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SOCIO-DEMOGRAPHIC AND ECONOMIC FACTORS THAT INFLUNECE OPEN DEFECATION IN LAWRA AND NANDOM DISTRICTS IN THE UPPER WEST REGION OF GHANA

FUSEINI IDDRISU

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SOCIO-DEMOGRAPHIC AND ECONOMIC FACTORS THAT INFLUNECE OPEN DEFECATION IN LAWRA AND NANDOM DISTRICTS IN THE UPPER WEST REGION OF GHANA

BY

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Presented to the Department of Agricultural Extension, Gender Relations and Rural Development, Faculty of Agribusiness and Communication Sciences in partial fulfillment of the requirement for the award of Master of Philosophy, in Innovation Communication

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DECLARATION

Candidate's Declaration

I hereby declare that this dissertation is the result of my own original research and that no part of it has been presented for another degree in this University or elsewhere.

Signature…… Date: 20/02/2016.

Candidate's name: FUSEINI IDDRISU

Supervisor's Declaration

I hereby declare that the preparation and presentation of this dissertation was supervised in accordance with the guidelines on dissertation laid down by the University of Development Studies (UDS)

Signature……. Date: 20/02/2016.

Supervisor's Name: PROFESSOR AMIN ALHASSAN

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ABSTRACT

There have been several efforts from both governmental and Non-Governmental Organizations to ensure adoption of open defecation free innovations in order to ensure good sanitary conditions. Studies show that there are still a large number of residents who have not adopted the innovations and continue to resort to open defecation in their respective communities. This study examined the socio-demographic factors which influence open defecation (OD) in Lawra and Nandom districts of the Upper West Region of Ghana. The study design was cross sectional where 229 sampled household heads or adult members of households were interviewed about their sanitation practices in Lawra and Nandom districts using structured questionnaires. Respondents from six communities (three from each district) in the two selected districts in the Upper West region were interviewed. The study found that about 34% of the respondents continue to defecate in the open. Educational attainment and being engaged in some form of economic activities were factors which influence open defecation in the districts whilst sex, age, religion, marital status and wealth have no statistical significant relationship with open defecation. Inaccessibility to good toilet facility was the main reason why people practiced open defecation in the districts. Other reasons were closest latrines being too dirty to use, open defecation was convenient and I don't know which also serve as attitudinal factors. Pit latrines are the most common toilet facilities found in the districts and most of them are poorly constructed, difficult to clean, have very bad odour and uncomfortable to use. The study therefore recommends that stakeholders should make both formal and non-formal education accessible and affordable to children and community members in the districts and also, organize trade and vocational skills training for members in the districts in order to reduce or eliminate open defecation in the area.

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DEDICATION

This work is dedicated to my family especially my brother Iddrisu Alhassan, my wife Abdlai Fatima and my children Timtooni and Tungteeya.

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Chapter One

Introduction

1.1 Background to the Study

Open defecation is regarded as a major issue all over the world, and as such developing countries were tasked during the Third World Water Forum in Kyoto to halve world's population without access to toilet facility among others by 2015. About $5 billion was devoted annually to improve sanitation and toilets conditions (Val and Sandy, 2003). Accessibility to improved toilet facilities is a serious problem in Africa. In 2006, only 38% of African population had access to improved toilet facilities, 17% used shared toilet facilities, 21% used unimproved toilet facilities and 24% engaged in open defecation. This situation is more serious in rural areas than it is in urban. For instance, in urban locality, 80% of people have access to improved toilet facilities whilst 20% use unimproved and open defecation. In contrast, 38% of people in rural communities have access to improved toilet facilities and 62% used unimproved facilities or practice open defecation. Thus one out of four persons in Africa practiced open- defecation which really put most of the countries off-track in meeting the Millennium Development Goals (MDGs) [WHO/UNICEF Joint Monitoring Programme (JMP,2008) and Mariama, 2010]. The Sustainable Development Goals (a replacement of the MDGs) still points to the fact that open defecation is highly practiced worldwide, thus about 946 million people in the world practiced open defecation and only 26% of the people in Sub Saharan Africa have access or use improved toilet facilities (UN, 2016).

It is worth noting from the literature that open defecation issues are of more rural than urban (since over 70% of Africans in urban areas have access to improved toilet facilities and less than 40% of rural population have access to improved toilet facilities). Thus, over 60% of rural

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population in Africa used unimproved toilet facilities and open defecation which affects their education, health and livelihood in general (Dale, 1979). This means sanitation is more serious in rural areas hence Africa in terms of sanitation has a very serious challenge as most of its communities are rural. Sanitation is therefore placed on top of policy agenda for agencies, institutions and organization in the developing world and for that matter Africa to make toilet facilities accessible to deprived communities for promotion of good health (Susan & Rupali, 2009).

The situation in Ghana is not different from the rest of the countries in the continent. Ghana faces a lot of challenges regarding sanitation in general and particularly open defecation. Averagely 24% of Ghana population practice open defecation (WSMP, 2008). This is however varied from region to region. The Ashanti Region recorded the lowest figure of 3.4% and the highest recorded Region is Upper East with 82% and the Upper West being the study area recorded the second highest in the country with 79%. 2010 population and housing census has similar figures for people who are at risk of practicing open defecation in these Regions: Upper East (93%), Upper West (92%) and Northern (92%). A survey by Afro barometer in 2014 also has similar figures: Upper East (77%), Upper West (83%) and Northern (91%) (Afro barometer, 2015).

Poor hygiene and inadequate sanitation practice are responsible for many diseases and deaths in Ghana. For instance over 60% of the diseases in Ghana are caused by poor hygiene and inadequate sanitation. Diarrhea is rated as the third leading cause of morbidity in the country with 4.3% after respiratory infections with 7.2% and malaria being first with 44.1%. Malaria also accounts for 25% of mortality rate among children under five years (Joyce and Loretta, 2009).

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1.2 Statement of Problem

Promoting sanitation and hygiene is an important step towards achieving not only the health target but the sustainable Development Goals (SDGs) as well. These targets can be achieved through increasing the number of sanitation facilities to cover the entire nation and to also encourage the use of improved latrines among the people in the country. As a result of this, the Government of Ghana (GOG) has clearly stated the importance of using improved toilet facilities for the promotion of environmental cleanliness and prevention of infectious diseases like diarrhea, typhoid, cholera and dysentery. To enable Ghanaians enjoy the benefits of good sanitation, the GOG has developed plans, policies, interventions and strategies to make toilet facilities accessible to every Ghanaian. It is the fundamental right of every individual to enjoy good sanitation and to facilitate the process of accessing good sanitation facilities is the responsibility of the state (UN, 2010). It is therefore necessary for the Government of Ghana to create an enabling environment for all the citizenry of the state to acquire or access decent toilet facilities.

Government of Ghana has therefore given priority to this area of sanitation in order to promote sound health and as a result a number of strategies have been outlined. These include; promoting the construction and use of improved household latrine, improving the treatment and disposal of waste, enforce laws on the provision of improved toilet facilities, promote widespread use of simplified sanitation system in the country, improve households and institutional sanitation systems including schools, rationalizing and up-dating District assembly by-laws on safe management of solid and liquid waste at the household levels, and the integration of hygiene education into water and sanitation delivery in the country [Growth Poverty Reduction Strategy two (GPRSII, 2005)].

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As part of the numerous strategies of the GOG to improve Water, Sanitation and Hygiene (WASH) in the country, the Metropolitans, Municipals, and District Assemblies (MMDAs) spend a portion of the District Assembly Common Fund (DACF) and other locally generated revenue and funds from donors on sanitation. The government does this upon realizing that, it will be difficult to get these strategies and interventions implemented without the availability of funds (DACF, 2014). Hemen (2011) revealed that, 1.7% of the total national budget is allocated annually for water, sanitation and hygiene programmes in the country and about three percent of the DACF is earmarked quarterly to be spent by every District Assembly on sanitation of which the study districts (Lawra and Nandom) are not exception. Still on efforts to improve the sanitation situations in the country especially in the Upper West Region, a good number of vibrant organization and agencies have identified and concentrated their efforts in the region. Examples of such organizations include the Canadian International Development Agency (CIDA) and the World Bank funded International Development Association (IDA) (Hemen, 2011). To promote sanitation in the study area, a sanitation market is established at Nandom District to serve as exhibition, demonstration and learning center for Lawra and Nandom Districts.

Despite these interventions, the expected impact or improvement on sanitation practices is still not achieved. Most of the GOG's WASH strategies and interventions have not worked well for the rural communities. Ghana placed tenth (10th) position from the bottom when African countries were evaluated and ranked in terms of sanitation improvement by the World Health Organization (WHO) and United Nations' Children Education Fund (UNICEF) Joint Monitoring Programme (WHO/UNICEF JMP, 2008). Open defecation should not only be attributed to the problem of accessibility: the lack or inadequate toilet facilities (accessibility problems) in Ghana

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especially in the rural areas where there is enough land to implement Community Led Total Sanitation (CLTS) programme which may begin with dig and bury or construction of fix point pit latrines and then scale up the sanitation ladder by construction of improved or standard household latrines (Peter et al, 2010).

Open defecation still poses threat and leads to poor sanitation in many communities in Ghana. Poor sanitation negatively affects the lives of people in diverse ways, particularly their health. It also affects their education and productivity levels. Very few studies have been conducted to assess the reasons or factors associated with open defecation. One of the reasons why many studies have not been done in this particular area is explained by Alicia (2005) in a study titled 'Hygiene in the Home: Relating Bugs and Behaviour' is that, it is generally difficult to study things relating to defecation practices of people because they are by nature private and moral. It is against this background that this study seeks to investigate the socio- demographic and economic factors underpinning the persistence of open defecation in the Lawra and Nandom districts.

1.3 Justification of the study

Though some amount of work has been done to assess socio-demographic and economic factors influencing open defecation in Ghana especially the Northern sector, but these studies have not gone further to identify among the factor that are so significant in terms of influencing open defecation in the Northern sector. This accounts for the knowledge gap in this particular field of study. This study therefore seeks to make some contribution towards filling this gap by examining the socio-demographic and economic factors that influence or affect open defecation in two districts in northern Ghana and the relationship that existed between these factors and

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open defecation. The results of this study will provide relevant stakeholders with further understanding of the issues concerning open defecation so that appropriate interventions can be designed to solve the problem. The findings of this study will also serve as reference point for further studies in open defecation. The findings will help the appropriate agencies to put in measures to reduce the menace of open defecation in the Lawra and Nandom Districts in particular and the nation at large.

1.4 Research questions

1. What are the socio-demographic and economic factors that influence open defecation in Lawra and Nandom Districts?
2. What is the prevalence or the level of open defecation in Lawra and Nandom districts?
3. What reasons account for open defecation in Lawra and Nandom Districts?
4. Is there any association between socio-economic status (wealth index) and open defecation?

1.5 Goal and objectives

The purpose of this study is to examine the socio-demographic and economic factors that influence open defecation in Northern Ghana and to discuss the implications of OD on sanitation in Ghana.

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Specific objectives

1. To identify the socio-demographic and economic factors that influence open defecation in Lawra and Nandom Districts.

2. To assess the levels of open defecation in Lawra and Nandom Districts.

3. To identify the reasons for open defecation in Lawra and Nandom Districts.

4. To access the association between socio-economic factors and open defecation.

1.6 Organization of Work

The thesis is organized into five chapters; Chapter one is a general introduction to the study comprising the background, problem statement, research questions, research objectives, organization of the work and justification of study. Chapter two reviews the relevant literature on the study. It explored critical issues of concern to the study by way of reviewing relevant secondary data on concepts of open defecation (OD) and open defecation free (ODF), effects of open defecation, relationships between socio-demographic and economic factors on adoption of ODF, theories of communication and behaviour change and the implications of OD on sanitation in Ghana. Chapter three indicates the research methodology employed in the investigation of the research issues; a brief profile of the study area, research design and approach, sampling units, sample size determination, sampling techniques, data collection, sources of data and data processing and analysis. Chapter four describes the results in detail, deals with findings and discussions of the research. Tables, figures, charts and other illustrations were used for presentation of the results. The summary of findings, limitations, conclusions and recommendations of the research were addressed in Chapter five.

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Chapter Two

Review of Relevant Literature

2.1Introduction

This chapter is arranged into five sections and these sections or themes are: Section one discussed the concepts which comprise definition of open definition (OD), open defecation free (ODF) and the effects of open defecation. The areas discussed under the effects of open defecation include; the effects on social life, on economic and on the environment. Section two explores the causes of open defecation and this is centered on access versus attitudinal problems. Section three explored the influence of socio-demographic and economic variables on OD. Section four also examined theories of communication and behaviour change which include community led total sanitation (CLTS), social marketing, entertainment education, extended parallel process model (EPPM), and policy implication of behaviour change and OD in Ghana.

2.2 Open Defecation and Open Defecation Free

Open defecation has been viewed differently by different scholars and organizations but all come to mean the same thing, thus shitting outside or in public irrespective of the specific locations it is done provided it does not separate the faeces from human contact. Such places include river banks, uncompleted building, water bodies, behind trees, in bushes, gutters, shit in plastic bags tie and throw, and in beeches. Open Defecation Free (ODF) is a complete separation of excreta from human contact and from the rich of living creatures such as fouls and flies [World Health Organization/United Nations Children Fund, Joint Monitoring Programme (WHO/UNICEF JMP, 2008)]. The consequences of open defecation are numerous. Some are direct for example sicknesses, loss of life and littering around which spoil the aesthetic beauty of the environment

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(Alicia, 2005). The indirect aspect of the negative consequences of open defecation stem from the fact that people spend several productive minutes and hours in searching for places of convenient to free themselves, and multiples of such times are also spent on sick beds and/or taking care of their sick relations especially children at both hospitals and homes. Also, the amount of money nations spent especially, the developing world on both prevention and curing of sanitation related diseases.

The first and foremost effect of open defecation is the disease it causes. Some of these diseases include cholera, typhoid, and dysentery. This is acquired through eating and drinking of contaminated food and water which sometimes lead to loss of lives. In Ghana, it is estimated that about 80% of all OPD reported cases is related to sanitation (WSMP, 2008). Open defecation could be one of the reasons for the perennial cholera outbreaks in Ghana. For example, in 2011, 10628 cholera cases were reported and 105 deaths were recorded out of this. In 2012, 9542 cholera cases were recorded with 100 deaths and during the recent outbreak of cholera disease in 2014 in the southern part of Ghana, the country recorded 10,265 cases within a period of three months -June to August, 2014 and each one of them spends at least some amount of time in the hospitals and the number of deaths recorded within this same period of three months stood at 92 (Daily Graphics, September, 2014). The devastating effects of sanitation and for that matter open defecation has made the world leaders to classify it as one of the biggest enemies of the developing world, and it is against this background that Kofi Annan (the former United Nations General Secretary) said it would be difficult to defeat the infectious diseases that affect the developing world until the battle of sanitation among others is won (Barbara, 2004).

In addition to the ill health and loss of lives, physical damage to the body could occur as a result of the materials use for anal cleaning in the course of open defecation. The common materials

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used for cleaning of anus during open defecation include leaves, corn stocks and cobs, and sticks. Such materials are very hard and rough and can easily cause irritations and bruises to anus when use to clean oneself after defecating (Adesope et al., 2012).

More so, people social life and dignity are at risk. Open defecation reduces people's privacy. Their nudity is exposed when defecating in the open especially during dry seasons when the vegetation cover is almost burnt completely. People with running stomachs sometimes mess themselves publicly in the quest of searching for convenient places or walking a distance to free themselves (Kazi, 2008). Also among the social effects of open defecation are physical attacks and sexual violence; several people suffered enemy attacks and most women including girls also faced danger of rape and defilement as they move away from home to defecate Rajeev (2008)

Furthermore, the education of the people is affected in the sense that, majority of the victims of open defecation are children under five years and most of these children miss school because of the infectious diseases caused by open defecation. Apart from these children missing schools, their parents who happen to be teachers also miss schools especially the female teachers to cater for their sick children at home or hospitals. It is also obvious that some students' needs such as school fees, uniforms, and books may not be provided because of payments of medical bills by the parents. This can adversely affects the academic performance of the students and subsequently leads to drop out of such students from schools (Benny, 2009).

Also, it is clear evidence that open defecation affects both individual and nations economically as they struggle to prevent and cure the diseases it caused. For example developing nations lose millions of USA dollars as a result of open defecation. Open defecation costs Ghana US$79 million annually due to the time spent in searching for convenient places to defecate (Nilanjana,

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2011, WSP 2012 and WSMP brief, 2008). It also includes the money government spent in prevention and curing of diseases relating to open defecation, and educational campaigns concerning open defecation and its consequences (Nilanjan, 2011, WSP 2012 and WSMP, 2008).

The issue of sanitation and health is directly linked to development and failure in these areas means no development. For example looking at the number of productive hours lost and the number of energetic and productive lives lost coupled with this huge sum of money loss could be used to carry out developmental projects such as construction of roads, provision of potable water for people, and building of schools especially in the rural and slum areas where these facilities are seriously lacking. It is as a result of this that one man said, that the day each and everyone get toilet to use, he shall know his country has reached the highest point of development (Benny, 2009). If one sits to reflect over this huge problems open defecation is causing on human and his environment, the biggest question that is likely to be asked is why should people continue to practice open defecation? This is then brought us to the causes of open defecation which triggered a lot of debates.

These debates are viewed from various perspectives. Many see it to be a problem of accessibility, to some it is an institutional problem and to others is attitudinal or behavioural problem. All these arguments depend on whoever is concerned and the angle from which it is viewed from. But for the purpose of this study the causes will be categorized into two main areas namely; accessibility problem versus social or individual level problem.

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2.3 The Attitudinal Argument

The attitudinal arguments stem from issues on both communities/individuals and institutional perspectives. The individual factors have to do with lack of knowledge/ignorance, socio- cultural and/or religious beliefs as reasons for practicing open defecation. And the institutional has to do with organizations and agencies responsible for facilitation and/or provision of sanitation facilities, enacting, implementation and enforcement of laws/bylaws.

