 0.7 and above (Gliem & Gliem, 2003; Tavakol & Dennick, 2011). After the pre-test of the instrument, and re-editing and correction of the questionnaires, the Cronbach Alpha was used to check the internal consistency of the questions. The Cronbach Alpha's coefficient for the questionnaire was 0.76. This means that the scale of measuring the stated objectives was reliable and consistent.

3.7.2. Qualitative Data Source

3.7.2.1. In-depth Interviews.

The study conducted in-depth interviews with key informants. The interviews were moderated by an interview guide (see Appendix A and B). The key informants interviewed were the Municipal Environmental Health and Sanitation Officer, Community Sanitation Officer, Public Toilet Attendants, and Assemblymen. The key informants were purposively selected because they have some depth of knowledge about open defecation practices in the municipality. According to Broshenka & Castro, (1983); cited in Teye (2008), a key informant is a person who is assumed to have some depth of knowledge about a research problem under study and who is willing to talk.

Although other key informants such as the traditional chiefs, religious leaders, and NGOs could have been included, the researcher assumed that the opinions of the assemblymen in each of the community reflected the views of the other opinion leaders in the community. The reason was that, in these communities, the assemblymen works in coordination with the other opinion leaders in the community. There were more than one public toilet attendants in all the study location, except for Besease and Domenase which had no public toilet. Therefore, the lottery method was used in selecting one public toilet attendant (for Komenda and Kissi), except for Elmina where two public toilet attendants were selected, because Elmina had more public toilets than the other communities. Except for Besease and Domenase which had one assemblyman, selection of each assemblyman from Elmina, Komenda and Kissi was based on convenient: availability and willingness to be interviewed. Interviews with the public toilet attendants and the Assemblymen lasted between 30 and 45 minutes. That of the Community and the Municipal's Sanitation Officer lasted for an hour. The interview was necessary for this study because issues

not captured by the quantitative instrument would have been missed. The breakdown of the total numbers on interviews conducted and the location is presented in Table 3.2.

Table 3. 2. Sampling Design for In-depth Interview.

Community	Group and Number of respondents	Total Number of Respondents
KEEA Municipal	Municipal Sanitation Officer(1)	**1**
Elmina	Assemblyman (1) Public toilet attendant(2) Community sanitation officer (1)	**3**
Komenda	Assemblyman(1) Public toilet attendant (1)	**3**
Kissi	Assemblyman (1) Public toilet attendant (1)	**2**
Domenase	Assemblyman(1)	**1**
Besease	Assemblyman(1)	**1**
Total		**11**

Source: Author's own construct.

3.7.2.2. Focused Group Discussion.

The study also used Focused Group Discussions (FGD) to gain further insights related to the study. One FGD was held in each of the selected communities and the. However, discussants for the FGD for Besease were joined with discussants at Kissi for a single discussion. However, probing of the discussants was geared to their respective communities. On that faithful day, there was a funeral at Kissi; hence all those selected from Beasese were Kissi. In all, four FGDs where held. Discussant at each community was purposively selected and brought together with the help of the assemblymen. All the discussions lasted between sixty and ninety minutes. The discussions were moderated by the researcher to ensure that all questions on the interview guide (see Appendix C) were exhausted. The researcher moderated the discussion to also ensure that, equal chances were given to both the men and women to speak. To avoid muting and dominance

of one sex over the other, the researcher occasionally, probed and directed question to each sex to solicit for their opinions. Composition of the participants is detailed in Table 3.3.

Table 3. 3. Sampling Design for Focused Group Discussion.

Community	Number of Discussants:		Total
	Male	Female	
Elmina	5	6	11
Komenda	5	4	9
Kissi and Besease	7	6	13
Domenase	6	3	9
Total.	**23**	**19**	**42**

Source: Author's own construct

3.7.2.3. Observation.

According to Jorgensen (2015), scientific observation encompasses the process of recording behavioural patterns of people, objects and events as they occur. This method has been adopted by studies by Weinberg *et al.* (2013) and Von Baeyer & Spargrud, (2007). The study, therefore, employed this data collection method through an observational checklist to gather information on the status and conditions of public toilets within the selected communities.. According to Jorgensen (2015), this method provides the researcher with the opportunity to capture and record information the respondents might be reluctant to discuss during an interview. Moreover, first-hand information was also discovered. Specifically, the researcher observed number of cubicles, presence of faeces, urine and anal cleaning material on the floor, condition of the roofing, and if the facility has light.

3.8. Data Collection Procedures

After the research proposal was approved, the researcher obtained an introductory letter from the Department of Geography and Resource Development at the University of Ghana. The

introductory letter enabled the researcher to collect the data without suspicion from locals. Moreover, at each community with the help of the assemblymen, an entry was done through the traditional authority. Contact with the respective assemblymen was made during the pre-test. Therefore, the security of the researcher was guaranteed. Moreover, consent was firstly sought from respondents before the start of an interview. The researcher made it known to the interviewee that, their responses are not binding, and they could withdraw from the study at any point in time or refuse to answer any question of their choice. The researcher then collected data from the field using the stated data collection instruments. All the interviews were recorded with a tape recorder.

The research visited all public toilets (PTs) within the selected communities, and the facility's geographic coordinates were recorded with a hand-held GPS device (Etrex SUMMIT GARMIN). The GPS device was placed close to the PT to record the coordinates. The latitude and longitude coordinates of the facility were recorded in degrees, minutes and seconds and converted into decimal degrees. Each time the PTs were visited, the researcher observed the type of the PT, its constructional details, state of the PTs and management structure. The coordinates were cross-validated using Google Earth imagery to ascertain if they fell at their true locations. This aided in ascertaining sanitation and hygiene condition of the facility. It was also to understand and experience how it felt to use these toilet facilities. Each time, photographs of premises and surroundings of PTs were taken.

3.9. Method And Tools For Data Analysis

For data analysis, quantitative data were analysed using the Statistical Program for Social Science (SPSS) version 23 and Stata. However, the qualitative data were transcribed from the audio version, coded, categorised and analysed according to the themes relative to the research

questions and objectives of the research. Thematic analysis and verbatim quotes from the qualitative data were used to buttress the quantitative results.

In analysing the quantitative data, the completed questionnaires were coded into the SPSS and edited to avoid any errors in them. The units of analysis were households. The SPSS was used to analyse categorical variables such as sex, age, marital status, religion, education, income (continues variable) and household size in the form of tables and percentage. Chi-square test was also used to test relationships between socioeconomic and demographic variables and availability and preferences of toilet facility.

For objective one and two, the GPS coordinates of the public toilet were exported into the ArcGIS software (version 10.4). The shape-file of each community was digitized from the Google Earth Imagery and exported from kml file to a layer in the ArcGIS. The projection parameters were the default World Geographic System 1984 (WGS 84). It was then overlaid with existing country shape-files, and layout maps were produced showing how the various public toilets are spatially distributed within Elmina, Komenda and Kissi Township. Afterwards, Chi-square was used to test how the spatial distribution of the public toilet influence open defecation practices in each community.

For objective three, Probit Regression Model in stata was used to predict how demographic and socio-economic factors influences open defecation practices. Chi-square test was also used to investigate some relationships between the socio-demographic variable.

Objective four was analysed using descriptive statistics and Chi-square test. The drivers of latrine adoption were firstly analysed through descriptive statistics at the community level. Chi-square test was then used to explore how the drivers are influenced by the socio-demographic factors.

3.9.1 Probit Regression Model

The probit model was used to estimate the determinants of open defecation in KEEA. This model was used because of the mutually exclusive nature of the dependent variable. That is, whether the individual open defecates or not. Factors that may influence an individual to practise open defecation will not necessarily be the same factors that may influence the individual's inability to open defecate. So, therefore, there are unobserved differences in the factors that influence open defecation of individuals' in KEEA. The latent or unobserved variable is represented with a linear regression model as follows:

$$Y_i^* = X_i'\beta + \mu_i \qquad (1)$$

The observed is, however, an occurrence that is denoted by a dichotomous variable Y, and it is defined as:

$Y_i = 1\ if\ Y_i^* > 0$ if the individual open defecates

$Y_i = 0\ if\ Y_i^* \leq 0$ if the individual does not open defecate

Where;

X_i', is an individuals' vector of social, economic and demographic factors;

μ_i, is an error term that is specific to each household;

β, the vector of parameter, is common to all households.

The probability that the individual open defecates given a set of social, economic and demographic characteristics is obtained as:

$$P_r(Y_{ij} = 1 \mid X_{ij}) = \Phi(X_{ij}'\beta) \qquad (2)$$

Where;

P_r denotes the probability;

Y_{ij} represents open defecation;

Φ is the Cumulative Density Function (CDF) of the Standards normal distribution;

X_{ij}' denotes the vector of individuals' social, economic and demographic characteristics that assumed to affect the dependent variable, Y.

The coefficients obtained from the above equation represents coefficients of the index function, which are partial effects. In the probit model, interpreting of the partial effects is inappropriate hence the need to compute the marginal effects for interpretation. The computation of the marginal effects is obtained as:

$$\frac{\partial P\,(Y=1|\,X)}{\partial X_i} = \beta f(X\beta) \qquad (3)$$

where $f(.)=\frac{\partial f(.)}{\partial(X\beta)}$

Empirical Model Specification

The Probit model for open defecation is specified as:

OD = f (Age, Sex, Level of education, Marital status, Religion, Household size, Ethnicity, Household income)

$$P_r \quad (OD_i = 1|X_i) = \beta_0 + \beta_1 Age + \beta_2 Sex + \beta_3 Edu + \beta_4 Mar + \beta_5 Rel + \beta_6 Hhs + \beta_7 Ethn + \beta_8 Inc + \epsilon_i \qquad (4)$$

Where;

OD = Open Defecation; β_0= a constant; $\beta_1 - \beta_8$ = are vectors of coefficient; Age = Age; Sex= Sex; Edu = Level of education; Mar = Marital status; Rel = Religion; Hhs = Household size; Ethn = Ethnicity; Inc = Income; and ϵ_i= error term capture all the factors that may influence the demand for insurance but have been omitted.

Definition, measurement and a'priori signs of variables

Variables	Definition of the variable	A priori sign
Open defecation (OD)	A binary variable that indicates whether the individual open defecate or not	
Age	A categorical variable that captures the age of the respondent. This was put in five categories; 20-30; 31-40; 41-50; 51-60; and 60 and above.	Indeterminate
Education	A categorical variable that captures the educational level of the respondents. It is categorized as no, basic, secondary and tertiary education.	Indeterminate
Sex	A binary variable that captures the sex of the respondent. It was coded 1=Male and 0=Female.	Indeterminate
Marital status	A categorical variable that captures the marital status of all respondents. It was put into four categories; single, married, divorced and widow.	Indeterminate
Religion	A categorical variable that captures the religious denominations of all respondents. This was put into three categories; Christianity; Islamic and Africa traditional religion.	Indeterminate
Household size	This is a categorical variable that captures the respondents' household size. It has four categories; the household size of 1-3; 4-6; 7-9; and 10 and above.	Indeterminate
Ethnicity	A categorical variable capturing the ethnic inclination of all respondents. It was put into six categories.	Indeterminate
Income	A continuous variable that captures the income level of all respondents.	Positive

Source: Author's own construct (2019).

3.10. Chapter Summary

In this chapter, the study area and the research methods were presented. The study area focused on the origin, socio-economic and demographic dynamics of the KEEA Municipal. The study communities were also profiled. The research methods also covered the research method philosophical underpinnings, types of data, target population and sampling techniques. Methods of data gathering and approaches used in analysing the data have also been presented. The analysis of the data and discussions of the results begins in the next chapter.

CHAPTER FOUR

PRESENTATION OF RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter presents the analysis and discussions of the results of the study objectives. Issues discussed include the spatial distribution of public toilets in the study location, availability of household toilet facility and the reasons for non-availability of household toilet facility. The chapter also discusses the socio-demographic determinants of open defecation practices. The later part of the chapters also discussed the results and finding of the drivers of household toilet facility adoption and how the drivers are influenced by socio-demographic variables such as marital status, education and income levels.

4.2. Socio-Demographic Characteristics of Respondent

4.2.1 Sex and Marital Status

The results for sex distribution and marital status are presented in Table 4.1. A total of 326 respondents were interviewed quantitatively, but six questionnaires were incomplete. Hence, 320 questionnaires were used for the analysis. Out of these, 75.3 per cent were males, and 24.7 per cent were females. Averagely, there was at least 68 per cent dominance of male respondents in each of the communities as compared to that of the female respondents. The sex composition of the respondents is, however, different from that of the municipal, which shows that males constitute 48.1 per cent and females being 51.9 per cent (GSS, 2012). The dominance of males is because household heads were considered as the study's target population. As a result, there was the likelihood to have more male respondents since cultural settings in Ghana puts men as the heads of households (Tanle, 2010).

Table 4. 1: Sex and marital status of the respondents

Demographics	Elmina	Komenda	Kissi	Besease	Domenase	Total
Sex of respondents						
Male	120 (73.2)	54(77.1)	36(78.3)	16(88.9)	15(75.3)	241(75.3)
Female	44(26.8)	16(22.9)	10(21.7)	2(11.1)	7(24.7)	79(24.7)
Total	164(100)	70(100)	46(100)	18(100)	22(100)	320(100)
Marital status						
Single	15(9.1)	14(20.0)	7(15.2)	6(33.3)	7(31.8)	49(15.3)
Married	138(84.1)	53(75.7)	34(73.9)	10(55.6)	12(54.5)	247(77.2)
Divorced	4(2.4)	1(1.4)	3(6.5)	2(11.1)	2(9.1)	12(3.8)
Widow/widower	7(4.3)	2(2.9)	2(4.3)	0(0.0)	1(4.5)	12(3.8)
Total	164(100)	70(100)	46(100)	18(100)	22(100)	320(100)

Figures in parentheses represent percentages and those not in parentheses are respondent counts.
Source: Field survey, 2019.

Table 4.1 also presents the marital status of the sampled respondents. The results indicate that 77.2 per cent are married or living together in a relationship, while 3.8 per cent are divorced. Out of those sampled, 15.3 per cent are single or have never married while 3.8 per cent have married but lost their partners. Marital status and sex dynamics indicate that 77.6 per cent of the males were married, as against 75.9 per cent females. Moreover, 17.8 per cent of the males were single as against 7.6 per cent of the females. At the community level, respondents within the married group were higher in the three urban communities (Elmina, Komenda and Kissi) than the two rural communities. Moreover, respondents with single marital status were also higher in rural communities than the urban settlements.

4.2.2. Age Distribution of Respondents

The respondents' ages range from 21 to 80 years, with an average age of 43 years. From Table 4.2, 19.7 per cent of the total respondents were within the age group of 20 to 30 years. Respondents within the age group 31 to 40 years also accounted for 24.7 per cent while those in

the age bracket 41 to 50 years also accounted for 29.7 per cent of the respondents. Only 11.9 per cent of the respondents were above 60 years. This means that a large proportion of the respondents (54.1%) are within the age group of 31 and 50 years as a result of household heads being considered as the target population for the study. It can also be deduced from Table 4.2 that, 68.5 per cent of the respondents are within the active or labour force age bracket (31 to 60 years).

Table 4. 2: Age of respondents

Age of respondents	**Name of Community**					**Total**
	Elmina	Komenda	Kissi	Besease	Domenase	
20 to 30	23(14.0)	21(30.0)	9(19.6)	7(38.9)	3(13.6)	63(19.7)
31 to 40	43(26.2)	16(22.9)	12(26.1)	4(22.2)	4(18.2)	79(24.7)
41 to 50	57(34.8)	16(22.9)	11(23.9)	4(22.2)	6(27.3)	94(29.4)
51 to 60	23(14.0)	9(12.9)	6(13.0)	3(16.7)	5(22.7)	46(14.4)
61 above	18(11.0)	8(11.4)	8(17.4)	0(0.0)	4(18.2)	38(11.9)
Total	**164(100)**	**70(100)**	**46(100)**	**18(100)**	**22(100)**	**320(100)**

Figures in parentheses represent percentages and those not in parentheses are respondent counts.
Source: Field survey, 2019.

4.2.3. Ethic Background of the Respondents

In terms of ethnicity, as presented in Table 4.3, the Fantis dominated the total respondents of each of the study community. Overall, the Fantis constituted 88.8 per cent of the respondents, followed by Ewes (4.4%) and Ashantis (3.4%). Other ethnic groups present in the study community were the Ga-Dangmes, Nzima's and others and they constituted 3.5 per cent of the respondents. The results show that Akans (Fantis and Ashantis) are 92.2 per cent of the population as compared to the 93.4 per cent for the municipal (GSS,2012). According to the 2010 census, the Fantis are the indigenous people of the municipality, and this explains why they dominated in each of the study community. It is equally important to note that, most of the

migrant ethnics are located in Elmina due to job availability (fishing and mongering) (Aheto *et al.*, 2012; Koranteng *et al.*, 2012).

Table 4. 3: Ethnicity of respondents

Ethnicity	**Name of Community**					**Total**
	Elmina	Komenda	Kissi	Besease	Domenase	
Fanti	140(85.4)	65(92.9)	42(91.3)	16(88.9)	21(95.5)	284(88.8)
Ashanti	8(4.9)	0(0.0)	2(4.3)	1(5.6)	0(0.0)	11(3.4)
Ewe	7(4.3)	5(7.1)	2(4.3)	0(0.0)	0(0.0)	14(4.4)
Ga	2(1.2)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	2(0.6)
Nzima	4(2.4)	0(0.0)	0(0.0)	1(5.6)	(0.0)0	5(1.6)
others	3(1.8)	0(0.0)	0(0.0)	0(0.0)	1(4.5)	4(1.3)
Total	**164(100)**	**70(100)**	**46(100)**	**18(100)**	**22(100)**	**320(100)**

Figures in parentheses represent percentages and those not in parentheses are respondent counts.
Source: Field survey, 2019.

4.2.4: Religious Afiliation of Respondents

In terms of religion, Christians accounted for 92.8 per cent of the respondents while the Muslims were 3.8 per cent. Communities such as Komenda and Besease had non-Muslim respondents. This result is not at variance with the municipality's religious composition where Christians and Muslims respectively accounted for 93.6 per cent and 5.3 per cent of the population (GSS, 2012). The results are equally not surprising because Christians overwhelmingly dominate all other regions; particularly in the southern part of the country, though Ghana is a secular state (GSS, 2012).

Table 4. 4: Religion of respondents

Religion	Elmina	Komenda	Kissi	Besease	Domenase	Total
Christian	150(91.5)	69(98.6)	41(89.1)	17(94.4)	20(90.9)	297(92.8)
Muslim	8(4.9)	0(0.0)	3(6.5)	0(0.0)	1(4.5)	12(3.8)
Traditionalist	2(1.2)	1(1.4)	2(4.3)	0(0.0)	1(4.5)	6(1.9)
Others	4(2.4)	0(0.0)	0(0.0)	1(5.6)	0(0.0)	5(1.6)
Total	**164(100)**	**70(100)**	**46(100)**	**18(100)**	**22(100)**	**320(100)**

Figures in parentheses represent percentages and those not in parentheses are respondent counts.
Source: Field survey, 2019.

