UNIVERSITY OF CAPE COAST

ASSESSING URBAN-RURAL DIFFERENCES IN ACHIEVING THE MILLENNIUM DEVELOPMENT GOAL FOR SANITATION: THE CASE OF NEW JUABENG MUNICIPALITY, GHANA

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BY

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SEPTEMBER, 2015

DECLARATION

Candidate's Declaration

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

Candidate's Name: Godlove Adjei

Signature:…… Date…….

Supervisors' Declaration

We hereby declare that the presentation and presentation of the thesis were supervised in accordance with guidelines on supervision of thesis laid down by the University of Cape Coast.

Principal Supervisor's Name: Professor Stephen B. Kendie

Signature:…… Date:……

Co-supervisor's Name: Dr. Simon Mariwah

Signature:…….. Date……

ABSTRACT

In spite of many decades of development planning and assistance, Ghana still has low sanitation coverage. This study therefore assessed the urban-rural variation in sanitation service delivery in the New Juabeng Municipality. Descriptive study design was adopted, using a mixed method approach to select two communities (Koforidua and Akwadum) to represent urban and rural communities respectively. Systematic and purposive sampling methods were adopted to select respondents for the study. These included 377 household heads, staff from the Municipal Environment Health Unit and other opinion leaders. The results showed that though sanitation coverage was generally low within the Municipality, there was a huge sanitation gap between urban and rural communities. The sanitation coverage for the urban communities was 15.1 and 2.5 percent for the rural areas. It also came out that implementation of sanitation projects was driven by low budgetary allocation to the sector and inadequate data for planning and implementation. Consequently, most people in the municipality preferred to have their own improved pit latrines and were willing to pay for improved sanitation facilities or services.

It is recommended that the Municipal Assembly should increase investment in sanitation and embark on enhanced social marketing for sanitation. Additionally, there should be general public education and sensitization on the importance of good hygiene including the use of improved sanitation facilities among rural households for improved health status.

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I wish to thank Mr. Richard Amfo- Outu for the day to day advice and encouragement he gave me in the entire period of this work. Also, to my wonderful mother Miss Agnes Love Owusu, my fiancée Susana Kiertey and the Association of African Universities (AAU) for all the financial assistance offered me.

To my family, I say God bless you for the understanding and love you showed to me during this period.

DEDICATION

To my dearest mother, Agnes Love Owusu, former Deputy Director, Department of Community Development, Eastern Region - Koforidua.

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LIST OF ABBREVIATIONS

ANOVA	Analysis Of Variance
AAU	Association of African Universities
ATP	Ability to Pay
AIDS	Acquire Immune Deficiency Syndrome
BMJ	British Medical Journal
BOT	Build Operate Transfer
BBC	Behaviour Change Communication
CLTS	Community-Led Total Sanitation
CWSA	Community Water and Sanitation Agency
CREPA	Capitol Region Emergency Planning Agency
CVM	Contingent Valuation Method
FAO	Food and Agriculture Organisation
GDHS	Ghana Demographic Heath Survey
GSS	Ghana Statistical Service
GHS	Ghana Health Service
HIV	Human Immune Virus
IGF	Internal Generated Fund
IWA	Institute of World Affairs
JMP	Joint Monitoring Programme
KVIP	Kumasi Ventilated Improved Pit
KAP	Knowledge, Attitudes and Practice
MDG	Millennium Development Goals
MMD	Metropolitan Municipal and District Assemblies
NGO	Non-Governmental Organisation

NJMA	New Juabeng Municipal Assembly
ODI	Overseas Development Institute
OD	Open Defecation
ODF	Open Defecation Free
OPD	Out Patient Department
PHAST	Participatory Hygiene and Sanitation Transformation
PD	Participatory Development
PPP	Public-Private Partnership
SSA	Sub-Saharan Africa
SPSS	Statistical Package for Social Sciences
TB	Tuberculosis
UN	United Nations
UNICEF	United Nations International Children Emergency Fund
UNDP	United Nations Development Programme
VERC	Village Education Reserve Centre
VIP	Ventilated Improved Pit
WHO	World Health Organisation
WSMP	Water and Sanitation Monitoring Platform
WASH	Water Sanitation and Hygiene
WSSCC	Water Supply and Sanitation Collaboration Council
WSP	Water Supply Papers
WEDC	Wisconsin Economic Development Corporation
WTO	World Toilet Organisation
WC	Water Closet
WTP	Willingness to Pay

CHAPTER ONE

INTRODUCTION

Background to the study

Access to improved sanitation facilities is a fundamental human right that safeguards health and human dignity. Every human being deserves to be protected from the many health problems- including dysentery, cholera and other serious infections- posed by poor disposal of excreta. Children, usually the first to fall sick and die from these diseases, deserve better. Their rights to an adequate standard of health are enshrined in the Convention on Rights of the Child, a treaty ratified by nearly every country in the world (UNICEF, 2000).

Meanwhile, there are many improved sanitation options throughout the world, including various dry and water based systems that can improve the health and dignity of users. "Improved sanitation" is defined by WHO as facilities that ensure hygienic separation of human excreta from human contact (UNICEF, 2006). Included are flush and pour flush toilets with piped sewer systems or septic tanks, soak away pits, ventilated improved pit latrines, pit latrines with slabs, and composting toilets. Not included in the improved definition are any of the above facilities that are shared between more than one household or are public facilities (UNICEF, 2006).

Subsequently, the United Nations General Assembly Fifty-Fifth Session Agenda 60 (b) in the year 2000 made some developmental declaration known as the Millennium Development Goals (MDGs) which spelt out some

development indicators to be achieved specifically by most developing countries by the year 2015 (United Nations General Assembly Report,2000). The United Nations reaffirmed its support for the principles of sustainable development, by adopting a new ethic of conservation and stewardship. Thus, Goal 7 of the MDGs seeks to integrate the principles of sustainable development into countries policies and programmes and reverse the loss of environmental resources. Goal 7, Target 10, aims to "Halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation".

This MDG Target requires providing around 1 billion people with access to sanitation, something that has become a daunting task even though there have been a lot of efforts to improve it. Current trends show that meeting the target is almost impossible, especially in most countries in Sub-Saharan Africa. This is reaffirmed by 2004 publication from the WHO/UNICEF Joint Monitoring Programme (JMP) on global statistics for water and sanitation, which shows that, based on the coverage figures from 1990 to 2002 the sanitation target of halving the number of underserved people worldwide by 2015 will not be met without a dramatic acceleration in the provision of services. For example, sanitation coverage in 2011 was 64 percent which means that the world still remains off track to meet the MDG sanitation target of 75 percent. If current trends continue, it is set to miss the target by more than half a billion.

Across the globe, Africa still remains the continent with the lowest sanitation. About 60 percent of the people lack access to proper toilet facilities (UNICEF, 2008). The WHO/UNICEF (2008) found that the proportion of the

population using an improved sanitation facility throughout Africa was 38 percent in 2006. The situation in Sub-Saharan Africa (SSA) is even worse in terms of improved sanitation coverage. Only 30 percent of the population in Sub-Saharan Africa (SSA) use improved sanitation and hygienic facilities, which is the lowest figure for any region of the world (WHO/UNICEF, 2012). Northern Africa had the largest whiles Western Africa had the lowest with 68 percent and 24 percent respectively.

In terms of open defecation, the number of people practicing open defecation decreased to a little over 1 billion, but this still represents 15% of the global population (WHO/UNICEF, 2013). Open defecation continues to be practiced by almost half the population in Southern Asia and more than a quarter of those living in Sub-Saharan Africa (UN, 2008, p41). Open defecation is prevalent in areas without adequate sanitation infrastructure, and besides the obvious ethical implications for so many people lacking basic necessities, open defecation creates multiple environmental and health concerns (WSSCC, 2012).

In Africa, open defecation is highest in Eastern Africa where 33 percent of the population does not use any type of sanitation facility. Eastern Africa saw a 25 percent decline in open defecation since 1990- from 44 to 33 percent. However, one in four people in Africa still practice open defecation (WHO/UNICEF, 2008). As the majority of the urban drains are open, they often serve as defecating channel for households that do not have adequate sanitation facilities. In the year 2006, 20 percent of all households in Ghana practiced open defecation, reflecting the absence of toilet facilities in many dwelling places in Ghana (WHO/UNICEF, 2008).

Sanitation is an important aspect of human life as both its demerits and benefits are enormous. The Overseas Development Institute (ODI) in 2006 asserts that, diarrhoea kills more young children than malaria and tuberculosis combined globally, and that alongside poor water quality, lack of sanitation and poor hygiene are the main culprits. Good sanitation however helps prevent a lot of diseases such as cholera, diarrhoea, malaria just to mention a few. It also helps to create physical environment that enhances safety, dignity and self-esteem .Safety issues are predominantly imperative for women and children, who are otherwise at risk with regards to sexual harassment and attack when defecating at night and in secluded areas (UNICEF, 2008).

"The developed world or international community is making several efforts and attempts to provide improved sanitation facilities to the people of developing countries" (Sepala, 2002).For example, there was a major move in 1981-1990 when it was declared as the International Drinking Water Supply and Sanitation Decade with the aim of providing potable water and sanitation to all. To highlight the importance of sanitation, the UN General Assembly also declared the year 2008, the International Year of Sanitation. Despite these efforts, the WHO/UNICEF Joint Monitoring Programme (JMP) affirms that, meeting the MDG on sanitation is almost impossible especially in most developing countries.

Thus, Sub-Saharan Africa accounts for 565 million of the 2.5 billion people without access to improved sanitation (toilet) worldwide, and a vast majority of these people live in rural areas and peri-urban slum settlements, where currently there is a great lack of access to proper sanitation and hygienic facilities (Szántó, Letema, & Van Lier , 2012). The sanitation target

for Ghana following the MDGs for use of improved sanitation and improved drinking water was 53 and 78 percent respectively with 1990 as the base year, Ghana Water and Sanitation Monitoring Platform (WSMP, 2008).Use of improved drinking water was 83.8 percent and 12.4 percent for improved sanitation in 2008 (GDHS,2008).This indicates that, according to the JMP definition for access to improved drinking water and sanitation, Ghana continues to be on track to meeting the MDG target for use of improved drinking water, which is 78 percent, but the same cannot be said about improved sanitation (toilet) facilities.

Across the globe, vast spatial variations exist between rural and urban areas when it comes to the provision of improved sanitation. In Ghana, the improved sanitation (toilet) facility for urban coverage was 17.8 percent whilst that of the rural coverage was 8.2 percent with the total country's sanitation coverage being 12.4 percent in 2008 (JMP/GDHS, 2008). The low urban and rural sanitation coverage in Ghana among other things made the Government to request landlords in some urban and rural areas to provide toilet facilities in their houses before they rent them out. Perhaps the majority 71 percent of those without sanitation live in rural area, where 90 percent of all open defecation takes place. (UNICEF, 2013)

Problem statement

Even though access to sanitation facilities is a general problem for people in urban areas, the problem is more prominent in rural areas where little or no attention is often paid to environmental sanitation because most of the dwellers are poor and perhaps ignorant of the impact of the health challenges

of inadequate sanitation (Muronda, 2008; Abdul-Mumin and Siwar, 2009; Sarode, 2010).

In Ghana, the Community Water and Sanitation Agency (CWSA) is responsible for ensuring rural communities' access to improved water and sanitation facilities in order to bridge the gap between the former and their urban counterparts. The CWSA, is committed to effective facilitation of the provision of sustainable potable water and related sanitation services as well as hygiene promotion to rural communities and small towns through resource mobilization, capacity building and standards setting with the active participation of major stakeholders (CWSA, 2013)

The focus of CWSA has not only been on water. Hygiene and sanitation have been recognized as key components in the effort towards improving the lives of rural people. Though the delivery of sanitation facilities has been slow, CWSA has over the years improved access to decent sanitation facilities across the country with the construction of 67,253 household latrines and 4,252 institution KVIP latrines, making a total delivery of 71,505 latrines to communities and institutions (CWSA, 2013).

In spite of these interventions by the CWSA, the use of improved sanitation (toilet) facility was 17.8 percent in the urban areas and 8.2 percent in the rural areas (GDHS, 2008). The huge gap between rural and urban sanitation raises a number of concerns regarding the socio-political factors responsible for the sanitation gap between urban and rural areas; the nature of policies or interventions put in place in providing improved sanitation within urban and rural settlements; the challenges in providing sanitation within settlements and whether urban and rural residents have the same willingness to

pay for improved sanitation. It is against this backdrop that this study sought to use the New Juabeng Municipality in the Eastern Region to understand how the sanitation goal of the MDG is achieved by urban and rural communities.

Objectives of the study

The main objective was to assess the urban-rural differences in achieving the Millennium Development Goal for sanitation in the New Juabeng Municipality, Ghana.

Specifically the study sought to:

1. Examine the sanitation gap for urban and rural settlements in the New Juabeng Municipality;
2. Explore sanitation preferences among urban and rural residents of New Juabeng Municipality;
3. Evaluate the various interventions put in place for improved sanitation;
4. Assess residents' willingness to pay for improved sanitation; and
5. Examine the challenges in providing improved sanitation.

Research questions

1. What sanitation gap exists between urban and rural settlements within the New Juabeng Municipality?
2. What are the sanitation preferences of the urban and rural residents in the Municipality?
3. What are the various interventions put in place for improved sanitation?
4. Are residents willing to pay for improved sanitation?
5. What are the challenges in providing improved sanitation?

Significance of the study

This study provides insights into theoretical and practical issues, and recommends solutions to sanitation problems in rural and urban areas as well. The research develops a theoretical model for sanitation improvements in Ghana. In practical terms, it informs the academia of the preferences or priorities of toilet facilities that urban and rural dwellers have. The ultimate aim is that the outcome will serve as a source of reference for academics, researchers and students who are interested in further research of the subject investigated.