Knowledge plays a crucial role in shaping attitudes towards adoption or rejection of innovation. With knowledge people become aware of what is happening and able to make judgments concerning their lives. For example they can analyze an existing behaviour (the status quo) for example open defecation and that of new behaviour (innovation) introduced to change the status quo (for example open defecation free) and be able to make an informed decision. (Benny 2009) rated knowledge/awareness to be a number one way of preventing open defecation. If people are well informed about the consequences of open defecation and if they become aware of their susceptibility to the problem, then they will look for solutions to the problem or adopt available innovation to eliminate or reduce the impact of the problem, for example adoption of ODF to fight against diseases cause by OD, and the lack of knowledge regarding an existing problem will cause a rejection of an intervention (ODF) (Benny, 2009).

Many sanitation interventions failed and many sanitation projects and facilities collapsed due to lack of knowledge regarding their maintenance and repairs and the worst of it all is the lack of knowledge of the importance of such interventions, projects and sanitation facilities. In the same vein, devoting efforts and resources to improving sanitation will not succeed until similar effort and resources are devoted into letting the people understand what good sanitation mean to them

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and letting them partake in any sanitation intervention or programme planned for them. Education is therefore important in the success of improved sanitation in every society especially in the rural and slum areas (Arku, 2010). According to Kaltenthaler et al (1995) people or areas with better knowledge in hygiene practices are likely to be less infested with the infectious diseases such as cholera than those with low knowledge in hygiene practices.

Koukouli et al (2002) stated that understanding the root causes of a problem helps in solving it. Understanding factors that contribute to a problem helps a lot. In the first place, it helps in preventing the future occurrences of the problem, it also helps in minimizing the impact of the problem, it further helps in reducing the amount of money that would have been used in solving the problem which will subsequently lead to development. These explanations have come to support the common saying that, knowing a problem is half way solving it. No matter the amount of money spent in searching for the root causes of a problem, it will always be better than solving it without knowing the causes. Kazi (2008) argued that people defecate in the open not because they cannot physically accessed toilets or not because they cannot afford to build and maintain household latrines and not because they cannot pay to access the service of a private or public toilet, but because they have not seen anything wrong in practicing open defecation.

This means, they are happy with their current behaviour (open defecation), and so long as they have not been able to associate open defecation to any health or environmental problem, it therefore means that they are content with the status quo (the practice of open defecation) and will like to maintain it. Ron 1982 in the discussion about the causes of open defecation maintain that many households could not construct latrines and for that matter practice open defecation because, they are not aware that constructing some of the household latrine do not require much. Thus, they are relatively less costly, easy to construct with available local materials such as mad

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or wattle and thatch and very simple to use. Construction of most of these household latrines may also require self help labour and local artisans with indigenous knowledge.

Much of the root cause of this ignorance stemmed from the fact that majority of people in the rural areas do not attach seriousness to sanitation and for that matter do not participate in sanitation improvement programmes organized for them. Most of the illiterates would have become aware of the importance of good practices of sanitation and the consequences of bad sanitation practices through such meetings, which would have enabled them to make an informed decision regarding their sanitation practices. It is obvious that majority of rural population did not attend school and for that matter would not have learned such practices from school and it will be difficult for such people to know them if they do not attend and participate in sanitation improvement programmes. Therefore the tendency of people in this caliber practicing open defecation will be high. In fact the argument is that, open defecation is an old habit which has been practiced for a very long time and has become part and parcel of the life of the people especially the rural duelers, and is therefore needless to give it attention. Abandoning open defecation will be difficult since it has to do with attitudes (Mehrotra and Patnaik, 2008).

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It is also part on the discussion that open defecation is good for certain activities or jobs and when engaged in such jobs the most convenient place for defecation is the nearby bushes or the open areas around them. Such related activities include fetching fuel wood for fire, fodder for animals, grass for roof and datum . Almost all the activities stated are carried in bushes or farms, usually distanced away from home. Going home to use latrine and then return to continue with the job will be tiring and inconvenience and for that matter shitting there will be appropriate at that particular moment (Pugh, 2009).

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To strengthen the stand that, open defecation is more attitude than accessibility problem, there are several advantages that can be associated with open defecation. One of such is the fresh natural air; Most of the places where open defecation is being carried out are open and have fresh natural air blowing all over and has always enjoyed by those engaged in this practice. Toilets or latrines with few ventilation points do not allow in same fresh natural air for users to enjoy, hence it makes them feel uncomfortable (Pugh, 2009). Home Sanitation (1940) stated that latrines with poor lighting and ventilation spread a lot of infectious diseases, and areas with such latrines and toilets are mostly suffered from flies and other insects. Bad smells, diseases infestation, and high production of insects have moved many people away from using latrines to the practice of open defecating (Pugh, 2009).

Open defecation is also seen as an activity that creates an opportunity for chatting. Shitting is a natural phenomenon, therefore everyone does it, and since it is done outside home, it paves way for people to go out, meet and discuss with friends and neighbours. Women under strict households' regulations seize the opportunity in open defecation to regularly go out to socialize and share their domestic grievances with one another. This sort of movement also serves as an opportunity for regular body exercise. Shitting is under normal circumstances done at least ones daily and this to and fro movement becomes a regular source of exercise for those who do it (Pugh, 2009).

The blame of the menace of open defecation should not only be put on the ordinary citizens but the leadership and institutions as well. Those leaders and institutions that are supposed to put things right in societies rather worsen them. One of the shortfalls is lack of incentives or motivation, individuals and groups in societies who have distinguished themselves in terms of self discipline without external supervision (for example practicing good sanitation). Such people

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should be motivated enough to maintain that behaviour. Rewarding self discipline people in societies will also create competition among individuals and groups where each wants to be recognized as first to adopt an innovation or discard an undesirable behaviour (Mehrotra and Patnaik, 2008).

Another problem of leadership and institutions is the failure to create an enabling environment for proper sanitation system to operate. The essence of decentralization of the local governance system is to empower the District Assemblies to enforce the existing laws and enact bylaws to govern our societies which rarely exist. For instance the existing laws regarding sanitation and for that matter open defecation are not enforced and most districts too do not enact bylaws that will help them reduce this menace. These attitudes of law makers and law enforcing agencies discourage the sanitary officers from performing their duties (Geisler, 2000). The failure could be attributed to bribery and corruption that prevails in the system. It makes environmental health officers difficult to report most of the culprits, and the few that are reported to the sanitation law courts for prosecution are not prosecuted because of the corruption and the likes (Stock, 1988 and Issaka, 2007).

Further review reveals belief systems (religious and cultural beliefs) as part of the causes of open defecation and its negative impacts. The belief people hold regarding hygiene and disease influences their attitudes and behaviours towards sanitation practices. Many people especially in Africa mostly perceived every situation in which they are as what their gods want them to be. The belief is that, they are either rewarded or punished according to their deeds. For instance, anytime there is an outbreak of disease (example cholera) they think it is a punishment from their gods for having wronged them and for that matter; they have to consult and appease them before they can be free from such calamity. They also perceived good health as blessings from the gods

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and should not be attributed to practices like personal or environmental hygiene. Such people may not see anything wrong with open defecation and as such may not accept open defecation free intervention as part of the measures to control a spread of disease in their communities (Food for the hungry, 2004).

These beliefs make them hold several taboos regarding faeces hence they pay less or no attention to any sanitation intervention particularly if it has to do with faeces. In the first place, it is forbidden to mention the word 'shit' in most of the native languages in Africa. The unacceptable nature of mentioning the word 'shit' and the openly discussing of it has made the control of open defecation difficult and even sound unpleasant to the ear. As a result, some local expressions have been developed as substitutes to the word 'shit' whenever is to be discussed or mentioned. The belief is that, it has some kind of misfortune for those who will mention or discuss it openly. It therefore becomes impossible for people to discuss the problems of open defecation and the possible ways of preventing it (Roundy, 1979**)**.

In some societies it is believed that when faeces gather at one place, it will bring a misfortune to the entire community, which includes death. Thus, it is a taboo for people to shit on one another's shit or at one place. It is still part of the beliefs in certain African societies that, members of certain secrete societies are not suppose to sit or squat over the shit of non members and for that matter building and using of latrines is not accepted by people who share these beliefs (Roundy, 1979). This has come to confirm the belief that in-laws faeces should not mix and as such using of latrines is not encouraged. The fear is that when in-laws faeces mix up, they will lose respect for one another which may cause a lot of chaos in the societies for example, breaking of marriages and its resultant consequences. This belief is in specific reference to father and daughter in-laws and is common to have these people under one roof especially in Africa.

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The common way of avoiding this mixture of faeces is to practice open defecation in specific areas within the nearby bush designated though informal according to sex (Roundy, 1979).

More so, it is very bad according to the beliefs of certain societies in Africa, for someone to fall into a pit of latrine. The idea regarding such a person is that, either he/she dies early, become temperamental or get mad in the long run. As a result, the weak (children, aged, the sick and disabled) in such societies are prevented from using latrines for the fear that they may fall into the pits of the latrines. It is also part of the beliefs that, pregnant women are considered vulnerable and for that matter are not supposed to use latrines. It is believed that, if pregnant women use latrines they may lose their inborn babies. It is also common among these beliefs that latrines produce some heat which is dangerous to human health and that those who experience such kind of heat will be sick and as a result may die (Roundy, 1979). Furthermore, some Africans believed that witches use peoples' faeces to bewitch them and as such some families in certain communities identify some portions in the nearby bush as places reserve solely for its members' site of defecation. Non member are not permitted to visit such places, even some times family visitors are directed to different locations for defecation (Roundy, 1979).

The societies or individuals should not be entirely blamed for non adoption of open defecation free innovations; certain conditions might compel them to behave so. Some of these compelling factors include; the technology involved, most of the technologies used in constructing the latrines are complex, and as such not friendly to the environment and for that matter lack community sense of ownership. These complexities have made construction, use and maintenance of latrines difficult especially, in the slum and rural areas. Also, owning a latrine is task involving, dehumanizing and sometimes worsens the problems it intended solving. Because; some of the modern water closets are difficult to operate with and/or fix back when the system

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break down. For instance it is not rare to have water closets flushing with buckets of water instead of using the knob (Nonhlanhla, 1996).

These interrupted systems of flush toilets often render the entire facility useless (Tarbett, 1942). More so, an innovation can be rejected not because the people did not know its usefulness but because of its location. If a toilet is wrongly sited people may not use it as expected or they may abandon it entirely. For example, building toilet by a road side or places where many people gather could scare the users away. It is also clear that when a latrine is built on a land that is not suitable for example water log or muddy area it will be difficult accessing it during rainy season. Such latrine may sink and develop cracks which may lead to its collapsing within a short period of time (Nilanjana, 2011).

These toilets usual pose threats to human life; since the super structures can collapse on people and animals and caved inn pits serve as death traps for both human beings and animals as they can easily fall in them, they also serve as places where dangerous animals such as snakes can hide and the collected dirty water serves as breeding places for mosquitoes (Joyce and Lorretta, 2009).

Further reading indicates that, the size of a latrine can limit its patronage. For instance the entrance of a latrine should be proportionate to the size hence the bigger the latrine, the bigger the entrance and the smaller the latrine, the smaller entrance. It is mostly difficult for people who are relatively fat and some pregnant women to use smaller latrines. They find it difficult passing through the entrances and/or closing the doors when entered and leaving them open means they are exposing themselves to outside people. A very spacious latrine will be suitable for both fat and pregnant people including those that are not fat (Nonhlanhla, 1996).

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Another challenge in the adoption of open defecation free innovation is the timing. An innovation can be rejected when introduced at a wrong hour, for example during rainy season when the people would have been busy with the farming activities (Peter et al, 2010). The structure of soil can also make adoption of latrine difficult especially when the place is covered with underlying rocks or when the water table is a very high. It becomes more difficult for the poor (slum and rural duelers) so long as their major tools for digging remain cutlasses and hoes (Joyce and Lorretta, 2009).

It is however worth noting that open defecation rather pushes people to the danger they try to avoid than the use of toilet. To start with, mixing of in-laws faeces is well pronounced with open defecation where all faeces are likely to be washed into water bodies which do not only mix up the faeces, but also makes them ingest each other's faeces through contaminated food and water (Charles, 2007). Open defecation also makes bewitching of people easier than using of household latrines. Each family has designated place in the nearby bush for shitting and collecting faeces there for witch-crafting is easier since it exposes entire family to the risk instead of an individual, but accessing the faeces from a toilet within a house will make it difficult because of the presence of people and how to even get the faeces out of the pit (Charles, 2007).

2.4 Accessibility argument

The issue of accessibility consists of non existence of toilet facilities, inadequate number of toilet facilities, poor conditions of the existing toilet facilities and economic constraints. Non existence or inadequate number of existing toilet infrastructures are some of the root causes of open defecation. Many people indulge in open defecation not because they do not know the negative

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effects of it but simple because, the facility does not exist. This is very common in most rural and urban slum areas. In some places the toilet facilities exist but woefully inadequate to cater for the populations in those areas. In other instances the facilities exist but in a deplorable conditions. People in such places will have to scramble over the few existing facilities which make things difficult, for example people with tight schedules will not have time to waste on toilets.

Situations such as this make open defecation more preferable than using of latrine. The rationale behind this is that doing it open could give ample time for important activities that would enhance other livelihood activities (Dale, 1979 and Economic and Political Weekly, 2009). Therefore lack of option becomes the common reasons why people practice open defecation (Spencer, 2012).

The inadequacy of the existing sanitation facilities often leads to sharing of toilets/latrines. It is very common to see both sexes using the same toilet facility. Each of the sexes feels comfortable using separate toilets and very uncomfortable sharing with opposite sex. Each sex feels that, there are certain things natural associated with the opposite sex which seems filthy and intimidating when sighted. For example men feel contaminated with exposure to menstrual blood of women, which they should be protected from or not even know that a woman is menstruating. It is difficult to get this protection when both sex share the same toilet facility. The likelihood of either or both sex abandoning the facility for open defecation is very high.

Lack or inadequate space for putting up latrine is yet another reason for open defecation. It is believed that accommodation is very paramount in human life especially sleeping places. In urban slums, people squeezed themselves into places such as marsh lands, along drains, rail lines, streets, and under bridges which are inadequate and inappropriate for construction of

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latrines. It is therefore unnecessary for those living in such places to think of toilet facility when struggling for spaces to put up structures to lay down their heads (Kazi, 2008). The slums are unapproved places for living which makes extension of infrastructure to those areas difficult, for example water which is key in latrine usage. It is very unlikely for people to carry water from far to construct or flush toilet when the same water is needed for drinking, cooking and washing (Spencer, 2012 and Nonhlanhla, 1996).

Also, non availability of basic constructional and cleaning materials could be a contributory factor for open defecation; some of the materials needed for construction and maintenance of latrines are very difficult to come by especially those living in remote rural areas. These materials may include; river sand, course-aggregate, cement, vent pipes, fly proof nets, detergents and scrapping brushes. These materials are usually transported from other places such as big towns and cities which do not only increase the construction and running cost but causing inconveniences and risks, thereby making things difficult for people to adopt and construct household latrines (United Nations, 2006).

There is no doubt that these factors play key role in adoption of innovation but should not to a larger extent prevent people from adopting ODF innovation, considering the fact that OD cost more than what it takes to adopt ODF and the fact that there are many ways to address this problems of accessibility. Tarbett, (1942) refers to some of these measures as emergency sanitation procedures: communities or areas that are closely built and face problem of excreta disposal can adopt scavenger or dry collection method to solve such problem. Rural areas are the most poorest and as such lack toilet facilities but have vast parcels of land available and may avoid the practice of open defecation by resorting to dig and bury of faeces at spots distance

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away at 100 feet from water source and at least 12 inches of earth covering, both individuals and families can practice this.

Excreta from infected persons should be disinfected with chlorinated lime before bury. Another way of solving this problem of accessibility is the exclusive use of ordinary galvanized containers with fitted covers which should be disinfected or wash and sterilize daily.

The issues of complex technologies and high cost of intervention serving as disincentives for adopting innovation can be challenged because (McGarry, 1980) beneficiaries can adopt and improve on such technologies to suit local environment. By this, the objectives of the technologies will reflect local priorities and respond to local conditions. These technologies are sustainable if local institutions are empowered to acquire the skills, knowledge and the experience to remain and serve their own people. The suitability of technologies to local environment will not only simplify the use but also reduce the cost since materials and artisans will be gotten from the environment (Ron, 1982).

From the discussion so far, it can be seen that both attitudinal argument and accessibility problems offer good solutions to the menace of open defecation, for none of them goes without limitations or shot falls. But both cannot be wrong or right at the same time. As such this study endorses the attitudinal argument and dismisses that of accessibility. In addressing the menace of open defecation by correcting the negative attitudes, misconception and beliefs people hold regarding sanitation and hygiene is like killing two birds with one stone, because it will not only make people stop or fight against open defecation but move a step ahead into committing their own resources to construct latrines in their homes.

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A statement in support of this assertion from a study by Mehrotra and Patnaik, 2008 says that, the most effective approach to ending the menace of open defecation is the use of education and sensitization to enable people establish the link between issues of open defecation and health through oral faecal contamination. Though this change cannot be done overnight because; attitudinal change is a gradual process and can be overcome with time, another seemingly statement by Rogers (2010) says that transforming mindsets is the best way to ending the menace of open defecation. When people appreciate the importance of living in a sanitation and hygienic environment, they will do everything possible within their own means to put an end to open defecation and then improve their general sanitary condition by using locally available resources to construct latrines and gradually improve upon them to the best standards.

Dealing with the menace of open defecation from the perspective of accessibility on the other hand is like using two stones to kill one bird. As Hollis (1953) stated above, that all efforts and resources used in improving sanitation will be in vain unless same or equal efforts and resources are used into letting people understand and partake in sanitation programmes. Another similar statement made by Benny (2009) says that, mere construction of latrines will not solve the problem of open defecation until more effort is made to get people use them. He further stated that about 20% of toilets built in India are not being used. He therefore acknowledges participation and awareness creation as the most important factors in ensuring adoption and sustainability of open defecation free intervention.

It has again established from the early discussion that, people practice open defecation not because they cannot access latrines but with unacceptable reason that latrines are alien to their culture and for that matter they should not be accepted (Benny, 2009). It is further acknowledged (Kazi, 2008) that, some people refuse to construct and maintain latrines not because they are not

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capable but because they think is the responsibility of the state. The question I asked is, can the state provide latrines for every household? If it can, can it be done at the same time? The answer is certainly no. it is against this reason that Ghanaian government has tasked the citizenry of the nation to take upon them the responsibility of practicing and maintaining good sanitation and hygiene by declaring first Saturday of each month as sanitation day which mandates every Ghanaian to take part in the cleanup exercise. This indeed endorses attitude as the main cause of sanitation problems. There is the need therefore to identify those who exhibit these negative attitudes/behaviuors and why, which takes us to socio-demographic and economic characteristics and adoption of innovation.