4.2.5. Respondents level of Education

Table 4.5 presents the educational attainment of the respondents. The data shows that 45.9 per cent had basic education, followed by secondary education (31.6 %) and 6.6 per cent attaining tertiary education. Inferences from the data show that 84.1 per cent of the respondent had some form of education (basic to tertiary), out of which, those with basic education (45.9 %) predominates as against 15.9 per cent without any form of education. Educational dynamics is, however, different from the individual study location. For instance, Elmina had the highest tertiary education respondents, and it is ranked second after Komenda for those without any form of education. Also, in each of the two rural communities (Besease and Domenase), more than half of their respondents highest educational attainment is basic education. The overall dynamics account for reasons why the majority of the respondents are engaged in the informal sector in occupations such as farming, fishing, artistry; services etc. (see Table 4.6) (GSS,2012). It also implies that about 61.8 per cent of the respondents are cut off from any form of formal work, including the public sector, where the basic requirement for recruitment is secondary education.

Table 4. 5: Educational attainment of respondents

Educational Background	Name of Community					Total
	Elmina	Komenda	Kissi	Besease	Domenase	
No Formal Education	31(18.8)	14(20.2)	3(6.5)	1(6.5)	2(9.1)	51(15.9)
Basic (Primary /JHS)	76(46.3)	28(40.0)	18(39.1)	10(55.6)	15(68.2)	147(45.9)
Secondary	45(27.4)	25(35.7)	21(45.7)	6(33.3)	4(18.2)	101(31.6)
Tertiary	12(7.3)	3(4.3)	4(8.7)	1(5.6)	1(4.5)	21(6.6)
Total	**164(100)**	**70(100)**	**46(100)**	**18(100)**	**22(100)**	**320(100)**

Figures in parentheses represent percentages and those not in parentheses are respondent counts.
Source: Field survey, 2019.

4.2.6 Occupation of Respondents

The performance of an economy depends on the various occupations that are available. Livelihood status within the study locations, as presented in Table 4.6 shows that 30.3 per cent of the respondents are engaged in sales and services business. This is followed by fishing or mongering (27.2%) and skilled manual workers (dressmakers, artisans, beauticians, among others) with 22.2 per cent.

Table 4. 6: Occupation of respondents

Occupation	Name of Community					Total
	Elmina	Komenda	Kissi	Besease	Domenase	
Farming	1(0.6)	7(10.0)	16(34.8)	6(33.3)	9(40.9)	39(12.2)
Fishing / Mongering	59(36.0)	26(37.1)	2(4.3)	0(0.0)	0(0.0)	87(27.2)
Services and Sales	63(38.4)	18(25.7)	12(26.1)	0(0.0)	4(18.2)	97(30.3)
Gov't Worker	8(4.9)	5(7.1)	4(8.7)	1(5.6)	1(4.5)	19(5.9)
Skilled Manual	30(18.3)	14(20.0)	12(26.1)	11(61.1)	4(18.2)	71(22.2)
Unemployed/ retired	3(1.8)	0(0.0)	0(0.0)	0(0.0)	4(18.2)	7(2.2.)
Total	**164(100)**	**70(100)**	**46(100)**	**18(100)**	**22(100)**	**320(100)**

Figures in parentheses represent percentages and those not in parentheses are respondent counts.
Source: Field survey, 2019.

From Table 4.6, those engaged in farming are 12.2 per cent, while 22.2 per cent are government workers. It can be deduced from the data that about 97.8 per cent of the respondents are engaged in some form of sustainable livelihood. This relates to the 2010 population and housing census, which posited that; the unemployment rate is relatively low in the municipality (GSS, 2012). Fishing is only done in Elmina and Komenda since these settlements are coastal towns. Moreover, in the two rural communities :Besease and Domenase, and Kissi, the primary source of sustainable livelihood is farming. Also, the low educational attainment accounts for reasons why only 5.9 per cent of the respondents are in the public or government works while higher percentages are into fishing, sales and services and skilled manual works as confirmed by the 2010 population census. Occupation influences income status, which can in turn influence affordability of toilet facility.

4.2.7 Respondents' Household Income

The distribution of the household income is presented in Table 4.7. Six respondents did not disclose their income, while 314 respondents disclosed their income**.** The data shows that 61.8 per cent of the respondents who disclosed their income earns between GHC 1-500 while 27.4 per cent earns between GHC501-1,000. Moreover, 5.1 percent earns between GHC 1,001-1,500 while 5.7 percent earns above GHC 1,500. Average income across the study communities is GHC 623. It is deduced from the data that more than 50 per cent of respondents of each of the study locations income does not exceed GHC 500. Also, 55.6 per cent of those who learn above GHC 1,500 are in Elmina whiles Kissi, Besease and Domenase, put together only have ten respondents whose income is above GHC 1,500.

Income levels across the study location are low as 61.8 per cent of the respondents earn less than GHC 500. Estimation by WASH (2014), showed that the majority of households in the

municipality earn a monthly income of less than GHC 500. The low-income status can be attributed to the types and main sources of sustainable livelihood in the study locations (see Table 4.6). Moreover, educational status is also low; hence, only a few people are in the formal sectors which offer well-paid jobs as compared to the informal sector.

Table 4. 7: Respondents income status

Income (GHC)	**Name of Community**					**Total**
	Elmina	Komenda	Kissi	Besease	Domenase	
500 and below	91(57.2)	46(65.7)	33(71.7)	13(72.2)	11(52.4)	194(61.8)
501 to 1000	50(31.4)	18(25.7)	7(15.2)	4(22.2)	7(33.3)	86(27.4)
1001 to 1500	8(5.0)	4(5.7)	2(4.3)	0(0.0)	2(9.5)	16(5.1)
1501 to 2000	5(3.1)	2(2.9)	3(6.5)	0(0.0)	0(0.0)	10(3.2)
2001 and above	5(3.1)	0(0.0)	1(2.2)	1(5.6)	1(4.8)	8(2.5)
Total	**159(100)**	**70(100)**	**46(100)**	**18(100)**	**21(100)**	**314(100)**

Figures in parentheses represent percentages and those not in parentheses are respondent counts.
Source: Field survey, 2019.

4.2.8 Respondents' Household Size

In terms of household size**,** Table 4.8 shows that 49.1 per cent of the sampled household varies from 4 to 6 occupants while household sizes of 7 to 10 recorded 23.4 per cent. Again, household sizes of 1 to 3 recorded 16.6 per cent while household sizes of 10 or more were for 10.9 per cent. It is deduced from the data that, small household-sizes between 1 and 3 persons were only a fraction of all the households visited. For instance, in Elmina, small household size of 1 to 3 accounted for only 15.2 per cent, likewise Komenda (17.2). The average household size of 6 persons is higher than that of the municipal (3.9), the regional (4.0) and the national (4.4) (GSS, 2014). The reason is that most of the houses being occupied are family houses. Household occupancy is, however, different across the study communities.

Table 4. 8: Distribution of household occupancy.

Household Size	Name of Community					Total
	Elmina	Komenda	Kissi	Besease	Domenase	
1 to 3	25(15.2)	12(17.2)	9(19.6)	3(16.7)	4(18.2)	53(16.6)
4 to 6	86(52.4)	30(42.9)	24(52.2)	8(44.4)	9(40.9)	157(49.1)
7 to 9	35(21.3)	21(30.3)	8(17.4)	4(22.2)	7(31.8)	75(23.4)
10 and above	18(11.0)	7(10.0)	5(10.9)	3(16.7)	2(9.1)	35(10.9)
Total	**164(100)**	**70(100)**	**46(100)**	**18(100)**	**22(100)**	**320(100)**

Figures in parentheses represent percentages and those not in parentheses are respondent counts.
Source: Field survey, 2019.

Table 4.8 also shows that Besease recorded the highest (16.7%) for household sizes of 10 or more persons. Domenase is also ranked the highest for household sizes of 7 to 9 while Elmina recorded 52.4 per cent for a household size of 4 to 6. The household occupancy dynamics shows that, within the study locations, about 83.4 per cent of the households are occupied by four or more persons.

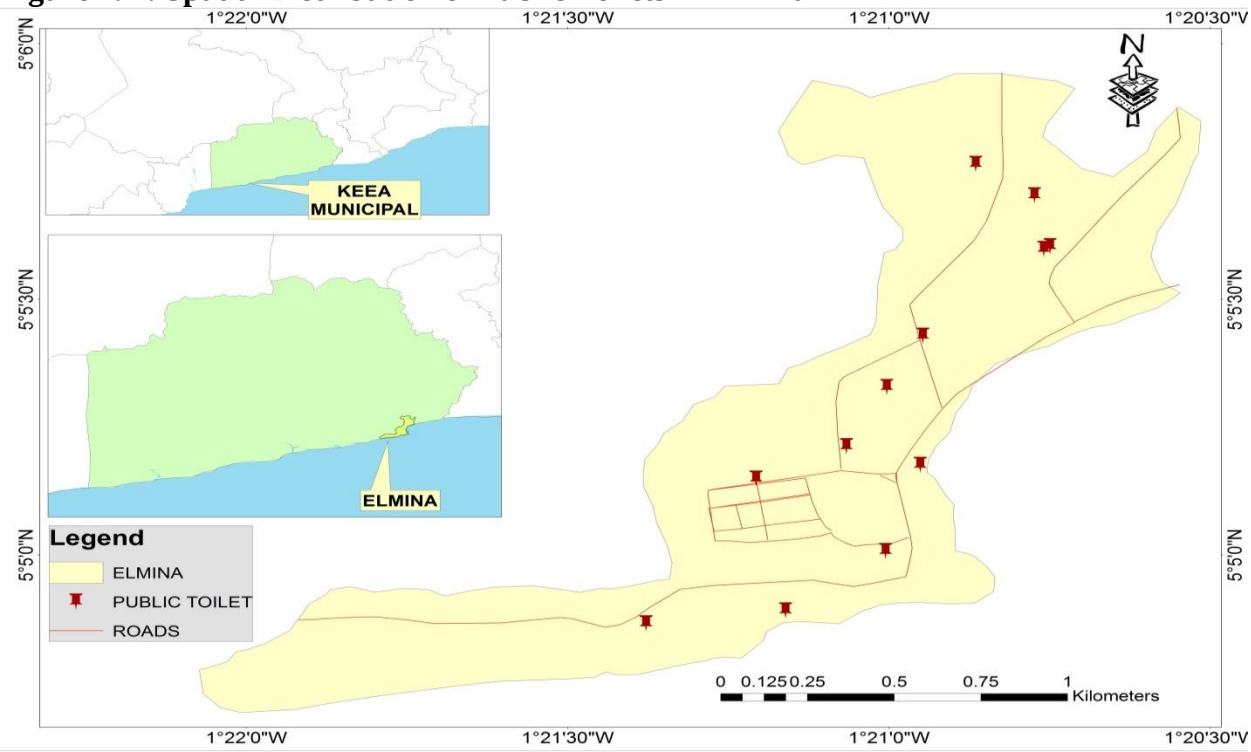
4.3: Spatial Distribution of Public Toilets in the Study Locations

This section discusses the spatial distribution of the public toilets in the five study locations. It also examines the hygienic conditions of the public toilet. The section also explains the management structure of the public toilet in this study location. Public toilet forms an important type of toilet facilities available in the municipality. According to the 2010 census, about 52.5 per cent of the municipals population uses public toilets as their place of convenience. This means almost 76,000 out of the 144,705 population attend their ‘‘natures’ call’’ at the public toilet (GSS, 2012). The toilet facility type is either a KVIP or Water Closet (WC).

In Elmina, there are about twelve public toilets that are spatially distributed across the town. Comparing the number of public toilets in the community to the community’s total population of 23,013 shows a ratio of one public toilet to 1,900 persons in Elmina. Comparatively, Elmina has

more public toilets than the other study locations because it is the municipal capital with a larger population. The public toilets are fairly distributed across Elmina Township except for areas near the Bantuma suburb in the south-western-most part of the community. This area has no public toilet, unlike suburbs like Bakanu, Tatriam, and Market area suburbs of the community (see Figure 4.1).

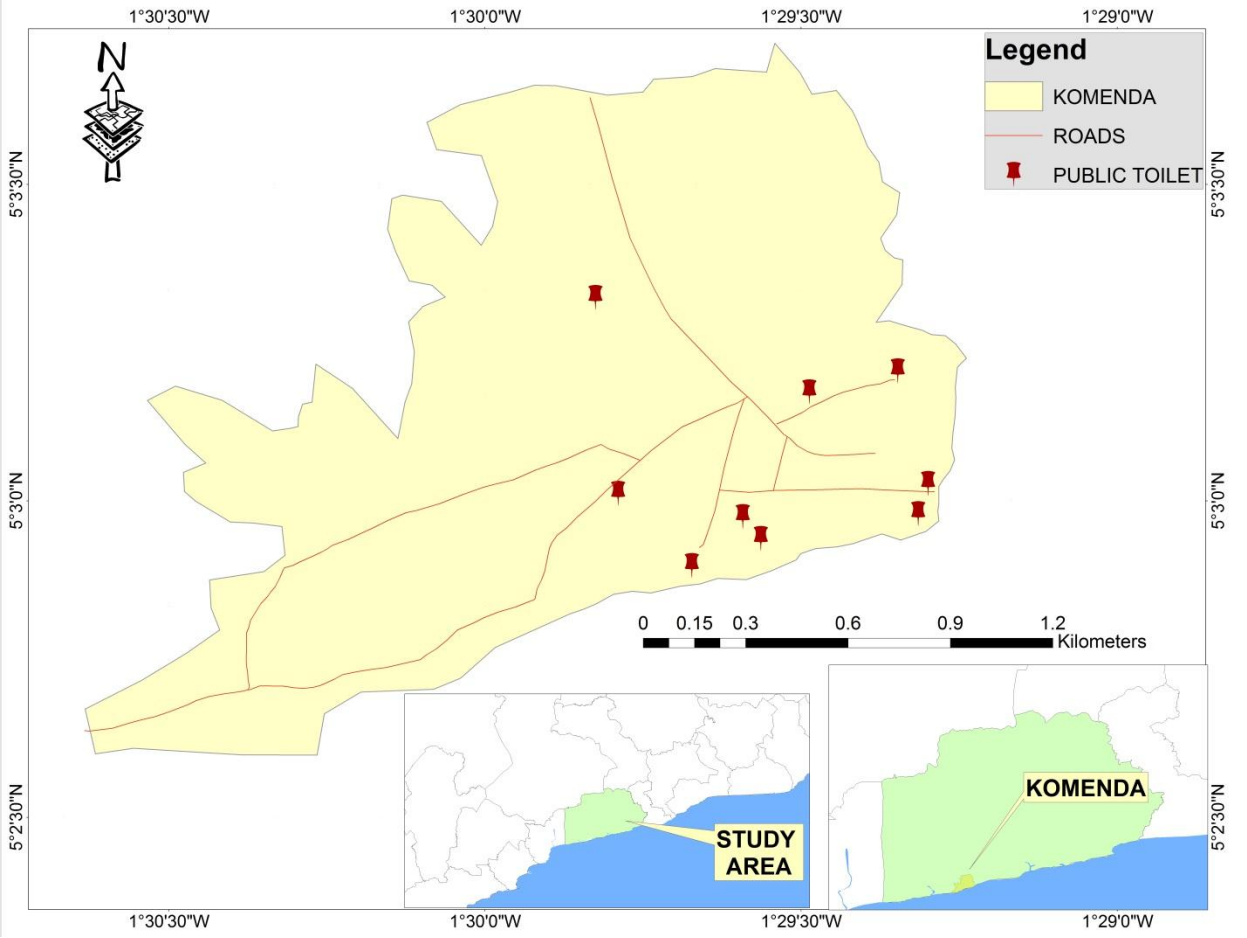
Figure 4. 1: Spatial Distribution of Public Toilets in Elmina



Source: Authors own construct.

Komenda, with a population of 14,754, has nine publics toilet facilities. This signifies a usage ratio of 1,640 persons per public toilet. This ratio is better as compared to Elmina. Efforts by the Komenda Local council and the Komenda Fishermen Association have constructed two of the nine public toilets in the community. The spatiality of the public toilets in the community is clustered in the Amoto suburb, located along the coast in the South Easternmost parts of the community. Suburbs such as Zongo (North Eastern), Sasem (South Western), and South Africa (Central and North Western) parts of the community are underserved (see Figure 4.2).

Figure 4. 2: Spatial Distribution of Public Toilets in Komenda.



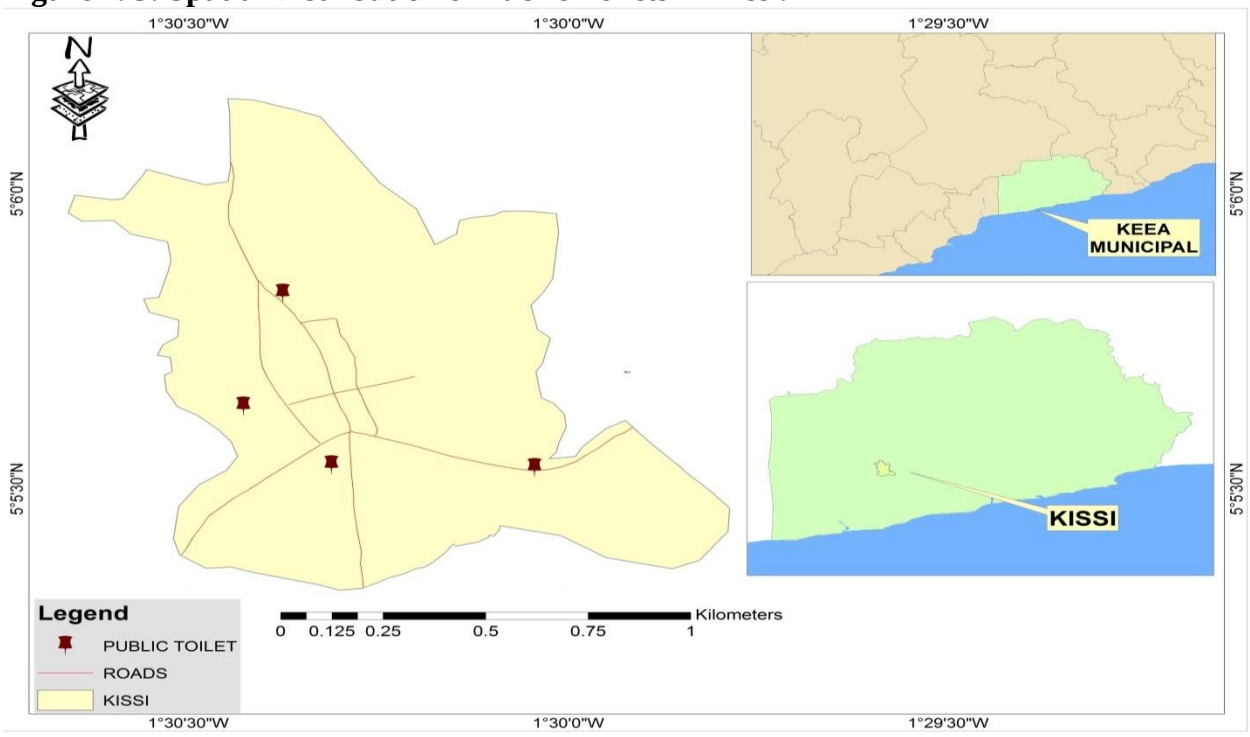
Source: Authors own construct.