The output of the research would also be relevant to the New Juabeng Municipal Assembly in particular and the Government of Ghana in general as they would get to know the latest information on toilet facilities in the New Juabeng Municipality.

Depending on the results, they can put in the necessary strategies to improve access to toilet facilities; providing standard sanitation facilities to many people in developing countries is one of the MDG.

Organisation of the thesis

The thesis is organized into five main chapters. The first is the introduction, which focuses on the background to the study, problem statement, and objectives of the study, significance of the study and the organisation of the thesis. The second chapter presents relevant literature on the concepts and theories on the subject matter of the study and concluded with a conceptual framework. The third chapter presents the methodology of the study. It involves the study area, study design, contingent valuation methodology, and sources of data, target population, sample size, sampling

procedure and instrumentation. The chapter also discusses data collection, data processing and analysis. The fourth chapter deals with analyses of results and discussions of findings of the study, while the final chapter contains the summary, conclusions and recommendation of the study as well as areas for further research.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

Introduction

This chapter reviewed the literature on subject under investigation, including the theories and concepts underpinning the study and the conceptual framework.

Definition and components of sanitation

Sanitation is defined as the hygienic obligations observed by individuals to promote good health in the home and community. The World Book Encyclopedia (1994) defines sanitation as a field of public health which involves various efforts to control diseases. It enumerates sanitation activities to include personal cleanliness which helps one to protect oneself against diseases. This cleanliness includes food processing and distribution sewage treatment, control of air pollution and rodents' control.

Many conceptualizations of the term sanitation refer to it as simply the safe means of waste disposal (Kendie, 2002).Since the safe disposal of waste has a significant and substantial effect on human health, improvement on sanitation need to be viewed in a wider perspective. Adequate sanitation includes facilities whose presence and use reduce the chances of human conflict with potential food and water contaminating wastes. Among these are good personal hygiene, the safe disposal of human excreta, wastewater, animal droppings and garbage/rubbish. Proper disposal of human excreta includes improved ventilated pit latrine which control flies and odours (Kendie, 2002)

Sanitation is defined to encompass all those inter-related activities which in the long run ensure the sustained health of the family (Kendie, 1990).It is important to stress that good health results only when the facilities are effectively used. The effective use of sanitation facilities is a behavourial issue. This generally relates to hygienic behavior of people, especially in relation to the situation they are in or the people they are with. Hygiene is also defined as the practice of keeping oneself and one's surroundings clean in order to prevent the spread of diseases. Thus good hygiene behavior refers to a wide range of actions that promote good health .The hygienic actions may include eating healthy diet and washing hands after defecation. If sanitation facilities are insufficient, then there is the concomitant change in hygiene behavior (Kendie, 2002).

The World Health Organization (WHO) defines "improved sanitation" as access to personal sanitation facilities that are able to hygienically separate human waste from human contact (WHO, 2008). These include flush and pour-flush toilets that empty into a sewer, septic tank or soak away pit, as well as pit latrines with slabs, ventilated improved pit latrines (VIPs) and composting toilets. Unimproved sanitation includes no sanitation facilities at all, known as "open defecation", pit latrines without slabs, hanging toilets, buckets, and shared or public facilities of any type.

Concept of sanitation ladder

Another way of visualizing the technical aspects of sanitation system is the popular concept of a sanitation ladder which is often used to illustrate how people can move from simpler sanitation solutions to more advanced ones by climbing the rungs on a ladder (Wood, Sawyer, & Simpson-Herbert, 1998 and

Lenton, Wright & Lewis, 2005).

The concept of a "sanitation ladder" was introduced by WHO to show differing levels of sanitation access which gives more information than the dichotomous "improved/ unimproved "labels (WHO, 2008) .The lowest rung of sanitation ladder is open defecation. The next rung is some sort of unimproved sanitation facility, such as pit latrines with no slabs, trenches, and buckets. Next is an improved facility that is somehow shared- in this case the facility itself is adequate, but it is not considered improved access because it is shared between households or is a public facility. It is believed that when a toilet facility is shared among two or more households, safety, accessibility and cleanliness of the facility will be compromised (WHO/UNICEF, 2008). The top rung on the sanitation ladder is the improved sanitation facilities of personal flush toilet, pit latrines with slabs, and VIP facilities.

There is controversy over the dichotomous improved or unimproved category system because it does not consider movement along the bottom three rungs of the sanitation ladder to count towards overall improvement in the sanitation sector. Supporters of this definition argue the overall goal of improved sanitation should not be compromised, because the overarching goal is for 100 percent of the world's population to have access to personal hygienic sanitation facilities. Opponents of the two category system argue that governments and NGOs are restricted from supporting projects that would move populations up the ladder from open defecation to shared facilities, because this improvement is not reflected in the estimates of sanitation access. Most governments and NGOs have strong incentive to support and invest in projects that will increase the percentage of the population with access to

improved sanitation, because "improved" sanitation is what contributes to the MDGs (WHO, 2008).

Therefore, projects that do not contribute to the MDGs are not politically supported even though they are improving quality of life. In many urban environments, shared toilets and pit latrines are inadequate to fulfill the primary health function of a toilet that is, to ensure the safe disposal of human excreta so it does not contaminate hands, clothes, water or food and is inaccessible to flies and other disease vectors. In urban communities where there is high percentage of low income households it is not uncommon for each toilet to be patronized by scores of people. Tens of millions of households in informal settlements in Africa and Asia have access only to overuse and poorly maintained communal or public toilets (UN-Habitat 2003, p. 173).

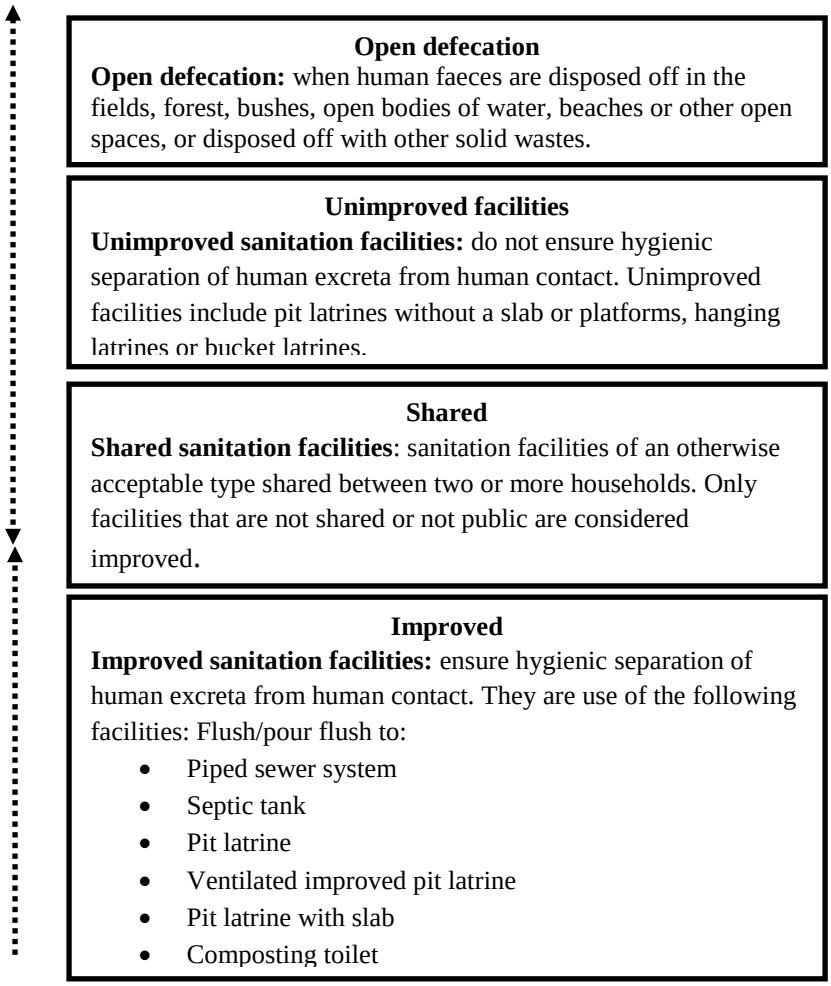

Figure 1 Sanitation Ladder
Source: WHO (2008)

Overview of the sanitation sector

Prior to the Water Decade (1980s), the United Nations estimated in 1980 that 1800 million people lacked access to safe water supplies and 3900 million lacked access to sanitation services. At the same time, the international community established as a common goal the provision of safe water supplies and adequate sanitation services to all the communities around the world. This meant that by 1990 everybody on this planet should have their basic needs met and should recognize the importance of hygiene and education for the

interruption of the water–disease cycle. Even though the goal was not accomplished, according to the United Nations Development Programme (UNDP) during the Water Decade approximately 750 million people obtained access to sanitation facilities and more than one billion people gained access to safe water. By the end of the decade and after two world conferences (New Delhi in 1990 and Dublin in 1992), the international community came to the conclusion that water and sanitation could no longer be regarded as simply social rights.

After the Dublin conference it was argued that water should be seen as an economic good because it had an environmental and a productive value. It was made clear that need was no longer a sufficient reason for the provision of water and sanitation to any community (Black, 1998 Cosgrove & Rijsberman, 2000). After the World Conference on Water and Sanitation held at The Hague, Netherlands in March 2000, the international community set a new common goal and published *World Water Vision: Making Water Everybody's Business.* The Vision proposes, by 2025, to achieve a world where everybody knows the importance of hygiene and education and enjoys safe water and appropriate sanitation services. A very important aspect of the document that reflects the concerns of the international community is the recognition of the need for a new approach.

This new approach has to emphasize the provision of sanitation and education before the implementation of a water project in any community. Sanitation is an issue that can be decided on a household basis, thus facilitating the selection of alternatives and construction of adequate facilities. At the same time, this process empowers and helps to organize the community

towards a future common goal, such as the procurement of safe water.

Another particular aspect of the World Water Vision report is the ratification of water and sanitation as basic human rights. After the Water Decade, the international community indicated that water and sanitation could not be seen as basic rights anymore because the beneficiaries of the projects did not value the improvements made and facilities constructed when they were not required to contribute monetarily. In other words, people will not appreciate, continue to utilize and preserve something that they have not paid for. Based on previous experiences the Conference concluded that the lack of a sense of ownership and commitment to project improvements on the part of the beneficiaries was due to the inadequate and often the exclusion of beneficiaries' preferences into project design and implementation. Beneficiaries of water and sanitation projects should be responsible for the costs of the operation and maintenance of the system but not for the costs of the project itself.

Sanitation and health

Substantial evidence exists documenting the relationship between improved water and sanitation and improved health (Montgomery and Elimelech, 2007). A recent study by the World Health Organization estimated that environmental risk factors account for 34 percent of the disease burden in children (Prüss-Üstün and Corvalán, 2007).

Safe drinking water, sanitation and good hygiene are fundamental health, survival, growth and development. However, these basic necessities are still a luxury for many of the world's poor people. Over 1.1 billion do not

use drinking water from improved sources, while 2.6 billion lack basic sanitation. Safe drinking water and basic sanitation are so obviously essential to health that they risk being taken for granted. Efforts to prevent death from diarrhoea or to reduce the burden of such diseases as ascaris, dracunculiasis, hookworm, schistosomiasis and trachoma are doomed to failure unless people have access to safe drinking water and basic sanitation. Lack of basic sanitation indirectly inhibits the learning abilities of millions of school-aged children who are infested with intestinal worms transmitted through inadequate sanitation facilities and poor hygiene (WHO/UNICEF, 2006).

Lack of sanitation leads to disease, as was first noted scientifically in 1842 in Chadwick's seminal "Report on an inquiry into the sanitary condition of the labouring population of Great Britain" .A less scientifically rigorous but nonetheless professionally significant indicator of the impact on health of poor sanitation was provided in 2007, when readers of the (British Medical Journal) (BMJ) voted sanitation the most important *medical* milestone since 1840.

In addition, unlike many other environmental risk factors, drinking water sources and sanitation facilities are factors that can be changed, given the appropriate technology and funding (Rehfuess et al. 2009). Recent estimates attribute 1.5 million child deaths each year to unclean water, inadequate hygiene, and a lack of adequate sanitation (UNICEF, 2010). Lack of clean water and adequate sanitation is the leading contributor to diarrheal diseases in children (Gamper-Rabindran et al. 2007), which account for 19 percent of total child deaths (Boschi-Pinto et al. 2008). Improving access to piped water and sanitation has been shown to significantly reduce infant mortality rates (Gamper-Rabindran et al. 2007, DaVanzo, 1988). Other studies have shown

that access to adequate water and sanitation is more highly correlated with decreased child mortality than other socioeconomic indicators, such as access to health care or percentage of households below the poverty line (Shi, 2000).

Thousands of children die each day from infectious diseases that are spread through unclean water and unhygienic sanitation practices. At any given time close to half of the urban populations of Africa, Asia, and Latin America have a disease associated with poor sanitation, hygiene, and water (Mara, Lane, Scott & Trouba, 2010). Estimates suggest that investments in clean water and adequate sanitation facilities are exceedingly cost-efficient with regard to health returns (Montgomery and Elimelech, 2007). The development industry says that everyone on earth should have access to improved sanitation. Framed as a public health issue, this so-called sanitation crisis is the leading cause of death in children under five worldwide, killing more children than malaria, AIDS and measles combined. Diseases from the lack of sanitation kill an estimated 1.6 to 2.5 million persons every day (UNICEF, 2010).