2.5 Socio-demographic and Economic Characteristics and adoption of Innovation

Socio-demographic and economic characteristics/factors are as important as serious health needs, they affect normal daily life and for that matter need to be considered when planning (Koukouli et al, 2002). Christian and Robert (2005) in the discussion of diffusion of innovation stated that, adoption of innovation and the rate at which is adopted depend largely on the characteristics of the adopters. They went further to state socio-economic status as one of the factors. These factors are numerous, they include age, sex, marital status, income, educational level, social class, migration, disease, ethnicity, and religion, but will be limited to age, sex, class/economic status, religion, marital status and educational level for the purpose of this study. It is however worth noting that none of these characteristics especially age and sex remain constant determinant of adoption of innovation, they change according to innovations. For example one may see males or youth influence adoption in a particular innovation but switch to females or elderly in another innovation. Adesope et al (2012) in their exploration of effect of socio-economic characteristics of farmers on their adoption of organic practices, identified sex and education as factors that can

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influence adoption of innovation and age was also identified as a factor that does not influence adoption of innovation.

Age affects adoption of innovation and the rate at which it is adopted. Therefore different studies have identified different age groups/life stages as either negatively or positively influencing adoption of innovation. United Nations, (2006), and Karn et al (2003) in their various explorations came out with older people as those who are more likely to adopt innovation than young ones. For example, in Ghana, older people (60 years and above) had adopted sanitation innovation by building personal latrines more than the youth (Spencer, 2012). Donsah (2013) and Albert (1996) have however identified older people as those less likely to adopt new innovations or ideas, and younger people as those more likely to adopt innovations and ideas.

The influence of sex dynamics on adoption of innovation is highly depended on where it is being introduced (for example either rural or urban). It has been observed that, construction of latrines in rural areas is mostly done by men without or with minimal consultation of the women (Nonhlanhla, 1996). Herbert (2010) added that, in most of the rural societies in Africa, women cannot construct latrine in their homes unless in consultation with their husbands and it is often difficult for them to discuss with their husbands when they realize the need for construction of household latrines. Though, women suffer more, the consequences of open defecation than their male counterparts and for this reason hate open defecation more. Women use household latrines for the sake of comfort, convenience and security but they are not able to construct latrines because of certain barriers. Men on the other hand practice open defecation more than women but they construct latrines more than women for the sake of prestige (Spencer, 2012).

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Education like any other socio-demographic factors also influences adoption of innovation. The rate of adoption increases with formal education (Chandra et al, 1999, Adesope et al, 2012). Herbert (2010) categorized innovation adopters according to the time of adoption, the group that always open to adoption of innovation first before any other group is term as innovators and education is one of the main influential factors. Cain and Mittman (2002) in their discussion of diffusion of innovation in health care stated that innovation spread faster among educated people than none educated, therefore the higher the education the faster the spread of innovation. For example, a study in Ghana indicates that a number of household latrines/toilets constructed by people who had completed junior secondary school had more than seven times increase by those who completed secondary school and had more than 25 times increase by those who had completed tertiary (Spencer, 2012).

Class/economic status are used to show individuals position in the stratification system and an individual is exposed to material resources, influence, and information. Class/economic status affect the kind of life one chooses to lead. Adoption of innovation increases with income/class (Pugh, 2009). People with high social class or who are wealthier are highly respected in a society (Cain Mittman, 2002). Many people practice open defecation because they cannot afford to construct a household latrine or pay in order to access the services of private or public toilet especially those living in rural and slum areas unless they are assisted by able bodies and organization (Dale, 2009, Nonhlanhla, 1996, Ron, 1982). Kazi (2008) share this view to some extent by stating economic hardship as one of the reasons that militate against adoption of household latrines which consequently leads to the practice of open defecation. Availability of funds for the construction of toilets or latrines are therefore key in promotion of open defecation free innovations.

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Kazi further stated that, most of the few among the poor who have tried constructing household latrines, built them outside their main homes with their doors facing away from the homes. This is because the latrines are poorly constructed and as such very difficult to maintain. They usually add more problems than they intend solving. For example, the nature of these latrines are such that, they expose the faeces to flies and other creatures, producing odour and maggots, which often make the inhabitants uncomfortable to live. Issaka, (2007) supported this by stating that; there are different types of toilets starting from pit latrines to water closets. As the toilets varied so too the quality and for that matter the cost, and the type of toilet one uses determines his or her economic status.

Majority of wealthy people use flush toilets with all sort of qualities one will think have whilst the poor use pit or KVIP latrines which normally describe as unhygienic, unclean, smelly, unhealthy and sub-standard and undesirable for human use. Rich or wealthy people are able to afford expensive and quality latrines or toilets in their homes and poor people are more likely to have poor quality latrines in their homes and for that matter will not be able to safe guard their health and also, may not be able to avoid taking contaminated food and water. It is also observed that households without toilets are likely to suffer more infectious diseases than households with latrines (Shuaib et al, 2012).

Individuals with certain demographic factors such as high income and education will access important information and may be aware of health related problems and will therefore avoid living certain lifestyles that will expose them to health risks (Spears, 2012). Spencer (2012) in the study of sanitation practices and preferences in peri-urban Accra, Ghana, also stated that older people are able to build personal latrines because of the long time accumulation of wealth, experience and knowledge regarding the relationship between health and sanitation. Women are

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more likely to adopt open defecation free (ODF) interventions because; they express more dislike to the practice of open defecation (OD) which is the first step in the diffusion of ODF intervention (Spencer, 2012).

No matter how important these socio-demographic and economic factors are, they may not necessarily influence adoption of innovation unless certain conditions are met. In the first place, the people concern must be aware or have information regarding the innovation; its benefits must outweigh the existing one. David et al, (2005) in their study on household willingness to pay for water service stated that, people will adopt and pay for innovation if the existing problem does not occur very often and for a long period of time when it occurs, if it does, they will develop some protection mechanisms for it. The innovation should be easy to try to enable people develop interest in it and should be able to established the fact that it will serve their interest and meet their aspirations after critical evaluations (Adesope et al, 2012). Innovations cannot be properly diffused when the infrastructures are not in place to support for example, to introduce flush toilets, water should be made available if necessary running tapes, there should be access roads to enable cesspit emptier access the septic tanks for siphoning of the content when the tanks are filled up, the emptier should be available to take the content and land field site should be available for damping of the content. For toilets or latrines to be responsive to local needs and aspiration, it must be affordable and match with environmental conditions (Benny, 2009).

An innovation may meet all the socio-demographic and economic conditions of the people. In other words they can be innovators but will not adopt the innovation if there is no consultation. Lack of consultation demonstrates a sign of disregard to the beneficiaries and lack of ownership of the innovation because the beneficiaries feel their views and opinions are not sought and for that matter they cannot be partners to it (Nonhlanhla, 1996). Nonhlanhla (1996) also stated

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innovation outcome as one of the factors which determines its adoption or rejection. If the outcome is good or meet the needs and aspirations of the beneficiaries as stated already it will be adopted but will be rejected if the outcome does not meet the needs and aspirations of the beneficiaries.

Akbar and Michihiko (2011) identified issues relating to attitudes, accessibility and economic factors as barriers of adoption. Among these issues include tradition norms which has to do with a way of life of people, an innovation is often perceived as something that is taken people away from a behaviour they already used to and very comfortable with. Another issue is existing usage pattern; like the tradition norms, people feel they will not be able to use an infrastructure or a facility which is newly introduced into the system. They will find it difficult to operate use and maintain since they are not familiar with such innovations. Akbar and Michihiko (2011) also identified physical risk as one of the issues as barrier to adoption of innovation. Most innovations are normally considered as things that will affect their bodies negatively. This is because it is relatively new and may require a lot of skills and experience.

Other issues that serve as barriers according to Akbar and Michihiko are: economic risk, this relates to the cost of procuring a product or adopting an innovation, its running cost and maintenance cost which may be above the limit within which the adopters can afford. It means only few within a society who are in the economic class that will be able to afford. Functional risk; with this the people have doubt regarding the properly functioning of the innovation especially if it is a physical product and as such may not solve the problem it is meant for. Lack of requisite skills and knowledge regarding the operation of the product as talked above will attract more cost as its breakdown will require people with such skill and knowledge to get it fixed. This is linked to the information access barrier as people may not have information

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regarding the existence of such innovation and for that matter will not know there are people amongst them who can easily ratified any anomaly that may come during the cause of applying the innovation probable at a relatively cheaper cost. Priority need barrier is also identified as people feel there are other things they needed most comparing to the innovation introduced to them and those things should be acquired first before any other thing.

Climate related features is also identified as barrier to adoption of innovation because the physical environment within which an innovation is introduced or the weather condition present at the time of introducing the innovation may not support such innovation. For example constructing a latrine at a water log area affect it negatively and thus eventually reduce the lifespan, it can also make the accessibility of such a latrine very difficult and not impossible. It is also difficult in constructing a latrine in a very stony area especially the digging of the pit as compare to constructing it in areas where the soil contains no rocks.

All this points to the fact adoption of innovation does not rely on a single factor but many several factors come together as discussed already to cause its adoption. It includes the technology or the innovation itself, the source of the innovation, the people introducing it, the manner and the media or channels through which the innovation is been introduced. This sends us to the discussion of theories of communication and behaviour change.

2.6 Theories of Communication and Behaviour Change

Behavioural change communication (BCC) is a combination of activities or interventions in order to reduce risk behaviour and vulnerability to a specific problem through creation of enabling environment for individual and/or collective behaviour change (Benny, 2009). To understand communities and individual behaviour and to effectively apply an innovation to

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either promote, change or maintain behaviour will call for models and theories of behaviour change. These theories of communication and behaviour change discussed in the study include community led total sanitation (CLTS), social marketing, entertainment education, and Sadharanikaran theory of communication and behaviour change.

Community Led Total Sanitation (CLTS), a behaviour change communication intervention started in Asian countries such as Bangladesh, Cambodia, India, Pakistan, and Nepal by Dr. Kamal Kar, an independent development consultant from India. it spreads to other countries in different continents for example Bolivia in Latin America, Yemen in Middle East, and many countries in Africa; Burkina Faso, Ethiopia, Ghana, Kenya, Malawi, Mali, Nigeria, Sierra Leone, Tanzania, Uganda and Zambia (McGarry, 1980). The spread or adoption of Community Led Total Sanitation by many African countries has actually shown how serious sanitation issues are in the continent and how committed the leaders are in addressing the issue of open defecation.

In 2007, CLTS was piloted in five Regions in Ghana (Northern, Upper West, Central, and Greater Accra Regions) by Community Water and Sanitation Agency (CWSA), Plan Ghana, United Nations Children's Fund (UNICEF), and WaterAid. After which an evaluation was done and has since been considered a preferred intervention with good strategy to improving rural sanitation (for example open defecation) in Ghana (Joyce and Roberts, 2009, NDPC and UNSG, 2012). If the intervention spreads to cover the whole nation, it will improve sanitation situation in the country. This puts Ghana in a better position to reduce its disease burden by 50% (WSP, 2008).

CLTS uses an approach and strategy that focus on the whole community rather than targeting individuals or groups in a social set up. It leads communities to identify and prioritize their needs

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with sanitation being highly targeted and to also identify solutions that will address them (Benny, 2009). It uses participatory process (triggering) in raising awareness and mobilizing collective action for change. The triggering makes communities feel uncomfortable, disgust, shame about the defecation practices and very anxious to put a stop to open defecation. This is achieved (Kamal, 2008) through the use of tools and techniques like: shit walk, community shit mapping, shit calculation, shit to home, and water and shit in glass.

This approach of CLTS differs from earlier approaches to sanitation in which emphasis was on prescription of high standard toilets, offering of subsidies as an incentive to motivate people to construct toilets, and provision of toilet facilities in communities. These approaches do not guarantee the adoption and sustainability of good sanitation practices (Kamal, 2005). Most of the subsidized latrines (about 50%) are left unused or being used for different purposes such as damping of refuse, keeping of poultry, and storing of goods (Deepak and Soma 2007).

Many countries in Africa have improved their sanitation situations and many other benefits were accrued through adoption of CLTS programme: in Sierra Leone over 3000 people have stopped open defecation and more are at the verge of stopping open defecation through CLTS programme (Jacob, 2008). The adoption of CLTS programme did not certain economic and social intervention programmes to improve their living standards. For example in Zambia, activities undertaken by such groups include fruit tree planting and education on HIV/AIDS. In Kenya, mash rooms and other vegetables farming and campaign against child abuse are some of the economic and social activities carried (Ardakanian, 2008). It is a major challenge dealing with the attitude or behavior of people towards sanitation (construction, use and maintenance of latrines) especially in rural areas where illiteracy and poverty are very high. However, the provision of infrastructure to improve sanitation such as improving in the vent systems, provision

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of pits with adequate depth, and construction of permanent super structures will increase the level of usage and acceptability (Spencer, 2012).

This approach of community led total sanitation, though necessary but might not be sufficient enough to cater for every individual's or group's behaviour in community, since behaviours are influenced by population dynamics such as socio-demographic and economic factors (for example age, sex, educational level, economic wellbeing, marital status, and beliefs). These factors to a larger extent influence adoption of innovation (Benny, 2009).

It is appropriate to identify and target particular group(s) or individuals within a community such as males or females, literate or non literate, older people or youth and concentrate more effort and resources to the identified targets. It is obvious that these categories of people might need different degrees of attention and different approaches to enable them modify, change, or maintain an existing behaviour, so long as they have different demographic characteristics (Jacqueline, 2009).

Diffusion of innovation like CLTS does not also pay much attention to the socio-demographic and economic characteristics in its principles and processes of introducing innovations for adoption. Instead, places much emphasis on the innovations and their attributes as agents of behaviour change (Rogers, 2010). These attributes include: relative advantage, compatibility, complexity, trial-ability, and observer-ability.

Relying solely on attributes of innovation to effect a change without considering the characteristics of the beneficiaries is more likely to face some rejections. For instance social norms can be a catalyst or a disincentive to a behaviour change. For example, when a child sees a colleague child defecating outside, such a child may consider it as a sign inviting him/her to join

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in practicing open defecation, or a household decides to construct and use latrine in the house because they have seen many households in the community construct and use latrines. Also, in most African societies children and youth are not allowed to take part in community meetings, and where they are allowed to attend, they are usually not given the chance to contribute ideas to whatever discussions taken place (Joyce & Lorretta, 2009).

The extended parallel process model (EPPM) is a behavioural change communication model which tries to explain when and why people accept, reject or maintain behaviour as a result of fear. This model states that to motivate people to adopt, discard or maintain a particular behaviour needs a very good intervention and the objective of the intervention must target two (2) things. First and foremost, the beneficiaries must realize the existence of a problem and that the consequences of the problem are very alarming which scares the people involved from continuing with the existing behaviour. Their perception of being exposed to the problem (perceive susceptibility) and also the intensity of the effects of the problem (perceive severity) must both be high (Don, 2000).

Secondly, once the people are scared as a result of the threat, they will look for solutions or interventions to the problem and they must believe in the solutions (self efficacy). They must also believe in the effectiveness of the solutions (response efficacy). This component of the theory addresses the efficacy aspect. The theory suggest that for people to effectively work towards discarding, maintaining or accept a behavior then, their level of fear and that of efficacy must both be at equilibrium. This will inspire them to take action(s) that will avert the situation (Don, 2000).

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However, the rate at which people react towards situations (fear or threat) varies, for instance, some react to high threat whilst others react to low threat or in-between these two (high and low) and using this method to effect change in behaviour within a group of people with such variations may not be effective. It is also clear that if the perceived threat is higher than the perceived efficacy people may not believe in their ability to deal with the problem. They may consider the intervention being too hard, too expensive, or not workable at all. At this stage people will develop some defensive mechanisms (fear control responses) such as avoiding the message or the intervention, denying that the behavior in question is risky, ignoring the message and so on. It is again realized in this theory that emphasis is highly placed on fear than reason and if people change their behaviour because of fear, it will be difficult to sustain it with time. Also, this theory fails to consider cost benefit analysis when introducing behaviour or an intervention for adoption. Therefore, if fear is used as a tool to effect behaviour change it may fail because; if a cost of adopting a proposed behavior is higher than the cost of the existing behavior.

Another difficult aspect of using this approach relates to a situation where people did not consider their behaviour to be a problem or where there is no problem at all with the behaviour in question or in a situation where the effects of a problem can be felt in the future or indirectly. This means there is nothing like fear that will make people to change the behaviour in question and for that matter will stick to the status quo (Mariama, 2010). If fear can scare some people from finding solutions to problems that confront them, then it must be packaged in a manner that will make it more appealing and pricking to find solution or adopt any intervention that is introduced to them. Using techniques like targeting and advertising as in social marketing may complement the effort of fear and other related methods.

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Social marketing; this is a behavioural change communication theory introduced by Philip Kotler and Gerald Zaltman. These personalities use marketing principles and techniques to make target individuals or groups change their behaviour voluntarily by accepting, rejecting, modifying, or abandon behaviour for a general good of a society, groups, or individual. This theory has been successful in changing public behaviour in areas like slaves freeing, abolishing child labour, influencing women's right to vote and getting women into the work force.

The theory relies heavily on voluntary compliance instead of applying force to effect a change in behaviour, therefore the results of change in behaviour from this principle is not immediate. With the use of principle of marketing, the theory identifies target audience since every society has individual members with different sets of behaviours forming the population, therefore what will take one to adopt an innovation may not be the same for another person. Different plans and objectives should therefore be made to target specific individuals or groups in order to make effective change of behaviour (Philip et al, 2002).

Entertainment education; this is one of the behavioural change communication theories in which social messages are integrated into entertainment programmes. It entertain at the same time educate in order to increase audience knowledge about social issues and also to promote, sustain, or change a behaviour by using role models. For example if messages are packaged into a form of drama, role play or concept party, they will attract more people than organizing meetings, talk shows or educational campaigns to discuss these. The role models are used to demonstrate the kind of attitudes or behaviours intended to promote (desirable) or sustain (existing) or change (negative). The idea behind this role model technique is that people like emulating role models' behaviour, therefore audience will adopt behaviours role models portray or exhibit in the story line after watching or listening to them (UNFPA, 2002).