Also, Kissi has four public toilets and a population of 7,160, signifying a usage ration of 1,700 persons per a public toilet. Currently, one of the four public toilets located at the Zongo suburb (south-eastern part) of the community has been abandoned since the structure is in a deplorable state (see Plate 4.1). This means that almost half of the community in the suburbs such as parts of Basonkwanta, Eporwano, Babrawom, Old A &B, and Zongo located from the northern, eastern, and southern parts of the community do not have a public toilet. Residents in these areas can only access public toilets at the other parts of the community in the suburbs such as Station (south-western), South Africa (eastern), and north-eastern parts of Basonkwanta (see Figure 4.3).

Plate 4. 1: Abandoned public toilet at Zongo Suburb of Kissi.

Source: Field survey, 2019.

Figure 4. 3: Spatial Distribution of Public Toilets in Kissi.



Source: Authors own construct.

It was realised during the fieldwork that the KEEA municipality had vested the management of these public toilets in the hands of private individuals. These private individuals pay monthly dividends to the municipalilty. The private individuals have employed attendants to keep the facility. An inspection of the premises of the facilities shows that some of the facilities are unkempt and are in deplorable states. Some have bad odour and others wereare full-up and had not been emptied. There were maggots, faeces and anal cleaning material on the floors on some of the facilities. It was realised through an interview with some of the toilet attendants that most of the facilities are not cleaned daily. Some of the attendants complained about the lack of detergent to clean and disinfect the facility to minimise the odour.

The attendants also attribute the odour of the premise to improper user practices by some of the users. Moreover, the structures of some of the toilets were deteriorating with leaking roofs, removed roofings, and disconnected light due to unpaid bills. The toilet attendants also complain about infrequent water flow, especially for the WC-types. Moreover, sinks in some of the facilities are no more in usage. In terms of management of the facility, the toilet attendants revealed that private individuals who employed them to manage the facility hardly respond and fix any fault they report about the facility.

Apart from the three urban study locations, the two rural study locations (Domenase and Besease) had a public toilet facility each. However, these public toilets have deteriorated and are not in use (see Plate 4.3 and 4.4). During the FGDs, the respondents in the two communities complained about the non-availability of a public toilet in the community. The same complaints were also raised by residents of Kissi, Komenda and Elmina. Moreover, the majority of the discussant in each of the five study location opined that building a public toilet is a responsibility

of the government or the municipality. The excerpts below highlight some of the comments that were raised during the FGDs:

*''I cannot even understand why a whole community like Domenase is without any public toilet. The KEEA is supposed to construct some for us but I don't know why they have ignored us''.***(**A 34 year old female farmer at Domenase- FGD, 10th May 2019).

''Our population keeps increasing but the municipal assembly has decided not to build an additional public toilet for us''. (A 34 year old female beautician at Kissi-FGD, 12th May 2019).

''Why should I pay and queue to use that smelling place when the bush is there'' (A 40 year old male farmer at Kissi- FGD, Kissi, 12th May 2019).

''The number of public toilet facility in the community is not enough, so the community has taken an initiative to construct one, although we were expecting the municipal to also construct additional ones''. (A 56 year old station master at Komenda - FGD, 9th May 2019).

''.....yes, it is their responsibility and we expect them to build new public toilet for us''. (A 36 year old female trader at Komenda -FGD, 9th May 2019).

''Some of the public toilets are very old and we are expecting the municipal assembly to start constructing new ones to replace the ones that are in a deplorable state''. (A 38 year old female trader.at Elmina - FGD, 8th May 2019).

Meanwhile, an in-depth interview with the Municipal's environmental sanitation officer shows that the above-mentioned opinions are different at their levels. While the provision of public toilets is seen as a responsibility for the municipal assembly, the purpose of such facilities is to serve as a place of convenience for traveller/visitors, but not for the local indigenes. To ensure that such facilities serves their intended purposes, they are provided at vantage locations such as market places, schools, lorry stations. Due to this, the environmental sanitation officer opined that opinions such as 'inadequate public toilets and provision of a public toilet as a responsibility of the municipal' should not be an excuse for an indigene to practice open defecation. The sanitation officer added that the municipal can only monitor and ensure that the privatised facilities are properly kept. The quote below highlights some of the comments raised during the in-depth interview.

*''Public toilet is not for people who are staying around. It's for travellers. Elmina for instance is a fishing community and people normally come from Cape Coast, Moree, and other places to transact business. These are the kind of people or the reason we put up public toilets but not for the natives or the indigene'' (*In-depth interview: KEEA Environment Health and Sanitation officer, 10th May 2019).

''....we are putting measures in place to frequently monitor the facilities to ensure that they are hygienically kept and properly maintained'' (In-depth interview: KEEA Environment Health and Sanitation officer, 10th May 2019).

''....they are supposed to have their household toilets. The public toilets are not meant for residents or the natives. There is a law that requires everybody to have private toilets in his/her home, and from now, we are going to enforce such laws''.(Key Informant Interview: Komenda Town council (Sanitation Officer), 9th May 2019).

Plate 4. 2 Functioning Public Toilet at the Study Locations

Source: Field survey, 2019.

Plate 4. 3: Detoraited public toilet in Besease

Source: Field survey, 2019.

Plate 4. 4 : Detoraited public toilet in Domenase

Source: Field survey, 2019.

4.4 Types of Toilet Facilities in the Study Location

4.4.1. Availability of household toilet facility

The result for the availability of household toilet is presented in Table 4.9. The respondents were asked if they have a toilet facility in their household. Out of the 320 respondents, 55.9 per cent said they do not have a household toilet while 44.1 per cent said they have a toilet facility in their homes. This result is not shocking as compared to the 2010 census data, which stated that more than 50 per cent of the households in the municipality do not have a household toilet.

Table 4. 9: Availability of household toilet facility

Have household Toilet?	**Name of Community**					**Total**
	Elmina	Komenda	Kissi	Besease	Domenase	
Yes	80(48.8)	31(44.3)	14(30.4)	8(44.4)	9(40.9)	142(44.4)
No	84(51.2)	39(55.7)	32(69.6)	10(55.6)	13(59.1)	178(55.6)
Total	**167(100)**	**70(100)**	**46(100)**	**18(100)**	**22(100)**	**320(100)**

Figures in parentheses represent percentages and those not in parentheses are respondent counts.
Source: Field survey, 2019.

It is observed from Table 4.9 that except for Elmina which had 48.8 per cent households with a household toilet facility, less than 45 per cent of the households in each of the other study locations had a household toilet. Kissi recorded the lowest (30.4%) for the number of households with a household toilet. The data also shows that, in terms of households without a household toilet, Elmina recorded the lowest (51.2%) while Kissi recorded the highest (69.6%).

Respondents in households with household toilets were further asked if they consistently attend nature's call at their household toilet facility. Out of the 142 respondents, 93 per cent said they always attend nature's call at the household toilet, while 7 per cent do not use the toilet facility

consistently. It is therefore inferred from the data that, at least as many as 188(58.8%) of the respondents attend natures call through other means other than using household toilet facility.

4.4.1.1. Relationship between Availability of household toilet and marital status.

From Table 4.9, 44.4 per cent of the sampled respondents have household toilet facilities. This section, therefore, sought to determine whether marital status influences the availability of household toilet facility in the study location. It is observed from Table 4.10 that, out of 44.4 per cent households with household toilet facility, more than three-quarter (77.5%) are married, 19 per cent are single, and 2.8 per cent are widow or widower. Moreover, out of the 178 respondents without a household toilet, more than three-quarter (77%) are also married, 12.4 per cent are single 6.2 are divorced, and 4.5 per cent are either widow or widower. If can be inferred from the table that, for respondents who are married, 55.5 per cent do not have a household toilet while respondents who are also single, accounted for 44.9 per cent.

Table 4. 10: Marital status and availability of household toilet facility

Have household Toilet	**Marital Status**				**Total**
	Single	Married	Divorced	Widow/Widower	
Yes	27(19.0)	110(77.5)	1(0.7)	4(2.8)	142(100)
No	22(12.4)	137(77.0)	11(6.2)	8(4.5)	178(100)
Total	**49**	**247**	**12**	**12**	**320(100)**

Figures in parentheses represent percentages and those not in parentheses are respondent counts.
Source: Field survey, 2019.

Pearson Chi-Square

Parameter	**Value**
Number of valid cases	320
Chi-Square	9.195
Degree of freedom	3
Significance (P-value)	0.027

A Chi-square test was used to determine if the marital status has an association with the availability of a household toilet. The result shows that there a significant relationship between marital status and availability of household toilet since the P-value (0.027) is less than the significant value (0.05). The significant relationship confirms earlier study in India by Stopnitzky, (2017) who emphasised that marital status is likely to influence toilet adoption. According to the author, those who are married are likely to own a household toilet facility. For household with toilet facility from Table 4.10 the majority (77.5 %) are married.

4.4.1.2. Relationship between the availability of household toilet facility and income status.

This section seeks to determine whether income status influences the availability of household toilet facility. The analysis was based on 314 out of the 320 respondents who disclosed their income status. The result is presented in Table 4.11. The results show that, out of the 194 respondents who earn below GHC 500, about 39.2 per cent have toilet facility in their house while 60.8 per cent do not have any toilet facility in their homes. Also, more than half (53.5%) of the respondents whose income is between GHC 501 and 1000, have constructed a toilet facility in their homes. Availability of toilet in homes of respondents whose income is between GHC 1,001 and 1,500 is symmetrical. It is also observed from Table 4.11 that, for respondents who earn more than GHC 1,500, more than half (55.6%) do not have toilet facility in their homes.

Table 4. 11: Relationship between the availability of household toilet and income status.

Have household toilet	**Income (GHC)**				**Total**
	500 and below	501 to 1000	1001 to 1500	1501 and above	
Yes	76 (39.2)	46 (53.5)	8 (50.0)	8(44.4)	138 (43.9)
No	118(60.8)	40(46.5)	8(50.0)	10(55.6)	176(56.1)
Total	**194(100)**	**86(100)**	**16(100)**	**18(100)**	**314(100)**

Figures in parentheses represent percentages and those not in parentheses are respondent counts.

Source: Field survey. 2019.

Chi-square test

Parameter	Value
Number of valid cases	314
Chi-Square	7.117
Degree of freedom	4
Significance (P value)	0.13

A Chi-square test was performed to determine if income status influence the availability of a household toilet. The results indicated that the relationship between income status and availability of household toilet is insignificant since the P-value (0.13) is great than the significant value (0.05). Therefore, since income status has no significant relationship with the availability of household toilet, it also means that income levels do not have a significant relationship with types of household toilet facility available in a household.

4.4.1.3. Relationship between the availability of household toilet facility and Education status.

This section also seeks to ascertain whether educational inclination of the respondents has any relationship with the availability of household toilet facility. The analysis was based on the 320 respondents, as presented in Table 4.12. It is deduced from Table 4.12 that educational level has a positive relationship with the availability of household toilet. As education level increase, the percentages for the availability of household toilet also increase and while education level decrease, the percentages for the availability of household toilet also decrease. For instance, availability of household toilet increased through 21.6 per cent to 81 per cent for no education, through to the tertiary level and vice versa.

A Chi-square test was performed to determine whether the positive relationship between educational inclination and availability of household toilet is significant. The result shows that the educational level has a significant relationship with the availability of household toilet. This is because the P-value (0.00) is less than the significant values (0.05).

Table 4. 12: Relationship between the availability of the household toilet facility and Education status.

Have household toilet	Education status				Total
	No Formal Education	Basic	Secondary	Tertiary	
Yes	11(21.6)	62(42.2)	52(51.5)	17(81.0)	142(44.4)
No	40(78.4)	85(57.8)	49(48.5)	4(19.0)	178(55.6)
Total	**51(100)**	**147(100)**	**101(101)**	**21(100)**	**320(100)**

Figures in parentheses represent percentages and those not in parentheses are respondent counts.
Source: Field survey, 2019.

Pearson Chi-Square

Parameter	Value
Number of valid cases	320
Chi-Square	24.485
Degree of freedom	3
Significance (P-value)	0.00

4.4.1.4. Types of household toilet facility.

This section explores the types of household toilet facilities in each of the study locations and whether the facility is shared with other households. Respondents who have toilets in their homes were asked the type of toilet facility. Out of the 142 respondents who said they have a household toilet, 55.6 per cent of such toilets are WC, 24 per cent are KVIP/VIP, and 20.4 per cent is a pit latrine as presented in Table 4.13.

From Table 4.13, there are spatial variations in types of household toilet facility between the urban and rural settlements. In the urban settlements, the most common type of toilet is WC while those in the rural settlements prefer pit latrine. Table 4.13 shows that in urban settlements, WC accounts for 65 per cent of the household toilets in Elmina, 58.1 per cent in Komenda and 35.7 per cent in Kissi. In the rural settlements, pit latrines account for 66.7 per cent of the household toilets in Domenase and 50 per cent in Besease.

Table 4. 13: Types of household toilet facilities.

Types of household Toilet	Name of Community					Total
	Elmina	Komenda	Kissi	Besease	Domenase	
WC	52 (65.0)	18(58.1)	5(35.7)	2(25.0)	2(22.2)	79(55.6)
KVIP/VIP	16(20.0)	10(32.3)	5(35.7)	2(25.0)	1(11.1)	34(24.0)
Pit Latrine	12(15.0)	3(9.7)	4(28.6)	4(50.0)	6(66.7)	29(20.4)
Total	**80(100)**	**31(100)**	**14(100)**	**8(100)**	**9(100)**	**142(100)**
Facility shared						
Yes	37(46.2)	37(63.8)	3(21.4)	4(50.0)	4(44.4)	58(40.9)
No	43(53.8)	21(36.2)	11(78.6)	4(50.0)	5(55.6)	84(59.1)
Total	**80(100)**	**31(100)**	**14(100)**	**8(100)**	**9(100)**	**142(100)**

Figures in parentheses represent percentages and those not in parentheses are respondent counts.
Source: Field survey, 2019.

The respondents with the household toilet were asked if they share their toilet facility with other households. The result shows that 40.9 per cent of the household toilets are shared with other households. The result in Table 4.13, however, indicates that there are variations at the community level in terms of sharing the household toilet with other households. For instance, 46.2 per cent of the household toilets in Elmina are shared, while 78.6 per cent are not shared in Kissi.

4.4.1.5. Relationship between types of household toilet facility and Education status.

Education level has a positive relationship with the availability of household toilet facility. This section, therefore, seeks to explore the extent to which educational inclination influences the type of household toilet facility, as presented in Table 4.14. The Chi-square result shows that educational level influences types of household toilet facility since the P-value (0.00) is less than the significance value (0.05). It is observed from Table 4.14 that, type of household toilet changes from pit latrine to KVIP/VIP and to WC as the educational status increase from no formal education through to tertiary level. Form the Table 4.14; it is seen that percentage of

households with WC increased from 2.0 per cent to 14.3 per cent and further to 57.1 per cent through 36.6 per cent. This increase is parallel to the increasing educational level; from no formal education through to the tertiary level. Table 4.14 also shows that there is a preference between pit latrine and KVIP/VIP types of household toilet, with increasing education status. For instance, respondents without formal education prefer pit latrines to KVIP/VIP, while respondents with basic and secondary education prefer KVIP/VIP to pit latrine. The results also show that percentages for households without toilet facility also decrease as educational attainments increase.

Table 4.14: Relationship between types of household toilet facility and Education status

Type household toilet	**Education status**				**Total**
	No Formal Education	Basic	Secondary	Tertiary	
Pit Latrine	5(9.8)	16(10.9)	5(5.0)	3(14.3)	29
KVIP/VIP	1(2.0)	21(14.3)	10(9.9)	2(9.5)	34
WC	5(9.8)	25(17.0)	37(36.6)	12(57.1)	79
No Household Toilet	40(78.4)	85(57.8)	49(48.5)	4(19.0)	178
Total	**51(100)**	**147(100)**	**101(100)**	**21(100)**	**320**

Figures in parentheses represent percentages and those not in parentheses are respondent counts.
Source: Field survey, 2019.

Pearson Chi-Square

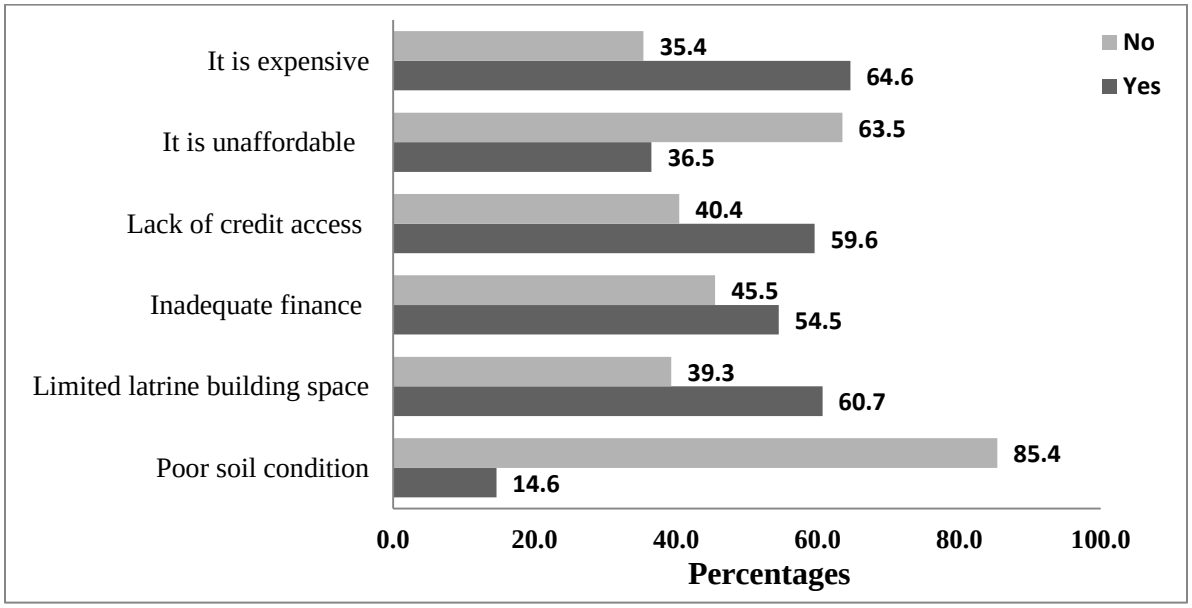
Parameter	**Value**
Number of valid cases	320
Chi-Square	42.370
Degree of freedom	9
Significance (P value)	0.00

4.4.2. Reasons for Non-Availability of Household Toilet

Data from the study shows that 178(55.6%) of the household visited do not have a household toilet. These respondents were asked reasons why they do not have a household toilet facility? Their reasons were attributed to a lot of factors, as illustrated in Figure 4.4.

The graph indicates that majority of the respondents (64.6 %) perceive the construction of a personal toilet as expensive whiles 35.4 per cent thought otherwise. Though installing a household latrine might be perceived as expensive, income status can make such toilets to be affordable. Amidst the perception that latrine construction is costly, 63.5 per cent perceive it is affordable. Only 36.5 per cent withheld that latrine construction is expensive and not affordable. Moreover, 59.6 per cent of the household heads who have not installed a toilet in their homes also attributed it to their inability to access loans.

Figure 4. 4: Reasons for Non-Availability of Household Toilet



Source: Field Survey, 2019.