Sanitation is a critical part of breaking the fecal-oral transmission route for many diarrheal and other illnesses. A lack of sanitation will eventually contaminate water, food or hands and transmit enteric pathogens. Figure 2 is known as the "F- diagram" and depicts possible transmission routes of fecal contamination pathways (Lanois, 1958). This shows that fecal contamination of fingers, food, and water can cause risk of illness even when a population has a reliable, safe water supply. Hygienic latrines clean drinking water, and proper hand washing and hygiene are all ways to decrease diarrheal disease and prevent fecal-oral transmission. Many programs seek to improve

sanitation, water supplies, and hygienic behavior in a combined effort, often called "WASH" programming (water, sanitation and hygiene).

Although these interventions do not necessarily need to be completed at the same time, they are often addressed together because they all contribute to reduction of diarrhoea disease. Sanitation interventions seek to promote improvements in environmental sanitation and living conditions so as to improve health and productivity (CWSA, 2004, p.4).

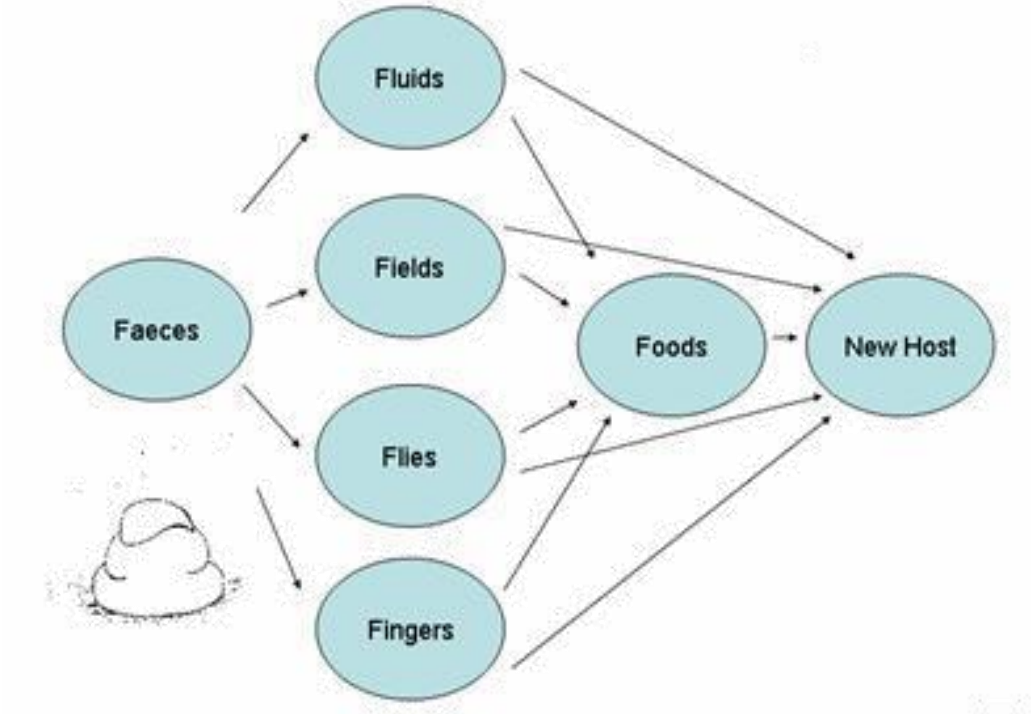

Figure 2: The "F-Diagram"
Source: Hunt (2001)

Unclean water, lack of sanitary facilities, and improper hand-washing and hygiene practices due to a lack of proper sanitation facilities are key environmental risk factors which are beginning to receive more attention from scholars because they are increasingly shown to influence public health significantly. In addition, unlike many other environmental risk factors,

drinking water sources and sanitation facilities are factors that can be changed, given the appropriate technology and funding (Rehfuess, Bruce, & Bartram, 2009). Recent estimates attribute 1.5 million child deaths each year to unclean water, inadequate hygiene, and a lack of adequate sanitation (UNICEF, 2010). Lack of clean water and adequate sanitation is the leading contributor to diarrheal diseases in children (Gamper-Rabindran, Khan, & Timas, 2007), which account for 19 percent of total child deaths (Boschi-Pinto et al. 2008). Improving access to piped water and sanitation has been shown to significantly reduce infant mortality rates (Gamper-Rabindran et al. 2007, DaVanzo, 1988). Other studies have shown that access to adequate water and sanitation is more highly correlated with decreased child mortality than other socioeconomic indicators, such as access to health care or percentage of households below the poverty line (Shi, 2000).

According to the Water Supply and Sanitation Collaborative Council (WSSCC) 2.2million people in developing countries, most of them children die every year from diseases associated with lack of access to safe drinking, inadequate sanitation and poor hygiene.

On the other hand simple hygiene practices such as disinfecting drinking water prior to consumption or preparation of food; cleaning hands, utensils, and surfaces before food preparation and consumption; and cooking food thoroughly can also greatly reduce morbidity and mortality rates from hygiene-related diseases, achieving cost-effective public health impacts spread equitably throughout society. For example hand washing with soap can reduce diarrhoea by over 40 percent and respiratory infection by 30 percent (Curtis & Cairncross, 2003). It was therefore not surprising when all these benefits of sanitation were

endorsed in the key messages of the International Year of Sanitation, Joint Monitoring Platform 2008:

- "*Sanitation is vital for human health;*
- *Sanitation generates economic benefits;*
- *Sanitation contributes to dignity and social development;*
- *Sanitation helps the environment; and*
- *Sanitation is achievable*.

Community-Led Total Sanitation (CLTS) Approach

Bangladesh is the home of a new approach to increasing sanitation coverage, called Community-Led Total Sanitation (CLTS), first introduced in 2000 in a small village in the Rajshabi District by Dr. Kamal Kar in cooperation with Water Aid Bangladesh and the Village Education Resource Centre (VERC). Most traditional sanitation programmes rely on the provision of subsidies, sanitation promotion, and hygiene education. The shortcomings of the established programmes led to the development of the new CLTS approach in Bangladesh, shifting the focus on personal responsibility and low-cost solutions. CLTS aims to totally stop open defecation within a community rather than facilitating improved sanitation only to selected households.

CLTS involves facilitating a process to inspire and empower rural communities to stop open defecation and to build and use latrines (Kar and Pasteur, 2005). It uses participatory methodologies to develop awareness of the risks of open defecation and facilitate community self-analysis of their health and sanitation status. Its aim is to "ignite" communities to cease open defecation and commence toilet construction using local materials. CLTS has

been recognized by the United Nations as one of the most effective approaches to promoting sanitation and achieving the MDGs for sanitation (Ahmed, 2008). Awareness of local sanitation issues is raised through a walk to open defecation areas and water points (walk of shame) and a calculation of the amount of excreta caused by open defecation. At the heart of CLTS lies the recognition that merely providing toilets does not guarantee their use, nor result in improved sanitation and hygiene. Earlier approaches to sanitation prescribed high initial standards and offered subsidies as an incentive. But this often led to uneven adoption, problems with long-term sustainability and only partial use. It also created a culture of dependence on subsidies. Open defecation and the cycle of fecal–oral contamination continued to spread disease.

Combined with hygiene education, the approach aims to make the entire community realize the severe health impacts of open defecation. Communities are facilitated to conduct their own appraisal and analysis of open defecation (OD) and take their own action to become open defecation free (ODF). Since individual carelessness may affect the entire community, pressure on each person becomes stronger to follow sanitation principles such as using sanitary toilets, washing hands, and practicing good hygiene. To introduce sanitation even in the poorest households, low-cost toilets are promoted, constructed with local materials. The purchase of the facility is not subsidized, so that every household must finance its own toilets. CLTS does not identify standards or designs for latrines, but encourages local creativeness. This leads to greater ownership, affordability and therefore sustainability (Kamal, 2003).

Several recent studies have suggested that people in particularly vulnerable situations are often neglected and/or have difficulties participating in CLTS for a variety of reasons (Bode and Haq, 2009; Chambers, 2008; Huda, 2008; Jones et al, 2009; Mahbub, 2008). This idea has been met with some criticism as it devalues the ability of CLTS as a method to assist the poorest people.

In contrast, CLTS focuses on the behavioural change needed to ensure real and sustainable improvements – investing in community mobilization instead of hardware, and shifting the focus from toilet construction for individual households to the creation of open defecation-free villages. By raising awareness that as long as even a minority continues to defecate in the open everyone is at risk of disease, CLTS triggers the community's desire for collective change, propels people into action and encourages innovation, mutual support and appropriate local solutions, thus leading to greater ownership and sustainability. CLTS has a great potential for contributing towards meeting the Millennium Development Goals, both directly on water and sanitation (Goal 7) and indirectly through the knock-on effects of improved sanitation on combating major diseases, particularly diarrhoea (goal 6), improving maternal health (Goal 5) and reducing child mortality (goal 4) (UNICEF, 2012). Table 1 shows the results of community led total sanitation implementation programme in some Western and Central African regions.

Table 1. CLTS implementation progress in West and Central Africa region

Country	National Workshop – date	Triggered villages	ODF villages	Comments/ next steps
Burkina Faso	WaterAid 2008	4	4	-
Cameroon	March 2009 – CREPA	10	-	Eight villages making good progress to ODF
Chad	Sept. 2009 – Kamal Kar	10	-	-
Congo Brazzaville	Planning for Nov. 2009	-	-	CREPA
Cote d'Ivoire	June 2009 – CREPA	10	1	Over 100 latrines are being built
Gambia	Regional – held in June 2009 in Upper River Region	4	-	2 villages close to ODF status. National - Planning for Dec. 2009
Ghana	National review of CLTS, July 2009.	308	54	CLTS adopted as national rural sanitation strategy after review.
Guinea	June 2009 – CREPA	9	-	50% of latrines built by September 2009
Liberia	April 2009 - Kamal Kar	25	3	4 further communities very close to ODF
Mali	March 2009 - Kamal Kar	49	35	20 of 35 communities ODF but yet to certify.

Mauritania	April 2009 – CREPA	58	8	Communities include the Town of Rosso - has 9 of 11 wards ODF
Niger	September 2009 – CREPA	10	-	-
Nigeria	WaterAid began training in 2005	1651	135	Concentrating on few regions. National review planned for 2010.
Senegal	Planning for Nov. 2009	-	-	-
Sierra Leone	WaterAid, PLAN & UNICEF began training in 2007	899	285	'Cascade' approach – CLTS introduced in all regions at same time
Togo	May 2009 – CREPA	10	-	1 village close to ODF

NB Data includes CLTS communities of all country partners where known to September 2009

Source: UNICEF/CREPA (2009)

Critiques of CLTS

First, the question of what "total" in "community-led total sanitation" is debated in the CLTS literature from the beginning. There exists the debate of the prioritization of latrines over drinking water services (Howes, Huda & Naser, 2011; Mehta, 2011), while others say that providing toilets is useless unless coupled with clean water and hand washing services. Moreover, different organizational bodies tend to focus on either water or sanitation, leading to "turf wars" based on who would speak about water against who would speak on sanitation (Sanan, 2011, p. 93). Water supply tends to be in

higher demand and politically more popular. Water supply systems are perceived as a highly technical and professional activity providing professional and organizational satisfaction (Joshi, 2011, p. 193). CLTS is seen as less professional than other core public health work (Joshi, 2011, p. 194; Priyono, 2011).

Technology has an important role in the discussion of sanitation. The principle of CLTS is "to start simple and allow local people to move up the sanitation ladder" from seasonal latrines made of local materials to more stable material models (Mehta, 2011, p. 6). Communities prioritized the more durable toilets as the model of choice (Dyalchand, Khale & Vasudevan, 2011, p. 106). Even though they are more expensive, sanitation entrepreneurs and sanitation developers continue to produce new technological innovations. Consumers also need facilities for payments by installations to afford better sanitation options (Ahmed, 2011, p. 35). The technology supply cannot currently meet the needs of the triggered community, concentrating the negative consequences of the poor as they cannot afford the high-demand technology (Kumar & Shukla, 2011, p. 134- 135).

CLTS is advocated as an end to Open Defecation (OD). However, such an aim can cause problems for "total" sanitation. The stated goal of CLTS is to end OD by implementing toilets to become Open Defecation Free (ODF). Participatory Development (PD) is contingent upon the demand for the development by the community. Several issues may generate artificial demand. Open Defecation Free (ODF) status is a condition for accessing other development goods (Joshi, 2011, p. 200). The status gained or the monetary

reward or incentive for ODF status can also cause artificial motivation for CLTS which is not sustainable long-term (Joshi, 2011, p. 200).

Some researches argue that toilets are only one aspect of sanitation and that hand washing and clean water provisioning are also necessary. However, Joshi (2011) argues that incentives of ODF status promote the success of CLTS in India and Indonesia. The continuation and sustainability of ODF status is also difficult. For example, of 112 communities that declared ODF, only 25 have maintained this status (Haq & Bode, 2011, p. 75). While the shame of OD remains after the epistemological shift of the new sanitation paradigm, communities lack resources for repairing latrines. When latrines are built, communities have conflicts about sharing them and other issues that prevent households from obtaining the hardware for the new sanitation paradigm.

Some research results argues that CLTS provides a starting point for solidarity building and empowerment that can trigger community-led total development because it is non- political, class neutral, easy to accomplish, brings considerable benefits to the community, develops collaborative community effort, and instills a sense of accomplishment and pride that can be reframed for other issues of poverty alleviation (Haq & Bode, 2011, p. 73). As such, total is not simply for sanitation but also a stepping-stone for other sustainable development such as gender issues, education, and other poverty alleviation. Specifically, total sanitation campaigns seldom target other types of sanitation rather than just shit, such as uncollected garbage, blocked drains, or industrial pollution (Musyoki, 2010). The focus on sanitation campaigns

can be perceived as shortsighted and over-emphasizing one aspect of fighting poverty.