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Entertainment education can be presented in different forms; it can be presented in a form of drama on radios or televisions (TVs), it can also be presented in a form of cartoons or talk shows. Entertainment education gives audience a free role to make their own decision. It presents sensitive issues that arouse the interest of people to discuss among their relations (peers, friends and family members). It promotes interpersonal communication which provides a very conducive atmosphere for people to learn and make good decision concerning issues they have watched or listened and discussed among themselves. At times questions can be asked for clarifications when it is talk shows. This can inspire audience to call for community mobilizations, gain more knowledge, and for collective or individual behaviour change (UNFPA, 2002).

Entertainment education is good for sensitive and delicate issues that are difficult to discuss, it present real life issues that matters most to people, and educates people who are into leadership positions. It is also good for collective behaviour change and changes that have to do with social-cultural norms, for example sexual transmitted diseases, sexual reproductive health, child abuse, child betrothal, female genital mutilation, community mobilization, reducing teenage pregnancy and civic participation in policy making (UNFPA, 2002).

Among the distinguishing features of entertainment education include; it has a very large audience in a sense that it is able to reach out to many people at the same time, for instance when a TV or radio is used as a medium. It promotes interpersonal and group communication and debates after listening or watching the programme and can be cost effective since it uses different forms of media, examples community debars, radios, TV among others.

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Entertainment education on the other hand could be expensive depending on the type of medium chosen. For instance, if you want to choose a medium that is more competitive in terms of types of programs, programs' quality and area of coverage. Target people may not listen to the medium if it is not competitive. People would not like a medium that has not got interesting programmes and good experts to man and run the programmes. The role models to be used should be people of good character else people will not listen to them and therefore will not get the message that they try to put across or nobody will want to emulate people with questionable characters. People controlling the station may alter or remove programmes they feel not fit (UNFPA, 2002).

Sadharanikran is a behaviour change communication theory, like entertainment education, it combines messages with dance and drama to change or maintain behaviour in a community. Sadharanikaran is an ancient Indian theory of communication which means simplification based on the modern times behavior change, and is also use dance and drama to put message across. The significance of the theory to health behavior and public health is based on the fact that it uses communication process which is sensitive to the culture of people in a community. For example it empathizes with communities and recognizes the structure of power and authority in them. It also recognizes the patterns of communication in terms of hierarchy and how things can be simplified for communities. The theory looks at how projects or programs can be simplified without changing the content and the form. That is simplifying while maintaining the fundamental nature and meaning of the content of the message to be communicated (Rajeev, 2008).

Sadharanikaran like most of the behavioural change communication theory focuses more on the human beings than any other thing; there are many other factors that serve as barriers to

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behaviour change for example, economic; people may want to adopt and practice health promotion behaviours like using improved latrines but, may not have money to construct latrines or pay to access public or private latrine. Also, lack of infrastructure and qualified personnel could be a barrier; people may develop the attitude of visiting health centers when sick or for pre and post natal care but may not get health facility to attend. Sometimes the facility can be there but no qualified personnel like doctors and nurses to take care of the patients who visited the facility for treatment (Rajeev, 2008).

Mariama (2010) suggested that to deliver an intervention to a general population audience without knowing the characteristics of the target population, then is good using qualifies professionals as agents of the intervention otherwise it will fail. Because people with different characteristics need different strategies or interventions to change their behaviour, for example some people may need persuasion, or incentives like social support or it could be the use force like sanctions and fines to enable them change their behaviour. For example, it is more successful targeting people or groups that lack power in societies (younger, females, ethnic minority, and less-educated) with interventions to prevent or control behaviour than those that possessed power (older, males, ethnic majority, and more educated). On the other hand, it is more successful influencing behaviour among people who wield power in society with norms because it is relatively stronger among these groups. This strategy has been successful in the area of health particularly in prevention of AIDS and other sexual transmitted disease **(**Mariama, 2010).

A combination of ideas from these theories will be good for this study because, to make people recognize that open defecation is a problem and pose serious threat like health hazards, calls for ideas from extended parallel process model. Developing intervention (example open defecation

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free) with right attributes needs ideas from diffusion of innovation and simplifying the intervention without changing its form or content and to also make intervention sensitive to culture of the beneficiary communities, groups or individual's calls for theory of Sadharankran. And for diffusing an innovation into target beneficiaries needs better packaging and effective communication strategies which also call for social marketing and entertainment education. This therefore means that each of the theories can be used to correct a specific behaviour. It also mean that, none of them cannot singly stand to correct or bring a perfect and general behaviour change. To be able to effectively deal with behaviour, there is the need to combine more than one of the theories or models (UNFPA, 2002).

2.7 Policy implication of behaviour change and ODF innovation

Sanitation policy in Ghana covers a wide area of environmental sanitation which include solid and liquid waste, industrial and hazardous waste, storm water drainage, environmental and hygiene education, vectors of disease and disposal of dead (Republic of Ghana, 1999 in Charles Thrift, 207). Ghana national policy in operation faces some challenges which affect agencies, organizations, ministries and individuals to fully put this policy into operation. Some of these challenges include lack of assigned roles for governmental bodies; a sector ministry at the national level executing projects at communities when there are departments and units at regional and district levels meant for such projects. Another challenge is lack of capacity and skilled professionals at all levels; those employed to implement the national sanitation policy and execute sanitation projects right from national to regional, district and community levels do not have the capacity and the requisite skills to implement and execute the sanitation policy and projects (Charles Thrift, 207). Also among the challenges Charles Thrift identified is the problem associated with the transfers of responsibilities for sanitation without the corresponding budget,

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personnel, and equipment transfers; this is referred to delegation of power from national level to regional, district and/or community levels to implement and execute sanitation policy and projects without equipping them with the necessary resources to enable them functioning properly. For instance the national sanitation day (the first Saturday of every month) is supposed to be observed by all the levels (national, regional and the district) but is only where the Government or its delegation is like the President, vice President and/or the Local Government Minister, will be provided with the necessary equipment and tools such as sanitation trucks, wheelbarrows, shovels, rakes, overalls and hand gloves for the exercise.

Some strategies were identified to reduce or eliminate these challenges according to Charles Thrift (207). These strategies include definition of roles and responsibilities related to sanitation of institutions from the national ministries down to unit committees, community organizations and individuals to ensure proper implementation of national sanitation policy and execution of sanitation projects at all the levels especially the community levels. Another strategy was the privatization of sanitation services; this is to ensure that all the activities or services that government is not able to provide are provided by the private sector. Also among the strategies to deal with these challenges is the creation of national sanitation policy coordinating council to coordinate all the sanitation related activities in the country in order to avoid over concentration and duplication of resources. There was also a creation of district sanitation fund as part of the strategies to take care of some sanitation activities and projects at the district level. In addition to these strategies was the phasing out of pan latrines in the system. This was to ensure that anything related to open defecation is completely eliminated in order to promote sound environmental sanitation in the country.

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Sanitation is very crucial in human development so long as it affects every sphere of human life for example education, health, income and empowerment (Ardakanian, 2008). Therefore investigating the effects of socio-demographic and economic factors on behaviour change and adoption of open defecation free innovation will help in formulation of sanitation policy in the country. It will guide policy makers to factor sanitation needs of various individuals and groups into national policy to ensure that sanitation needs of these individuals and groups are well catered for (Ardkanian, 2008). For example United Nations Children's Fund (UNICEF) design special toilet seats to cater for the weak in society for example disable and aged (UNICEF, 2013).

Studying and reporting on sanitation innovations will inform policy makers to approve and support organizations with best and appropriate innovations to champion the course of sanitation in the country. Innovation can best succeed when is approved and supported by government policies and external agencies, for example CLTS succeeded in Kenya because public health ministry accepted it as best innovation that can accelerate sanitation coverage and also good for rural and urban slums areas. This will also help governments and donor agencies to identify and create enabling environment among all units that support sanitation activities to coordinate among them in order to avoid over concentrations and duplication of resources and projects (Beavan, 2010).

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CHAPTER THREE

Methodology

3.1 Introduction

The purpose for the study is to identify the socio-demographic and economic factors influencing open defecation and then to discuss the implications of open defecation in achieving the Millennium Development Goal on sanitation. This section outlines the various processes and procedures leading to the collection of verifiable data for analysis and interpretation. The chapter is organised in the following order: the research design, sampling and its procedures, data collection procedures, tools for data analysis and the profile of the study area.

3.2 Research Design

This was a cross sectional study where sampled household heads or adult members of households were interviewed about their sanitation practices in Lawra and Nandom districts. This design was appropriate for the study because, the target was not to interview every member from the households or the communities, but the responses from the household heads will be used as a representation for the entire households or the communities (Owens, 2005).

3.3 Study Area

The study was conducted in Lawra and Nandom districts in the Upper West region of Ghana. The Lawra and Nandom districts were purposively selected because, there were areas within the Upper West Region in which CLTS activities had been implemented and CARE Ghana is still actively engaged with CLTS activities in the districts. The two Districts (Lawra and Nandom) share boundaries and for most of the features are almost the same. For the purpose of this research, the common features will be used to describe the districts as one study area. The study

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area lied in the north western corner of the Upper West Region in Ghana between Long. 2°25 W and 2°45W and Lat. 10°20 and 11°00. They bounded to East and south by the Jirapa / Lambussie District and to the North and West by the Republic of Burkina Faso. The total area of the Districts is put at 1051.2 square km. This constitutes about 5.7% of the Region's total land area, which is estimated at 18,476 square km (Lawra District Assembly, 20130).

Sketch map of the Upper West Region

Source: Districts of Ghana at statoids.com 2015

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3.4 Study population

The study population includes household members in the Community Led Total Sanitation (CLTS) triggered communities in the Lawra and Nandom Districts of the Upper West Region of Ghana. They were 50 CLTS communities with 25 in each district. In each community sampled, a number of households were then randomly sampled.

3.5 Sampling and sample size

A two-stage sampling technique was used to randomly select respondents for the survey. In the first stage, three communities from each district were randomly selected. Six communities were selected from the two districts. The communities selected from Lawra were Dazzur, Yagra, and Nayirborg. Those from Namdom were Danko, Newtown and Betaglu. These are CLTS triggered communities. In the next stage, a number of households were randomly selected in each community based on the size of the community by going to the centre of the community and spinning a pen. The direction in which the pen pointed was followed and from which the first house/ household was selected. The household head or an adult member of the household was interviewed. The interviewer then spins the pen again from the last selected compound to the nearest house. This continued till the required number of respondents was obtained in each community. The spin pen method was necessitated by the housing arrangements in the study communities; most of the houses were nucleated (Grais et al,207). For instance at Nayirborgu, where the chief resided have several houses put together as one block but separated with common walls.

In all 229 individuals were interviewed. The number was limited to 229 based on the resources and time required to carry out this study. In Lawra district, 120 households were interviewed and in Nandom 109. The sample size for the study was determined by the use of a statistical formula. The application of the formula was informed by the availability of data on the population and the

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determination of the number (538) that constituted the sample frame of the study. The statistical formula used to calculate the sample size of the study is shown below.

$$\text{Sample size (n)} = \frac{N}{1 + N\,(\alpha)^2}$$

Where 'N' is the sample frame, 'n' is the sample size and 'α' is the margin of error. With 95% confidence interval, the sample size of the study was calculated as below. By the formula, N= 538 and α= (0.05).With the application of the statistical formula, the sample size of the study was calculated as follows.

$$\text{Sample size} \quad (n) = \frac{538}{1 + 538\,(0.05)^2}$$

$$\text{Sample size} \quad (n) = \frac{538}{1 + 538\,(0.0025)}$$

Sample size (n) = 229. 424307

3.6 Data Collection Instruments

Structured questionnaires were used to collect the data through face to face interview. Structured questionnaires with pre-coded multiple choice responses were used to obtain data on where people usually go for toilet or defecate, demographic characteristics of respondents, the existence of latrine in a household, and household assets which were used to generate the wealth index which serves as a proxy for socioeconomic status.

3.7 Pilot-Testing of questionnaire

In order to avoid any inconsistency of responses in the questionnaires, it became imperative to pilot or pre-test them. In view of this, a 5 respondents who were not part of the study were

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selected purposefully for the pilot testing of the questionnaire. After pilot testing the questionnaire, some changes were made to improve the data collection instruments.

3.8 Data collection

The researcher traced and contacted the respondents for the interviews in their respective households. The face to face interview commenced with self-introduction and explanation of the purpose of the study and the co-operation of some key personalities at the various study sites (Assemble members and Unit Committee Members through the District Environmental Health Officers). This was done because, during the pilot testing period, some of the respondents were not readily prepared to be interviewed especially the females. Because of the cooperation received at this stage of data collection, the interviewing of respondents lasted exactly one month. After collecting the data, the researcher went through all the questionnaires to make sure that each one of them was correctly filled and those with gaps were corrected.

3.9 Household Socioeconomic status

Socioeconomic status was assessed using household assets or possessions. A wealth or assets index was estimated using household assets characteristics (Davidson R. Gwatkin & Adam Wagstaff, 2005) . The approach involves the use of a principal component analysis (PCA) where the scoring factors of each asset are used to form an index for each household (A_j) based on the formula:

$$A_j = f_1 * (a_{j1} - a_1)/(s_1) + ... + f_N * (a_{jN} - a_N)/(s_N)$$

Where f_1 is the scoring factor' for the first asset, a_{j1} is the j^{th} household's value for the first asset, a_1 and s_1 are the mean and standard deviation of the first asset variable over all households.

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The household assets included in computing the assets index included ownership of car, motor bike, bicycle, kerosene stove, electricity, solar lights, refrigerator, DVD player, radio sewing, machine, stereo, iron, fan, mobile phone gas stove, donkey cart, tractor grinding mill, cattle, sheep, donkey, goat, pig, horse and rabbit

3.10 Data Analysis

The data was analyzed using STATA 12.1. Data cleaning by way of identifying outliers and checking for consistencies among variables were carried out by running frequencies and cross tabulations. Descriptive analyses were used to describe socio-demographic characteristics of respondents. The statistical point estimates were computed and presented as means, proportions or percentages for all the background characteristics. Open defecation in this study refers to going to toilet in the open e.g. bush, uncompleted building, gutter or any other open place without covering the shit. Chi-square test was used to assess the association between open defecation and other socio-demographic variables. Unadjusted and adjusted odds ratios with 95% confidence intervals were computed to assess the relationship between the open defecation and selected variables using bivariate and multiple logistic regression models. Statistical significance level was set at 5%.

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CHAPTER FOUR

Data analysis, Interpretation and Discussions

4.1 Introduction

The objective of this study is to access the socio-demographic and economic factors that influence Open Defecation (OD) in Northern Ghana and to discuss the implications of OD on sanitation. This chapter which presents the results and discussions of the study basically consists of the socio-demographic characteristics of the respondents, factors leading to defecation practices, the effects of socio-demographic and economic factors on OD and, the implication of OD on sanitation in Ghana.

4.1.0 Background characteristics of respondents

The background characteristics of respondents consist of age, sex, education, marital status, religion, ethnicity, and occupation which are analysed in the context of the study. The study took place in two districts from Upper West Region thus Lawra and Nandom. Hundred and twenty respondents were drawn from three communities in Lawra district constituting 52% of the respondents. The communities include; Yagra 43 (19%), Nayirborg 36 (16%), and Danzuur 41(18%). Hundred and nine respondents were also drawn from three communities in Nandom District which also constituted 48% of the respondents, they were; Newtown 49 (21%), Danko 26 (11%) and Betaglo 34 (15%).

4.1.1 Sex distribution of respondents

Figure 4.1 describes the sex distribution of respondents. In all, 229 adults (18 years and older) were interviewed. One hundred and two representing 45% were female respondents and one

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hundred and twenty-seven representing 55% were male respondents. Male respondents were slightly more than (10%) the female respondents

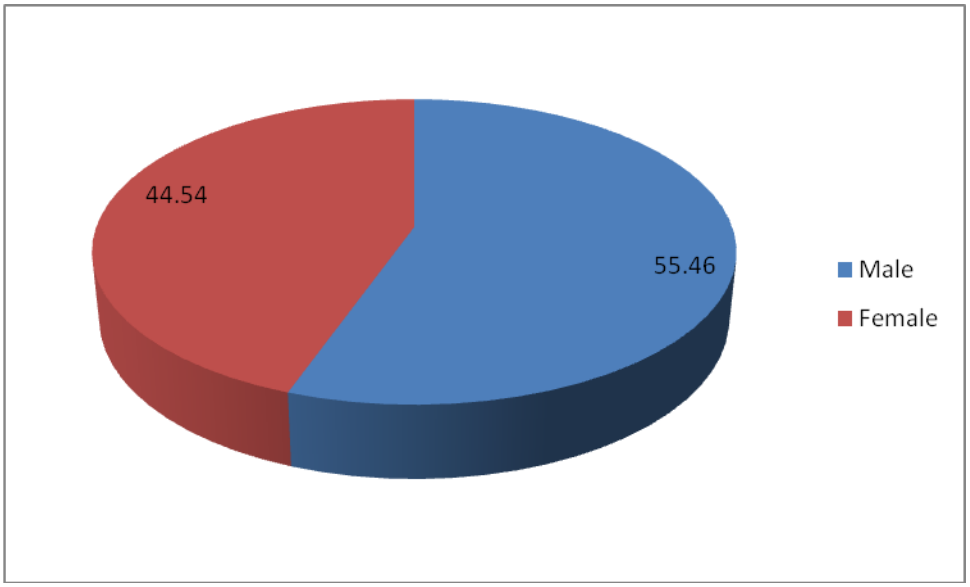

Figure 4.1: percentage distribution of sex
Source: Field Data, 2015.

4.1.2 Age distribution of respondents

Figure 4.2 shows the distribution of age of respondents in the study. All the 229 people interviewed had their ages within the range of 18 – 86 years. The mean age of respondents was 47 with the standard deviation of 17. The respondents also had median age of 46 years with the inter quarter range of 32 – 61. To express the age distribution into percentages, it was regrouped into three; 90 respondents fall within the age range of 18 – 40 which represented 39%, 78 respondents were within ages 41 – 60 also represented 34% and those who were 60 years and older recorded 61 represented 27%. These showed a normal distribution of broad base age structure where majority of people are those in the lower ages and decrease as ages increase.