Furthermore, 54.5 per cent agreed that they do not have enough funds to install a household toilet. Other reasons cited by the respondents for their inability to install a household toilet include limited latrine building space (60.7%) and poor soil conditions (14.6%). Some of the reasons highlighted in Figure 4.4 were also expressed in the Focused Group Discussions (FGDs) and in-depth interviews in all the study locations, as noted in the excerpts below.

"You will see a big family house about 21 rooms and occupied by different households not having any toilet facility'' (A 45 year old female chop bar operator at Komenda, - FGD, 9th May 2019).

"In the past, our forefathers build and converted all spaces into rooms, so there is no other place to construct a personal toilet in the house. So, if they had built and left a space for us to build a toilet, we wouldn't have been suffering today". (A 39 year old mason at Komenda- FGD, 9th May 2019).

''Previously, all house built by our forefather had no toilet facilities in them. There was only palm or bucket latrine, but currently, such type of latrines are not used again'' (A 33 year old driver at Komenda-FGD, 9th May 2019).

''We know the biogas type does not need a big space for their construction, unlike other brands, but can we afford it?'' (A 41 year old seamstress at Komenda-FGD, 9th May 2019).

''All building plans also have a plan for a toilet facility. No one should say it's because of money issues. How can you build the house and say you do not have money to build a toilet? Building a toilet should be included in the budget of building the house. I think building the toilet should even be a priority. So all those who are building now should be educated on the need to make toilet building a priority in house building plans'' (A 56 year old station master- FGD at Komenda, 9th May 2019)

*''We those who live in old family houses, it will be difficult to build a toilet because there is no space'' (*A 44 year old electrician-FGD at Elmina, 8th May 2019).

''We have heard a lot on this issues from the municipal and the government, and if they are willing to support us by subsidising or taking part of the cost in building our latrines, most of us will be willing to construct our own personal toilets'' (A 46 year old mechanic-FGD at Kissi, 12th May 2019)

''It is all because of money issues because building personal or household latrines will cost you more than GHC 600 or 700, and if you want to construct current and scientific one, you will have to spend more than GHC 1000''(A 42 year old female farmer-FGD at Kissi, 12th May 2019).

''It will be challenging for we the farmers unless there is an external help'' (A 40 year old farmer-FGD at Kissi, 12th May 2019)

''Boss, the truth is most of us in this community cannot afford to spend GHC800 or 1000 just to build a toilet. Where are we going to get that money from? From farming! No, that is not possible'' (A 42 year old farmer-FGD at Kissi, 12th May 2019)

''See I'm very old. I have children, and I'm not working. My children are schooling, and I also pay utility bills, so building a household latrine will be a big burden for me'' (A 52 year old farmer-FGD at Domenase, 10th May 2019)

''*They just hear it, and all that they know is it is expensive. Building a household toilet will cost about GHC 1,000 and spending GHC 1,000 in a village is not easy, it's bigger money for someone to hear''*(Domenase Assemblyman-Key Informant Interview, 9th May 2019).

Meanwhile, Komenda Town Council-Sanitation Officer also added that:

"It's not true that most of the houses were built a long time ago without leaving space for latrine construction. Those houses had places for toilet facilities, but they have converted it into rooms for renting or for their children since they have given birth to too many children and there were shortage of rooms. So it is a fallacy to say they didn't build with a toilet, it was there, but they turned it into a living room. They can even build a toilet with a small space. This time, the type of toilets we have does not need a lot of space for its construction like the biogas typed. The issue is, can they afford it?'' (Key Informant Interview: Komenda Town council (Sanitation Officer), 9th May 2019).

It is inferred from the excerpts of the qualitative interviews that, limited space is a major obstacle for building a household toilet in the two urban settlements (Elmina and Komenda), unlike the other study locations. This reason was attributed to large extended family sizes. Besides, most of the houses are family houses and were constructed a couple of years back. Some of the focused group discussants in Komenda and Elmina, for instance, noted that some of these family houses had spaces to construct a household toilet. Still, due to large family houses and increasing housing demand, such space has been converted into living rooms for family members or for renting.

Meanwhile, some of the leaders in this community and some of the discussants emphasised that current modern types of household toilets (biogas type-WC) do not need any big space for their construction. However, the adoption of such type of toilet facility depends on its affordability. Some of the discussants also opined that new houses yet to be built should prioritise the building of household toilet facilities as part of the building plans since it is a requirement that has been stipulated in Ghana's building regulation policy.

Unlike Komenda and Elmina where it is perceived that there is lack of space to build a household toilet, in Kissi, Besease, and Domenase, financial constraints are a major obstacle for households to construct their household toilet. Income levels are relatively low in this community because their primary source of occupation is farming. The average income level in

these communities is GHC 600, which is less than their perceived cost of constructing a household toilet. Majority of the discussant in these communities estimated that at least building a household toilet will cost more than GHC 1,000, and they do not see the need to spend such an amount on only toilet construction.

Studies have shown that financial status is a major determinant of household toilet adoption. According to JMP, (2015); Connell, (2014), there is an association between wealth status of a household and latrine ownership. Anand (1999) added that higher-income households are more likely to spend more than 5 per cent of their income on faeces or excreta disposal whiles only 2-5 per cent of income is likely to be spent by low-income households. As a result, Osmanu & Kosoe, (2013) added that financial constraints prevent household heads to construct toilet facility in their home. Moreover, affordability constraints such as lack of access to credit and perceived cost of latrine constrained construction of household toilets in Benin (Jenkins & Scott, 2007; Gross & Gunther, 2014). Although subsidy-driven intervention had not yielded a positive impact on household toilet adoption in Zambia (Lawrence *et al.*, 2016; Coffey *et al.*, 2014), in different social-economic and cultural settings like the KEEA, such interventions will have positive impacts on household toilet adoption. Building regulations in Ghana demands that each household build its household toilet. However, this regulation is not coming into fruition in the KEEA municipal as a result of the reasons cited in Figure 4.4. Therefore, subsidy driven interventions will aid the household without toilet facilities to construct one. In so doing, the expectations of the building regulations in terms of each household providing its household toilet will be met.

Aside from the reasons cited in Figure 4.4, one interesting concern that was raised in all the urban study location during the FGDs was that tenants were unwilling to invest in constructing

their household toilet due to the nature of landlord-tenant relations. The discussants noted that some of the houses they have rented do not have toilet facilities. Also, some of the tenants intend to stay in their rented houses for temporary basis until they build their permanent homes. Moreover, some of the discussants also noted that they are workers or travellers, and they might probably move out of the house anytime. They attributed their unwillingness to invest in building their household toilet to the insecurity of their tenancy arrangement. They opined that they could be sacked from their rented apartments by the landlord at any time, or the landlord can decide to terminate or refuse to renew their tenets arrangements after expiry. Due to these concerns, they feel insecure about building their household toilet. They see it as a responsibility of the landlord since they cannot charge the landlord the cost and neither will they be able to take the toilet facility alone, if they are to move out of the house. Excerpts of these comments that were raised during the FGDs are captures by the quotes below.

''I am from Moree, but I am a fisherman in this community. I rented the house, and I can move out anytime, so I just have to be using the public toilet''. (A 37 year old fisherman- FGD at Elmina, 8th May 2019).

''The house is not mine, I rented it. So, what if I build the household toilet, and I am not able to pay my rent?'' (A 41 year old driver- FGD at Elmina, 8th May 2019).

''....the landlords will not allow you to build the household toilet because there is no space in the house for such purpose. They will tell you to use the public toilet''. (A 33 year old driver.- FGD at Komenda, 9th May 2019).

''Well, if I build the toilet and the landlord is willing to factor the cost from my rent charges, then that would not be a problem. But there has to be an agreement to that effect'' (A 46 year old mechanic - FGD at Kissi, 12th May 2019).

Building regulations in Ghana requires that landlords provide toilet facilities in their houses. However, in the KEEA municipality, about 70 per cent of the population do not have a household toilet, and out of these numbers, about 53 per cent uses the public toilet (GSS, 2012). Inferences from the FGDs show that most of the tenants lack the security to construct their toilet facility in the house. Moreover, most of the tenants in homes that do not have a toilet facility will

be willing to build their household toilet if there is a policy that safeguards them from any unforeseen actions from their landlords.

4.4.3. Means of Attending Natures' Call for Non-HouseholdToilet Households

This section sought to understand where respondents in the household without household toilet attend to natures' call. This analysis is summarised in Table 4.15. The table shows that out of the 178 respondents without a household toilet, 64.1 per cent use the public toilets and 14.6 per cent also defecate at the beach. Moreover, 15.7 per cent also said they attend natures call in the bush while 4.5 per cent also defecate at the refuse dump. Only 1.1 per cent uses their relatives' household toilet. The data shows that defecating at the beach is only prevalent in Elmina and Komenda because these study locations are along the coast.

Table 4. 15: Household without toilet place of attending nature's call

Place of attending nature's call	**Name of Community**					**Total**
	Elmina	Komenda	Kissi	Besease	Domenase	
Bush	2(2.4)	6(15.4)	11(34.4)	6(60)	3(23.1)	28(15.7)
Beach	23(27.4)	3(7.7)	0(0.0)	0(0.0)	0(0.0)	26(14.6)
Refuse Dump	0(0.0)	2(5.1)	1(3.1)	2(22.5)	3(23.1)	8(4.5)
Public toilet	58(69.0)	28(71.8)	20(62.5)	2(22.5)	6(46.2)	114(64.1)
Relative's house	1(1.2)	0(0.0)	0(0.0)	0(0.0)	1(7.7)	2(1.1)
Total	**84(100)**	**39(100)**	**32(100)**	**10(100)**	**13(100)**	**178(100)**

Figures in parentheses represent percentages and those not in parentheses are respondent counts.
Source: Field survey, 2019.

From Table 4.15, relative to the 64.1 per cent who do not have a household toilet but defecate at the public toilet, the majority are in Elmina (50.9%) and Komenda (24.6%). This could be attributed to how public toilets are distributed in this community as compared to Kissi. The quantitative data assumed that there is a public toilet in Besease and Domenase. However, these public toilets are currently not functioning (see Plate 4.3 & 4.4). In Domenase, for instance, the non-functioning public toilet is a "death trap" to most of the vulnerable users since the floor has developed cracks, and it could collapse-in upon usage.

Inferences from the data show that Kissi recorded the highest (39.4 %) for those who defecate in the bush as compared to 21.5 per cent each, in Komenda and Besease. This is because the spatial distribution of the public toilet in Kissi is skewed toward Baso N'kwanta, South Africa, Market Area suburbs of the community. Areas such as Eporwanu, Babrawom, Old A&B, and Zongo do not have any public toilet. The abandoned public toilet in Kissi (see Plate 4.1) was supposed to serve both Old A&B and Zongo Suburbs of the community. The excerpts below are some of the consent from the focused group discussants at Kiss;

''We those at Babrawon and Zongo do not have any PT facility. The one we had was along the A&B school road, but it broke down some years ago. No one can tell us not to open defecate. Fortunately, we are located at the periphery of the town'' (A 29 year old driver-FGD at Kissi, 12th May 2019).

''To use the public toilet, I have to walk for more than five minutes to use the one at the Market Area or ten minutes to use the one in South Africa Suburb of the community'' (A 34 year old beautician -FGD at Kissi, 12th May 2019).

The quantitative data in Table 4.15 also shows that only 4.5 per cent defecate at the refuse dump. However, this might be misleading. It was realised that respondents in Komenda, Besease, and Domenase were shy to mention refuse dump as their place of defecation when the quantitative questions were read to them. The FGDs in these communities, however, revealed that most of the residents in these communities defecate both at the refuse dump and in the bush (Plate 4.5). In Besease and Domenase, for instance, the dumping sites are enclosed with bushes. Therefore, open defecators could hide and defecate. It is unlikely to find a refuse dump in Elmina (see Plate 4.6) because all wastes are safely contained for dumping elsewhere; outside the city. Moreover, in Kissi the refuse dump is visible (see Plate 4.7) hence only kids defecate there.

Plate 4. 5 : Open Defecation Site at the Study Location

Source: Field survey, 2019.

Plate 4. 6 : Refuse collection site at Elmina.

Source: Field survey, 2019.

Plate 4. 7 : Refuse dump at Kissi.

Source: Field survey, 2019.

It is highly unlikely to see an adult defecating at the refuse dump most notably during the day-time. In these communities, only kids defecate at the refuse dump during the daytime. This partly accounts for reasons why there were only 4.5 per cent open defecators at the refuse dump.

Besides, the target population for the study was adults who are household heads. The above comments were highlighted in excerpts of some of the in-depth interviews and FGDs in the study locations as follows;

"There is a problem because Domenase with a population of almost five thousand, having only one public toilet. Sometimes you know what happens when somebody is experiencing tenesmus or bowel urgency; the person does what will let him/her be at ease in a nearby bush. The only toilet in the community is around one of the suburbs called Brofoyedru, and it's a death trap" **(**Domenase Assemblyman- Key Informant Interview, 9th May 2019.)

There is no public toilet in Besease. If you want to defecate, and luckily you happen to be at the farm, then you just have to dig a hole. But if you are at home, then, either you go to the refuse dump or enter any bush. **(** A 49 year old male farmer- FGD at Besease, 12th May 2019**).**

I prefer to defecate in the bush than the refuse dump because, at the refuse dump, you might probably step into someone's excreta. (A 38 year old beautician -FGD at Besease, 12th May 2019).

"Currently, the only toilet available in the community looks scary. It takes a lot of courage to use the toilet because the floor has developed a lot of cracks. So, everywhere you go, you will see dumped excreta in polythene (A 47 year old male farm - FGD at Domenase, 10th May 2019).

It is a shame to be squatting close to the opposite sex to defecate at the refuse dump. There is no privacy at all because you will see things you are not supposed to be seeing (A 31 year old carpenter- FGD at Domenase, 10th May 2019).

The young guys usually go to the cemetery to defecate, and sometimes they defecate along the roadside (A 33 year old beautician - FGD at Domenase, 10th May 2019).

If you are a lady and you are afraid to go to the cemetery to defecate, then you have to defecate into a polythene bag (flying latrine) (A 35 year old electrician- FGD at Domenase, 10th May 2019).

It is therefore deduced from Table 4.15 that, out of the total respondents without household toilet facility, almost 35 per cent practice open defecation either in the bush, along the beach, or at the refuse dump. At the community level, Kissi recorded the highest (37.5%) for on open defecation, followed by Elmina (31.2%) and Komenda (28.2%). Almost all the respondents without household toilet faculty in Domenase and Besease practice open defecation since these communities do not have any functioning public toilet.

Comparing the result for respondents who defecate in the bush, along the coast or at the refuse dump to the entire study sample size (320), about 22 per cent of the respondents practise open defecation as compared to the 19 per cent open defecation practices in the Municipal (GSS, 2012). While 64.1 per cent of the respondents without household toilet facility use a public toilet, the 22 per cent open defecation practices could even be higher. Studies by Obeng *et al*. (2015a) and Peprah *et al.* (2015) have shown that high reliance on public toilet increases open defecation due to the unkempt status and other socio-cultural perceptions of using public toilets.

The FGDs and in-depth interviews at Elmina, Komenda and Kissi also show that open defecation practices are attributed to the privatisation and unkempt nature of most public toilet facilities. For these respondents who do not use the public toilet, it is an inconvenience to pay and queue to use the unhygienic public toilet while alternatively, defecating in the bush, beach or at the refuse dump offer more comfort. Additionally, such public toilets become inaccessible in the night because the facility attendants have to lock the facility. The in-depth interviews with the facility attendants confirmed that the facility is locked after 9 p.m. and re-open at 4.30 a.m. These comments are captured in the excerpts of the quotes below.

''Why should I pay and queue to use that smelling place when the bush is there'' (A 42 year old farmer - FGD, Kissi, 12th May 2019).'

''*...you will see some people with paper, heading towards the refuse dump to defecate. You can't force the person to pay and use the toilet…''*(PT attendant, In-depth int; Komenda-9th May 2019).

I usually lock the facility at 9 pm, and I re-open it at 4.30 am, so I do not know where they defecate when I lock the facility (PT attendant , In-depth int; Komenda-8th May 2019).

The excerpts of the comments above corroborate earlier empirical findings; for instance, Caruso *et al.* (2017) attributed persisted open defecation practices to the locking of toilet facilities at

night which makes the facility unavailable to the users. While Dreibelbis *et al.* (2015) also attributed the practices to the unappealing status of the facility, Kulkarni, O'Reilly & Bhat, (2017) have also related the practice to the over-dependence on the facilities which discourage users due to forming of queues to use the facility.

4.4.4. Proximity to Public Toilet and Public Toilet Usage

Table 4.15 showed that the majority (64.1%) of the 55.6 per cent household without household toilet facility use the public toilet. Domenase and Besease do not have a functioning public toilet, therefore respondent who uses the public toilet in Elmina, Komenda and Kissi were asked about their perception of their proximity to the nearest public toilet as presented in Table 4.16. The measure of the respondents' proximity to the nearest public toilet was based on their subjective viewpoints.

Table 4. 16: Public toilet users' proximity to the nearest public toilet

Proximity	**Elmina**	**Komenda**	**Kissi**	**Total**
Very Close	7(12.1)	8(28.6)	4(20.0)	19(17.9)
Close	20(34.4)	5(17.9)	1(5.0)	26(24.5)
Far	23(39.7)	11(39.3)	9(45.0)	43(40.6)
Very Far	8(13.8)	4(14.2)	6(30.0)	18(17.0)
Total	**58(100)**	**28(100)**	**20(100)**	**106(100)**

Figures in parentheses represent percentages and those not in parentheses are respondent counts.
Source: Field survey, 2019.

Table 4.16 shows that public toilet users in Elmina, Komenda, and Kissi accounts for one-third of the total respondents of the study. Out of this number, 40.6 per cent perceived their proximity to the nearest public toilet as *far* while those who perceived theirs as *close* were 24.5 per cent. In each of the three study communities, respondents who perceived their proximity as *far* recorded the highest. Elmina recorded the lowest (13.8%) for public toilet users who are *very far* from

their nearest public toilet. This is because the spatial distribution of public toilets in Elmina is near-symmetrical (except for Bantuma suburb) as compared to Komenda and Kissi (see Figure 4.1, 4.2 and 4.3). On the other hand, Kissi recorded the highest for public toilet users who stays *very far* from their nearest public toilet. This is explained by the asymmetrical distribution of the public toilet in Kissi. For instance, the spatial distribution of the public toilet in Kissi is skewed toward Baso N'kwanta, South Africa, Market -Area suburbs of the community. Areas such as Eporwanu, Babrawom, Old A&B, and Zongo do not have any public toilet.

4.4.4.1. Relationship between Perceptions of Proximity to a public toilet and travelling time to use public Toilet.

Since respondents who do not have household toilet facilities but uses public toilet will have to travel to use the toilet facility, the study also sought to find out the average times it takes to access the facility. Out of the 106 respondents in this category (see Table 4.17), 19(17.8 %) travel for not more than 2 minutes to get to the facility, while 18(17%) travels between 6-9 minutes. Respondents who travel for 3-5 minutes recorded the highest: 39(36.8%), followed by 30(28.3%) for those who travel for 10 minutes and above.