The primary difference between the CLTS perspective in comparison to other sanitation initiatives is that it is an approach rather than a program (Kumar & Shukla 2011.p.135). It is highly adaptable to the community and situation. Second, the question of hardware subsidies is hotly debated in the CLTS community. CLTS advocates a no-hardware subsidy position because "the subsidy scheme failed to generate real demand for sanitation because it was not internalized by the people" (Ahmed, 2011, p. 26). Providing toilets through a top-down approach is against the CLTS model of PD (Khale & Dyalchand, 2011, p. 126).

Some critics even go as far as arguing that subsidies have created a culture of dependence making pure CLTS more difficult to enact in communities that have already undergone wash infrastructure development schemes. Subsidies can be perceived as a threat to ODF sustenance as they push infrastructure construction without considering the reasons for use (the triggering) (Haq & Bode, 2011, p. 78-79). For example, in India, a $100 million subsidy for sanitation over three years showed that usage is 57% in the best cases, when the goal is total sanitation under a similar trajectory as CLTS (Sanan, 2011, p.89). Similarly, Joshi found that a "fresh slate" context for CLTS is more effective than communities where sanitation campaigns previously attempted and failed (2011, p. 195).

Ahmed was of the view that the shift away from the subsidy-based sanitation development structure happened because "the community became the unit of action rather than individual households" (Ahmed, 2011, p.

27).With such a shift in attitude, development practitioners "stopped counting toilets and started paying attention to whether the whole community stopped Open Defecation" (p. 27). People stopped waiting for subsidies from the government and built toilets with their own resources.

Participatory Hygiene and Sanitation Transformation (PHAST)

Participatory Hygiene and Sanitation Transformation (PHAST) is an "innovative approach designed to promote hygiene behavior, sanitation improvements and community management of water and sanitation facilities using specifically developed participatory techniques" (Sawyer & Clarke, 1997). The PHAST is an innovative approach to promoting hygiene, sanitation and community management of water and sanitation facilities. It builds on people's innate ability to address and resolve their own problems. It aims to empower communities to manage their water and to control sanitation-related diseases, and it does so by promoting health awareness and understanding which, in turn, lead to environmental and behavioural improvement (WHO, 2000).

PHAST practitioners that participated in a workshop in Kenya identified a specific set of characteristics that are present in all the PHAST communities:

A belief in their ability to solve problems, basic understanding of the health implications of poor water supply and sanitation, sense of common purpose and a way of planning change in the community and the presence of a committed extension worker, who is collaborating with them to plan their own future (Sawyer & Clarke, 1997).

The PHAST initiative started in 1992 as a pilot project for the improvement of the sanitation services in four different countries of Africa

(Botswana, Kenya, Uganda and Zimbabwe). It was designed, planned and sponsored by various international agencies some of whom include the UNDP–World Bank Regional Water and Sanitation Group – East Africa, the Rural Environmental Health Unit of the WHO in Geneva, UNICEF, the Danish Agency for Development Assistance and the Swedish International Development Cooperation Agency.

The 18-month, regional pilot program was implemented in collaboration with the government of these countries and in close partnership with UNICEF (particularly in Kenya, Botswana and Zimbabwe) and various regional and national NGOs (for example CARE, KWAHO and Water Aid).

Merits of PHAST in community participation

One of the main strengths of the PHAST methodology is that it helps communities understand the importance of improved water supplies and sanitation services (Sawyer & Clarke, 1997). This methodology also empowers communities to improve health conditions by promoting health awareness and understanding the fecal–oral route of disease (Sawyer & Clarke, 1997). PHAST involves all members of society (young and old, female and male, higher and lower status), including illiterate people and allows them to determine their own priorities. As a result of its implementation, communities are able to build their organizational skills and identify barriers against cooperation. Finally, PHAST recognizes the existence and importance of indigenous knowledge and it helps communities identify the barriers that can help block the transmission of diseases.

Demerits of PHAST in community participation

PHAST, like any other participatory methodology, presents some limitations and risks. First, it requires sufficient time to be invested in field-based training of facilitators/researchers, which can sometimes be overly time consuming and resource demanding (Sawyer & Clarke, 1997). Many projects have staff members who are accustomed to the traditional top-down approach, which does not allow beneficiaries the possibility to express themselves and formulate solutions to their problems. Second, PHAST emphasizes educational campaigns and capacity building, which might lead to constraints for the implementing agencies if there is lack of appropriate institutional support (Sawyer & Clarke, 1997). Third, extensive monitoring and follow-up are required and most implementing agencies lack experience with participatory techniques and methodologies. Finally, PHAST requires flexibility in the design of projects so that findings from the monitoring and evaluation phases can be incorporated in a timely manner. This flexibility creates uniqueness, which makes projects difficult to replicate in other areas (Sawyer & Clarke, 1997).

Methods for studying sanitation

For a few years the failure of supply driven sanitation hardware provision and hygiene education approaches has widely been acknowledged (e.g. Mukherjee, Kumar, Cardosi, & Singh, 2009, pp.293-94; water Aid, 2011, p.20) and has provoked the development of bottom-up sanitation promotion approaches (sanitation software).These bottom-up approaches aim to gain

understanding of the target community and their perceptions of and motivation for improving sanitation (Peal, Evans, & Van der Voorden, 2010, p.5)

With the incentive to improve sanitation set by the MDGs and other public health funding, the problem becomes how to improve population access to sanitation and change sanitation behavior. In order to do this, it is necessary to effectively measure sanitation behavior, access, and demand. There is a growing body of literature examining the factors that influence choices about sanitation practices and preferences through multiple methods, as well as accurately documenting sanitation behaviors. Failure to take into account a community's practices, preferences and attitudes towards sanitation can result in interventions that are not appropriate for a community. They may require behavior change that the community is not willing to make, they may be too technologically sophisticated for a community to relate to, operate and maintain, or they may not be culturally acceptable or conform to community norms and attitudes about sanitation (Yacoob, 1994).

Knowledge, Attitudes and Practice surveys (KAP) are a common quantitative research tool used to understand population level information about WASH behavior. These surveys can accurately capture information on a population's knowledge of hygienic behavior, latrine ownership, and reasons for sanitation behavior. They can also attempt to quantify latrine access and usage, diarrhoea incidence, and hand-washing, although this information is more prone to response bias (Banda et al., 2007). For a more in-depth understanding of factors influencing sanitation behavior as well as the cultural context of the population, qualitative methods such as in-depth interviews and focus groups can be used (Banda, et al., 2007).

One direct survey approach for evaluating sanitation demand information is called the Contingent Valuation Method (CVM). This type of survey includes questions on preferences of sanitation options as well as collecting information willingness to pay for sanitation services (Altaf & Hughes, 1994). Preferences can be evaluated by asking about specific sanitation options, or describing relevant characteristics of an unfamiliar sanitation technology. Another approach is to ask respondents to rank services they would like from the government, from a list including water, sanitation, and solid waste services (Mir Anjum Altaf, 1994). A detailed survey on sanitation contains questions not only on preferences and willingness to pay, but also on satisfaction, reasons for building a latrine, and constraints to building a latrine (Jenkins & Scott, 2007).

Collecting accurate data on sensitive issues presents many challenges for research. Many surveys attempt to phrase questions in a culturally acceptable way and use local translators for accurate responses. Hygiene and hand washing behavior is notoriously hard to measure accurately. Most people know that they should be washing their hands, and therefore will indicate to researchers that they do, even when observations show that they do not (Commission, 2009). Reported sanitation behavior may be subject to the same reporting bias problem, if people believe that open defecation is unacceptable and are not truthful in surveys (Manun'Ebo, Cousens, Haggerty & Kirkwood, 1997).

Observational studies, where researchers physically observe behavior, are often the gold standard for behavior research even though they are also subject to bias. Hand washing studies have shown that people are likely to change

their behavior when they know they are being observed and may wash their hands more than they normally would. This is known as the Hawthorne effect (Commission, 2009). Observing behavior without the knowledge of subject causes ethical concerns, even for something like hand washing, and is not possible for more personal habits involving sanitation. A new motion-sensor technology shows promise for ethical latrine use observation, but latrine owners would still be aware that the monitor is installed, and the Hawthorne effect could still bias the data collection (Clasen, Fabini, Boisson, & Taneja 2012).

One methodology that has been adopted by some researchers is to observe populations post-defecation; that is to look in latrines and outdoor areas for fresh feaces to estimate what proportion of the population is defecating in certain areas and facilities (Montgomery, Desai, & Elimelech, 2010). A more indirect method is to simply survey an area and count latrines and toilets, asking to see each one to determine how often it is used and if it is functioning and being maintained (WHO, 1992). Simply asking about the presence of a latrine could result in inaccurate information and does not provide information about actual use and conditions. Some studies have combined the methods to measure accuracy of surveys as well as availability, functionality and usage of latrines (Montgomery, et al., 2010).

Impediments to improved sanitation

The lack of national policies is a major constraint to success in sanitation. Governments in general and health ministries in particular cannot play their oles as facilitators and regulators of sanitation without policies that support the

transformation of national institutions into lead institutions for sanitation, that increase focus on household behaviours and community action, that promote demand creation, and that enable health systems to incorporate sanitation and hygiene. Other constraints to success in sanitation are population growth and increasingly high population densities in urban and peri-urban areas of developing countries. Furthermore, most of the people who lack improved sanitation live on less than $2 per day, which makes high-cost, high-technology sanitation solutions inappropriate (Mara, Lane, Scott & Trouba , 2010).

Improving sanitation coverage has many challenges. Sanitation coverage has focused on sustainability and equity, which can often be at odds with each other as far as providing improved sanitation, is concerned. The environmental sustainability of how waste is physically being disposed of, and its impact on the surrounding environment, can affect all people in a region, regardless of socio-economic status. Water resources for sanitation systems are also an important aspect of environment sustainability. Financial sustainability, how the sanitation systems and facilities will be operated and maintained and who is paying for them, depends in a large part on the consumer. The long-term sustainability of a system requires some sort of user fee and input from the people benefiting from the service. These fees are important to make sure people have ownership of their services and for accountability to make sure the system is functioning correctly. However, they can also be a barrier to sanitation for the poorest, which leads to unequal sanitation access and benefits (Moe & Rheingans, 2006).

Cultures where open defecation is socially acceptable may not see a need to change their practices, and populations without an understanding of germ theory may fail to see the public health benefits of sanitation. One reason for this is that sanitation coverage must be high in order for a community to see the effects of reduced disease and environmental impact. Even 90% latrine coverage can be negated by 10 percent open defecation, and such high coverage numbers are rare in the developing world (Cairncross, 1992).

Populations that recognize the need for or want sanitation facilities may also be limited by finances and logistics. Many areas that want improved sanitation desire flush toilets, because previous experiences with any kind of latrines have not been positive.

Areas that lack reliable running water often do not have the infrastructure for piped water and sewage. It is unlikely that populations that have to purchase water by the bucket will turn around and flush that water down a toilet. Many populations do not have the financial resources to build sanitation facilities. Even if an NGO or government were able to provide latrines and/or toilets, the question of sustainability still remains. Water for flush toilets, either piped or pour-flush, must be paid for, and latrines and septic tanks must be cleaned, repaired, and emptied. Public facilities often charge fees for upkeep and maintenance, but for a personal facility, this responsibility falls on the owner. Often it is the poorest of the poor that lack adequate sanitation and practice open defecation, and they cannot afford to pay for public facilities or the construction and upkeep of personal ones.

Several methods have been used to increase sanitation coverage in low resource areas with mixed results. One of the more universal ideas, with many

possible inputs and outputs, is to create new markets for sanitation. This involves incentivizing sanitation, either for health reasons, or other motivations such as privacy, hygiene, and social status (Curtis & Cairncross, 2003). Once demand exists for sanitation, there are many options for fulfilling that demand including through NGOs and outside donors, working with local artisans, and/or working with the local or state government. Social marketing has been successfully used for other public health products and services, such as household drinking water treatment and insecticide-treated bed nets (Waterkeyn & Cairncross, 2005).

One method of changing community perception of sanitation is Community-Led Total Sanitation (CLTS) (Foundation, 2011). This involves a trusted community member or outsider gathering the community together and explaining how open defecation results in feaces movement to places where food is grown, children play, public areas, and water sources (Kar & Chambers, 2008). The purpose is to shame the community into rejecting open defecation, and empower the community to tackle the problem of open defecation. By addressing the community as a whole, the issue of partial sanitation coverage is avoided. Criticism of the program includes questioning the ethics of using shame as a tool for behavior change (WaterAID, 2010). There have been some documented negative impacts on members of a village who were caught defecating in the open after the program implementation, often with harsh penalties from within the communities (Sah & Negussie, 2009) (Chatterjee, 2011).

Sanitation marketing

The concept of sanitation marketing is based on the principles of social marketing approaches. Social marketing has been applied in different fields since the early 1970s (Buchanan, 1994). For a better understanding of the general concept of social marketing a frequently cited definition of social marketing was given by Weinreich (1999, p.3). "Social marketing is the use of commercial marketing techniques to promote the adoption of a behaviour that will improve the health or well-being of the target audience or the society as a whole"

With respect to the provided background and based on the concept of social marketing i.e. applying commercial principles to social causes, sanitation marketing is defined as "the application of commercial concepts and principles on the whole latrine promotion strategy" (Budds, Obika, Howard, Jenkins, & Curtis, 2002, p.174). Peal et al. (2010, p.86) stress that "sanitation marketing is not a single approach but rather a collective term for a number of approaches that aim to make the potential consumer aware, informed and interested in purchasing a sanitation facility".