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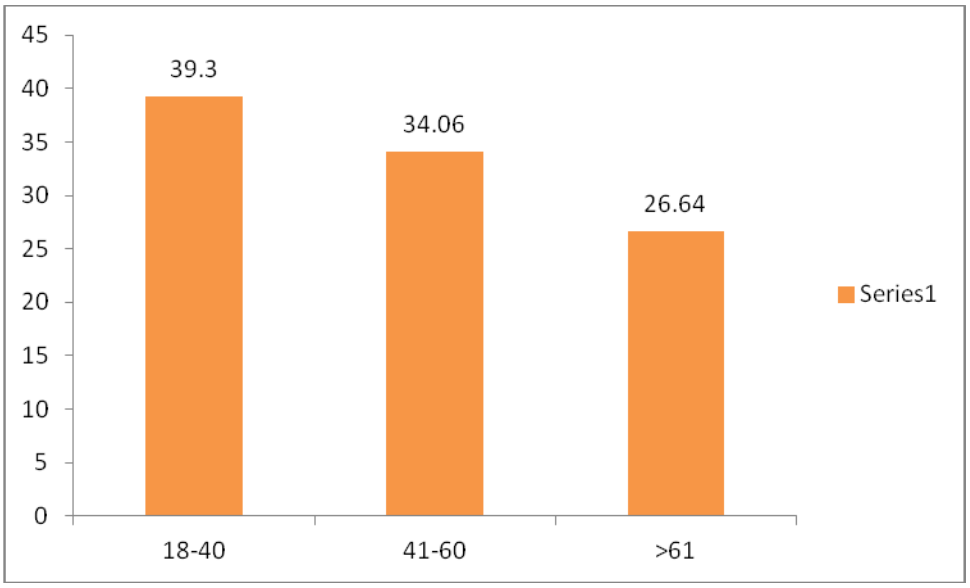

figure 4.2:percentage distribution of age
Source: Field Data, 2015.

4.1.3 Educational background of respondents

With educational background, Figure 4.3 indicates that majority of respondents were without any form of formal education. They were 118 representing 52% of the total respondents. Basic education was second with 70 respondents and constituted 31% of the total sample size. Senior secondary school or tertiary recorded the least with 41 representing 18% of the total respondents. The basic education comprised of those who completed primary school, junior secondary/Junior high schools, and middle school. Secondary education comprises of senior secondary/senior high, vocational and technical education, and tertiary comprises of diploma or higher education. Respondents with no any form of formal education constituted the majority because almost all the study communities were rural and it is one of the characteristics of the rural areas.

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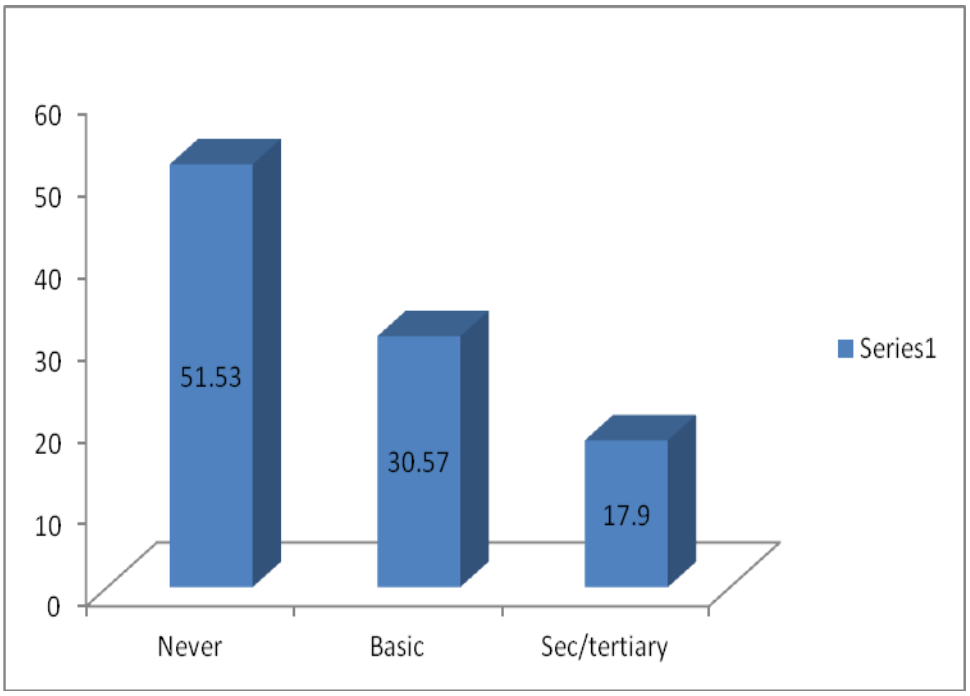

figure 4.3: Percentage distribution of educational status
Source: Field Data, 2015.

4.1.4 Religious background of the respondents

Respondents were provided with various religious denominations to choose the one they belong to. They include; Christianity, Islam, African Traditional Religion (ATR) and No Religion. Over whelming majority indicated they practiced Christianity thus 196 representing 86% of the respondents. Islam, African Traditional Religion and No Religion recorded very small numbers and as such they were put together as others which also recorded 33 and represented 14% of the respondents and it is shown in Figure 4.4 below.

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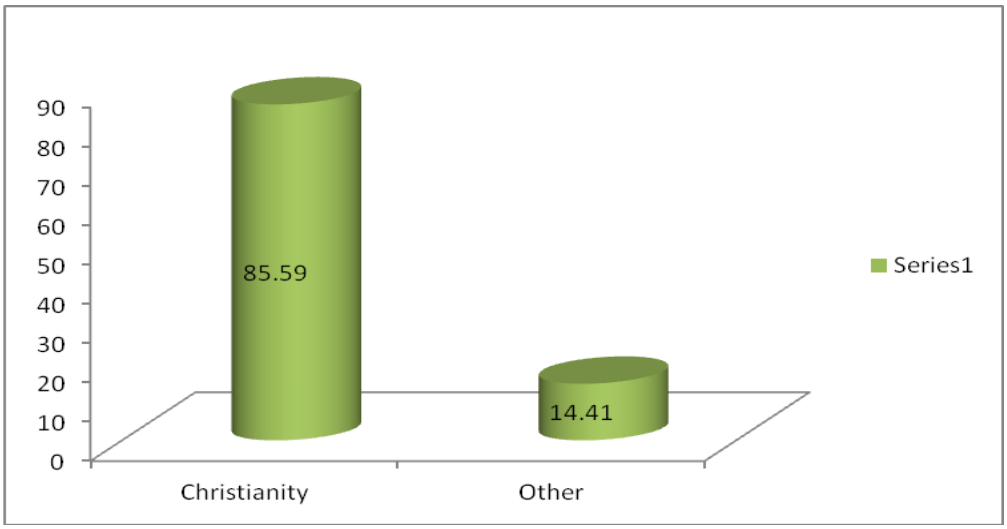

figure 4.4: Percentage distribution of religious status
Source: Field Data, 2015.

4.1.5 Marital status of the respondents

Figure 4.5 indicated that significant proportion of people interviewed were married, they recorded 74% (196). Divorce/separation being next to married with 35 respondents representing 15% and those never married were termed as single and recorded 24 representing 10% of the total respondents. Cohabiting is however not shown because it recorded no figure.

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figure 4.5: percentage distribution of marital status
Source: Field Data, 2015.

4.2.0 Economic characteristics of respondents

Economic status of respondents was determined by asking questions regarding respondents' major economic activities, and wealth index which was determined by one's household assets.

4.2.1 Economic activities of respondents

Table 4.1 indicates that majority of the respondents depended on farming as their main source of livelihood and they recorded 155 representing 68%. It is worth noting that this type of farming was mainly subsistent. Self employed was second with 31 respondents representing 13%, and they include trading and all forms of artisans. Formal employment which included both private and public sectors was next with 23 representing 10% of the respondents. Others which included retired persons, housewives and students recorded the least with 20 respondents representing 9% of the total people interviewed.

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Table 4.1:Economic activities of respondents

Activities	Frequency	Percent
Farming	155	67.7
Self employed	31	13.1
Formal employed	23	10.0
Others	20	8.7
Total	229	100.0

Source: Field Data, 2015.

4.2.2Wealth distribution of respondents

The wealth index was computed by using the types of means a respondent has, electrical appliances used, types of animals and number one has, types of stoves one use for cooking, and whether the respondent has electricity in the household, sewing machine, a grinding mill and/or tractor. The highest category is the poorer with 47 (21%) and it is only one percent different from the rest. There are poorest 46 (20%), poor 45 (20%), less poor 46 (20%) and least poor 45(20%). In all those who were poor stood at 138 representing at least 60% of the respondents and they constituted the majority and those relatively rich recorded 91representing 40% of the respondents and also constituted the minority.

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Table 4.2:wealth (index) distribution of respondents

Categories	Frequency	Percent
poorest	46	20.1
Poorer	47	21.5
Poor	45	19.7
Less poor	46	20.1
Least poor	45	19.7
Total	229	100.0

Source: Field Data, 2015.

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4.3.0 Sanitation practices in Lawra and Nandom districts

These practices include defecation type, places for defecation, reasons for open defecation, types of toilet facilities preferred by the people in the districts, maintenance of toilet facilities and the responsible persons in charge of the maintenance.

4.3.1type of defecation

For the purpose of this study, defecating outside a toilet facility but covering the shit will be treated as not open defecation. Figure 4.6 indicates that a significant number 78 (34%) of the respondents practiced open defecation, 11 (5%) defecate outside the toilet facility but practiced dig and burry, and majority 140 (61%) used toilet facilities. Therefore 151 (66%) of the people did not practice open defecation.

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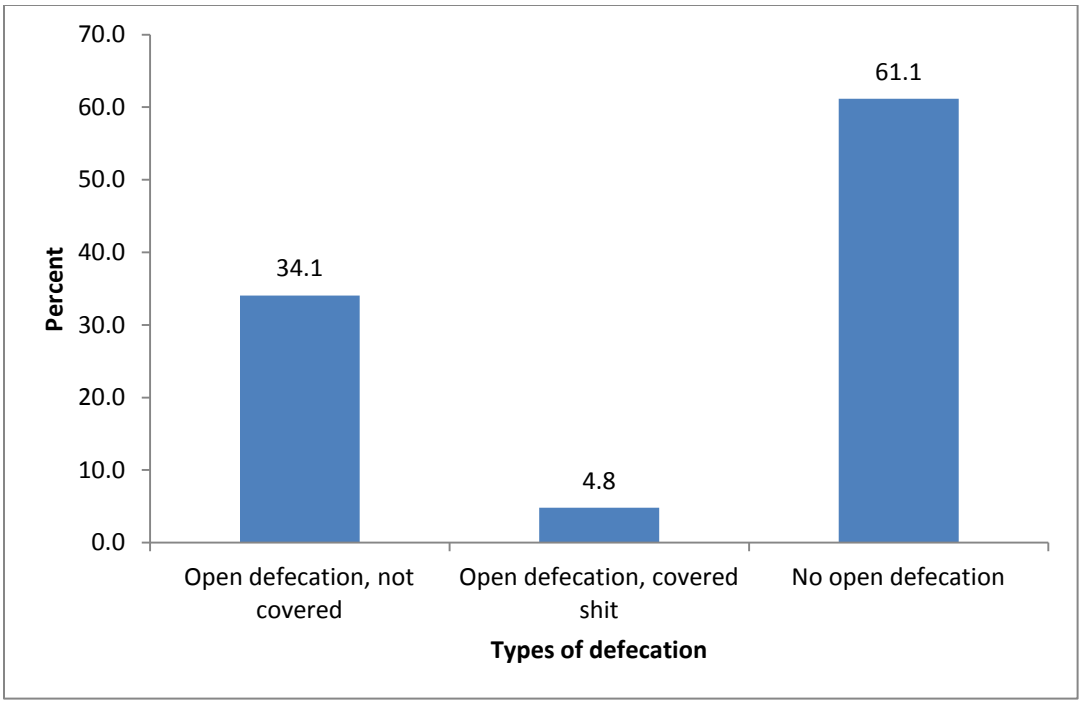

Figure 4.6 percentage distribution of defecation practices in Lawra and Nandom Districts
Source: Field Data, 2015.

4.3.2 Usual place for toilet

Places where people go to defecate were numerous but was broadly grouped into two for the purpose of this study; improved (use of toilet facility and/or dig and burry) and unimproved (open defecation). Figure 4.7 shows that those using improved places for defecation (flush toilet, traditional pit latrines, and ventilated improved pit latrines) were the majority in the study area with 140 (61%) respondents and those using unimproved places for defecation (no facility/bush/field, uncompleted buildings, gutters and the use of plastic bags) constituted the lowest percentage of the total respondents with 89 (39%).

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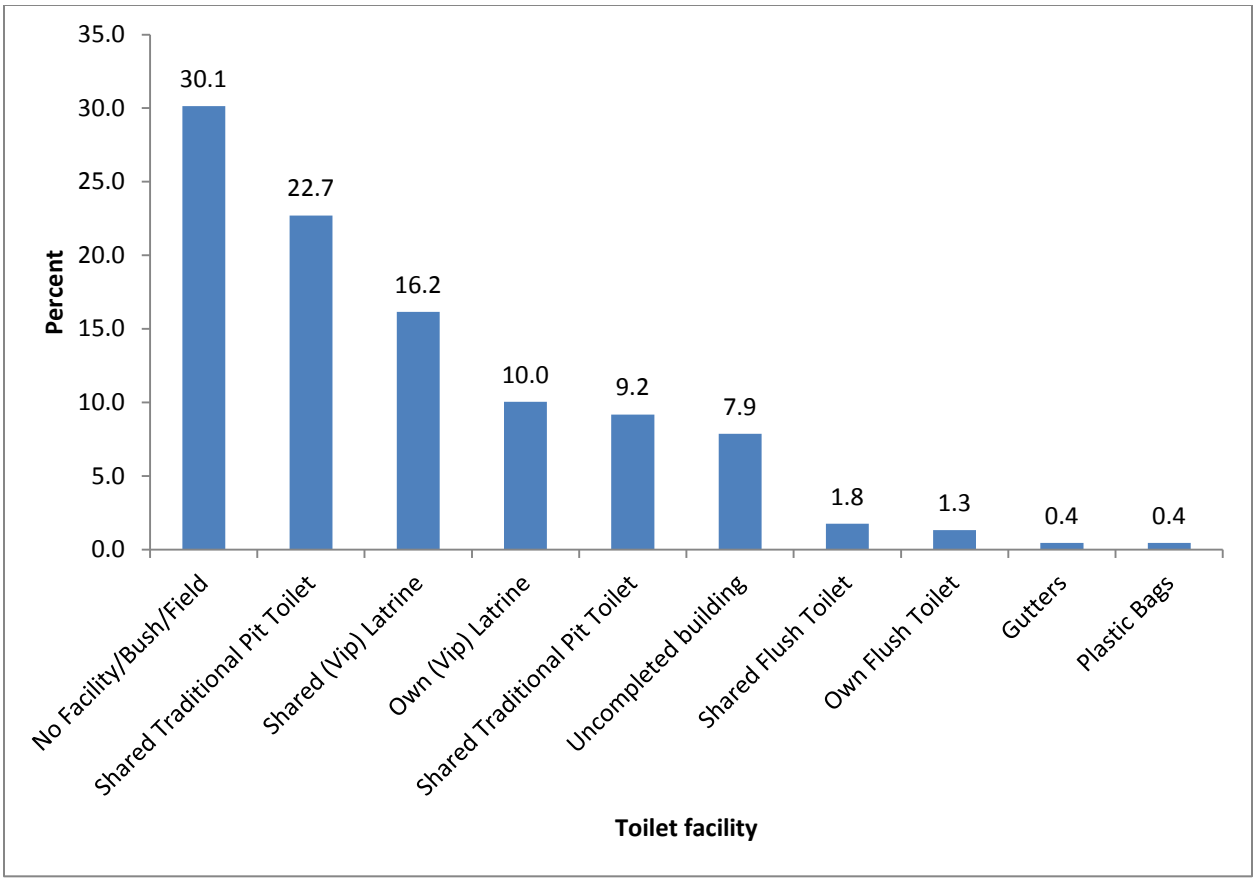

Figure 4.7 percentage distribution of places where respondents usually go for toilet
Source: Field Data, 2015.

4.3.3 Reasons for practicing open defecation

Figure 4.8 indicates that respondents who chose 'closest latrine not safe for use' as their reason for practicing open defecation recorded the highest with 24 (28%), followed by those who chose 'open defecation was the only option they have' with 19 (22%). Those chose 'closest latrine was too dirty' as a reason were third with 14 (16%), next was 'other places are too far' with 10 (12%) and then followed by 'it is conveniently located' with 6 (7%). The rest were 'closest latrine was too expensive' and 'don't know' both recorded 4 (5%) each and 'closest latrine queue too long' and 'it is free of charge' also respectively recorded 3 (3%) each. For the purpose of this study, these reasons were however grouped into two as problem of accessibility and attitude.

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Accessibility has the higher record of 63 (73%) and it includes reasons such as 'other latrines being too far away', 'closest latrines are too expensive', 'closest latrines not safe', 'closest latrines queue too long', 'open defecation is free of charge' and 'open defecation is the only option I have'. Attitude on the other hand recorded the least with 24 (27%) and this also includes reasons such as 'closest latrine was too dirty', 'open defecation is conveniently located', and 'I don't know'.

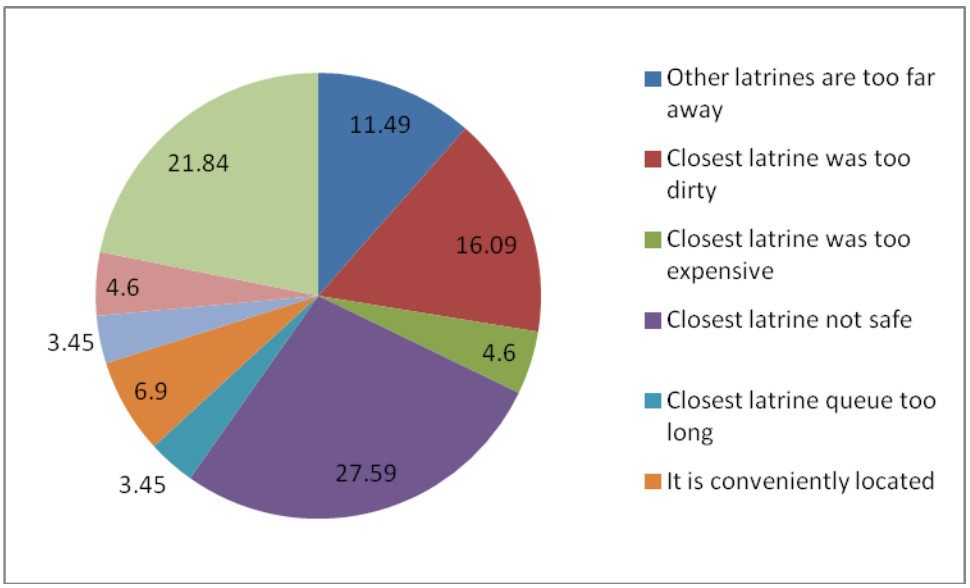

Figure 4.8: reasons for practicing open defecation
Source: Field Data, 2015.