Table 4.17: Relationship between perceptions of proximity and travelling time to use a public toilet

Perceived Proximity	**2 minutes or less**	**3-5 minutes**	**6-9 minutes**	**10 minutes or more**	**total**
Very Close	5(26.3)	11(28.2)	-	-	16(15.1)
Close	11(57.9)	17(43.6)	1(5.6)	-	46(43.4)
Very far	-	1(2.6)	1(5.6)	13(43.3)	15(14.1)
Far	3(15.8)	10(25.6)	16(88.8)	17(56.7)	29(27.4)
Total	**19(100)**	**39(100)**	**18(100)**	**30(100)**	**106(100)**

Figures in parentheses represent percentages and those not in parentheses are respondent counts.
Source: Field survey, 2019.

The is observed from Table 4.17 that, for respondents who travel for 5 minutes or less to use a public toilet, those who perceived such travelling times as close recorded the highest in each category (57.9 % for *not more than 2 minutes* and 43.6 % for 3-5 minutes). It is however observed that the travelling time of six or more minutes to a public toilet is perceived as far. In this category, 88.8 per cent of respondents of the 6-9 minutes travelling category, see the minutes as far, while those who travel for 10 minutes or more minutes recorded 56.7 per cent for the same category.

4.4.4.2. Perceptions of Proximity to Public toilet and frequency of public toilet usage.

Since the majority of the non-household toilet respondents use the public toilet, the study sought to find out if these respondents' perception of their proximity to a public toilet influences their frequency of the facility usage. The result is presented in Table 4.18. It is observed from the table that 91.5 per cent of public toilet users in Elmina, Komenda, and Kissi use the facility daily, irrespective of their perceived proximity from the facility. For instance, about 93.3 per cent of the public toilet users who perceived their proximity to the facility as *very far* use the facility daily. At the same time, the facility is also used daily by all users (100%) that stay *very close* to the facility.

Table 4. 18: Relationship between the frequency of public toilet usage and proximity to use the facility.

Frequency of PT usage	**Perceptions of proximity to a public toilet**				**Total**
	Very far	Far	Close	Very close	
Daily	14(93.3)	42(91.3)	25(86.2)	16 (100)	97(91.5)
Alternate days	0(0.0)	3(6.5)	1(3.4)	0(0.0)	4(3.8)
Occasional	1(6.7)	1(2.2)	3(10.3)	0(0.0)	5(4.7)
Total	**15(100)**	**46(100)**	**29(100)**	**16(100)**	**106(100)**

Figures in parentheses represent percentages and those not in parentheses are respondent counts.
Source: Field survey, 2019.

This can be attributed to the fact that open defecation has been prohibited in the KEEA municipality by the municipal's authorities. In 2017, 2nd November, there was a public announcement by the municipal which stated that ''*anyone found defecating at an unauthorized place shall be arrested and prosecuted in the court of law''.* This means that, for these people, proximity does not influence their usage of the public toilet since they are compelled by the authorities to use the public toilet to avoid being reprimanded.

4.4.4.3. Relationship between public toilet user's level of satisfaction of the hygienic condition of the facility and frequency of usage.

The study also sought to find out the public toilet uses levels of satisfaction with how the facility is cleaned and if their levels of satisfaction also influence their frequency of the facility usage. Levels of satisfaction with how the public toilet is cleaned (see Table 4.19) show that users who were dissatisfied recorded the highest: 26(24.5%), followed by very satisfied: 25(23.6%). Respondents who were neutral recorded the lowest: 14(13.2%). It is, however observed that irrespective of the levels of satisfaction, about 91.5 per cent use the facility daily. Within the levels of satisfaction, all respondents who were either satisfied or neutral use the facility daily. Moreover, about 82.4 per cent of users who were very dissatisfied with the hygienic conditions of the facility also use the facility daily. Only a fraction (4.7%) uses the facility occasionally.

Table 4. 19: Public toilet usage and levels of satisfaction of the facility's hygienic conditions

Frequency of PT usage	The extent of satisfaction with how the toilet is cleaned					Total
	very satisfied	satisfied	dissatisfied	very dissatisfied	neutral	
Daily	23(92.0)	24(100)	22(84.6)	14(82.4)	14(100)	97(91.5)
Alternate days	1(4.0)	0(0.0)	2(7.7)	1(5.9)	0(0.0)	4(3.8)
Occasional	1(4.0)	0(0.0)	2(7.7)	2(11.8)	0(0.0)	5(4.7)
Total	**25(100)**	**24(100)**	**26(100)**	**17(100)**	**14(100)**	**106(100)**

Figures in parentheses represent percentages and those not in parentheses are respondent counts.
Source: Field survey, 2019.

It can be deduced from the FGDs that the public toilet users have concerns about the open-location and unkempt nature of the facility. These concerns were raised during the FGDs at Kissi and Komenda. Some of the discussants opined that at times they feel uncomfortable and ashamed to be seen using the facility. Additionally, some of the users also complained that due to the odour and unhygienic nature of the public toilet, they have to remove their shirts and hung it outside the facility, before using the facility. Otherwise, their dresses will be scented with the bad odour. The quotes below are some of the comments raised during the FGDs.

"Anytime I use the PT I have to take my bath because the odour will always be on me. As a gentleman like me, it will be embarrassing for a toilet odour to be all over me" (A 39 year old mason- FGD at Komenda, 9th May 2019)

A 33 year old driver also noted:

*"I will never use the PT during the day time. The toilet is full up, and the place smells bad. I do not want to be seen using the facility. It's better to hide in the bush or somewhere else to defecate than be seen using the public toilet. At night, no one can see me using the facility" (*FGD, Komenda, 9th May 2019).

These views were also expressed in the FGD in Kissi in addition to the unequal distribution of public toilet in the community. Excerpts of the quotes below are some of the discussant comments:

"I have to walk from Babrawom (a suburb of the community) to Basonkwanto just to use the PT and afterwards, all the odour of the toilet will remain on my dress. This will make you shy and uncomfortable. You can just imagine someone passing by me. The person will turn back to look at me again". (A 46 year old mechanic - FGD, Kissi, 12th May 2019).

''The place smells terrible. Most of us who use the facility have to take-off your dress and hung it outside the facility; else odour will be in your dress. (A 29 year old driver -FGD, Kissi, 12th May 2019).

This assertion confirms studies by Dittmer (2009) in Ghana, Mali, and Nigeria where he found that public toilet users feel ashamed and embarrassed when they are seen using the facility and as such people prefer open defecation to the usage of public toilet. However, public toilet users in the three urban locations are compelled to use the facility to avoid been persecuted for practising open defecation. Relating this to the pathways of attaining a hygienic and improved sanitation conceptual framework (see Fig. 2.2), the toilet facilities may be available, but issues pertaining to its consistent usage becomes lacking. The frameworks emphasise that, for public toilet users, although there is an attitudinal change from open defecation to using of toilet facility, if the attitudinal change is unmatched with improved and hygienic conditions of the toilet facility, then, in the long run, users may resort back to open defecation practices if they cannot afford to build their household toilet facility. To compliment effort to ensure massive household toilet adoption and ending open defecation, issues of proper management of public toilet facilities is vital. Moreover, frequent update and maintenance of the facility will imperatively be the surest pathway for attaining the better hygienic and improved sanitation status as stipulated by the framework adapted for the study (see Fig. 2.2). This behaviour is also explained by the opportunity category of the theoretical framework adopted for the study (see Fig. 2.1)

Inferences from the FGDs show that the hygienic status of a specific public toilet does not influence the facility's usage irrespective of the user's distance from the facility. As a result, if a user places more importance on the hygienic conditions of a toilet facility, the user can travel for

more minutes to access a specific hygienic facility even if a public toilet is closer to the user. This, however, depends on the behaviour of the public toilet user. For instance, if respondents form a habit of refraining from open defecation, then such a person's usage of the facility is not affected by his or her perception of proximity to the nearest public toilet. While studies by Obeng *et al.* (2015a) and Peprah *et al.* (2015) have emphasised that the unkept status of public toilets influence the facility's usage, the results of this study stress that, frequent usability of the facility is also dependant on the behaviours and prevailing conditions of the user. For instance, if a regular public toilet user who stays *fa*r from a public urgently needs to attend nature's call and the facility happens to be *far* from him, whiles other alternatives of attending nature's call are closer, in this circumstance, the person is likely to open defecate. This reason is explained in the subsection below.

4.4.4.4. Relationship between travailing time to use public toilet and likelihood to practise open defecation.

Table 4.20 presents respondents likelihood to practice open defecation based on their travelling time to a public toilet. It can be deduced from the table that, of all the respondents who attend natures call at the public toilet, 40(37.7%) are very likely to practice open defecation while the practice is less likely to be practised by 57(53.8%). With the various category of travelling time to a public toilet, it is inferred that, for respondents who travel for more than 10 minutes, 53.3 per cent are very likely to open defecate while 26.7 per cent are less likely. On the other hand, it is also inferred that respondents within a travelling category or 6 to 9 minutes, 66.7 per cent are less likely to open defecate, compare to 27.8 per cent who are likely to open defecate. It can also be deduced that for respondents within travelling time of not more than 5 minutes, 65.6 per cent are less likely to open defecate.

Table 4.20: Relationship between likelihood to open defecate and travelling time to use a public toilet.

Travelling time to a public toilet facility	Likely to practise open defecation			Total
	Very likely	Occasional	Less likely	
2 minutes or less	4(10.0)	0(0.0)	15(26.3)	19(17.9)
3 to 5 minutes	15(37.5)	1(11.1)	23(40.4)	39(36.8)
6 to 9 minutes	5(12.5)	2(22.2)	11(19.3)	18(17.0
10 minutes and above	16(40.0)	6(66.7)	8(14.0)	30(28.3)
Total	**40(100)**	**9(100)**	**57(100)**	**106(100)**

Figures in parentheses represent percentages and those not in parentheses are respondent counts.
Source: Field survey, 2019.

Chi-square

Parameter	Value
Number of valid cases	106
Chi-Square	18.521
Degree of freedom	9
Significance (P value)	0.030

A Chi-square test was used to test whether there is a significant relationship between travelling time to use public toilets and the user's likelihood to practice open defecation. The result shows that there is a significant relationship between the likelihood to open defecate and travelling time to use the public toilet. This is because the P-value (0.03) is lower than the significant level (0.05).

Again, it is observed from Table 4.20 that, there is a higher likelihood to practice open-defecate as travelling time increase beyond 10 minutes. On the other hand, there is less likelihood to open defecate if the travelling time to use the toilet facility does not exceed 9 minutes. The likelihood to open defecate is possible if the public toilet user is *hard-pressed* to attend natures call but cannot hold the bowl urgency and travel for 10 minutes. In such circumstances, the person will

be compelled to choose alternative means of attending natures' calls such as defecating along the beach, at the refuse dump, or in the bush if such places are relatively closer to the person.

It was deduced from the FGDs in all the study locations that, women mostly practise the flying method of open defecation. It is usually practised at night where they defecate into polythene bags and dump it on roofs of their neighbours' or into bins. This method is mostly used by women because of the fear of going out at night to defecate and to avoid being attacked or harassed. According to Khanna & Das (2016) and Sahoo *et al.* (2015) due to fear of attack, women mostly prefer the flying method of open defecation. This view was further justified by Alhassan & Anyarayor (2018). They emphasised that women will prefer their place of defecating to be closer to their homes due to risk perceptions such as sexual harassment. The excerpts below are some of the highlighted comments of the FGDs:

''All the lights at the public toilet have been disconnected because the facility keepers have not been paying their light bills. The few that is opened at night, the place looks scary, so I do not use it at night and going to the beach too is not an option'' (A 36 year old female trader - FGD at Elmina, 8th May 2019**).**

''*The sad part is that there were bushes where we hide to defecate, but just recently, the bushes have been cleared. So if you are a lady and you are afraid to go to the cemetery to defecate, then you have to defecate into a polythene bag (*flying latrine*)'' (A 31 year old carpenter-FGD at* Domenase, 10th May 2019).

''At night I am afraid to go to the public toilet. I usually defecate into a polythene bag, and at dawn, I deposit it into the bush'' (A31 year old female trader - FGD at Kissi - 12th May 2019).

Another method of open defecation practice that was highlighted during the FGDs is the cat method. This method involves digging a hole for defecation and afterwards, covering the hole. It was realised through the FGDs that, this method is mostly practised in the farming communities such as Kissi, Besease, and Domenase. In these communities, domestic animals are reared as indicated in excerpts of the interviews below.

‘‘*My house is located at the periphery, and I rear fowls and ducks. So you can just imagine what would happen, if we just defecate around anyhow without digging a hole’’* (A 38 year old female farmer - FGD at Besease, 12th May 2019).

‘‘Every morning I have to ride for half a mile with a motorbike before I can be able to defecate and usually when you go far from the town, it is peoples’ farmland, so you have to dig a hole to defecate’’ (A 35 year old electrician - FGD at Domenase, 10th May 2019).

Aside from the above open defecation methods; it was also identified through the FGDs that, free-range method of defecation is also practised in areas where there is an open field’s or space and at the refuse dump. In Elmina, for instance, the free-range is practised along the beaches and in bushes closer to the Bantuma suburb of the community. The same method is also practised at Komenda along the coast and the Lagoon, and in bushes closer to the old Komenda sugar factory in the south-western part of the community. During the FGDs at Elmina, a respondent highlighted that, at times, some of the fishermen sail their boats on the sea to defecate into the water.

4.5 Socio-Demographic Determinants of Open Defecation Practices

The study examined the influence of socio-demographic factors on the adoption of household toilet facility in the KEEA Municipality. This section presents findings from the regression analysis on the socio-demographic variables; age, sex, education, marital status, religion, household size, ethnicity and household income determinants of open defecation practices. The probit regression was chosen because it estimates the likelihood of an event occurring by predicting a binary dependent variable from a set of covariates. This means that probit regression can estimate the likelihood that observation with some characteristics will be between specific groups. These results have been presented in Table 4.21. Post-estimation tests like the linktest and Hosmer-Lemeshow were conducted to test for model specification and goodness-of-fit respectively. For the model to be correctly specified, Chen, Hua, Reifman, & Cheng (2003)

recommended that the scores for linktest (_hatsq) must be insignificant regardless of the score _hat takes. The linktest recorded a score of P>|z|= 0.260; meaning the model is correctly specified. Also, the fitness of the overall model recorded a value of 0.000 indicated by the Prob > Chi 2. This implies the model is of good-fit; meaning, we are 95 per cent confident in the predictive power of the model. With regards to the explanatory power of the covariates or independents variables, values of the Pseudo R-squared (R^2) suggest that the covariates fairly explain the determinants of open defecation in the KEEA. Thus, a value of 0.1711 was observed, and this indicates that 17.1 per cent of the variations in open defecation was explained by the independent or covariate variables. Although there is no existing acceptable minimum level of variance (R^2), Falk & Miller (1992), recommended an R^2 of at least 0.1(10%). Cohen (1988) also added that researchers should rely on a ‘‘rough’’ guide of 0.26 (as substantial), 0.13(as moderate), and 0.02 (as weak) levels of predictive accuracy. Further, because of issues of collinearity during the data analysis, the total sample size reduced. Hence, in the regression analysis, the sample size of 313 was used for the analysis.

Table 4. 21: Probit regression model for the determinants of open defecation in KEEA

Explanatory variable	(1) Coefficient		(2) Marginal effects	
Age (Base=60 and above)				
20-30	0.421	(0.332)	0.144	(0.113)
31-40	0.103	(0.356)	0.036	(0.122)
41-50	0.414	(0.372)	0.141	(0.126)
51-60	1.712***	(0.525)	0.455***	(0.121)
Sex (Base=Female)				
Male	-0.329*	(0.196)	-0.104*	(0.060)
Educational level (Base=No education)				
Basic Education	-0.471**	(0.233)	-0.142**	(0.067)
Secondary Education	-0.821***	(0.252)	-0.260***	(0.073)
Tertiary Education	-1.241***	(0.401)	-0.398***	(0.122)
Marital status (Base=Single)				
Married	-0.301	(0.242)	-0.094	(0.073)
Divorced	-0.417	(0.517)	-0.132	(0.168)
Widow	-1.574***	(0.428)	-0.474***	(0.105)
Religion (Base=Christians)				
Muslim	0.068	(0.501)	0.022	(0.161)
African Traditional Religion (ATR)	0.835**	(0.502)	0.237**	(0.114)
Household size (Base=1-3)				
4-6	-0.031	(0.228)	-0.010	(0.073)
7-9	-0.183	(0.258)	-0.059	(0.084)
10 and above	-0.331	(0.331)	-0.108	(0.108)
Ethnicity (Base=Ashanti)				
Fante	0.311	(0.413)	0.102	(0.135)
Ewe	0.663	(0.528)	0.210	(0.165)
Ga	0.028	(0.803)	0.009	(0.263)
Nzema	-0.025	(0.699)	-0.008	(0.229)
Others	1.896***	(0.883)	0.455***	(0.147)
Household income	-0.001***	(0.000)	-0.000***	(0.000)
Constant	1.082*	(0.631)		

Source: Author's own computation, 2019

Pseudo R^2 0.1711

Prob>Chi2 0.000

N = 313

Hosmer – Lemeshaw Prob > chi2 = 0.2183

Linktest _hat: P>|z|= 0.000 _hatsq: P>|z|= 0.260

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The regression result in Table 4.21 shows the socio-demographic factors or predictors of open defecation (OD) practices in the KEEA municipality. Although age is crucial in determining OD practice in the KEEA, it is statistically not significant. However, those who are above 51-60 years are more likely to open defecate, and this increases by 45.5 per cent points relative to those who are 60 years and above. In agreement with this finding are the earlier studies by Coffey *et al*. (2014) and Routray *et al.* (2015) that established that OD is mostly practised among older people because of their inability to walk to public toilet sites. According to WHO (2018), public toilet facilities may not be adequately accessible to intended users, particularly women, older people or people with disabilities. This study categorically specifies that older people between 51 and 60 years are most likely to open defecate.

Sex also influences the susceptibility to open defecate. The study found that males, relative to females, are less likely to open defecate compared to their female counterparts. Thus, the likelihood to open defecate decreases by 10 per cent for males than for females. This is statistically significant. This implies that females are more likely to practise open defecate than their male counterparts. This is because, most of the women in the study location asserted that, public toilets are poorly managed, and as such, they become susceptible to all forms of infections, like candidiasis. They will, therefore, prefer to open defecate than to use a public toilet if they do not have a household toilet. These views were also expressed during the FGDs.

For instance, a 38 year old woman who is a trader at Komenda opined that *''the public toilets are unkempt and we the women are always exposed to all forms of infections like candidiasis. The reason is that anytime we squat, the stench and the heat from the toilet enters our body and this is dangerous.''* This view was also expressed by two women during the FGDs at Kissi.

Moreover, women also feel ashamed to be seen using the public toilet by the opposite sex because the place smells bad. This finding, therefore, corroborates studies such as Robinson (2009) in Nigeria; Kema et al. (2012) in Tanzania; Pedi et al. (2014) in Cambodia; Shrestha et al. (2017) in Nepal. These authors withheld that females are more likely to open defecate than using the public toilet, especially in households headed by females. Although Coffey et al., (2014) stressed that because of the stigma and shame attached to OD practices, women turn to have a high propensity to adopt and use toilet facility. Notwithstanding, women are least likely to have the intra-household power to allocate resources to building one. During the FGDs, it was realised that women feel more uncomfortable to use any public toilet that has stench or odour. The following excerpts highlights such comments

''The place smells terrible. Most of us who use the facility have to take-off your dress and hung it outside the facility; else odour will be in our dress''(A 29 year driver at Kissi- FGDs, 12th May,2019).