While these two definitions focus on the means to prompt households to purchase a latrine, Devine (2010) widens the definitions as she proposes to understand sanitation marketing as a way to promote behaviour change in four sanitation related areas: 1.) Abandon open defecation, 2.) Adopting or upgrading to latrine that effectively separates excreta from human contact, 3.) Adequate maintenance of the facility, 4.) Correct handling and disposing of children's excreta (Devine, 2010, p.42).

However, as Obika (2004) points out, "sanitation marketing approaches do not only incorporate the effective promotion or advertising of sanitation behaviour change with well-targeted messages, they also assure a balance between demand and supply by supporting the private sector in its performance and capacity".

Sanitation marketing is a relatively new approach to support sanitation promotion and thus comprehensive literature about experiences and lessons-learnt is limited. In particular, published articles are hard to find as most knowledge is contained in grey literature such as agency reports and internal documents. To illustrate the extent of the gap in independent publications Devine (2010,p.41) points out that a recent systemic literature review conducted by Evans, Pattanayak, Young and Buszincould (2014), only identify five published articles, which mention the application of social marketing strategy in the context of sanitation promotion in any depth. Despite the gap in well-documented experiences, many major players in the sanitation development sector currently consider marketing as a promising approach for their sanitation promotion programmes (e.g. WaterAid, 2011, p.20).

Furthermore, the WSP Global Scaling up Rural Sanitation Project, which has a distinct learning component, as an interactive online resource, show the emerging interest in further learning about the potentials and application of sanitation marketing.

A common stated advantage of sanitation marketing (e.g. cairncross, 2004, pp.2-4; Budds et al., 2001, pp.174-175) is that it takes into account the various incentives people might have for adopting a latrine, as well as the constraints that holds them of getting a latrine. Therefore, the segmentation of the market

is a key out of the formative research. Market segmentation takes into account the different socio-economic backgrounds, current sanitation practices and needs of the population. Market or consumer segmentation divides the target population into more manageable homogenous segments. By acknowledging key behaviours, motivators and obstacles, the right range of products and set of marketing strategies can be developed, so as to avoid the exclusion of parts of the population through inappropriate or inflexible measures. Consumers have various starting points relating to their sanitation practice and thus different relevant and appropriate options and strategies need to be developed distinctly. Where needed adequate support needs to be provided, which might be technical support for suppliers or support in establishing effective financing mechanisms (Jenkins & Scott, 2007, p.24).

Intentions follow as the second stage. Intention reflects a general plan to build or purchase a latrine but proceeding to stage of choice, taken to mean the final decision and implementation of the plan, is determined by the absence of temporary constraints to acquiring sanitation (Jenkins & Scott, 2007; Jenkins & Sugden, 2006, p.11-17). Devine (2010, p.50) points out, sanitation marketing is still very new concept and there is still no common definition of sanitation marketing and agreed understanding of its objectives amongst practitioners.

Moreover it still has not been agreed on how sanitation marketing and CLTS fit together and might complement each other .Lack of financial capacity is an important barrier for households to invest in sanitation. Market-based approaches for sanitation promotion have been criticized to run the risk of failing to reach the poorest and vulnerable, who cannot afford to pay for the

offered products and services (e.g. Water Aid, 2011, p.22; Thomas, 2010, p.11)

Challenges of marketing sanitation

Cairncross (2004, p.11 and 2003, p.123) concludes that sanitation marketing is currently the most suitable approach to overcome the gaps in sanitation provision. However, various author point out challenges for the marketing of rural sanitation that might limit the potential of the approach to measure up to such high expectations.

Fragmented demand: Schaub-Jones (2011) identifies fragmented demand as a particular challenge for growing sanitation businesses. As demand from individual households for sanitation services such as latrine construction or emptying tends to have a very limited frequency, private providers of sanitation services need to deal with high geographic scattering of their customers which challenge efficiency in services delivery and hinders the scaling up of these services (Schaub-Jones, 20011, pp.16-17). Seasonality of the demand (Mendiratta, 2000, p.157) further depresses rural market volume and its profitability. Compared to urban areas, rural sanitation markets face demand for the construction and emptying services is generally smaller than in urban markets. Rural households are more likely to dig latrines themselves and availability of space allows filled up latrines to be replaced rather than emptied. Challenges with users' reluctances to invest in sanitation in rental accommodations are more related to urban contexts (Schaub-Jones, 2011, pp.16-17).

Fragmented distribution: Fragmented demand on the customer side is antagonized by fragmented distribution on the supplier side (Devine, 2010,

p.44). Devine describes the supply chain for sanitation as a multiple player framework, including distributors, wholesalers, retailers of cement, local producers, masons, etc. Vertical networks between the different segments of the supply chain do not always exist and suppliers have rarely received any formal training in sanitation. As sanitation is very unlikely their core business, they might offer only the most common products, or products with unlikely their core business, they might not be aware about a large range of improved technologies and/or the correct technical specifications. Devine (2010, p.45) concludes that "the distribution channel for sanitation can thus be described as diverse, fragmented and largely informal"

Challenges of programme design and high costs: Godfrey et al. (2010, p.28) point out that sanitation marketing programmes are more complex than for example CLTS programmes which have been scaled up in many countries. Sanitation marketing requires very specialized skills e.g. for the formative market research that do not typically exist in the WASH sector. Bringing in these skills from the commercial sector might be costly and the disadvantage that the commercial sector might lack an understanding of the complex rural sanitation sector (Godfrey et al., 2010, p.30). Obtaining the necessary skills might even become more challenging when CLTS and sanitation marketing approached are combined and consequently separated skills are needed at different levels to make the implementation successful.

Complexity of the product: According to Devine (2010, p.44) the marketing of rural household latrines is quite complex due to the variety of available options for the three main components of rural household latrines (i.e. the infrastructure (e.g. pit, septic tank), the interface with the user (floor,

slab, etc.) and the superstructure). This complexity is a marketing challenge in terms that it limits the possibility to set up a standardized product and price that can be promoted and easily advertised.

As a way to address this problem UNICEF (UNICEF Bangladesh, 2002) and WEDC (Obika, 2004b) have published catalogue style illustrated booklets with low cost toilet options that enable the reader to flip separately through the options for different superstructure, floors and pits to create a combination according to the households specific needs and opportunities.

Finally sanitation marketing is not a cheap approach to promote sanitation. As mentioned before, marketing programmes require very specialized skills and the initial formative market research contributes to higher upfront costs of sanitation marketing when compared to other sanitation promotion approaches (Godfrey et al., 2010, p.36).

Gender and sanitation management

The importance of involving both women and men in the management of water and sanitation has been recognized at the global level, starting from the 1977 United Nations Water Conference at Mardel Plata, the International Drinking Water and Sanitation (1981-90) and the International conference on Water and the Environment in Dublin January 1992, which explicitly recognizes the central role of women in the provision, management and safeguarding of water and sanitation.

Poor sanitation and hygiene are the highest cost for women and children. Women, adolescent girls, children and infants suffer most from inadequate hygiene and sanitation facilities. The two main causes of mortality among

children under age five – acute respiratory infections and diarrhoeal diseases – are closely linked to poor water, hygiene and sanitation (UNICEF, 2009). Girls and women are made more vulnerable by poor sanitation and hygiene. Lack of safe, separate and private sanitation can inhibit girls from attending school and increase the burden of caring for the sick, as well as the likelihood of disease during pregnancy. While men participate in the decision making around the type and building of the toilet, its maintenance is seen as the responsibility of women since cleaning the house and toilet are not regarded as work for men (SA Water Research Commission, 1999).

Women encourage or discourage, teach and supervise young children's use of the units; small aspects of design can make a big difference between the use and non-use of these facilities. Many mothers are fearful of their children using pit latrines because of the size of the hole. In Botswana, a specially designed pit latrine seat for children has led to far higher usage of toilets (UNDP, 1990). The location of the latrine can be a major determining factor in women's use of the facility for reasons of security and privacy. In one East African country, women did not use toilets that men built along the road so that they would be easier for officials to inspect because they did not like to be seen entering or leaving the toilet (UNDP, 1990). Sharing of latrines can also be a deterrent to their use by women; research in Bangladesh showed that shared latrines led to parallel use of unsanitary facilities alongside the new, more hygienic ones. Women are mostly responsible for cleaning sanitation units and often do so without any guidance from sanitation staff (World Bank, 1995).

According to the special report by WHO/UNICEF JMP for Water Supply and Sanitation 2008, the importance of sanitation is indisputable. It is a crucial stepping stone to better health indeed; it forms a basis for achievement of most – if not all – of the MDG targets. It is fundamental to gender equity as it protects women's dignity. At the community levels, sanitation and hygiene are considered a women's issue, though they impact on both gender. However, societal barriers continually restrict women's involvement in decisions regarding sanitation improvement programmes. It is imperative that sanitation and hygiene promotion and education are perceived as concern of men, women, and children and not only of women (GWA, 2006). Are the sanitary facilities in the sub-region gender friendly? There are other social gains through sanitation including convenience and comfort, privacy and safety, for women and girls especially - avoidance of sexual harassment and assault, less embarrassment with visitors and dignity and social status. Furthermore, for women, the provision of household sanitation reduces the risk of rape and/or attack experienced when going to public latrines or the bush to defecate, and for girls, the provision of school sanitation facilities means that they are less likely to miss school by staying at home during menstruation. Sanitation is also a key to economic development in that investments in sanitation protect investments made in other sectors, such as education and health, and bring measurable economic returns.

"After realizing the value and positive impact of improved sanitation on community health and the physical environment, and the added convenience of being able to use the toilet close to the household rather than going to the bush (especially for women and girls, who value the privacy and freedom of

using toilets at any time of the day and night), there is a rarely any going back to open defecation" (Kar, Kamal and Pasteur, 2005).

Urban versus rural sanitation

The demand for water supply and sanitation services is growing fast owing to the interactive effects of demographic growth, economic development and improvements in living standards. In view of their economic and welfare contributions as well as their political implications, there is always a constant budgetary pressure for additional resource allocation to meet the increasing demand for these services both in rural and urban areas. To meet the water supply and sanitation targets of the Millennium Development Goals (MDG), huge numbers of people in urban areas require new services by the end of 2015, at least 300,000 people per day for water and at least 400,000 per day for sanitation and this is for every day during 2001 – 2015 (WHO/UNICEF,2000,2004).

A comparison of the urban and rural coverage of sanitation in the world revealed that 79 percent has been achieved in the urban areas while 45 percent was achieved in rural areas. The disparity is very great though the world's population in 2006 was almost equally urban / rural. The rural-urban disparities emerge again in water and sanitation access. Globally, 84 percent of rural residents lack access to an improved drinking water source compared to 16 percent of urban residents. Access to improved sanitation eludes 32 percent of people in urban areas and 60 percent of those in rural locations (UNICEF 2010).

The challenges of sanitation service delivery are exacerbated by the fact that many poor urban residents live in the unplanned and underserved informal

settlements commonly known as slums or in expanding peri-urban areas. Urban administrations do not have the capacity and often are not planning for service provision in these marginalised areas. This is reflected in the most recent United Nations Joint Monitoring Programme reports that predict that the number of the world's urban population without access to a safe source of drinking water will increase from 137 million (2006) to 296 million (2015) and those without access to improved sanitation will increase from 661 million to 898 million, respectively (UN/JMP, 2008).

The urban and rural sanitation coverage in the sub-Saharan Africa was 42 percent and 24 percent respectively against 90 percent and 59 percent respectively in North Africa (UNICEF, 2006). Although, the disparity was relatively low in sub-Saharan Africa, the coverage is not encouraging especially in rural areas. Generally urban improved sanitation coverage in West Africa is better than in the rural areas with the exception of Gambia which has 55 percent coverage for rural and 50 percent for urban (WHO/UNICEF, 2008). Even this hides a problem. Generally the coverage figures in urban areas are considerably exaggerated by the JMP and the pace of urbanisation means that it is extremely difficult to make inroads into urban coverage deficits in the face of increases in population, which most often occur in unplanned urban areas/slums. The gravity of the situation with regard to excreta disposal is illustrated by the World Bank's estimate that almost 26 percent of the world's urban population, over 400 million people in total, lack access to the simplest latrines (World Bank, 2000).

Urban and peri-urban areas face unique sanitation challenges. However, for example, households in the coastal and mountain regions of Karnataka

(India) have better access to toilet facilities compared to the remaining parts of the state. This is mainly due to the fact that the districts in the coastal and mountain regions have a better economic status, education level and infrastructure condition (Sastry & Rao, 2002). In addition to the universal economic and logistical concerns, urban and peri-urban populations often live in very crowded areas where there may not be physical space for each household to have a personal latrine or toilet (Ayee & Crook, 2003).

Furthermore the number and concentration of people compound the negative consequences of open defecation due to the sheer amount of faeces in the environment and increased risk of exposure (Ayee & Crook, 2003). In addition, urban populations tend to move around and are often illegally residing in slums in and around cities. These migrant and squatting populations tend to be very poor and unable to afford to pay for sanitation, often connecting to existing water and sewer lines illegally. These populations are often not documented, resulting in them being understudied and having less services and programs targeted to them. This also results in millions more people using the current systems then they were designed to serve, often overwhelming government water and sanitation infrastructure capacity (Allen et. al., 2006).

Most successful demand-led approaches have been developed in rural contexts. Urban sanitation is much more complex, mainly because of higher population densities, less-coherent community structures, and the absence of opportunities for open defecation. Urban sanitation must extend beyond the household acquisition of a toilet to a systems-based approach that covers the removal, transport, and safe treatment or disposal of excreta (Mara, Lane,

Scott & Trouba, 2010). Again, migration from rural to urban areas poses a major challenge for city planners; extending basic drinking water and sanitation services to peri-urban and slum areas to reach the poorest people is of the utmost importance to prevent outbreaks of cholera and other water-related diseases in these often overcrowded places.