4.3.4 Satisfaction with current place of defecation

Respondents were asked if there were satisfied with their current place of defecation and 'Yes' or' No' options were provided as answers for them to choose. Majority chose 'No' 192 (84%) and few of them chose 'Yes' 37 (16%) and these responses are displayed in figure 4.9 below. In another question, respondents were asked to specified their preferred toilet type and Figure 4.11 indicates that a little over halve 120 (52%) preferred VIP latrine, followed by KVIP 35 (15%).

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The rest are; WC 19 (8%), Pit latrine 16 (7%), flush latrine 3 (1%) and Not Applicable (NA) was 36 (16%).

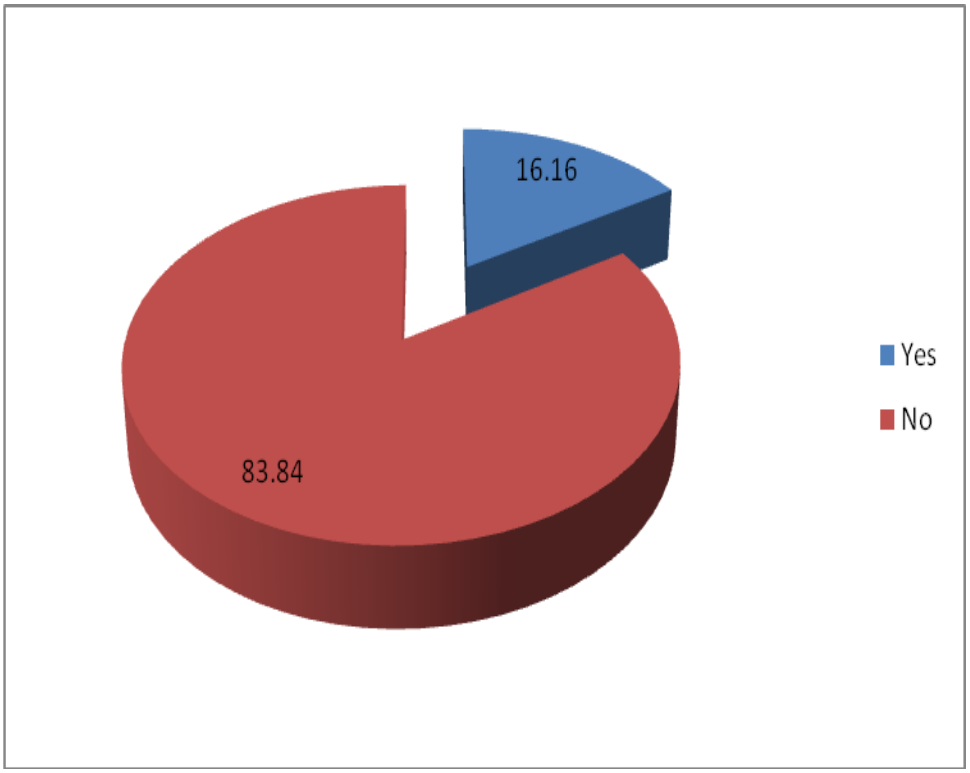

figure 4.9: percentage distribution of satisfaction with current place of defecation
Source: Field Data, 2015.

4.3.5 Whether respondents prefer other toilet facilities

Respondents were also asked if they prefer other toilet facilities to those they are currently using. "Yes" or "No" were options provided for them to choose as answers. Majority of the respondents chose 'Yes' (195), this figure represented 85% of the total respondents. Those who chose "No" as the answer to the question were only 34 which also represented 15% of the total respondents. This information is displayed in figure 4.10.

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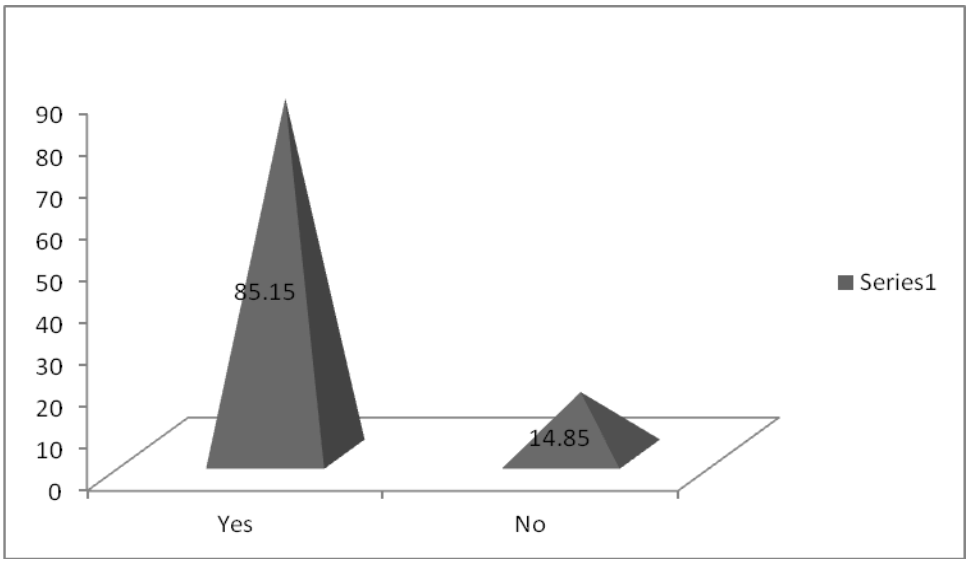

figure 4.10: percentage distribution of whether respondents prefer other toilet facilities?
Source: Field Data, 2015.

4.3.6 Respondents' preferred toilet facilities

After interviewees responded to the question 'whether respondents preferred other toilet facilities to those they are currently using', there were then asked further to identified those they preferred. A little over half of the respondents (52%) identified VIP latrine as the preferred facility type. Not Applicable (NA) was next with 16%, followed by KVIP latrine with 15%, the rest were WC (8%), Pit latrine (7%) and Flush toilet was the least with 1%.

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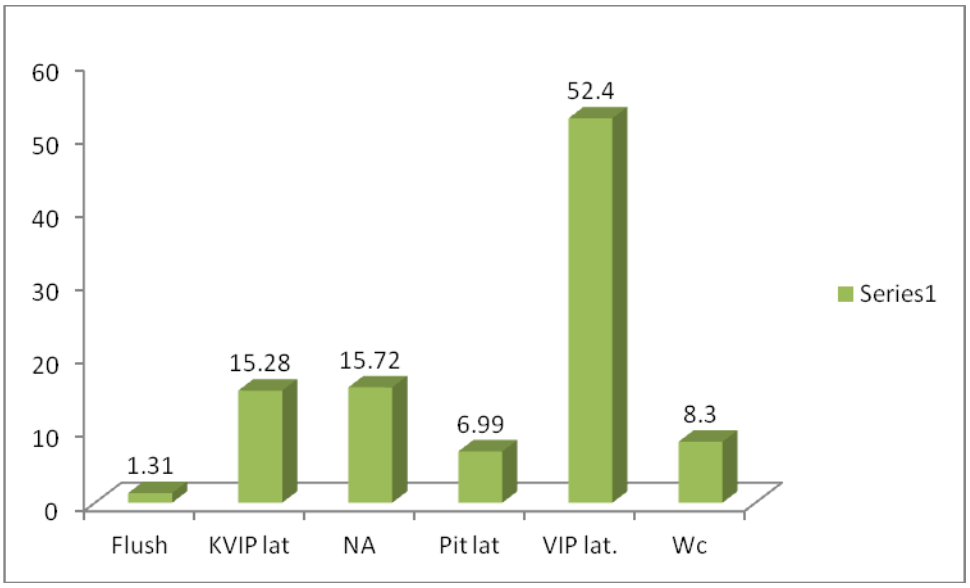

figure 4.11: percentage distribution of respondents' preferred toilet facilities
Source: Field Data, 2015.

4.3.7 Maintenance of toilet facility

Respondents were asked about the regularity of maintenance regarding the use toilet facilities. The options were No maintenance, Daily maintenance, Weekly maintenance, and Monthly maintenance. Figure 4.12 shows that over half of respondents chose Weekly maintenance 79 (56%), followed by Daily maintenance with 59 (42%), Monthly maintenance and No maintenance were least recorded with 2 (1%) each.

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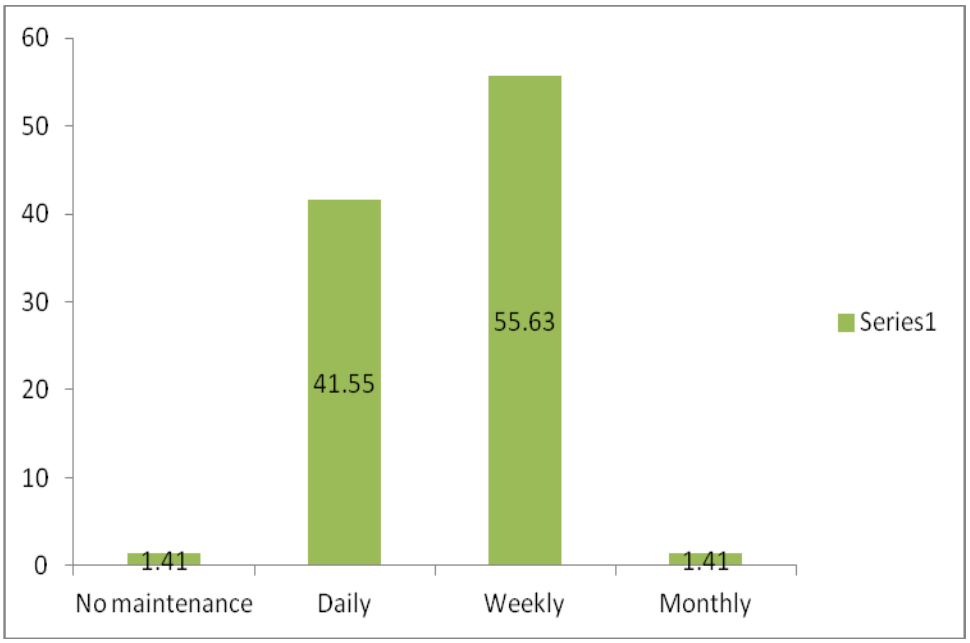

figure 4.12: percentage distribution of latrine maintenance periods

Source: Field Data, 2015.

4.3.8 People responsible for Maintenance of household latrines

Males, females, and both (males and females) were options provided for respondents to make their choice. It came out from Figure 4.13 that females recorded highest percentage of the responses 51% (116), both became second with 42% (96) and then male being last with only 7% (17).

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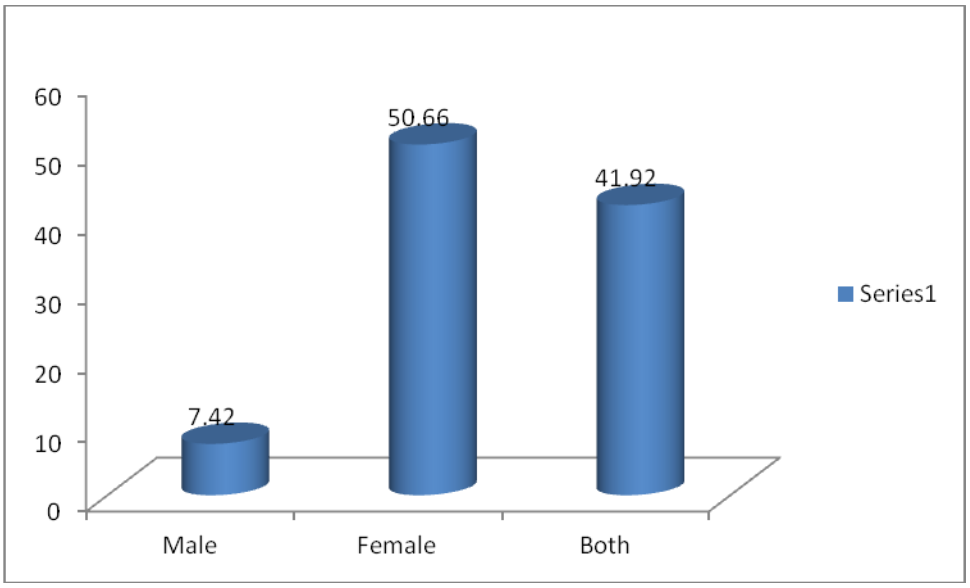

figure 4.13: percentage distribution of people responsible for household latrine maintenance
Source: Field Data, 2015.

4.4.0 Association between open defecation and socio-demographic factors

Open defecation was the dependent variable and other socio-demographic factors such as sex, age, religion, marital status, and education were the independent variables.

4.4.1 Association between open defecation and sex

Table 4.3 indicates that, in bivariate analysis, there was no statistically significant association between open defecation and sex. The proportion of males who practiced open defecation was 37% compared with 30% for females (p= 0. 294). After adjusting for other confounding factors (age, religion, marital status, education, and wealth), females had 28% decrease odds of practicing open defecation compared with males and this was not statistically significant at 95% confidence interval [aOR= 0.72 (0.35-1.5)] (table 4.3)

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Table 4.3: Adjusted and unadjusted Odds ratios showing association between sex and open defecation in Lawra and Nandom districts in Northern Ghana

Variable	number	Unadjusted OR	P-Value	Adjusted OR	P-value
Sex					
Male	127	ref		ref	
Female	102	0.74 (0.43-1.29)	0.294	0.72 (0.35-1.5)	0.383

Source: Field Data, 2015.

4.4.2 Association between open defecation and age

In bivariate analysis, individuals aged over 40 years had almost twofold increase odds of practicing open defecation compared with those aged 18-40 years, and this was statistically significant. After adjusting for other confounding variables in the multiple logistic regression model, the association was no more statistically significant (table 4.4).

Table 4.4: Adjusted and unadjusted Odds ratios showing association between age and open defecation in Lawra and Nandom districts in Northern Ghana

Variable	number	Unadjusted OR	P-Value	Adjusted OR	P-value
Age group					
18-40	90	ref		ref	
41-60	78	2.15 (1.11-4.16)	0.023	0.80 (35-1.84)	0.598
>61	61	2.00 (0.99-4.05)	0.053	0.83 (0.33-2.08)	0.688

Source: Field Data, 2015.

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4.4.3 Association between open defecation and religion

There was no statistically significant association between open defecation and religion. The proportion of non Christians who practiced open defecation was 42% compared with 33% for Christians (p=0.273). After adjusting for other confounding factors, non Christians still had 52% increase odds of practicing open defecation compared with Christians, and this was not statistically significant at 5% significance level [aOR= 1.52 (0.72-3.22)] (table 4.5).

Table 4.5: Adjusted and unadjusted Odds ratios showing association between religion and open defecation in Lawra and Nandom districts in Northern Ghana

Variable	number	Unadjusted OR	P-Value	Adjusted OR	P-value
Religion					
Christianity	196	ref		ref	
Other	33	1.07 (0.41-2.76)	0.897	1.52 (0.72-3.22)	0.275

Source: Field Data, 2015.

4.4.4 Association between open defecation and marital status

There was statistically significant association between open defecation and marital status. The proportion of divorce/separation that practiced open defecation was 37% compared with those that have never married (single) but practiced open defecation 13% (p=0.059). After adjusting for other confounding factors, divorce/separation had 198% increase odds of practicing open defecation compared with those that are single and this was not statistically significant at 5% significance level [aOR= 2.98 (0.50-17.79)] (table 4.6).

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Table 4.6: Adjusted and unadjusted Odds ratios showing association between marital status and open defecation in Lawra and Nandom districts in Northern Ghana

Variable	number	Unadjusted OR	P-Value	Adjusted OR	P-value
Marital status					
Single	24	ref		ref	
Married	170	4.12 (1.18-14.37)	0.026	2.76 (0.60-12.58)	0.190
Divorced/Sep	35	3.65 (0.90-14.76)	0.069	2.98 (050-17.79)	0.232

Source: Field Data, 2015.

4.4.5 Association between open defecation and educational status

In bivariate analysis, there was statistically significance association between open defecation and educational status. The proportion of those that have never had any form of formal education was 52% compared with those with high education (secondary or tertiary) 5% (p=<0.001). After adjusting for other confounding factors (in multiple regression analysis), adults with secondary or tertiary education had at least 91% decrease odds of practicing open defecation compared with those with no formal education, and this was still statistically significant at 95% confidence interval [aOR= 0.09(0.01-0.50)] (table 4.7). Overall, education was statistically significantly associated with open defecation.

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Table 4.7: Adjusted and unadjusted Odds ratios showing association between educational status and open defecation in Lawra and Nandom districts in Northern Ghana

Variable	number	Unadjusted OR	P-Value	Adjusted OR	P-value
Educational status					
Never	118	ref		ref	
Basic	70	0.25 (0.13-0.50)	<0.001	0.02 (0.09-0.44)	<0.001
Sec/tertiary	41	0.05 (0.01-0.21)	<0.001	0.09 (0.01-0.50)	0.006

Source: Field Data, 2015.

4.5.0 Association between wealth and open defecation

There was statistically significance association between open education and wealth index in bivariate analysis. The proportion of the poorest who practiced open defecation was 50% compared with the least poor 13% (p=0.006). In multiple logistic regression analysis, people who were in the poorest quintile had two folds increase odds of practicing open defecation compared with the least poor. Generally, there was no any significant association between open defecation and wealth index after adjusting for other confounding variables (table 4.8).