''…..*I feel uncomfortable to take off my dress and hung it outside before using the public toilet''* (A 41 year old carpenter at Komenda-FGDs, 9th May,2019)

''I cannot undress myself outside because I am shy.'' (A 30 year old beautician at Komenda-FGDs, 9th May,2019)

As a lady it will be embarrassing to have the odour from the toilet all over you (*''* (A 33 year of female trader at Kissi- FGDs, 12th May,2019)

''We know the public toilet stinks but personally, I feel more ashamed to be seen by a man when I am using the facility.''(A 39 year of female fishmonger at Elmina- FGDs, 8th May,2019)

Aside from the preceding arguments, according to Winter et al., (2018) and O'Reilly, (2016) stressors that woman face in trying to manage their daily sanitation and menstrual needs is crucial and it accounts for their susceptibility to OD. Although females stated OD practice as a caution from contracting diseases such as candidiasis as a result of using PT, evidence by Padhi *et al.* (2015), Benova *et al.* (2014) and Campbell (2015) suggested that women who practice open defecation are more likely than those who used a latrine to experience adverse pregnancy

outcomes, including preterm birth and low birth weight, maternal mortality, and other adverse pregnancy outcomes.

Furthermore, the educational level of the respondent is also known to influence open defecation practices. Concerning the educational level, Table 4.21 shows significant results. Using *no education* as the base reference, respondents with basic, secondary and tertiary education are less likely to open defecate compared to their counterparts with no education. Estimates of the marginal effects suggest that, the likelihood to open defecate increases by 14, 20 and 40 per cent for respondents with basic, secondary and tertiary education respectively. While respondents with secondary and tertiary education are significant at 1 per cent in determining open defecation, respondents with basic education are significant at 5 per cent in determining open defecation. It could, therefore, be deduced that, as the level of education increases, the probability of practising open defecation decreases. This means that those with no education are more likely to practise open defecate while those with higher education are less likely to practice open defecation. These reasons are attributed to the fact that, as one's educational inclination increases, the person becomes more aware of the dangers and effects of practising open defecation as consented to by Briceno *et al.* (2015). The JMP (2014) also reported an inverse relationship between open defecation practices and education status. Dreibelbis *et al.* (2013) and Golden *et al.* (2012) added that education could bring about an improvement in safe hygiene practice as well as practices that will integrate good health/hygienic behaviour with health-related information.

Marital status of the respondents has a negative relationship with open defecation practices in the KEEA. Using respondents who are single as the base reference, the probability of practising open defecation decreases for married divorced and widowed respondents compared to their

counterparts who are single. Although married and divorced respondents are less likely to open defecate, they are, however, statistically not significant in determining open defecation practices in the KEEA. Respondents who have lost either a husband/wife are a significant determinant of open defecation in KEEA. Estimates from Table 4.21 shows that the likelihood of open defecating decreases by 9.4, 13.2 and 47.4 per cent for married, divorced and widowed respondents respectively. This finding indicates that respondents whose marital status are single are most likely to open defecate compared to married, divorced and widowed respondents. Evidently in Haryana state in India, there is a policy of ‘‘No Toilet, No Bride’’, where parent always resist their daughters been married into a home without toilets. This programme, therefore, encourages girls and their families to demand a latrine before consenting to marry a male suitor (Stopnitzky, 2017).

In Domenase for instance, a 47 year old man (farmer) opined that ‘‘*it is unhealthy for married women to be exposing their body to defecte at the refuse dump*. *It is even risky for the young female adolescents because, we men we are attracted to what we see*.’’ In addition to this opinion, some of the male discussants at Kissi, Elmina and Komenda emphasised that, it is a responsibility of the man (married) to provide a decent place for attending natures call for his wife and the kids, as expressed in the following excerpts:

‘‘It does not even speak well of you as a man for not having a toilet facility in your house. If they defecate along the beach and they are caught, the fine comes to you the man.’’ (A 37year old fisherman at Elmina-FGDs, 8th May,2019)

‘‘….at times they can be hurt by objects such as a nail or a stick when they attend nature’s call at the refuse dump and as a man or father, you have to take responsibility for that.’’ (A 33 year old driver at Komenda-FGDs, 9th May, 2019).

Regarding the religious affiliation of the respondent, Muslims and African Traditional Religion (ATR) compared to Christians are more likely to practice open defecation. This likelihood

increases by 6.8 and 83.5 per cent points respectively for Muslims and African Traditional Religion. While respondents of the Islamic faith are more likely to open defecate, it is not a significant determinate of open defecation in the KEEA. African Traditional Religion (ATR), on the other hand, is a significant determinant of open defecation. These results suggest that Christians are less likely to open defecate. The reason for such an outcome is because Christians believe the assertion that "cleanliness is next to Godliness".

From the results obtained in Table 4.21, household size is not a significant determinate of open defecation in the KEEA although Crocker et al., (2016) and O'Loughlin *et al.* (2006) sees larger household size as likely to own a toilet facility. On the other hand, Pedi (2014) considers the larger household size as a barrier or constraint for not owning a latrine. Although the household size is negatively related to open defecation practices in the municipality, it is not a significant predictor of open defecation practices in the study locations.

Again, the ethnicity of the respondent is also not a significant determinate of open defecation, although, across all the categories, ethnicity has a positive relationship with open defecation. Thus, Fante's, Ewe's, Ga's are more likely to open defecate compared to Ashanti's. However, respondents who are of the Nzema tribe are less likely to open defecate. While the likelihood of open defecation increases by 10.2, 21, and 0.9 per cent for Fante's, Ewe's and Ga's respectively, it decreases by 0.8 per cent points for Nzemas'.

The respondents' monthly income is a significant determinant of open defecation in the KEEA (see Table 4.21). A negative relationship exists between the monthly incomes of the respondent with the probability of the respondent open defecating. This means that, for any GHC 1.00 increase in the income level of the respondent, he/she becomes better-off and the propensity to open defecate becomes highly unlikely because they can now afford to install a toilet in their

home or they can afford to pay the price for using public toilets. This implies that respondents with less income or a decline in their income levels will be more likely to open defecate. Thus, the respondents stated financial constraints and the high cost of building a toilet facility as a barrier inhibiting their inability to install. Due to this pressure coupled with low-income status, people are compelled to open defecate since they cannot afford to pay for using the PT as an alternative toilet facility. This study is in parallel with earlier studies which posited an inverse relationship between income status and OD practices and adoption of household toilet facility (see JMP, 2015; Connell, 2014; Gross & Gunther, 2014 and Osmanu & Kosoe, 2013).

Identifying the socio-demographic factors that predict open defecation practices will aid in the attempts of curbing the practice in the municipality as emphasised by the framework adapted for the study (see Figures 2.1 & 2.2). Identifying these determinants will further help to identify areas where sanitation education could be intensified as well as areas where the hardware interventions for toilet facility adoption (see Figure 2.2) could be geared to.

On the other hand, studies by Novotny (2017) Lawrence *et al.* (2016), Ackun, (2015) and Dittmer (2009) stressed that cultural factors exacerbate OD practices as it discourages usage of latrines. However, except for the socio-demographic factors mention in Table 4.21, cultural perceptions do not always hold in different social-cultural setting. The following excerpts from the FGDs confirm that such s cultural believes are non-existent in the study locations.

''Aah which belief? The public toilets are not enough and you are saying cultural factors.'' (A 31 year old female trader at Kissi-FGDs, 12th May,2019)

''.....meaning I have to build construct a separate toilet for my wife, the children and myself? Please there is nothing like that in this community.'' (A 42 year of male farmer at Kissi- FGDs, 12th May,2019)

''It doesn't even make any sense for each and every individual in the same household to have a separate private toilet. There is one household toilet facility in my household and that is where we all attend nature's call.'' (A 36 year old businessman at Elmina, FGDs-8th May,2019)

''I do not think there are any cultural beliefs that deter people from using the facility. Maybe during the night we the women are afraid to use the facility because the place looks dark.'' (A 39 year old fisherman at Komenda-FGDs – 9th May, 2019)

For instance, according to Lawrence *et al.* (2016), there is a long-standing taboo that people should never use the same toilets as their in-laws, members of the opposite sex, or different generations within a family in Zambia. Dittmer (2009) also found that in some Idoma communities, husbands do not allow their wives or daughters to share the same latrines with them. In Bwaba ethnic groups of Burkina Faso, Dittmer (2009), stated that one has to reciprocate to a farmer or a food giver by defecating in the food givers farm as a way to fertilize the crops and the land. Additionally, Dittmer (2009) further found that, in Ghana, Mali, Nigeria, and Burkina Faso, OD was exacerbated by the fear of losing one's magical powers or being possessed by demons as a result of using a toilet facility. Earlier before, Belcher (1978) had confirmed such cultural findings in studies at Uganda. However, it is evident from the excerpt from the FGDs that, such cultural perceptions do not hold in the KEEA Municipality

4.6. Drivers of Household Toilet Adoption

Building regulation in Ghana requires that each household builds a household toilet. However, the 2010 census reported that in the KEEA Municipal, about 19 per cent of the population does not use any type of toilet facility while about 52.5 per cent uses the public toilet. Reasons for the non-availability of the household toilet were highlighted in Figure 4.4. This section, therefore, seeks to investigate the factors that will motivate or trigger household heads to install a household toilet facility. These factors were categorized as prestige, well-being and economic drivers. None of the respondents was undecided in terms of agreeing or disregarding the drivers.

Given this and to present the result, the respondents who were in favour or strongly in favour of the driver were presented as ‘‘*agree* ’’. Respondents who disregarded or strongly disregarded to the drivers were also presented as ‘*‘disagreed’’*.

4.6.1. Prestige Drivers for Household Toilet Adoption

The prestigious drivers have three factors, as presented in Table 4.22. It is perceived by 83.4 per cent of the total respondents that building a household toilet identifies one with an urban lifestyle while this driver was disregarded by 16.6 per cent of the respondent. Almost all the respondents (99.4%) perceive that building a latrine helps to receive visitors properly or to avoid shame and embarrassment from visitors. It is also believed by 98.8 per cent of the respondents that, having a household toilet is a way of ensuring that a household is adequately established. Table 4.22 indicates that, at the community level, respondents perception of the prestige driver were higher in Domenase than all the other study locations. Perceptions of building household toilet as a way to be identified with urban lifestyle were also high in the rural communities (Beaseae and Domenase), compared to the other three urban communities.

Table 4. 22: Prestige drivers of household toilet adoption

Prestige Driver		Elmina	Komenda	Kissi	Besease	Domenase	Total
Identify with the urban elite	Agree	132(80.5)	59(84.3)	39(84.7)	18(100)	19(86.4)	267(83.4)
	Disagree	32(19.5)	11(15.7)	7(15.2)	-	3(13.6)	53(16.6)
	Total	**164(100)**	**70(100)**	**46(100)**	**18(100)**	**22(100)**	**320(100)**
To properly receive visitors	Agree	163(99.4)	70(100)	45(97.8)	18(100)	22(100)	318(99.4)
	Disagree	1(0.6)	-	1(2.2)	-	-	2(0.6)
	Total	**164(100)**	**70(100)**	**46(100)**	**18(100)**	**22(100)**	**320(100)**
To feel the home is properly established	Agree	161(98.2)	70(100)	45(97.8)	18(100)	22(100)	316(98.8)
	Disagree	3(1.8)	-	1(2.2)	-	-	4(1.2)
	Total	**164(100)**	**70(100)**	**46(100)**	**18(100)**	**22(100)**	**320(100)**

Figures in parentheses represent percentages and those not in parentheses are respondent counts.
Source: Field survey, 2019.

Moreover, the prestige drivers such as: building household toilet to receive visitors properly, and building household toilet to ensure proper establishment of a house were highly regarded in all the study locations as compared to the other prestige drivers in the study location. In the two rural communities, there were high perceptions of being identified with urban life if one uses or build household toilet as compared to the urban study locations. These results are consistent to earlier findings by Jenkins & Curtis (2005), Jenkins & Sugden (2006), Jenkins & Scott, (2007) and Peal *et al.* (2010). These authors posited that the motives of building household toilet facility have more to do with privacy, convenience, dignity, and comfort. Moreover, Jenkins & Curtis (2005) further added that prestige related drivers contain elements of self-expression and pride.

4.6.2. Health Drivers of Household Toilet Adoption

Table 4.23 presents the result for the health drivers of toilet adoption**.** Toilet adoption triggers that fall under this category include convince and comfort, and adoption of a toilet to protect personal and family health. These drivers, each, were perceived by 99.1 per cent of the respondents as a trigger for latrine adoption.

Taking a closer look at the table, one interesting trend that can be identified at the community level is that, in each of the three urban communities, (Elmina, Komenda and Kissi), there were high perceptions of household toilet offering more convenience and comfort that the other two rural towns. This reason can be explained by the non-availability of a public toilet in the two rural communities, while more than 50 per cent of the respondents in each of these communities do not have a household toilet.

Table 4. 23: Health drivers for household toilet adoption

Health Drivers		Name of Community					Total
		Elmina	Komenda	Kissi	Besease	Domenase	
For health and family protect protection	Agree	163(99.4)	70(100)	45(97.8)	17(94.4)	22(100)	317(99.1)
	Disagree	1(0.6)	0	1(2.2)	1(5.6)	0	3(0.9)
	Total	**164(100)**	**70(100)**	**46(100)**	**18(100)**	**22(100)**	**320**
For convenience And comfort	Agree	164(100)	70(100)	45(97.8)	17(94.4)	21(95.5)	317(99.1)
	Disagree	0	0	1(2.2)	1(5.6)	1(4.5)	3(0.9)
	Total	**164(100)**	**70(100)**	**46(100)**	**18(100)**	**22(100)**	**320 (100)**

Figures in parentheses represent percentages and those not in parentheses are respondent counts.
Source: Field survey, 2019.

From Table 4.23, although at least 95 per cent of the respondents in the rural study locations perceived household toilet as convenient, these views were mostly expressed by households with toilet facility and a few non-household toilet facility households. In these rural communities, however, open defecation is considered as a routine practice, unlike the urban settlements where open defecators are always arrested. Consequently, in the three urban locations, there were higher perceptions of building household toilet to ensure personal health and to protect family compared to the two rural communities. Table 4.23 also shows that health drivers were highly regarded. In agreement to this finding is a study by Jenkins & Curtis (2005) who posited that household heads would be motivated to install a toilet facility to either protect family health as well as to ensure personal health as a precaution against any risk and infectious diseases.

4.6.3. Economic Driver for Household Toilet Adoption

The economic driver relates to the building of a household toilet for financial gains. It is perceived that household heads or landlords who have household toilet facility will be able to charge their tenants higher prices than households without toilet facility. As presented in Table 4.24, building household toilet to increase rental income was perceived by 82.8 per cent of the

respondents. This driver was, however, disregarded by 17.2 per cent by the respondents. At the community level, Domenase, followed by Elmina, recorded the highest perception of the driver. In terms of respondents who disregarded this driver, Besease recoded the highest (27.8%) followed by Komenda (21.4%). The 82.8 per cent of the respondents who regarded the economic driver means that building a household toilet facility is an opportunity for landlords to increase the rental charges of their houses. The study by Jenkins & Curtis (2005) has confirmed that household heads or landlords would be triggered to build a latrine for economic reasons.

Table 4. 24: Economic driver of toilet adoption.

Economic driver		**Name of Community**					**Total**
		Elmina	Komenda	Kissi	Besease	Domenase	
To increased rental income	Agree	140(85.4)	55(78.6)	38(82.6)	13(72.2)	19(86.4)	265(82.8)
	Disagree	24(14.6)	15(21.4)	8(17.4)	5(27.8)	3(13.6)	55(17.2)
	Total	**164(100)**	**70(100)**	**46(100)**	**18(100)**	**22(100)**	**320(100)**

Figures in parentheses represent percentages and those not in parentheses are respondent counts.
Source: Field survey, 2019.

4.6.4. Relationships between Socio-Demographic factors and Drivers for Household Toilet Adoption

It has been presented in Tables 4.22, 4.23 and 4.24 that, the prestige, health and economic drivers were highly perceived to influence household toilet adoption by the respondents. This subsection, therefore, explores the relationship between toilet adoption drivers and respondents socio-demographic characteristics. The respondents' age, sex, household size, religion, ethnicity, and household size does not have any association with any of the household toilet facility adoption drivers. However, the respondents' educational status, marital status, and income levels have an association with the drivers for the household toilet facility adoption. Therefore, the relationship is based on the respondent's marital status, education and income status.

4.6.4.1. Relationship between the prestige drivers and the socio-demographic factors (marital status, education and income levels) for household toilet adoption.

Table 4.25 presents the relationship between the prestigious drivers and marital status of the respondent. The table illustrates that prestigious driver such as building household toilet to portray urban lifestyle and to feel the home is adequately established does not have a significant relationship with the respondent's marital status. However, marital status significantly influences the perception of building a household toilet to receive visitors properly.

Table 4. 25 Relationships between Prestige Drivers and Marital Status

Prestige Drivers		**Marital Status**				**Total**	**Significance *(Chi-square test)***
		Single (%)	Married (%)	Divorced (%)	Widow/ Widower %)		
Identify with the urban elite	Agree	14.7	77.4	4.1	3.8	266	χ2: 13.774 N= 320 df: 9 ***P-value* : 0.131**
	Disagree	18.5	75.9	1.9	3.7	54	
	total	**15.2**	**77.2**	**3.8**	**3.8**	**320**	
To properly receive visitors	Agree	14.7	77.7	3.8	3.8	**314**	χ2:19.503 N:320 df:9 ***P-value: 0.02******
	Disagree	50	50	0.0	0.0	**6**	
	total	**15.2**	**77.2**	**3.8**	**3.8**	**320**	
To feel the home is properly established	Agree	15.2	77.2	3.8	3.8	316	χ2: 7.307 N: 320 df: 6 ***P-value: 0.293***
	Disagree	25	75	-	-	4	
	total	**15.2**	**77.2**	**3.8**	**3.8**	**320**	

Source: Field survey, 2019.

For respondents who were in favour of this driver, the majority (77.7 %) are married while 14.7 per cent are single. Meaning, for prestigious reasons, respondents who are married are more likely to own or build a household toilet to receive their visitors properly. Elmina recoded the highest (84.1%) for its total respondents who are married. Komenda and Kissi also recorded 75.7 per cent and 73.9 per cent, respectively. The number of married respondents in rural study

locations was lower than the urban location. Besease, for instance, recorded 55.6 married respondents while Domenase also recorded 54.5 per cent.

Table 4.26 illustrates the relationship between the prestige drivers and education status of the respondents. A closer look at the table shows that respondents with basic education were popular across all the category of the prestige drivers. The table shows that ‘‘*to identify with urban elite*’’ and ‘‘*to feel household is properly established’’* categories of the prestige drivers do not have a significant relationship with respondent’s educational status. Educational status, however, has a significant influence on the ‘‘*to properly receive visitors’’* driver of the prestige drivers’’ intentions for building toilet facility. The respondents who regarded this driver across the various education groups were 314(98.1%). Within this, those with basic education recorded the highest (46.8%), followed by respondents who have attained secondary education statues.