Rural and urban settlements offer different challenges regarding planning and the implementation of improved urban services. Rural areas tend to have significantly lower service coverage rates than the world over. The largest disparity between urban and rural sanitation coverage can be found in Latin America and the Caribbean (86–52%) and Southern Asia (57–23%). Sub-Saharan Africa is worst off, as both rural and urban sanitation coverage are both off track to meet the MDG target coverage (42% versus 24%) in 2015 (UN JMP 2008). Thus, the focus in the rural sanitation sector is often simply on hygiene and behaviour change and encouraging communities to move towards open-defecation-free (ODF) environments, i.e. the first step towards participation in sanitation services that ensure hygienic separation of human excreta from human contact. In the heterogeneous city, many of the rural attitudes and norms are still present in pockets of the city population, so that it is still relevant to consider planning tools and service provision approaches that are traditionally adapted to the rural environment.

Despite this trend, there have been a number of recent innovative initiatives for extending the coverage of sanitation services in both rural and urban contexts. These approaches are based on demand-driven and participatory approaches that both motivate community involvement and encourage appropriate technology which better fits the realities in the field.

They promote participatory processes where solutions result from the inputs of local stakeholders and not solely from 'conventional wisdom' or 'prescriptive' planning (Atkinson, 2007).

Theories and concepts that informed the study

Theory of Behaviour Change Communication (BCC)

The importance of the BCC to this study is to highlight the possibility of a given population not willing to make use of an improved facility if there is any access to it due to an addicted behaviour or attitude. During the past decade, there has been a growing recognition of the usefulness of behavioral theory in the development of behavior-change interventions (see, National Institutes of Health, 1997). Theories of behavioral prediction and behavior change are useful because they provide a framework to help identify the determinants of any given behavior, an essential first step in the development of successful interventions to change that behavior. Clearly, the more one knows about the determinants of a given behavior, the more likely it is that one can develop an effective communication or other type of intervention to reinforce or change that behavior.

The theory has become a central objective of public health interventions over the last decade, as the influence of prevention within the health services has increased. The increased influence of prevention has coincided with increased multi-lateral and bi-lateral aid in the area of human development, and the increased need for the international development community to show cost-effectiveness for allocated dollars spent.

The behaviour change theory however has been the grounded theory in most behaviour change programmes, which have evolved over time,

encompass a broad range of activities and approaches, which focus on the individual, community, and environmental influences on behavior. The term Behaviour Change Communication (BCC) specifically refers to community health seeking behaviour, and was first employed in HIV and TB prevention projects. More recently, its ambit has grown to encompass any communication activity whose goal is to help individuals and communities select and control any developmental project that affects their wellbeing.

BCC is an evidence- and research-based process of using communication to promote behaviors that lead to improvements in health outcomes. BCC intends to foster necessary actions in the home, community, health facility or society that improve health outcomes by promoting healthy lifestyles or preventing and limiting the impact of health problems using an appropriate mix of interpersonal, group and mass-media channels. Maintaining social marketing focus, effective communication strategies rely on formative research with beneficiaries to understand the context, the issue from their perspective, and factors that influence improved practices. The explicit emphasis on behavior change as an outcome helped to highlight the need for a thorough understanding of the full range of determinants, both internal and external factors, to understand why people do what they do and how to facilitate healthy options, decisions and support. These determinants could include knowledge and attitudes as well as many other factors elucidated in theories such as access to services, emotions, real and perceived consequences, social support.

Therefore, just like any of the behaviour change theories, as far as sanitation is concern, then people's lifestyle and practices that lead to

unimproved sanitation conditions such as the use of unimproved toilet facilities and open defecation could be changed for the better hence ensuring healthy lifestyle practices including the use of improved sanitary facilities.

Concept of participation

Participation as a concept in any development discourse would also drive this study. This is because stakeholder engagement and participation are popular concepts in many disciplines, from environmental management to community development. Since the 1980s, many international development organizations have embraced participatory methods for incorporating local knowledge and values into project planning and development. The participation paradigm is now widely accepted as best-practice by development agencies, and there is increasing promotion of collaborative design and policymaking among academics and politicians as a way to increase the sustainability of society.

The conceptualization of participation has been very difficult with different authors interpreting it differently in different context to mean different thing (Hussein, 1995; Kelly, 2001). However, one commonality to all definitions is the role of community in decision-making. As such participation is often referred to as community participation. Community can be defined as a range of factors including geographic location, norms, and interests. Many definitions of participation hint at the participation continuum and the various levels of community involvement. Some definitions focus on other aspects such as the involvement of all stakeholders, at all stages of development; on outcomes; on empowerment; and on the important role of disadvantaged groups particularly women and the poor.

Ndekha, Hansen et al (2003) and Chamala (1995) provided good holistic starting points for defining participation as a social process whereby specific groups with shared needs living in a defined geographic area actively pursue identification of their needs, take decisions and establish mechanisms to meet these needs' cited in (Ndekha, Hansen et al. 2003).

Participation in the development context is a process through which all members of a community or organization are involved in and have influence on decisions related to development activities that will affect them. That implies that development projects will address those community or group needs on which members have chosen to focus and that all phases of development process will be characterized by active involvement of community or organization members. There is evidence from rural water supply projects that community participation has significant impacts on achieving functioning systems (Narayan, 1995; Prokopy, 2005). Although, there has been some success with participatory rural sanitation methods, e.g. PHAST (Wood et al., 1998) and community health clubs (Waterkeyn & Cairncross, 2005), the same depth of evidence has yet to be provided for sanitation in rural/urban areas. Still, the participation theme seems to have been picked up by the entire sanitation sector, especially as it recognizes that achieving improved sanitation conditions is something that must be addressed at both individual and community levels (WSSCC/Eawag, 2005).

An overview of current best-practice approaches to sanitation planning highlights the use of participation tools. Participatory approaches to sanitation planning claim to increase the potential for a sustainable system through better management of the numerous risk-factors and capacity development for

operation and maintenance within the local domains (Kvarnström & af Petersens, 2004.IWA, 2006). In addition, they are intended to help decision-makers in selecting appropriate technology to satisfy the functional requirements of the various stakeholders. In recognition of this a number of organizations have developed or are promoting planning frameworks for sanitation based on participatory assessment of stakeholder priorities at different levels of decision-making (Kvarnström & Petersens, 2004; WSSCC/Eawag, 2005; IWA, 2006).

A participatory decision-making process brings together people with a diverse set of interests in an open, authentic discussion of possible solutions in order to arrive at a mutually beneficial solution (Hajer & Wagenaar, 2003). In practice there are many levels of participation from attending meetings, providing information to surveys, or taking an active role in debates and decision-making. Participation is often linked to discussions of empowerment and ownership, since taking part in society is often seen as having a voice.

A conceptual model for environmental sanitation programme development

The concept in Figure 3 has a general goal of achieving improved sanitation, ensuring a healthy life and sustainable development. In order to realize such goals, Government and other stakeholders in policy making must put in place better sanitation policies, programmes and projects. Subsequently, doing the latter will lead to capacity building, knowledge and skills development among people as far as sanitation issues are concerned making them aware of the merits of improved sanitation. As a result there will be

provision of more toilet facilities in households, public places of convenience, more public sanitation awareness through education and enforcement of sanitation laws within communities.

Furthermore, the provision of such facilities will ensure household sanitation security, safe environmental sanitation and good hygiene sanitation practices. Household sanitation security means presence of improved toilet facilities which are accessible and affordable to use.

Hence, one must readily find an improved sanitary facility and it should be accessible without any impediment such as cost in accessing them, especially the public facilities. Again, the provision of more improved sanitation (toilet) facilities among the populace will also ensure safe environmental sanitation. This means that there will be proper disposal of human excreta where it does not come into contact with the human body as conceptualized to be "improved sanitation" by the UN Joint Monitoring Programme (JMP). Also there will be improved hygiene sanitation practiced within communities.

In conclusion, ensuring household sanitation, safe environmental sanitation and good hygiene overall will help achieve the overall goal of improved sanitation, healthy life and sustainable development.

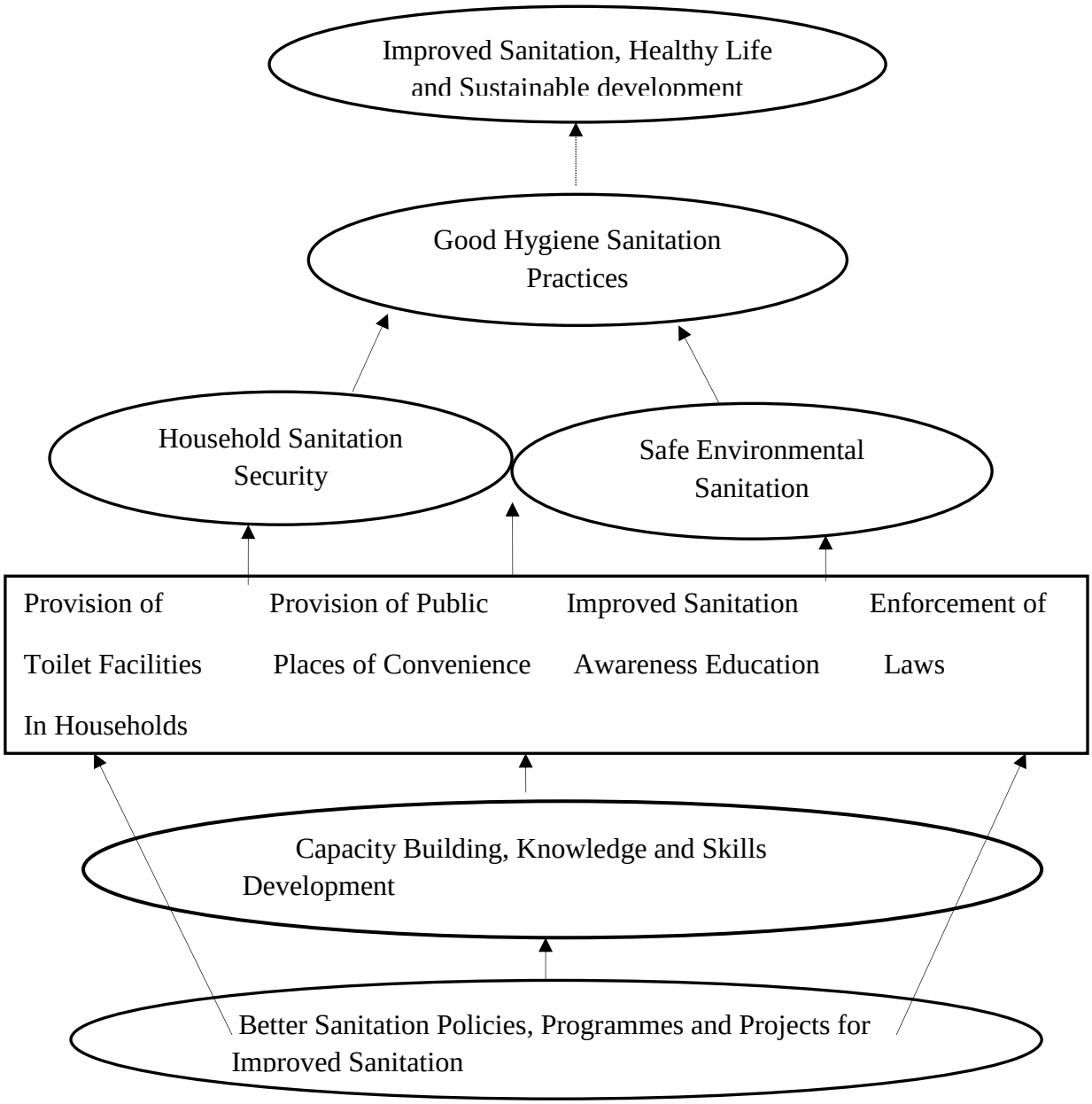

Figure 3: A conceptual model for environmental sanitation programme development

Source: Adopted from UNICEF, (1997)

CHAPTER THREE

METHODOLOGY

Introduction

This chapter presents the logical sequence of how the research procedure was carried out. Thus it includes the description of the research design, willingness to pay methodology, population size, and sampling type and how the various sampling techniques were applied. It also indicates the data collection methods and data analysis.

Research design

Research design is a process or a plan that enables a researcher develop and execute a research agenda, including the topic selection and answering questions of why, how a particular problem will be scientifically investigated to its logical conclusion. Three main types of research design are quantitative, qualitative and mixed method approaches.

The research design adopted was the mixed method, that is, both qualitative and quantitative approaches. Qualitative approach is used when we do not know what to expect, to define the problem or develop an approach to the problem. It is also used to go deeper into issues of interest and explore nuances related to the problem at hand. Common data collection methods used in qualitative research is focus groups, triads, dyads, in-depth interviews, uninterrupted observation, bulletin boards, and ethnographic participation or observation. On the other hand, quantitative approach is conclusive in its purpose as it tries to quantify the problem and understand how prevalent it is by looking for projectable results to a larger population. Here we collect data

through surveys, audits, points of purchase (purchase transactions), and click-streams. Both approaches are used in this study because combining the two approaches is useful in addressing issues of complexity in the phenomenon under study (Sale et al., 2002). Again, the researcher is of the view that, the nature of knowledge and how we know what we know (epistemological purity) does not get research done (Miles & Huberman, 1984). Therefore, both qualitative and quantitative approaches to gaining knowledge are legitimate ways of understanding the world. The use of the mixed method also facilitated the researcher in using one approach as a precursor for the other to answer different questions embedded on a specific instrument. This study was also based on systematic description of the sanitation situations in the two areas (urban and rural) was outlined as far as people access to specific sanitation facilities were concerned and whether there were some social systems, events or relations put in place relative to their sanitation situations.