Table 4.8: Adjusted and unadjusted Odds ratios showing association between wealth and open defecation in Lawra and Nandom districts in Northern Ghana

Variable	number	Unadjusted OR	P-Value	Adjusted OR	P-value
Wealth index					
Poorest	46	6.50 (2.31-18.31)	<0.001	2.09 (0.56-7.87)	0.275
Poorer	47	3.05 (1.06-8.76)	0.039	0.99 (0.26-3.68)	0.984
Poor	45	3.95 (1.38-11.27)	0.010	2.51 (0.68-9.32)	0.168
Less poor	46	3.81 (1.34-10.86)	0.012	2.24 (0.59-8.52)	0.237
Least poor	45	ref		ref	

Source: Field Data, 2015.

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4.5.1 Association between open defecation and economic activities

The proportion of farmers who practiced open defecation was 46% compared with those in formal employment where 0% practiced open defecation. The association between open defecation and economic activities was still significant at 95% confidence interval after adjusting for other confounding factors.

Table 4.9: Adjusted and unadjusted Odds ratios showing associated between economic activity and open defecation in Lawra and Nandom districts in Northern Ghana

Variable	number	Unadjusted OR	P-Value	Adjusted OR	P-value
Economic activity					
Farming	155	ref		ref	
Self-employed	31	0.08 (0.02-0.34)	0.001	0.07 (0.01-0.35)	0.01
Formal employment	23	(empty)		(empty)	
other	20	0.29 (0.09-0.09)	0.032	1.18 (0.26-5.36)	0.831

Source: Field Data, 2015.

4.6.0 Discussion of results

The purpose of this was to determine the sanitation practices and preferences of residence in Lawra and Nandom Districts in the Upper West Region, Ghana. Factors influencing the practice of open defecation, reasons for the practice of open defecation, and relationship between open defecation and socio-demographic and economic factors were examined as well as implication of open defecation in relation to the attainment of MDG on sanitation in Ghana.

Using data from the survey, it was found that a significant portion (34%) of the respondents practiced open defecation which is much lower than the regional figure of 79% and slightly higher than national average figure of 24% (WSMP, 2008). The variation could be due to the

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difference in the time periods, it could also be attributed to the efforts made by both Government and NGOs to solve open defecation problem in the area. Another factor could be the consideration of dig and burry, pan latrines and fixed point pit latrines with lids as improved methods of defecation in this study. This percentage (34%) of open defecation in these particular districts is highly unacceptable in this twenty-first century because, the effects of open defecation on the wellbeing of people can be devastating and this cannot be easily resolved until everyone has toilet to use (Benny, 2009). Many practiced open defecation because of the type and the nature of toilet facility found in the districts. The common one is the pit latrine (32%) followed by VIP (16%) which are normally unhygienic, unclean, smelly, unhealthy and sub-standard and undesirable for human use (Issaka, 2007). This is why over 80% of the respondents said they were not satisfied with their current places of defecation and thus preferred a better facility, and is manifested in the people's choice of preferred toilet type in which only 7% of the respondents chose pit latrine.

It is however surprising that majority of the respondents chose KVIP/VIP (67%) as the preferred facility type but it is all because it is relatively better than the pit latrines in terms of quality and comfort and relatively cheaper compared with water closets/flush toilets which were only chosen by 9% as their preferred toilet type. Pit latrine being one of the causes of open defecation in the districts manifest in reasons why people practiced open defecation. Thus a significant proportion (43%) of respondents said they practiced open defecation because of the nature of the latrines found around them; 'closest latrine was too dirty' was the third highest reason with 16% respondents and 'closest latrine not safe' was the first highest reason with 27% respondents. Over half (56%) of the respondents said a toilet/latrine should be clean weekly, 42% of the respondents think it should be maintained/ cleaned daily, and those who think it should be

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maintain/clean monthly and those who think it should not be maintained/cleaned at all recorded 1% each. For those in charge of maintenance, 51% of the respondents said it is the responsibility of the females, 42% of the respondents said it is the responsibility of both males and females and only 7% of the respondents said it is the responsibility of males. This is in line with findings of Mariama (2010) which stated that, it is the responsibility of women in most African societies to see to it that household latrines are emptied when full and kept clean for daily use. This tedious task involve opening of the storage facility, scooping out the smelly content, digging and disposing the content into the pit.

The significant proportion (84%) of dissatisfaction with open defecation and unfit pit latrines indicates the districts readiness for adoption of open defecation free (ODF) and the fact that majority (85%) chose KVIP/VIP as the preferred toilet type indicates that there is high demand for it. Communities, Non Governmental Organisations (NGOs) and Government should therefore intensify their campaigns on sanitation by using appropriate and effective communication strategies (for example social marketing and entertainment education) and media (community durbars, radios and television) and. Government and Non Governmental Organisation should create market for KVIP/VIP by researching into improving its quality and comfort, training more artisans to meet the high demand and by making the constructional materials accessible to those who need them.

In the area of sex and open defecation, the study found that the percentage of people within the male category that practiced open defecation was slightly higher (37%) than those who practiced open defecation within the female category (30%). This could be attributed to the fact that women hate open defecation and is because they suffer the consequences more than their male counterparts. Women therefore used toilet facilities for the sake of comfort, convenience, and

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security (Spencer, 2012). Women also practiced less open defecation because they attached more seriousness to the religious teaching especially Islam that states that women should clean their genitals with clean water (which is not contaminated with urine and faeces) (Mariama, 2010 and Overall, 2007). Women use complex clothes, they are more sensitive to messiness and also thought to value their physically privacy more than men. Therefore they need more time and greater privacy to free themselves and using of toilet facility will definitely serve these purposes more than shitting outside and this is one of the reasons why women practice less open defecation compared to men (Overall, 2007). Men should be the main target or should be given more attention when sensitizing the communities against open defecation since they recorded high percentage in terms of practicing open defecation.

With regards to open defecation and age, it was observed from the study that, the percentage of those that practiced open defecation within ages 41-60 and 60 and older was almost twice thus 41% and 39% respectively compared with those within ages 18-40 (24%). This finding confirms that of Donsah (2013) and Albet (1996) which stated that youth are more likely to adopt an innovation than older people and contrary to the findings of United Nations (2006), Karn et al (2003) and Spencer (2012) that stated that older people are more likely to adopt sanitation innovations and construction of household latrines than youth because of the long time accumulation of wealth and experience regarding sanitation and health. Another reason why older people practiced open defecation more than the youth is fear of falling into the pit latrines which will make them go mad, become temperamental or die early (Roundy, 1979). In most African societies it is the elderly people that hate mentioning the word ‘shit’ in their local languages and the discussion of the effects of shit or anything related to shit, this could therefore be another reason why they practiced open defecation more than the youth (Mariama, 2010).

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Here again, sanitation campaigns should focus more on older people (ages 41 and older) since they practiced open defecation more than the younger age grouping (18-40).

The study also examined religion and the practice of open defecation in Lawra and Nandom districts. 33% of Christians practiced open defecation compared with others (non Christians) which comprised of Moslems, African Traditional Religion and those who did practiced any religion at all (42%). The non Christian group was the minority yet they recorded the highest percentage in terms of practicing open defecation. Even though this study did not delve into why the non Christians practiced more open defecation but Roundy, 1979 explained this in relation to certain African traditional beliefs. These include the belief that; pregnant women are more likely to lose their unborn babies through the use of latrines, heat from latrines is very dangerous and can killed and that witches can easily bewitched people through their faeces and latrines make it easier for them. Christians and Moslems are less likely to practiced open defecation because they don't want to disobey God as the teachings from their leaders discourage them from shitting near the Churches and Mosques. Their religious books also prohibit them from worshiping if they are not clean and pure (Mariama, 2010). More education is needed to disabuse people's minds from such beliefs that promote the practice of open defecation and discourage the adoption of open defecation free. The education should focus more on those with African Traditional Religion and those without religion.

Marital status was categorized into three; single, married, and divorce/separation, 13% of the single practiced open defecation against 37% of the married and 34% of the divorce or separation. The single recorded least because majority of them could be students and might have had knowledge regarding open defecation and its consequences. More of the sanitation

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programme should target the married and/or the ever married people in order to improve sanitation situation in the districts.

There are clear wide gaps regarding the practice of open defecation among the educational categories; never 52%, basic 21% and secondary/tertiary 5%. This wide gap existed between those that have never been to school and those with formal education because education enables people to know the importance of using toilets; they also gain knowledge regarding the use and maintenance of toilets. Therefore education is very important if we want to improve sanitation in every society especially in the rural areas (Arku, 20210). People or areas with knowledge are less likely to be infested with the infectious diseases such as cholera than those with low knowledge (Kaltenthaler et al, 1995). The rate at which people adopt innovation increases with formal education (Chandra et al, 1999, and Adesope, et al, 2012). Herbert 2010 even considered education as one of the influential factors of innovators. Innovation spread faster among those educated than the non educated ones, therefore the higher the education the faster the rate of adoption (Cain and Mittman, 2002). The results of the study indicates that those with basic education was 75% less likely to practice open defecation and 95% of those with secondary and/or tertiary education less likely to practice open education compared with those without any formal education. This finding confirms that of Spencer (2012) which states that a number of household latrines/toilets constructed by people who had completed junior secondary school had more than seven times increase by those who completed secondary school and had more than 25 times increase by those who had completed tertiary. Another reason why educated people were less likely to practice open defecation is the respect and recognition they have gained from the society and may not want to lose it through open defecation and also the fact that their certificates would have earned them better jobs from which a lot of wealth would have been

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accumulated for construction of toilet/latrine (Spencer, 2012). To reduce the rate of open defecation in the districts, the communities should organize non formal education for the adult illiterates in the societies and government and NGOs should embark on policies that will encourage all children under school going age to enroll and stay in school to complete at least basic school.

For economic activities, majority of those who practiced open defecation were engaged in farming (46%) compared with 6% in self employed and 0% in formal employed. This is so because of the nature of the jobs the men in the study districts are involved in. Majority of the people are farmers and do spend much of their time in the bush and open defecation is described as best for certain jobs such as fetching of fuel wood, fodder for animals, grass for thatch, farming and datum (Pugh, 2009). To solve the sanitation problem, government and other able bodies should assist people to attend higher schools such that they will get certificates that will enable them gain employment into the formal sector. Those that will not get the opportunity of working in the formal sector should also be assisted to establish their own businesses like bee keeping, guinea fowl rearing, shoe manufacturing, shea-butter processing, soap making, and so on and with this they will in turn employ other people.

In examining the association between socioeconomic status (wealth index) and open defecation, majority (50%) within the poorest group practiced open defecation and only 13% within the least poor practiced open defecation. Majority of the poor people practiced open defecation because they cannot afford to construct a household latrine and/or pay in order to access the services of private or public toilet especially those living in rural and slum areas unless they are assisted by able bodies and organization (Dale, 2009, Nonhlanhla, 1996, Ron, 1982). Economic hardship therefore prevents many from adopting household latrines and consequently leads them to

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practice open defecation (Kazi, 2008). The few among the poor who have tried constructing household latrines, built them outside their main homes with their doors facing away from the homes. This is because the latrines are poorly constructed and as such very difficult to maintain. They usually add more problems than they intend solving. For example, the nature of these latrines are such that, they expose the faeces to flies and other creatures, producing odour and maggots, which often make the inhabitants uncomfortable to live (Kazi, 2008). Rich or wealthy people are able to afford and enjoy the comfort of expensive but quality latrines or toilets in their homes whilst poor people are more likely to have cheap but poor quality latrines in their homes and for that matter will not be able to safe guard their health and also, may not be able to avoid taking contaminated food and water (Issaka, 2007 and Shuaib et al, 2012). The poor in the communities should be identified and assisted by either subsidizing the cost of a household latrine for them or providing them with latrines without any cost. They can also be empowered economically to enable them pay for the construction of their own household latrines or toilets and/or pay to access the services of private and public toilets.

In finding the significance of the relationships between the socio-demographic and economic factors and open defecation, the study shows that sex, religion and marital status had no statistically significant relationship with open defecation, age and wealth were significantly associated with open defecation in bivariate analysis but not statistically significant when adjusted with other confounding factors, and educational and economic status were statistically significantly associated with open defecation in both the adjusted and unadjusted logistic regression models.

The implication of these findings to the policy maker is that, if there is going to be a programme that geared towards improving sanitation in the Lawra and Nandom districts of the Upper West

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Region in particular and Ghana at large especially reducing or eradicating open defecation, then it should target improving the formal education in the area. For example government should intensify its policy of Free Compulsory Basic Education Programme and if necessary extend it to the higher levels because the higher the level of one's education, the less likely he/she will practice open defecation. Non formal education can also be used to get some of the illiterate adults in the districts educated especially the older people (41 and older) since they are more likely to practice open defecation than the youth (18-40). If formal education is expensive or will delay the process of achieving open defecation free within a short period of time, another policy option could be drawn to get more of the people in the districts into other sectors of employment other than farming. For example the Youth Employment Programme can be used to train people in trade and vocational skills like dress making, soap making, masonry, carpentry, tie and dye/batik making, animal keeping and so on. This will enable most of the people gain employment into both formal and private sectors and others can be employees of their own.

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CHAPTER FIVE

Summary of Findings, Conclusions and Recommendations

5.0 Introduction

The purpose of the study is to determine sanitation practices and preferences in the Lawra and Nandom districts, access factors influencing open defecation in the districts, examine their reasons for open defecation, access the association between socio-demographic and economic factors and open defecation and discuss the implication of open defecation in relation to the attainment of MDG on sanitation in Ghana. This chapter will therefore deal with the summary of the results of the study and provide the basis for the recommendations and conclusion of the study.

5.1 Background characteristics of respondents

The study took place in two districts from the Upper West Region, Ghana, and majority of the respondents were from Lawra district (52%) whilst the rest of the 48% of the respondents came from Nandom district. The study showed that the male respondents were the majority since they constituted 55% of the respondents, whereas the remaining 45% represented the female respondents. The study also found that majority of the respondents were within ages 18-40 and represented 39%, followed by ages 41-60 with 34% and the least was within ages 61 and older with 27%. The study further indicated that, majority of the respondents had no formal education (52%). Those with basic educational qualification represent 31% and those with secondary and/or tertiary education as their highest educational qualification were 18%.

With regards to religion, the study pointed out that Christians were the majority as they recorded 86% of the total respondents and the remaining 14% was for 'Other' which comprise of

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Muslims, African Traditionalists and those without religion. The study also found that respondents who were married constituted the majority with 86%, 15% was for divorce/separation and 10% for single. The study also disclosed that overwhelming majority (68%) of the respondents were engaged in farming as their main economic activity and the rest of the 32% was for self employed, formal employed and 'other'.

5.2 sanitation practices and preferences of the respondents

The study found that 34% of respondents in Lawra and Nandom districts practiced open defecation. Those that did not practice open defecation were 66% of the total respondents. This was also reflected in response to the usual place of defecation. Majority of the respondents used improved places for defecation and they constituted 66%. These places included flush toilets, KVIP/VIP toilets, and pit latrines. Whilst those used unimproved places for defecation were the minority with 34% respondents which also included uncompleted buildings, gutters, bush/open places, and the use of robber bags. In the case of maintenance of toilet/latrine, majority of the respondent (56%) expresses their thought that a latrine/toilet should be maintained weekly, 42% of the respondents also expressed their thought that it should be maintained daily where as 2% thought it should be maintained monthly or no maintenance at all. For those responsible in the maintenance, the study showed that a little over half (51%) of the respondents thought women are solely responsible for the maintenance of household latrines, 42% thought is the responsibility of both male and female and only 7% thought is the responsibility of only men.

The study revealed that accessibility was the main reason why majority (73%) of the respondents practiced open defecation. The reasons were as follows; 'closets latrine not safe for use', 'open defecation was the only option', 'closets latrine was too far', 'closest latrine was too expensive',

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'closest latrine queue too long', and 'open defecation was free of charge'. Attitudinal reasons on the other hand were also comprised of 'closest latrine being too dirty to use', 'open defecation was conveniently located', and 'I don't know'. This was the least with 27% of the total respondents. The study disclosed that 84% of the respondents were not satisfied with their current place of defecation, it is also indicated that 85% of the respondents preferred another toilet facility to the current one being used. The study further indicates that majority (67%) of the respondents chose KVIP/VIP as their preferred toilet type, 9% chose WC/water closest, 7% chose pit latrine and not applicable represented 16% of the total respondents.

5.3 Associations between open defecation and socio-demographic factors

The findings of study identified sex and religious status of respondents to have no any statistically significant association with open defecation in both adjusted and unadjusted odds ratios. The findings also showed that age, marital status and wealth of respondents had statistically significant association with open defecation in unadjusted odds ratio and had no statistically significant association with open defecation in multiple logistic regression model. The study however indentified educational status and economic status of respondents to have statistically significant association with open defecation in both adjusted and unadjusted odds ratios.

5.4 Limitations of the Study

In every research, there are bound to be associated limitations. This was a cross-sectional study and as such inherits all the limitations associated with cross-sectional studies. In addition to this, due to time and resource constraints, a lot more people could not be sampled. This could possibly

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reduce the power to observe any statistical significant associations between some of the variables and open defecation.

5.5 Conclusion

The study eventually concludes that, open defecation is a serious phenomenon in the Lawra and Nandom districts of the Upper West Region in northern Ghana. A high proportion of them continue to defecate in the open. They are therefore susceptible to the effects of open defecation such as cholera outbreaks, and increases in the cases of diarrhea, dysentery, and other diseases associated with poor sanitation. The common places used for open defecation in the districts are bush, open places, uncompleted buildings, gutters and the use of plastic bags. Pit latrines are the most common toilet facility found in the districts and most of them are poorly constructed, difficult to clean, have very bad odour and uncomfortable to use. Therefore over half of the people with latrines in the area don't clean them daily and women were mainly found to be responsible for the maintenance of latrines in the districts.

Inaccessibility to good toilet facilities is the main reason why people practiced open defecation in the district. Other reasons respondents gave for practicing open defecation were the closest latrines were too dirty to be used, cost of construction of latrines and fees for accessing private or public toilet becomes difficult for most people in the area to afford, some of the available latrines were too far to access and other latrines which were closer were not safe to be used. Therefore open defecation was the obvious option so far as it was found convenient and free of charge.

There was a clear demonstration that, the people in the districts were not happy about the sanitation situation in the area, since majority of them expressed their dissatisfaction of the open

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defecation practices in the districts. They have therefore identified KVIP/VIP latrines as better option for use.