The data also shows that all the respondents with no-education and basic education were in favour of this drive. Majority of the respondents who disregarded this driver were respondents with secondary or tertiary education. Although education attainments in the study location are low, the significant relationship in Table 4.26 shows that irrespective of educational status, the respondents are likely to adopt a household toilet facility if they intend to receive their visitors properly.

Table 4. 26: Relationship between Prestige Drivers and Education

Prestige Drivers		Education				Total	Significance *(Chi-square test)*
		No Formal Education (%)	Basic (%)	Secondary (%)	Tertiary (%)		
Identify with the urban elite	Agree	18	42.9	32.3	6.8	266	χ2: 16.177 N= 320 df: 9 ***P-value* : 0.06**
	Disagree	5.6	61.1	27.7	5.6	54	
	total	**15.9**	**45.9**	**31.6**	**6.6**	**320**	
To properly receive visitors	Agree	16.2	46.8	31.2	5.7	314	χ2: 35.219 N:320 df:9 ***P-value: 0.00******
	Disagree	-	-	50	50	6	
	total	**15.9**	**45.9**	**31.6**	**6.6**	**320**	
To feel the home is properly established	Agree	15.8	46.5	31.3	6.3	15.8	χ2: 7.189 N: 320 df: 6 ***P-value: 0.304***
	Disagree	25	-	50	25	4	
	total	**15.9**	**45.9**	**31.6**	**6.6**	**320**	

Source: Field survey, 2019.

The data was further analysed to explore the influence of income status on the prestige drivers. Table 4.27 indicates that income levels have significant influences on some of the prestige drivers. From the table, the relationship between income levels and a prestige driver of ‘‘*adopting household toilet to be identified with urban elite’’* is statistically significant. The majority of the respondents who regarded this driver are within the income bracket of Ghc ‘500 and below’. For this category of respondents, as income levels increase, the percentage of respondents who regarded this drive decreases, excluding respondents who earn Ghc 1,501 and above.

Moreover, for respondents who disregarded this driver, the majority (47.2%) earns Ghc 500 or less. However, this percentage decreases as income levels increase. The significant relationship shows that, although there is a low-income level across the study locations, there is likelihood for respondents to adopt household toilet facility for prestige reason of being identified with the urban elite.

Table 4. 27:Relationship between Prestige Drivers and Income Levels

Prestige Drivers		Income (GHC)				Total	Significance *(Chi-square test)*
		500 and below (%)	501 to 1,000 (%)	1,001 to 1,500 (%)	1,501 and above (%)		
Identify with the urban elite	*Agree*	64.8	26.1	3.4	5.7	**261**	χ2: 27.346 N= 314 df: 12 *P-value* : **0.007*** **
	Disagree	47.2	34.0	13.2	5.7	**53**	
	total	**61.8**	**27.4**	**5.1**	**5.7**	**114**	
To properly receive visitors	*Agree*	62.0	27.3	5.2	5.5	**308**	χ2: 20.697 N:314 df:12 ***P-value: 0.055***
	Disagree	50.0	33.3	0.0	16.7	**6**	
	total	**61.8**	**27.4**	**5.1**	**5.7**	**314**	
To feel the home is properly established	*Agree*	61.6	27.4	5.2	5.8	**310**	χ2: 22.498 N: 314 df: 8 *P-value:* ***0.004**** **
	Disagree	75	25	-	-	**4**	
	total	**61.8**	**27.4**	**5.1**	**5.7**	**314**	

Source: Field survey, 2019.

Income levels also have a significant relationship with the prestige of building a household toilet ‘‘*to make their homes properly established’’*. This driver is regarded by 98.7 per cent of the respondent. Majority of these respondents (61.6%) earn Ghc 500 or less, but these percentages of respondents decrease as income levels increases. The significant relationship shows that, although income levels are low in the study locations, it is likely to stimulate adoption of household toilet facility since there is a perception that, households with toilet facility is *well established*. For instance, none of the respondents who earn above Ghc 1,000 disregarded this driver.

4.6.4.2. Relationship between the health drivers and the socio-demographic factors (marital status, education and income levels) for household toilet adoption.

This section presents findings on how marital status, education and income levels influence respondent’s perceptions of the health drivers of toilet adoption. Table 2.28 summarises the influence of marital status on the health drivers.

Table 4.28 shows the health driver of *self and family health protection* trigger of building a household toilet facility has an insignificant relationship with respondent's marital status. However, 77.3 per cent and 15.1 per cent of the respondents who accepted this driver are married and single, respectively. This finding is not shocking as findings by Jenkins & Curtis (2005) emphasised that health outcome are not an essential factor for latrine adoption. Their proposition was based on the fact that health benefits are not realized instantaneous but over some time. Although the findings by Jenkins & Curtis (2005) were in contrast to the views of Carter *et al.* (2017) and Hammer & Spears (2016) that health benefits are the main drive behind the improvement in sanitation, they however, agreed that these benefits are only realised over time. They added that such benefits are confounded and dependent on various socio-cultural and environmental parameters.

Table 4.28: Relationship between Health Drivers and Marital Status

Health Drivers		**Marital Status**				**Total**	**Significance** ***(Chi-square test)***
		Single (%)	Married (%)	Divorced (%)	Widow/ widower(%)		
For health and family protection	Agree	15.1	77.3	3.8	3.8	**317**	χ^2: 8.155 N= 320 df: 9 ***P-value* : 0.519**
	Disagree	33.3	66.7	0.0	0.0	**3**	
	total	15.3	77.2	3.8	3.8	**320**	
For convenience And comfort	Agree	14.8	77.6	3.8	3.8	**317**	χ^2: 18.300 N:320 df:9 ***P-value: 0.03** ****
	Disagree	33.3	66.7	0.0	0.0	**3**	
	total	15.3	77.2	3.8	3.8	**320**	

Source: Field survey, 2019.

A closer look at the Table 4.28 again, shows that there is a significant relationship between marital status and the health drive of building a household toilet since the household toilet is perceived to offer more convenience and comfort. Majority of the respondents who were in favour of this driver are married (77.6%). The significant relationship means that marital status

has the likelihood to stimulate household toilet construction. The likelihood is higher for respondents who are married compared to other marital groups. In the socio-cultural settings in Ghana, it is expected that married couples are to ensure maximum privacy of their bodies. Open defecation does not provide privacy while using the public toilet does provide maximum comfort. This explains the reason why the majority of the respondents who are married have a household toilet (see Table 4.10) since it ensures privacy and comfort in-terms of attending nature's call. This study confirms an earlier study in India by Stopnitzky (2017). Findings from Stopnitzky's (2017) research shows that in Haryana state in India, there is a policy of No-Toilet, No-Bride. Parents in this state always resist their daughters to be married into a home without a toilet facility. This programme, therefore, encourages women and their families to demand the male counterpart to build a household toilet before being permitted by the bride's family to marry their daughter.

Table 4.29 also presents results on the relationship between education status and the health drivers.

Table 4. 29: Relationship between Health Drivers and Education

Health Drivers		**Education**				**Total**	**Significance** ***(Chi-square test)***
		No Formal Education (%)	Basic (%)	Secondary (%)	Tertiary (%)		
For health and family protection	Agree	15.8	46.4	31.5	6.3	**317**	χ^2: 13.740 N= 320 df: 9 ***P-value* : 0.132**
	Disagree	33.3	0.0	33.3	33.3	**3**	
	total	**15.9**	**45.9**	**31.6**	**6.6**	**320**	
For convenience And comfort	Agree	16.1	46.1	31.5	6.3	**317**	χ^2: 15.869 N:320 df:9 ***P-value: 0.07***
	Disagree	0.0	33.3	33.3	33.3	**3**	
	total	**15.9**	**45.9**	**31.6**	**6.6**	**320**	

Source: Field survey, 2019.

One exciting trend that is identified from the table is that for respondents who were in favour of the health drivers, those with basic education status recorded the highest under each category of the health drivers. Those with secondary education followed this. It has been noted that education plays a vital role in terms of health knowledge. However, the influence of educational status on health drivers is statistically insignificant. This relationship means that irrespective of the educational inclination of the respondents, their perceptions about the health drivers are influenced by other factors but not their education status.

Although educational status has an insignificant influence on the health drivers of household toilet adoption, results in Table 4.30 shows that income status has a significant influence on the perceptions of building a household toilet *for convenience and comfort*. It is observed from the table that only three respondents disregarded the convenience and comfort health driver. About 61.7 per cent of the respondents who regarded this driver earn less than Ghc 500. The reason for this is that about 61.8 per cent of the study samples are within the income bracket of Ghc 500 or less. One pattern that can also be identified from the table is that, as income levels increase, the percentages for respondents who regarded this driver decrease except for those who earn above Ghc 1,500.

Table 4. 30:Relationship between Health Drivers and Income Levels

Health Drivers		**Income (GHC)**				**Total**	**Significance *(Chi-square test)***
		500 and below (%)	501 to 1000 (%)	1001 to 1500 (%)	1501 and above (%)		
For health and family protection	Agree	61.7	27.3	5.1	5.8	311	χ2: 11.037 N= 314 df: 12 ***P-value* : 0.526**
	Disagree	66.7	33.3	0.0	0.0	3	
	total	**61.8**	**27.4**	**5.1**	**5.7**	**114**	
For convenience And comfort	Agree	61.7	27.3	5.1	5.8	311	χ2: 23.125 N:314 df: 12 ***P-value: 0.02******
	Disagree	66.7	33.3	0.0	0.0	3	
	total	**61.8**	**27.4**	**5.1**	**5.7**	**314**	

Source: Field survey. 2019.

The study has shown that income levels are significant determinants of open defecation (see Table 4.21). Thus, an increase in income levels means there is likelihood to afford to build a household toilet facility, and this reduces the probability to practice open defecation. Moreover, inadequate income or finance was some of the primary reasons why some households have not constructed household toilet (see Figure 4.4). It can be deduced from the significant result in Table 4.30 that the respondent's income status will stimulate the perception to build an household toilet for convenience and comfort. Although the respondent's perceived cost of constructing a household toilet is above their average income, it can be inferred from the significant result in the table that, the household heads will be triggered to build a household toilet for comfort and convenience if they can afford the cost of constructing the facility. These comments were also highlighted in the FDGs as captured in excerpts of the following comments.

''We *do not have a household toilet because we cannot afford. Building personal latrines will cost you more than* GH₵ 600 *or* GH₵ *700, and if you want to construct current scientific types, you will have to spend more than* GH₵ 1,000. *Most of us are farmers, and rainfall is very erratic, so farming is less rewarding for us to get enough money to construct our toilets. We always plan for that, but such plans never materialize. We have heard a lot on this issue from the municipal and the government, and if they are willing to support us by subsidizing the cost, most of us will be willing to construct own personal toilets''* (A 52 year old male farmer - FGD at Domenase, 10th May 2019)

An assemblyman also noted:

''They just hear it, and all that they know is it is expensive. Unlike the other traditional types, these new ones will cost about GHC 1,000 to build and spending GHC1,000 in a village is not easy, it is bigger money for someone to hear." (Domenase Assemblyman-Key Informant Interview, 9th May 2019.)

Inferences from the FDGs above show that the respondents are willing to install current types of scientific toilet facilities if there are external supports. However, they are constrained by their poor economic background (mostly farmers) as noted in excerpts of the comments above.

4.6.4.3. Relationship between the economic driver and the socio-demographic factors (marital status, education and income levels) for household toilet adoption.

It has been presented that almost all the respondents (99.1%) across the study locations perceived the economic drive to trigger household toilet construction (see Table 4.24). Table 4.31 presents how the respondents' socio-demographic variables influence the respondents' perceptions of the economic driver.

Table 4. 31:Relationship between Economic Driver and Socio-Demographic Factors

To increased Rental income	**Marital Status**				**Total**	**Significance** ***(Chi-square test)***
	Single (%)	*Married (%)*	*Divorced (%)*	*Widow/ Widower (%)*		
Agree	14.3	78.1	4.2	3.4	**265**	χ2: 8.198 N=:114 df: 12 ***P-value*** **: 0.76**
Disagree	20.0	72.7	1.8	5.5	**55**	
Total	**15.3**	**77.2**	**3.8**	**3.8**	**320**	
	Education					
	No formal Education (%)	*Basic (%)*	*Secondary (%)*	*Tertiary (%)*		
Agree	15.8	**47.5**	30.9	5.7	265	χ2: 15.796 N= 320 df: 12 ***P-value*** **: 0.201**
Disagree	16.4	38.2	34.5	10.9	55	
Total	**15.9**	**45.9**	**31.6**	**6.6**	**320**	
	Income (GHC)					
	500 and below (%)	*501 to 1,000 (%)*	*1,001 to 1,500 (%)*	*1,501 and above (%)*		
Agree	**63.8**	26.5	5.0	4.6	**260**	χ2: 17.856 N= 314 df: 16 ***P-value*** **: 0.33**
Disagree	51.9	31.5	5.6	11.1	**54**	
Total	**61.8**	**27.4**	**5.1**	**5.7**	**314**	

Source: Field survey, 2019.

The table shows that, for marital status for respondents who were in favour of the economic driver, the majority (78.1%) are married. The economic driver was also regarded by 47.5 per cent of the respondents with basic education. Moreover, 63.8 per cent of the respondents who

were in favour of the driver are within the income bracket ‘Ghc 1-500’. Overall, the table shows that the economic driver has no significant relationship with the respondent’s marital status, education level and income status.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION, RECOMMENDATIONS AND DIRECTION FOR FUTURE STUDIES

5.1 Introduction

This chapter summarises the finding of this study titled "*Curbing open defecation in the KEEA municipality in the central region*". This chapter draws conclusions based on the presentation and results from the previous chapters. The section also provides recommendations based on the findings from the study.

5.2 Summary of Main Findings

The study aimed at achieving four specific objectives. The first was to identify and map-out the spatial distribution of public toilets among the selected communities. The second was to analyse the spatial accessibility of the public toilets in the selected communities. The third objective sought to predict the socio-demographic factors that determined open defecation practices in the selected communities, and the fourth was to investigate the drivers of latrines adoption and usage in the selected communities and how these drivers are influenced by social-demographic variable. The phenomena under study were conceptualised with inspiration from the FOAM Framework (Coombers & Devine, 2010) and Sanitation Pathways (Novotny *et al.* 2017).

5.2.1. Spatial Distribution and Accessibility of Toilet Facility

The study used both descriptive statistics and a Chi-square test to analyse the spatial distribution and accessibility to public toilets in the study location. The study identified twelve public toilet facilities in Elmina; signifying a facility per population ratio of one to 1,900 persons. Komenda, which has nine public toilets, also has a ratio of one toilet facility per 1,640 persons. The four public toilets in Kissi also show a usage ration of 1,700 persons per public toilet. The public

toilets in the communities are managed by a private entity Moreover, the number of public toilet facilities in each of the community were inadequate and the few that were available were skewed to parts of the community; making the facility inaccessible to all suburbs of the community. While in the perspective of the district environmental and sanitation officers, public toilets are not meant for indigenes but commuters. However, at the community level, the indigenes perceive the public toilet as their main place of attending nature's call. Domenase and Besease do not have any public toilet. An inspection of the facilities in the three communities shows that some of the facilities are unkempt and are in a deplorable state.

About 55.6 per cent of the household do not have a household toilet while about 33.1 per cent of the households in Elmina, Komenda and Kissi use the public toilet. The reasons for the non-availability of household toilet facility were attributed to limited space for building toilet and issues relating to financial constraints. Another thing that came up has to do with the insecurity of tenants to build a household toilet in rented houses which do not have a toilet facility.

The spatiality of the public toilet shows that the respondent's perceived proximity and levels of satisfaction with how the public toilet facilities are kept do not influence the frequency of usage for those who use the public toilet. However, there was a relationship between travelling time to use the facility and the likelihood to defecate openly: those who are further away from the facility are likely to practise open defecation.

For respondents who, neither have a household toilet nor uses the public toilet, the unhygienic status of the public toilet as well as paying and queuing to use the facility is perceived as an inconvenience. These respondents perceive open defecation as convenient.

5.2.2 Determinants of Open Defecation

Availability of household latrine shows that water closet toilet facility is mostly preferred in the urban communities' while pit latrine is preferred in rural settings.

The study used a probit regression technique to achieve the third objective of finding out the social-demographic factors that determine open defecation practices. The results obtained from the probit regression suggested that social-demographic factors play significant roles in determining open defecation practices in the study area. Sex is a significant determinant of open defecation practices with females more likely to practice open defecation as compared to males in the study area. Although age is not a significant determinant, those between 50-60 years are more likely to open defecate. Moreover, education and income status are also significant determinants of open defecation practices. As educational inclination or income level increases, the probability to open defecate decreases. Marital status, religion and ethnicity are, however, insignificant in predicting open defecation practices in the study area.

5.2.3. Drivers of Latrine Adoption and Usage

The study used descriptive statistics in analysing the drivers of household toilet adoption. At the same time, the Chi-square test was used to determine the level of significance between the drivers and social-demographic variables. The drivers (prestige, health and economic) were highly perceived to stimulate household toilet facility construction in all the study location.

For the prestige drivers, building household toilet facility to properly receive visitors was significantly influenced by marital status and education level. Other prestige drivers such as building household toilet to be identified with the urban elite and to feel the house is adequately established were significantly influenced by income status. For the health driver, building a household toilet to ensure convenience and comfort has a significant relationship with marital

status and income levels. However, the economic diver does not have any significant association with any of the social demographic variables.

5.3 Conclusion

Based on the discussions of the findings, the following conclusions were drawn from the study. Public toilets serves as the main place for attending nature's call in the KEEA Municipality. However, these facilities are inadequate and the few that are available in Kissi, Komenda and Elmina are not evenly accessible to all suburbs of the community. More so, privatisation of theses facility has left majority of the facility in a deplorable state because the facility is poorly managed. Communities such as Domenase and Besease do not any functioning public toilet. The indigenes are dependent on the KEEA Municipal Assembly to provide more public toilets, while the Municipal Assembly is reluctant to provide such facilities for the indigenes since they perceive that public toilet are not meant for the indigenes but for commuters or travellers.

Empirical findings from the study also showed that the public toilet facilities were inaccessible to respondents who do not use the public toilet. The reason was that using the facility was inconvenient to the users since they have to pay and queue to use the unkempt facility while there were more convenient alternative means of attending to nature's call (open defecation). Also, users were not able to have access to the facility during the night since the place was locked. Further, the users feel ashamed to be seen by the opposite sex when they are visiting the facility.

Furthermore, the perception of proximity to the public toilet and users' level of satisfaction about how the facility is maintained does not influence the frequency of using the facility by public toilet users. This is attributed to positive attitudinal changes from open defecation practices to the use of a toilet facility for households that do not have a household toilet. However, this positive

attitudinal change is temporal and it might change to open defecation practices if there is an unmatched improvement in the hygienic conditions of the public toilets. Also, most of the households do not have a household toilet, and the majority of these people use the public toilet irrespective of the facility's hygienic nature. Therefore, for the Municipal to attain open defecation free status, provision of public toilets is inevitable in the short terms while the adoption of household toilet facility gradually takes effect in the long-term.

In terms of factors that limit households from building their household toilet, the study demonstrated that such reasons are attributed to limited space, financial constraints and the unwillingness of tenets to construct their household toilet facility. The tenants' reluctance was due to insecurity of their tenancy arrangement vis-à-vis the inability of the landlord to provide the facility.