Profile of study area

The New Juabeng Municipal Assembly was established by the Legislative Instrument (LI) 1426 of 1988. The Municipality has 52 communities with Koforidua as its capital. The Municipality covers a land area of 110 square kilometres. It shares boundaries to the north-east with East Akim Municipality, to the south-east with Akuapem North District, Yilo Krobo District to the east and Suhum Kraboa Coaltar District to the west. According to the Ghana Statistical Service (2000), the total population in the municipality was 136,768.Out of this, Koforidua and Akwadum had a total population of 87,315 and 2,114 respectively. The number of males and females in Koforidua was 42,099 and 45,216 respectively while that of Akwadum was 1,028 for

males and 1,086 females. In terms of household characteristics, the total number of houses for the two communities was 7,318 for Koforidua and 207 for Akwadum with the same average household size of 3.9. The key sectors of the Municipal economy are industrial manufacturing and processing which constitutes about 26.7 percent, the service sector 39.9 percent, agriculture 26.1 percent and 7.3 percent engaged in other socio-economic activities. Whilst majority of industrial establishments are found in the central business area of the Municipality, agricultural production is carried out at the small settlements and the peri-urban locations of the Municipality. Educational facilities in the Municipality include pre-schools, primary, JHS, SHS, Technical and Vocational Schools, Teacher Training College and Tertiary Institutions. The River Volta and Densu are the main sources that supply water for treatment and delivery to the municipality and satellite communities. The average water coverage is 49 per cent. However, some of these sources are unsafe and expose the people to water-related diseases such as diarrhoea, typhoid fever, guinea worm and schistosomiasis. There is only one approved waste management site within the municipality.

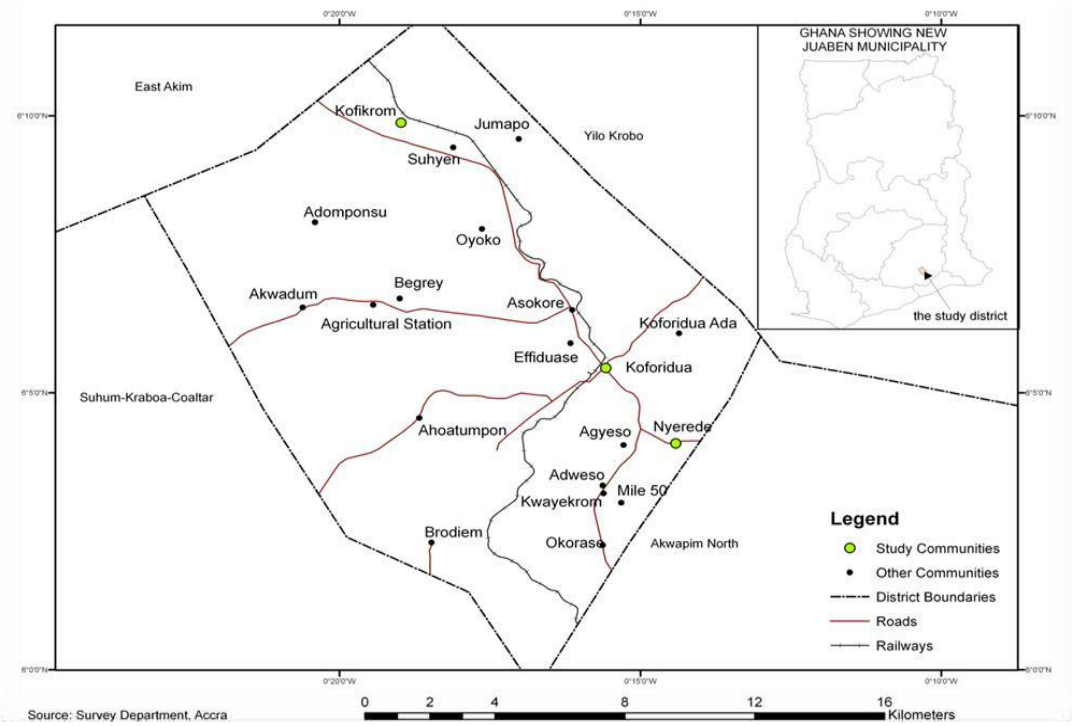

Figure 4: Map of New Juabeng Municipality
Source: NJMA Composite Budget, 2013

Study population

The population for the study was household heads resident in Koforidua and Akwadum who have stayed in the area for not less than six months. The cutoff of household heads having stayed in the municipality for not less than six months was based on the Ghana Statistical Service categorization and definition of who a resident is during the 2010 population and housing census. This was made up of various households within the communities which were systematically selected, comprising of male and female adult household heads who could give a vivid description of their sanitation situations including that of their children. Also, key respondents such as officers from the Environmental Health Directorate of the New Juabeng Municipal Assembly formed part of the study population.

Sample size determination

The sampling unit for this study was the household. This is because, sanitation (toilet) facilities are provided to a household and not just one individual in any social setting. Furthermore, since the number of households for the Koforidua was 22,513 and that of the Akwadum as 540 giving the total number of households for the two settlements as 23,053 and based on Krejcie and Morgan's (1970) determination of sample size from a population, the sample size for the study was 377 (see Appendix D).

Subsequently, since the study took place in two towns, the sample size of 377 households was distributed among the two settlements using equal allocation rather than proportional allocation. The distribution was done using equal allocation because the number of households in Koforidua, 22, 513 far outnumbered that of Akwadum which was 540. Thus, the use of proportional allocation would have ended up with households in Koforidua being sampled more than that of Akwadum. Therefore, in order to have a fair representation of the sampled households among the two towns, equal allocation was the most appropriate where there was a 50-50 allocation hence 188 and 189 households being sampled from each community respectively.

Sampling procedure

The sampling procedures used in the study were the systematic and purposive sampling methods. The systematic sampling meant there is an equal chance (probability) of selecting each unit from within the population in this case, household heads. On the other hand, with the composition of the sampled household (tenants, household heads and landlords), a nonrandom sampling technique, purposive sampling was used to purposively sample

household heads and landlords because they were specifically relevant to the study as the provision of sanitation facilities for a household greatly depends on them. Also, key informants such as assembly members, environmental health department staff of the assembly were also purposively sampled.

This study took place in the Koforidua and Akwadum. Koforidua constituted an urban community whilst Akwadum constituted a rural community. According to the New Juabeng Municipal Assembly, the total population of the two areas is about 87,315 and 2,114 respectively. The former (an urban) settlement was chosen among other towns in the municipality because, it is the municipal capital and exhibits all features and characteristics of an urban area, namely, has a population of more than 5,000 (GSS, 2010) , has modern housing structures, has improved infrastructure and the presence of growth poles (schools, hospitals, banks etc) with most of its population literates and employed in the service sector rather than the agricultural sector as maintained by Sorokin and Zimmerman (1929).Therefore, there was no township in the municipality which could best describe and exhibit urbanism than the municipal capital, Koforidua.

On the other hand, Akwadum, also a suburb in the municipality was selected to represent a rural community since the study tried to compare sanitation situations in the municipality from an urban-rural perspective. Akwadum was selected to represent a rural area because, the town has a population of less than 5,000 (GSS, 2010), its inhabitants mostly agrarians, has some primitive housing structures, has seen little infrastructural development, neither are there presence of significant growth poles in the township. Thus, as classified by Sorokin and Zimmerman in their book,

"Principles of Rural Sociology", Akwadum represented a rural settlement for the study.

Willingness to Pay Methodology (WTP)

This study assessed the willingness of residents in Koforidua and Akwadum, New Juabeng Municipality to pay for improvements in their sanitation service delivery. From household's perspective, demand for a product may consist of both "use value" and "non-use value" (Hussen 2004, Thampapillai 2000, Carson 1999). Theoretically, these two components of demand influence household's decision to purchase a product. Thus, the amount the household is willing to pay (WTP) for the product actually reflects total value of the product to the household. In the case of this study, for example, a household may pay for a "sanitary latrine" not only for its direct use values but also for the ancillary benefits associated with the installation of the latrine. The ancillary benefits in this case might be in the form of reduced health burden, social status, or simply improved ambient environment. WTP is essentially the maximum amount of money the beneficiaries are willing to pay for certain hypothetical service. However, from a practical perspective to design a tariff structure it is also essential to match household's WTP with its ability to pay (ATP) (Fujita et al. 2005).

Contingent Valuation Method (CVM)

Services such as sanitation and water supply are not generally traded in markets and information on market demand or competitive market prices are often unavailable to value benefits (Yang et al. 2006, FAO 2000). This study used a survey-based mechanism called the Contingent Valuation Method

(CVM) which has been widely used in last few decades to elicit people's preferences when market for a good is absent, imperfect or incomplete (Ahmad et al. 2003, Fujita et al. 2005). CVM creates a hypothetical market for such products and reveals the stated preference of the respondent. CVM is the standard and often the only approach that can include both use and non-use value (Carson, 1999). It is well reported that, with stated preference techniques, researchers can design surveys to elicit preferences for goods with attributes that are not currently available in the market (Devicienti, 2005).

Thus, the effectiveness of the CVM relies heavily on how well the questionnaire was designed and also on how well the survey was administered. The three most pronounced biases often associated with CV approach are: a) starting point bias, b) strategic bias, and c) hypothetical bias. Thus, to ensure the reliability of the CVM findings, following approaches are often cited by some of the subject matter experts (Devicienti 2005): (a) a conservative survey design, (b) the use of WTP rather than willingness to accept (WTA) questions, (c) the use of the referendum form rather than open-ended questions, (d) an accurate description of programme and policies, (e) a reminder of substitute commodities, (f) the use of yes-or-no follow up questions and (g) checks on the respondent's understanding of the scenario. Although efforts have been made to follow these approaches closely for this study, due to the nature of the study some of the conditions had to be relaxed for the sake of practical implication of the results.

Data sources

Data was collected from both primary and tertiary sources of data. Primary sources of data such as facts and figures relating to the population were used in order to get the exact information wanted as far as sanitation provision is concerned. Thus, the primary data gathered aided in answering objective two (2) and four (4) which looks at communities' sanitation preferences and willingness to pay for improved sanitation. Tertiary data such as those originally collected usually for administrative reasons like, official statistics of a country (Ghana Statistical Service; Population and Housing Census Reports; and Ghana Demographic Health Survey), organizations and institutions was also used since they were easily accessible and less expensive. The use of such secondary data highlighted the existing sanitation gaps and challenges within the various communities and thereby helped made a better comparison and analysis in answering objective one (1), three (3) and five (5).

Multiple sources of evidence thus, non- participant observation, and face-to-face semi-structured interviews, were also used. Multiple data sources or triangulation of data sources are likely to support a more conclusive and accurate conclusions, unlike when a single source of evidence is used (Yin 2003).Semi-structured interviews using interview guides were used to collect data from some key respondents at the municipal assembly on what sanitation gap exist currently among urban and rural residents in the municipality and the various interventions and policies put in place in addressing such challenges.

Data collection instruments

Four main sets of data collection instruments were employed in this study. These were questionnaire, interview schedule, observation checklist and interview guide. The questionnaire as instrument was used because it offers opportunity for both the researcher and the respondent. For the former, it aids to save time whilst it avoids any influence or interference from the researcher to the latter when answering questions. Since questionnaires are normally administered among a literate population, it was mostly administered in the urban community (Koforidua) among household heads, landlords who could read and write. However, it was also administered to those literates in the rural areas as well.

The second instrument, interview schedule was used because, some of the respondents were not able to read and write and for that matter could not be able to answer questions all by themselves using questionnaire. Thus, the interview schedule was administered mostly on respondents in the rural area where most of them could not read and write and needed further explanation from the researcher for accurate responses. Observation check list was the third instrument used. The observation check list was used to check the nature and characteristics of improved or unimproved sanitation (toilet) facilities in the sampled households of the two communities. Lastly was the interview guide which was used to get information from the key respondents such as the Environmental Health Officers of the assembly. (See Appendices)

Data collection method

The various methods employed in the collection of data during this study using the above-mentioned instruments were questionnaire administration, interviewing and observation.

Data analysis

Quantitative Data

Using Statistical Package for Social Scientists (SPSS), quantitative analysis techniques were used. Open coding was conducted to generate mutually exclusive categories, including descriptive statistics (*e.g.*, frequencies) and cross-tabulations to determine relationships among variables, one-sample chi-square and one-way ANOVA to test statistical significance.

Qualitative Data

The qualitative approach in analysing data entailed interpretation techniques such as decoding and translation of data. Further, a thematic analysis was used to transcribe data obtained from interview into themes. These were patterns across the data sets that were important to the description of the phenomenon thus, to specific objectives. In this case, objectives two (2), three (3) and five (5) of the study.

Ethical issues in the study

The study took into consideration a lot of ethical issues during the d0ata collection stage. Ethical practices and procedures were very important to the study as it protected research subjects from physical and psychological harm and ensure that their rights were not violated.

The first ethical consideration was the right to free and informed consent. Respondents were not coaxed in any way to participate in the research project as they voluntarily participated in the research process. Also, participants were provided with sufficient information to make knowledgeable decisions about their participation or non-participation.

Secondly, issues of confidentiality and privacy were not compromised in the study. Thus, information obtained from the respondents was used only for academic purposes.

Again, appropriate methodology was used to conduct the research systematically and objectively applying many controls and acceptable research procedures appropriate for the specific project.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

This chapter presents the results and discussion of data. The chapter includes background characteristics of respondents, sanitation preferences, and resident's willingness to pay for improved services, interventions put in place, ownership and provision of improved sanitation (toilet facilities) as well as challenges in providing improved sanitation.