Final conclusion is that, sex, age, religion, marital status and wealth are factors that do not influence the practice of open defecation in the districts since they found to have no statistically significant relationship with open defecation. But education and economic activities are factors that influence open defecation in the district since they are found to have statistically significant relationship with open defecation. It is good to note that some of these socio-demographic factors were partially insignificant where as others were fully insignificant. For instance, marital status, wealth and age were statistically significant at bivariate analysis but were not statistically significant when confounded with other factors. But sex and religion were not statistically significant at both adjusted and unadjusted odd ratios.

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5.6 Recommendations

In order to improve sanitation situation and for that matter reduce the practice of open defecation in the districts, there is the need for community dialogue between residents, sanitation service providers, and community leaders when new sanitation initiatives are to be undertaken. The poor or uncomfortable nature of pit latrines and the negative consequences of open defecation need to be thoroughly explained to community members before other alternatives can be explored or community members may feel they are not being listened to.

Government, Non Governmental Organisations and other able bodies should construct shared or public sanitation facilities in communities where none exist and increase the number in communities where such facilities are in existence (but not sufficient) to service the households without latrines and visitors. Community members should come together and mobilize resource

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to put up community latrines for visitors and other members without latrines. These have potential to reduce the practice of open defecation in the area and to offer enough time for the poorest in the communities to mobilize resources to construct their own latrines. These will also give households with full or collapsed pit latrines more time to construct better, clean and comfortable toilets.

Careful construction and management of sanitation facility is needed to prevent dangerous and unusable facilities. Poor construction may have contributed to the dissatisfaction with sanitation facilities in the districts especially the pit latrines and some of the KVIP/VIP toilets. There is a potential market for building and maintaining high quality KVIP/VIP latrines, therefore stakeholders or sanitation providers should take that into serious consideration when planning to improve sanitation in the districts by improving the quality, training more artisans to provide the services for members in the districts and making the materials accessible and affordable to community members.

Government, Non Governmental Organisations, and religious organizations should make formal education accessible and affordable to all children under school going age in the districts since education is one of the factors that can reduce or eliminate open defecation in the districts. Community members should also send their wards to school and do well to contribute their quota towards the success of their wards education. The stakeholders should not only put emphasis on enrolments but extra effort should be made to see to it that pupils aspire for higher educational qualifications and certificate that will offer them great chances of gaining better employment into both public and private sectors. This will enable them accumulate wealth for construction of their own latrines and/or pay to access the services of both public and private toilets. It will also

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enable them gain respect in society or assume societal positions that will deter them from practicing open defecation.

Adult members in the communities and school dropouts should learn trade or vocation to enable them also gain employment into the private and public sectors especially the manufacturing and construction firms or become employees of their own and can even employ others from the community. With this, there will be resourceful enough to construct their own latrines/toilets or pay to access the services of private or public toilets. Policy makers and stakeholders should therefore create an enabling environment for the people to learn such vocations. Graduates and those with vocational skills who do not gain employment should be assisted to establish their businesses.

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APENDIX A

A. BACKGROUND

Date:……

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NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
1	Name of District	Lawra……..1 Nandom……..……2	
2	Name of community	…… ……	
3	House Number	…… ……..	
4	Name of Respondent	…… ……	
5	Phone Number of Respondent	…… ……	
6	What is your age in complete years?	AGE……..	
7	Sex	Male…….....1 Female……...2	
8	Ethnicity	Dagare…….,…..1 Wale……..2 Sisala…….……3 Dagomba ……..4 Ahante……...5 Hausa ……...6 Gonja…….....7 Ewe……8 Kokomba……...9 Ga……10 Fante……11 Others (Specify)……,….12	
9	What religion do you practice?	Christianity…….....1 Islam…….……2 African Traditional Religion……..…3 None……...……....4 Other (Specify):…….……5	

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NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
10	What is your marital status	Single……..1 Married……..2 Divorced……3 Widowed……...4 Cohabiting…….....5 Separation……..6	
11	What is your level of formal education?	Basic School…….....1 Senior HighSchool..……..2 Tertiary (College/University/polythecnic…3 Never been to school……..…….……4 Other (specify)…….....5	
12	Major economic activity of respondent	Farming……..1 Self-employed……2 Government Employee……..3 Private Employee……...4 House Wife…….....5 Retired……...6 Others Specify……7	
13	Occupation	Unemployed……1 Trader…….....2 Farmer…….3 Artisan…….4 NGO……5 Government employee……6 Student……...7 Others (specify)……..8	
14	Ownership Status of the House:	Own……1 Rented……2 High Purchase ……3	
15	Type of Dueling	Block house……1 Mud House……2 Wattle house……...3 Mat house……...4 Stones……5 others specify……6	

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NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
16	TOILET FACILITY: Where do you usually go for toilet? (IF LATRINE: PROBE FOR THE TYPE)	No Facility/Bush/Field……1 Uncompleted building…… 2 Gutters……..…..3 Bucket/Pan……..….4 Plastic Bags……..5 Own Flush Toilet……6 Shared Flush Toilet……7 Own Traditional Pit Toilet……..8 Shared Traditional Pit Toilet……..….9 Own (Vip) Latrine……10 Shared (Vip) Latrine…….. ……11	**If 6 to 11 ➔ 19**
17	Was the faeces covered after shitting? (**only asked those who chose 1-5**)	Yes…….....1 No……...2 NA……..3	
18	Reasons for using open defecation	Other latrines are too far away……1 Closest latrine was too dirty……2 Closest latrine was too expensive……3 Closest latrine not safe…….....4 Closest latrine queue too long…….....5 It is conveniently located…….....6 It is free of charge……...7 I don't know……8 That is the only option I have…….....9 Other…….....10 Did Not Answer……..……..11	
19	Who owes the used toilet facility?	Household……..……1 Community…….……2 Private person……..3 Shared by more than a household……..….4	
20	Have you heard of CLTS?	Yes…….....1 No……...2	
21	From which source did you hear it?	Government ……1 NGOs…….....2 Friends……3 Others Specify……4	
22	Are you satisfied with your current place of defecation?	Yes…….....1 No……..2	
23	Do you prefer another toilet facility to the current one being used?	Yes……..... ……...1 No…….. 2	**If 2 ➔ 25**

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NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
24	If Yes, please specify your prefer facility type	……	
25	How regular is the used facility maintained?	No maintenance……1 Fortnight…….....2 Daily……..…….3 Weekly……..…….4 Monthly……5 Yearly……6	

26	Who is responsible for the maintenance of a household latrine?	Male……..…….1 Female…….……2 Both……3	
27	Who is responsible for the construction of a household latrine?	Male……1 Female..……...2 Both male and female…….……3 Government..…….. 4 NGOs.……5	
NO.	**Household assets, income or expenditure**	CODING CATEGORIES	SKIP

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26	Who is responsible for the maintenance of a household latrine?	Male…….....1 Female…….……2 Both…….3	
27	Who is responsible for the construction of a household latrine?	Male…….1 Female..……...2 Both male and female…….……3 Government..…….. 4 NGOs..…….5	
NO.	**Household assets, income or expenditure**	CODING CATEGORIES	SKIP
28	Does your household have?	YES NO A Car/truck ……..1 2 A motorcycle……1 2 A Bicycle …….....1 2 Electricity…… 1 2 Solar light…… 1 2 A Refrigerator…….....1 2 A Television……1 2 Decoder/DVD/VCD……1 2 Radio…….....1 2 A Sewing machine…….....1 2 A Stereo system …….....1 2 An Electric iron/box iron……1 2 A fan…….....1 2 Telephone…….....1 2 An electric/gas stove……..……..1 2 A Donkey cart/push truck..……..1 2 Tractor……..1 2 Grinding mill…….....1 2 Kerosene stove……1 2 Personal Computer ……..1 2 Cattle…….....1 2 Sheep…….....1 2 Donkeys……..……1 2 Goats……....1 2 Pigs……...1 2 Horse……...……1 2 Rabbits……..1 2	

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APENDIX B

Table 1: Background characteristics of respondents

Variable	Number N=229	Percent
Type of defecation		
Open defecation, not covered	78	34.06
Open defecation, covered shit	11	4.8
No open defecation	140	61.14
Sex		
Male	127	55.46
Female	102	44.54
Wealth index		
Poorest	46	20.09
Poorer	47	20.52
Poor	45	19.65
Less poor	46	20.09
Least poor	45	19.65
Age group		
18-40	90	39.3
41-60	78	34.06
>61	61	26.64
Religion		
Christianity	196	85.59
Other	33	14.41
Marital status		
Single	24	10.48
Married	170	74.24
Divorced/Sep	35	15.28
Educational status		
Never	118	51.53
Basic	70	30.57
Sec/tertiary	41	17.9
Economic activity		
Farming	155	67.69
Self-employed	31	13.54
Formal employment	23	10.04
other	20	8.73
District		
Lawra	120	52.4
Nandom	109	47.6
Name of community		
Betaglo	34	14.85
Danko	26	11.35
Dazuur	41	17.9

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Nayirbog	36	15.72
Newtown	49	21.4
Yagra	43	18.78

Source; field data, 2015

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APENDIX C

Table 2: Percentage distribution of usual places where respondents go for toilet, ownership of toilet and other behavioral characteristics of respondents

Variable	Number	Percent
Usual place for toilet		
No Facility/Bush/Field	69	30.13
Uncompleted building	18	7.86
Gutters	1	0.44
Plastic Bags	1	0.44
Own Flush Toilet	3	1.31
Shared Flush Toilet	4	1.75
Own Traditional Pit Toilet	52	22.71
Shared Traditional Pit Toilet	21	9.17
Own (Vip) Latrine	23	10.04
Shared (Vip) Latrine	37	16.16
Was the faeces covered?		
Yes	11	12.64
No	76	87.36
Reasons for using open defecation		
Other latrines are too far away	10	11.49
Closest latrine was too dirty	14	16.09
Closest latrine was too expensive	4	4.6
Closest latrine not safe	24	27.59
Closest latrine queue too long	3	3.45
It is conveniently located	6	6.9
It is free of charge	3	3.45
Don't know	4	4.6
That is the only option I have	19	21.84
Household ownership		
Own	203	88.65
Rented	26	11.35
Type of duelling		
Block house	41	17.9
Mud House	188	82.1
Who owes the used toilet facility?		
Household	81	55.48
Community	21	14.38
Shared by more than a household	44	30.14
Have you heard of CLTS?		
Yes	226	98.69
No	3	1.31

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From which source did you hear of CLT?		
Government	108	47.58
NGOs	116	51.1
Friends	3	1.32
Satisfied with your current place of defecation?		
Yes	37	16.16
No	192	83.84
prefer another toilet facility to the current one		
Yes	195	85.15
No	34	14.85
Specify your prefer facility type		
Flush	3	1.31
KVIP lat	35	15.28
NA	36	15.72
Pit lat	16	6.99
VIP lat.	120	52.4
Wc	19	8.3
How regular is the used facility maintained?		
No maintenance	2	1.41
Daily	59	41.55
Weekly	79	55.63
Monthly	2	1.41
Who is responsible for the maintenance of a household latrine		
Male	17	7.42
Female	116	50.66
Both	96	41.92

Source; field data, 2015

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APENDIX D

Table 3: Percentage distribution of open defection by socio-demographic and other background characteristics of respondents

Variable	Not open defecation		Open defecation		P-value
	number	percent	number	percent	
Sex					
Male	80	63.0	47	37.0	
Female	71	69.6	31	30.4	0.294
Wealth index					
Poorest	23	50	23	50	
Poorer	32	68	15	32	
Poor	28	62	17	38	0.006
Less poor	29	63	19	37	
Least poor	39	87	6	13	
Age group					
18-40	68	76	22	24	
41-60	46	59	32	41	0.046
>61	37	61	24	39	
Religion					
Christianity	132	67	64	33	0.273
Other	19	58	14	42	
Marital status					
Single	21	87	3	13	
Married	107	63	63	37	0.059
Divorced/Sep	23	66	12	34	
Educational status					
Never	57	48	61	52	
Basic	55	79	15	21	<0.001
Sec/tertiary	39	95	2	5	
Economic activity					
Farming	83	54	72	46	
Self-employed	29	94	2	6	<0.001
Formal employment	23	100	0	00	
other	16	80	4	20	
District					
Lawra	73	61	47	39	0.087
Nandom	78	72	31	28	
Name of community					
Betaglo	24	71	10	29	
Danko	17	65	9	35	
Dazuur	23	56	18	44	0.408
Nayirbog	21	58	15	42	

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Newtown	37	76	12	24	
Yagra	29	67	14	33	

Source; field data, 2015

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APENDIX E

Table 4: Adjusted and unadjusted Odds raios showing the factors associated with open defecation in Lawra and Nandom districts in Northern Ghana

Variable	number	Unadjusted OR	P-Value	Adjusted OR	P-value
Sex					
Male	127	ref		ref	
Female	102	0.74 (0.43-1.29)	0.294	0.72 (0.35-1.5)	0.383
Wealth index					
Poorest	46	6.50 (2.31-18.31)	<0.001	2.09 (0.56-7.87)	0.275
Poorer	47	3.05 (1.06-8.76)	0.039	0.99 (0.26-3.68)	0.984
Poor	45	3.95 (1.38-11.27)	0.010	2.51 (0.68-9.32)	0.168
Less poor	46	3.81 (1.34-10.86)	0.012	2.24 (0.59-8.52)	0.237
Least poor	45	ref		ref	
Age group					
18-40	90	ref		ref	
41-60	78	2.15 (1.11-4.16)	0.023	0.80 (35-1.84)	0.598
>61	61	2.00 (0.99-4.05)	0.053	0.83 (0.33-2.08)	0.688
Religion					
Christianity	196	ref		ref	
Other	33	1.07 (0.41-2.76)	0.897	1.52 (0.72-3.22)	0.275
Marital status					
Single	24	ref		ref	
Married	170	4.12 (1.18-14.37)	0.026	2.76 (0.60-12.58)	0.190
Divorced/Sep	35	3.65 (0.90-14.76)	0.069	2.98 (050-17.79)	0.232
Educational status					
Never	118	ref		ref	
Basic	70	0.25 (0.13-0.50)	<0.001	0.02 (0.09-0.44)	<0.001
Sec/tertiary	41	0.05 (0.01-0.21)	<0.001	0.09 (0.01-0.50)	0.006
Economic activity					

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Farming	155	ref		ref	
Self-employed	31	0.08 (0.02-0.34)	0.001	0.07 (0.01-0.35)	0.01
Formal employment	23	(empty)		(empty)	
other	20	0.29 (0.09-0.09)	0.032	1.18 (0.26-5.36)	0.831
District					
Lawra	120	ref		ref	
Nandom	109	0.62 (0.35-1.07)	0.088	1.36 (0.64-2.88)	0.425

Source ; field data, 2015

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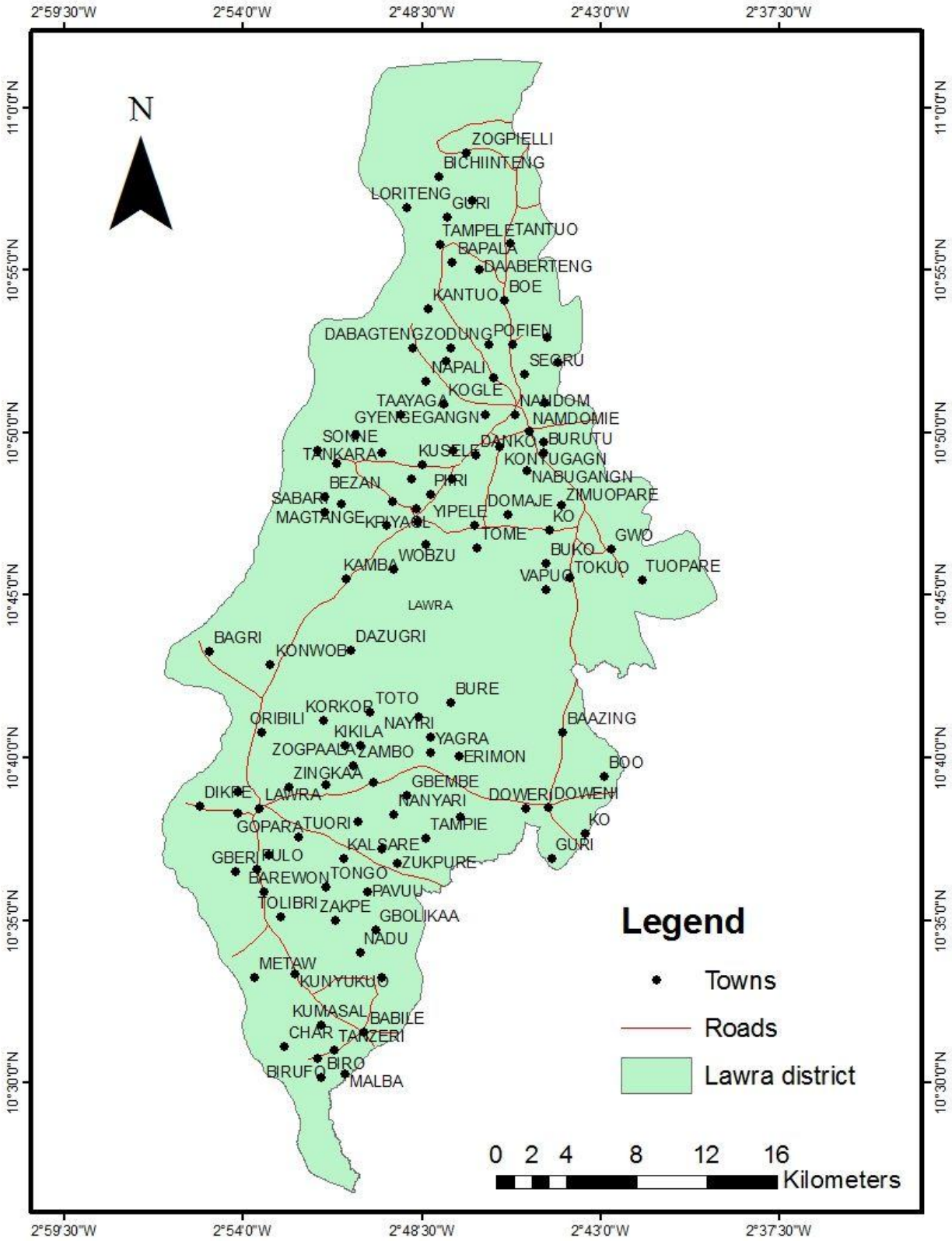
APPENDIX F
MAP OF STUDY DISTRICT



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