For the determinants of open defecation practices, the study demonstrated that social-demographic factors play a significant role. Sex is a significant determinant of open defecation practices with females more likely to open defecates as compared to males in the study area. Those between 50-60 years are more likely to open defecate, compared to other age groups. Moreover, education and income status are also significant determinants of open defecation practices.

The study has also demonstrated that the prestige, health and economic drivers were perceived to trigger toilet facility adoption. In terms of the socio-demographic influences on theses driver, marital status, and educational level had a significant relationship on the adoption of a household toilet as a way to receive visitors for the prestige driver. Income levels also influence the other prestige drivers; adopting household toilet to be identified with the urban elite and to ensure

proper establishment of the household. Moreover, marital status and income levels also influence the desire to install a household toilet for convenience and comfort for the health driver.

5.4 Recommendation

Based on the findings of this study, the following recommendations are proposed to help curb open defecation practices.

5.4.1 Provision of Public Toilets

The study found that some communities (Besease and Domenase) do not have a functioning public toilet while the available facilities in the other communities are inadequate and are skew to sections of the community. The study recommends that, in the short term, public toilet usage is inevitable in an attempt of ending open defecation in the KEEA. Therefore the local governments should augment the few facilities in each of the community to meet the needs of the increasing population vis-à-vis the long term efforts of ensuring that all households have a household toilet facility. Moreover, almost all the respondents in Domenase and Besease practice open defecation. It is therefore recommended that, in the short term, there should be efforts by the municipal and the community to construct public toilets in these communities, while efforts should also be intensified for household's household toilet in the long term. It will also be expedient to differently site female latrines from males so that females would not feel ashamed to be seen using the public facility by the opposite sex vis-à-vis.

5.4.2 Re-check the Privatisation and Management of Public Toilets

Privatisation of the public toilets should be re-checked to ensure that users are not over-levied. In terms of managing the facility, there should be a shift system to ensure that the facility is always open to users, especially during the night. Moreover, almost all the public toilet attendants

confirmed that managers of the facility hardly repair any fault they report on the facility. It is therefore necessary that although the facilities have been privatised, the municipal authorities should frequently monitor such facilities to ensure that they are regularly well-kept and adequately maintained so that households without toilet facilities can patronise the facilities.

5.4.3 Landlord-Tenant's Relation Policy

One of the key findings from the study is that tenants are unwilling to invest in the construction of their household toilet facility due to insecurity. It is not all rented houses that have toilet facility in them although building regulations require all landlords to provide a toilet for their households. While the Local Government Act (462) on sanitation should be enforced to ensure landlords provide toilets for their tenants, the landlords should also be encouraged to reinvest their rental income in building toilets for their tenants. While there are laws (The Local Government Act (Act 462), Rent Control Law (1989): PNDC Law 138, and Ghana Rent Act 220) check issues and terms of house renting, there should also be a policy document that will encourage tenants to invest in building their toilet facility. The policy document should specify how the tenant could recoup the cost of constructing the toilet facility.

5.4.4. Subsidising Household Toilet Construction

The study has concluded that financial constraint is a major setback for constructing a household toilet. Having personal and household latrine offers more convenience and comfort. Therefore there should be campaigns to encourage residents to choose household latrines over public toilet facilities. For the fruition of such campaigns, the local government should negotiate with external and internal donors so they could subsidise latrine construction cost by coming into agreement with manufactures or suppliers of such latrine materials. While community and self-

support initiatives are also encouraged, the local government should also partner with the private sector to design and develop sanitation products that are affordable to the poor.

5.4.5. Mandatory adoption of Household Toilet Facility for New Buildings

The study has identified that limited space is a constraint for constructing a household toilet. It is undeniable that the study towns are experiencing growth as a result of population increase. The periphery of these communities, especially Elmina, Komenda and Kissi, are undergoing massive construction of new buildings. The study, therefore, recommends strict enforcement of building codes by the Municipal Assembly to ensure that these newly constructed houses have built a house latrine as part of the building plans. Houses yet to be built should mandatorily include toilets in the building plan, and the Municipal authorities should ensure that, upon completion of such houses, the constructions of the toilets are also completed. The Municipal authorities should also form committees to monitor that spaces intended for constructing toilet are not converted into rooms due to housing demands.

5.4.6. Education

Findings from the study suggest that prestige, health and economic drivers are likely to stimulate household toilet construction. The study, therefore, recommends that knowledge on hygiene and defecatory behaviours are acquired both at community and household levels and this should be targeted by health and hygiene promoters. Health education and sanitation campaigns on the risk associated with open defecation may be useful in triggering latrine adoption. Moreover, the prestige and health benefit associated with having a household toilet should also be spelt-out to make the adoption of household toilet appealing to them. In the long run, this will stimulate household heads to prioritise latrine building in their respective homes. Therefore, the

municipals' sanitation task forces should not only focus their attention on arresting open defecators but also in educating households on the need to adopt household toilet facilities. The task forces should also focus on teaching the local people how to use local or traditional materials to construct their toilet facility which hygienically separates human contact from excreta. Moreover, the sanitation task force should also intensify hygiene education among public toilet operators to ensure cleanliness at the premises of the facility.

5.4.7 A Better and a Deeper understanding of Socio-Demographic characteristics at Household and Community Levels

The conclusions drawn from the study shows that the likelihood to practice open defecation is influenced by household socio-demographics. Moreover, empirical findings show that socio-demographic and economic variable, such as age, sex, economic and educational background has been identified as a predictor of adoption sanitation and hygienic practice. The study recommends that the KEEA Municipal Assembly through its Environmental Health and Sanitation Division to have a better understanding of the demographics of the various household and communities where interventions are to take place. Moreover, household and community members should be involved in planning, especially in the designing of a sanitation facility to ensure it meets the expectations of the users and thus encourage patronage

5.5 Suggestion for Future Studies

Given resources and time constraints, the limitations of this study is that; the study did not consider the influence of the traditional authority on behaviour change and attitude in terms of open defecation practices. Moreover, this study did not delve into details, the influence that landlord-tenant relations has on adoption and investment in building a household toilet facility. Notwithstanding, the study has highlighted the factors that predict open defecation practices and

the drivers for adopting household toilet facility in the study area. However, had the study taken into consideration, the identified limitations, this possibly could have enhanced the generalizability and contextual insights of the findings.

This study therefore, recommends that future studies should investigate how landlord-tenant relations influence investments in household toilet construction. Moreover, further studies should also give a holistic focus on how traditional authorities can abate open defecation practices and the adoption of household toilet facility.

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APPENDIX A

INTERVIEW GUIDE FOR OPINION LEADERS IN KEEA.

Observed Sex	Education Level	Name Of Community	Age	Ethnicity	Religion

1. How long have you been an opinion leader (assemblyman/woman, headmaster/mistress, religious leader, community sanitation officer) in this community?
2. What latrine facility options have been provided to this community by
    a. The municipality/government
    b. The community.
    c. Any donor or NGO
3. Currently, how many of these facilities are functional within the community?
    a. How effective are they used
    b. Have such facility been updated, please explain your response

(Aim: To explore both community and municipality arrangements in terms of provision of toilet facilities).

4. How was the practice in this community previously as compared to now?
5. How did the practice affect the community (previously and now?)
6. Why do some people in this community open defecate?
7. Why a lot of households have no latrines in their homes

(Aim: To understand open defecation practices within this community)

8. How is the public toilet kept
9. Where do the proceeds charge for the public toilet go and how are such monies spent.
10. Why do some people choose open defecation over usage of public toilets?

(Aim: To identify barriers of public toilet usage and their maintenance)

11. a. What will motivate and individual or household use a public toilet or to build a household toilet?
    Probe: for prestigious reasons, for health reason and other reasons.

(Aim: To identify the drivers for adopting or using a latrine.

12. Discuss measures that you have been put in place to check open defecation?
13. What about ways to encourage the usability of the public toilets.
14. To the best of your knowledge, how can peoples or defecator behaviours be changed?
15. Are there any measures to ensure household own or build a latrine
    a. Are there any measures or policy to ensure new buildings are built with a toilet facility?
    b. How effective is the measure put in place to check the practice?

(Aim: To identify the various measures put in place and how effective they are to check the practice.)

APPENDIX B

INTERVIEW GUIDE FOR PUBLIC TOILET ATTENDANTS AND CLEANERS

1. Please can you tell me about yourself
    - **a.** (age, education status, ethnicity, religion, gender observed.)
    - **b.** How long have you been keeping the facility and what work were you doing before

(Objective: To establish the socio-demographic characteristics of the attendants.)

2. How are you motivated for the work you do?
3. How do you keep the facility: **Probe -** cleaning materials, frequency (within a day and week), locking and opening periods?

(Objective: To know more about their work, how they are motivated and how the facility is kept)

4. Who owns the facility (government/community/private)
5. How do you obtain the materials you used in cleaning the facility
6. **Disinfection of the toilet (** probe**: type of disinfection used, how frequent)**
7. Where do the proceeds leveed for the facility usage go
8. If any part of the facility develops a fault, who do you report to and how rapid are you responded to?

(Objective: To know how the facility is managed and maintained.)

9. What is the capacity of the toilet (number of seaters) and how are the general conditions of the facility
10. Please tell about any unacceptable behaviour and practices of users
11. Challenges in terms of usage and maintenance of the facility
    a. Users**: Probe** ..cost, proximity to the facility, queues, odour of the facility
    b. Attendants: **Probe**… improper practices by the user, challenges of

(Objective: To know the general conditions of the facility, its usability and challenges both the users and the attendant's faces)

12. What do you think about open defecation practices in this community
13. To the best of your knowledge, why do you think some people prefer open defecation to the usage of the facility and how can usability of the facility be increased?
14. How can the practice be control
15. What about the influence of the traditional authority: (**Probe** using taboos and prohibiting the practice)

(Objective: To know the attendants perceptions of open defecation and how effective can the traditional and local authority be in terms of curbing the practice).

APPENDIX C

FOCUS GROUP DISCUSSION GUIDE

Name	*Sex Observed*	*Education Level*	*Ethnicity*	*Religion*
NAME OF COMUNITY				

1. What kind of toilet facility do members of your household use?
   ***Probe**. What is it like to own, share or use the public latrine?*
2. How will you describe your community and your living area when it comes to sanitation? (***Probe**; the latrine situation)*
3. What do you consider being a good choice of sanitation for people living here and why?

(Aim: To ascertain the various sanitation practices and preferences both at the household and community level).

4. Why a lot of households have not built their own toilets?
   a. **Probe** –*latrine priority, is latrines building embedded into building plans….space constraints, Morphology of the soil/land and water table, cost*. Etc.

(Aim: To identify the barriers of building personal or household latrine).

5. Could you share with us some of the benefits you see in having your own toilet instead of:
   a. Sharing,
   b. Using public toilet
   c. Open defecation?
6. Which latrine is the most preferred choice, and why?

(*Aim:* To identify the preferences for latrine facility)

7. What are some of the challenges that discourage you from using the public toilet?

a. Probe: quantity, locations, distribution, hygiene conditions, mode of cleansing, management of the facility, why children don't use.

***(Aim:* To identify the barriers of public toilet usability)**

8. What preferences do people have for open defecation over public toilet usage?
   a. Can you share a personal experience on the last time you had to defecate either in the bush or beach?....(**probe**: *socializing, take fresh air,* etc.)
   b. Could you please share with us any historical facts related to open defecation in this community?
   c. What do you consider in choosing a place to defecate?
   d. Does the choice of a place to defecate take into consideration whether one is male, female, or a child—please explain your response
   e. Why public toilets are not consistently used (**Probe**... *shame to be seen using PT, levy, pressures, odour, proximity to households etc.*

***(Aim: To identify* the reasons for preferences of open defecation over public toilet usage)**

9. Do members of this community have any cultural beliefs about faeces?
   a. What are they?
   b. Are they specific to certain people?
   c. Do they influence the choice of a place to defecate

(Aim: To identify cultural practice that facilitates open defecation practices)

10. What are the municipality's and community's arrangements toward the practice

11. How effective have such arrangements been?

(Aim: to identify measures put in place by the municipality and the community and to ascertain the effectiveness of such measures.)

12. In your opinion, what can be done to increase the adoption of latrines in this community?
   a. What roles can our chiefs perform in this fight?
      a. *Probe... using taboos to forbid the practice* based on previous experiences /instances.
   b. What role can any other authorities perform?.

(Aim: to establish ways to change defecators open defecatory behaviours).

APPENDIX D

UNIVERSITY OF GHANA
DEPARTMENT OF GEOGRAPHY AND RESOURCE DEVELOPMENT
HOUSEHOLD SURVEY QUESTIONNAIRE

My name is Clifford Semabiah, a Post Graduate student pursuing MPhil in Geography and Resource Development at the University of Ghana. I am researching on the topic ***''Curbing Open Defecation to ensure community resilient in the KEEA Municipality***'' for my thesis. I would be grateful if you could assist me by answering the following questions. I wish to assure you that this is purely academic exercise and all information you shall give will strictly be used for that purpose above. You are assured of absolute anonymity. There is no right or wrong answer to any question.

Your household has been chosen by chance to be part of this voluntary exercise. You are, however at liberty not to answer or to withdraw at any point you feel like uncomfortable. This interview will take not more than 30 minutes.

Participant initials:		Consent was taken by	
Signature (Initials):		Signature	
Date:		Date:	

Please tick ✓ the number in [ ] to indicate your response and where necessary, write your response in the space provided.

SECTION A: SOCIO-DEMOGRAPHIC CHARACTERISTICS

1. Name of community……
2. Age …….
3. Sex……..
4. Marital status **[1]**Single **[2]**Married **[3]**Divorced **[4]**Widow

5. Educational background **[1]** No formal education **[2]**Primary **[3]** JHS **[4]** SHS **[5]** Tertiary
6. Occupation. **[1]** Farming **[2]**Fishing **[3]** Trading [**4]**Teaching **[5.]** others, specify……..
7. Religion **[1]**Christianity **[2]**Muslim **[3]**Traditional **[4]** others(Specify)
8. Ethnicity **[1]** Fanti **[2]** Ashanti **[3]** Ewe **[4]** Ga **[5]** Nzima **[6]** Others…….
9. Average monthly expenditure (GH₵) ……
10. The total number of people in this household …….

SECTION B: AVAILABILITY OF HOUSEHOLD INFRASTRUCTURE

11. Do you have a toilet facility in your house? **[1]** Yes **[2]**No.
12. **a.** If Yes, what type of toilet facility is used in this household? **[1]**KVIP/VIP **[2]** Pit Latrine **[3]**Water Closet (WC) **[4]** Others (specify……..…

    b. Is the facility shared with other households? **[1]**Yes **[2]**No

    c. Is the facility consistently used? **[1]** Yes **[2]** No

    d.. what difficulty do you face when using the facility…….

    ……..

13. a. If No, why haven't you installed a toilet facility? ***Tick as many as you can***

    [1] it is Expensive, **[2]** it is unaffordable, **[3]** lack of access to credit, **[4]** inadequate finance, **[5]** inadequate space to build a household latrine, **[6]**Water/soil conditions of the area hinders the building of a latrine

    b. How do you attend nature's call? **……**

    c. Have you considered installing a household toilet now? **[1]**Yes **[2]**No

    d. Which type of toilet facility would you prefer? **[1]**KVIP/VIP **[2]**Pit Latrine **[3]**Water Closet (WC) **[4]** Others (specify……..….....

    e. Why do you prefer the chosen facility? ***Tick as many as you can.***

    [1]Convenient **[2]** can be flushed with water

[3]Not expensive **[4]**easy to use

[5]Shows social class status **[6]**Does not need water for flushing

[7]does not smell or emit bad or. **[8]** Easy to construct

14. How do children in this household attend nature's call……

……..

15. Do you have access to tap water in this household? **[1]**Yes **[2]**No

16. How do you feel about OD …….....

……

……

17. What are some of the risk associated with OD that you can remember?**.....**

.....……

18. Before this house was built, was latrine building factored into the building plans? **[1]** Yes **[2]** No

19. Do you perceive building private latrines as a luxury? [1] Yes [2] No

20. Averagely, how much are you willing to spend on latrine construction……....

SECTION C: SPATIAL DISTRIBUTION AND ACCESSIBILITY OF PUBLIC TOILET FACILITY

21. How far is your house to a public toilet? **[1]V**ery far **[2]**Far **[3]**Clos **[4]**very close.

22. How many minutes does it take you to access a public toilet facility……..

23. How frequently do you use the public toilet facility **[1]D**aily **[2]**Alternate days **[3]W**eekly **[4]**Monthly **[5]**Occasionally?

24. How likely are you to practice OD if the toilet facility is far from your house?

[1]Very likely **[2]** Occasional **[3]**Less likely

25. If you are to OD, which method will you adopt? **[1]**Cat meth **[2]** Flying Latrines, **[3]** Free-range **[4]** Others, specify……..……..

26. Which place will you consider more appropriate to open defecate? **[1]**Bush **[2]**Beach

[3]Refuse dump **[4]** Uncompleted building **[5]** other, specify,……..

27. Do you think the location of the public toilet does not favour your usage **[1]**Yes **[2]**No

28. How many times is the toilet cleaned in a day **[1]** 1x **[2]** 2x **[3]** 3x **[4]** 4x **[5]** 5x **[6.]** None

29. How frequent is the toilet facility cleaned in a week? **[1]**Daily, **[2]**Every two days, **[3]**Every three days **[4]**others specify……. **[5.]** None

30. Is the toilet disinfected? **[1]** Yes **[2]**No

31. To what extent are you satisfied with how the toilet facility is cleaned**? [1]**Very satisfied **[2]** Satisfied**, [3]** dissatisfied **[4]**Very dissatisfied. **[5]** Neutral

32. What comment can you give about the status of public toilets in this community?

…… ……

SECTION D: BEHAVIOUR OF LATRINE USAGE AND OD

33. When was the last time you defecated outside? **[1]**Today **[2]** Yesterday **[3]** Last two days **[4]**Couple of days ago **[5]**Last week **[6**]None**.**

34. Which method did you use? [1]Cat meth [2] Flying latrines, [3]Free range [4]Others specify……..

35. Would you feel ashamed when someone sees you defecating openly **[1]**Yes **[2]**No

36. In this household/community do you think the building of household latrine is less prioritize **[1]**Yes **[2]**No

37. How satisfied are you with your current place of defecation? '**[1]**Very satisfied,**[2]**Satisfied, **[3]** Unsatisfied **[4]** Very unsatisfied [5] Neutral

SECTION E: DRIVERS OF LATRINES ADOPTION AND USAGE.

38. Do you think using a latrine for defecation identifies one as civilized and portrays urban lifestyle? **[1]**Yes [**2]**No

39. To what extent do you agree to the following drivers as a motivation to adopt latrines?

Note SA- *Strongly agree*, **A**-*Agree*, **D**-*Disagree*, **SD** *Strongly Disagree*, **UN**-*Undecided*

Driver	**SA**	**A**	**D**	**SD**	**UD**
Prestige					
1. Affiliate/identify with the urban elite					
2. To properly receive visitors.					
3. To feel the home is properly established					
Well-being					
4. Protect personal and family health dangers & safety from daily dangers & infectious diseases					
5. Convenience & Comfort					
Economic reasons					
6. Increase in rental income					

40. What other efforts can be taken by the community to stop OD …….

……..

41. Highlight any measures by municipality authorities to curb the practice……

……

……

42. In general, how can OD be curbed? ……..

……

……..

Thank you