Household profile

This section presents the household characteristics of the respondents such as the sex, educational background and occupation of household heads. Also, the total number of males, females, children and the aged, including the average household size and monthly income of households is also discussed.

In most households, the provision of most facilities including sanitation facilities is the responsibility of the husband (male) while the maintenance of such facilities lies on the wife (female). Therefore, the sex composition of household heads was paramount to the provision of sanitation and the study as a whole.

Figure 5 indicates the percentages of male and female household heads across the two communities. The majority of rural household heads, (74.1%) were males while the remaining (25.9%) were females. Also, the same observation was made in the urban area as well, where the majorities (76.6%) of household heads were males and the minority (23.4%) females. This was consistent with the findings made by the Ghana Statistical Service Census

Survey, 2010 and a study by Lien Aid and World Toilet Organization (WTO), (2010), that the majority of household heads were males.

Figure 5: Sex of household heads
Source: Field Data

Table 2 presents the educational attainment of respondents in both rural and urban communities since the level of education was paramount to their understanding of sanitation provisions and the need for improvement. Most respondents had some level of formal education with only 9.5 percent and 6.4 percent with no formal education in both the rural and urban areas respectively. In the urban and rural areas, the majority of household heads representing 51.9 percent and 31.4 percent respectively had some primary education. However, only 6.9 percent in the rural area had tertiary education as compared to 16.0 percent of urban residents.

Thus, increased education could contribute to a better understanding of hygiene and disease transmission and therefore increase the desire for a personal toilet or latrine (Jenkins & Curtis, 2005). Again, increased in education may contribute to increased prestige, which may motivate a

respondent to maintain a personal sanitation facility because it is expected of someone of their rank in society (Cairncross, 1992).

Table 2: Educational level of household heads

Level of education	Urban	Rural	Total
	%	%	%
No formal school	6.4	9.5	8.0
Primary	31.4	51.9	41.6
JHS	27.7	20.6	24.1
Secondary	18.6	11.1	14.9
Tertiary	16.0	6.9	11.4
Total	100.0	100.0	100.0

Source: Field Survey

The type of occupation one is engaged in somehow determines the level of household income. Hence, whether a household can afford a particular type of sanitation facility depends on the type of work and income generated from it. Table 3 indicates the occupational background of the various household heads. A total of 188 and 189 respondents were selected in both urban and rural settlements respectively. About four out of ten (40.7%) of the household heads in the rural area were farmers while 4.2 percent were unemployed. However, in the urban area, almost 32 percent were engaged in the services/sales/commercial sector whereas 5.3 percent were also unemployed.

Table 3: Occupation of household heads

Type of occupation	Urban	Rural	Total
	%	%	%
Farmers	12.8	40.7	26.8
Civil service	28.7	9.5	19.1
Services/sales/commercial	31.9	27.5	29.7
Unemployed	5.3	4.2	4.8
Professional/Technical	21.3	18.0	19.6
Total	100.0	100.0	100.0

Source: Field Survey

From Table 4, the average household size in the selected households was recorded. Half of the households in the urban area (50.0%) had between 4-6 household members while only (5.9%) had between 7-9 household members. Also, within the rural area as well, almost half of the households (49.9%) had household members between 4-6 with the highest household size being 10 people and above representing (0.5%). In urban and rural areas, the average number of people living in a household was about 3.8. This was slightly lower than the average size of households during the 2010 population and housing census for both communities, which were 3.9 (GSS, 2010).

Table 4: Average household size

Average household size	Urban	Rural	Total
	%	%	%
1-3	44.1	45.5	44.8
4-6	50.0	49.7	49.9
7-9	5.9	3.7	4.8
10+	0.0	1.1	0.5
Total	100.0	100.0	100.0
Average household size	Urban= 3.78		Rural= 3.72

Source: Field Survey

There is a direct relationship between income and provision of sanitation facilities because the ability to afford improved sanitation depends on one's income level. Thus, the higher the household income level, the more likely that the household can afford improved sanitation facilities or services. Therefore, Table 5 indicates the average monthly income of households. From the Table, it could be observed that even though more households in the rural areas earned between GHS 50-350 as compared to those in the urban areas, the latter had more households earning higher incomes (> GHS 350) than the former, thereby indicating a higher average income for the urban households (GHS 358.03) compared to GHS 294.34 for the rural households. Thus, urban households had higher income levels than the rural households. This was important to the study as the ability of households to afford improved sanitation facilities depended greatly on the level of income.

Table 5: Average monthly income of households

Income (GHC)	Urban	Rural	Total
	%	%	%
50-350	66.5	80.4	73.5
351-650	21.3	15.9	18.6
651-950	10.1	2.1	6.1
1001-1250	1.6	1.1	1.3
1251-1550+	0.5	0.5	0.5
Total	100.0	100.0	100.0
Average income	Urban= 358.03 (GHC)		Rural= 294.34 (GHC)

Source: Field Survey

Table 6 indicates the number of males in the selected households across the two areas thus, urban and rural. This was important to this study since gender plays a significant role in the provision of sanitation at the household level since provision of such facilities is normally the responsibility of the man (husband) thus, the importance of household gender composition. For both localities, more than half of the households selected had between 0-2 males. Also, 23.9 percent and 22.8 percent of the household members in the urban and rural communities respectively, had between 3 and 5 males.

Table 6: Number of males in household

Number of males	Urban	Rural	Total
	%	%	%
0-2	76.1	76.7	76.4
3-5	23.9	22.8	23.3
6+	0.0	0.5	0.3
Total	100.0	100.0	100

Source: Field Survey

Again, Table 7 gives the total number of females in the various households surveyed for the study. The composition of females in the household was paramount for the study because women are normally responsible for the up keep and maintenance of sanitation facilities in the house and also are the most vulnerable at places where there are no sanitation facilities. Also, as stated in the literature, poor sanitation and hygiene are the highest cost for women and children. Women, adolescent girls, children and infants suffer most from inadequate hygiene and sanitation facilities (UNICEF, 2009). Thus lack of safe, separate and private sanitation can inhibit girls from attending school and increase the burden of caring for the sick, as well as the likelihood of disease during pregnancy. Therefore, if women are more dissatisfied than men it suggests they could be the target of a sanitation campaign (Program, 2004).

In both urban and rural areas, about three-fourth of the households selected also had between 0-2 females. Again, 30.9 percent and 27.0 percent

of the household members in the urban and rural communities respectively had between 3 and 5 females.

Table 7: Number of females in household

Number of females	Urban	Rural	Total
	%	%	%
0-2	69.1	72.5	70.8
3-5	30.9	27.0	28.9
6+	0.0	0.5	0.3
Total	100.0	100.0	100

Source: Field Survey

Furthermore, Table 8 also discusses the number of children living within the various households selected. Children just like women, are among the most vulnerable in communities where there is lack of sanitation facilities. Thus, the number of children in every household within the various communities was important for the study. From the Table, nearly all the households in the urban area (98.4%) had between 0-2 children while 93.7% of the households in the rural area had children within the same range.

Table 8: Number of children in household

Number of children	Urban	Rural	Total
	%	%	%
0-2	98.4	93.7	96.0
3-5	1.6	6.3	4.0
Total	100.0	100.0	100

Source: Field Survey

Again, Table 9 indicates the number of aged in the various households surveyed. Since the aged was no exception to the vulnerable group in most societies as far as sanitation is concerned, their inclusion and composition of the various households was very important for this study. Majority of the households in both urban and rural areas had between 0-1 aged member representing (96.3%) and (89.9%) of the total households respectively. Moreover, only 3.7 percent and 10.1 percent of the households respectively in both areas had between 2-3 aged members.

Table 9: Number of aged in household

Number of aged	Urban	Rural	Total
	%	%	%
0-1	96.3	89.9	93.1
2-3	3.7	10.1	6.9
Total	100.0	100.0	100

Source: Field Survey

Sanitation gap between urban and rural communities

This section presents data on the sanitation gap that exist between urban and rural communities at the national and district level. The section is of paramount importance to the study as it helps answer both the general and first specific objectives of the study: assessing the urban-rural differences in achieving the MDG for sanitation in the Case of New Juabeng Municipality, Ghana.

Table 10 shows access to improved sanitation in Ghana between 1993 and 2008. On the whole, 12.4 percent of the country's total population had access to improved sanitation by 2008. However, there was a gradual improvement over the years (5 year period) since the least percentage, (4.0%) was recorded in 1993. In 1998, there was a 1 percent improvement with 5.0 percent of the population having access to improved sanitation. Again, in 2003, there was a 3 percent increase as 8.0 percent of the population had access to improved sanitation. Thus, in 2008, 12.4 percent of the country's population had access to improved sanitation, an increase of 4 percent between 2003 and 2008.

In terms of space (urban and rural), it was observed that by 2008, more urban population had access to improved sanitation than rural households. Between 1993 and 2008, 17.0 percent of people living in urban areas in Ghana had access to improved sanitation with only 8.2 percent in the rural areas. Whilst nationally there was a gradual improvement over the years, the same could not be said in terms of access to improved sanitation in rural areas. There was only 1 percent improvement in the percentage of rural population who had access to improved sanitation from 1993 to 2003. On the other hand, there was a 5 percent improvement over the same period in the urban areas. Clearly, there is significant gap between urban and rural areas in terms of access to improved sanitation.

Table 10: Access to improved sanitation in Ghana (1993-2008)

Year	Rural	Urban	National
1993	1.0	10.0	4.0
1998	1.0	11.0	5.0
2003	2.0	15.0	8.0
2008	8.2	17.8	12.4

Source: GDHS (1993, 1998, 2003, 2008)

Similarly, the data from the Joint Monitoring Programme (JMP) of the World Health Organisation (WHO) and the United Nations International Children's Emergency Fund (UNICEF) show that there is a wide disparity between rural and urban areas in terms of access to improved sanitation in Ghana. Table 11 shows that only 13 percent of the proportion of the country's population used improved sanitation facilities as at 2011. The majority (59%) used shared sanitation facilities which are considered as unimproved by

WHO/UNICEF, with 18 percent engaged in open defecation. Comparatively, between the year 2000, which marks the starting period of the MDGs and 2011, 19 percent of urban population used improved sanitation facilities while 8 percent used same facilities in the rural areas. Again, only 6 percent of the urban population engaged in open defecation as compared to 32 percent among the rural population. The results therefore, indicate a huge gap between urban and rural localities as far as the use of improved sanitation facilities is concerned.

Table 11: Use of sanitation facilities (proportion of population)

			Year		
Locality	Sanitation options		1990	2000	2011
Urban	Improved	Improved	12	15	19
	Unimproved	Shared	45	59	72
		Unimproved	32	17	3
		Open defecation	11	9	6
Rural	Improved	Improved	3	6	8
	Unimproved	Shared	19	32	44
		Unimproved	49	31	16
		Open defecation	29	31	32
Total	Improved	Improved	6	10	13
	Unimproved	Shared	29	44	59
		Unimproved	43	25	10
		Open defecation	23	21	18

Proportion of 2011 population that gained access since 1995
Source: WHO/UNICEF (2013)

Subsequently, Table 12 presents data on the type of toilet facilities used among urban and rural households in the New Juabeng Municipality. It was observed that more households within the urban area use improved form of toilet facilities (WC, KVIP) as compared to their rural counterparts within the municipality. About three (3) out of ten (10) households (31.5%) in the urban area used water closet (WC) as against about one (1) in ten (10) (11.8%) for the rural households. Similarly, 17.3 percent of urban households used Kumasi

Ventilated Improved Pit (KVIP) while 11.2 percent for rural areas. However, it is worthy of note that the majority of the households (36.2% for urban and 31.5% for rural`) depended greatly on public latrines. This observation is of great concern because public toilets are mainly meant for the visitors and the transient population. Therefore, if more householders use public toilets, it reflects the high inadequacy of private sanitation in the Municipality, with its attendant health and environmental challenges.

On the other hand, 5.8%, 38.9%, 0.4% and 0.5% respectively of the households in the rural area had respectively no toilet facility, or used the pit latrine, bucket/pan or other form of toilet facility which are regarded as unimproved while a slightly lower percentage were observed in the urban areas. This indicates a wide gap among urban and rural households with respect to access to improved sanitation (toilet facilities) as more households within the latter continue to use unimproved types of toilet facilities. Comparing the data at the national and district levels, it could be observed that, indeed there is a huge difference as far as access and usage of improved sanitation facilities, among urban and rural settlements was concerned.

Table 12: Toilet facility used by household in the NJMA

Type of toilet facility	Urban (%)	Rural (%)
No facility (bush/beach/field)	2.7	5.8
Water closet	31.5	11.8
Pit latrine	11.5	38.9
KVIP	17.3	11.2
Bucket/Pan	0.5	0.4
Public (WC/KVP/PIT/PAN etc)	36.2	31.5
Other	0.3	0.5

Source: GSS Regional Analytical Report, (2010)

Having analyzed the sanitation gap at the national and district levels using existing data from Population and Housing Census and the Ghana Demographic and Health Survey conducted by the Ghana Statistical Service, as well as data from the Joint Monitoring Programme of the WHO/UNICEF, this section highlights the current sanitation practices of the various households sampled for the study which was also a way of examining the rural-urban sanitation gap in the selected communities. This included data on the type of toilet facility used, usage of public latrines and average distance in accessing them.

From Table 13, 82.5 percent of the households in the rural area used shared -improved pit latrine while 1.1 percent each used shared or their own flush toilet facility. In the urban area as well, 48.4 percent used shared improved pit latrine. Therefore, per the UN and WHO convention, most households in both the rural and urban communities in the NJMA used an unimproved type of toilet facility since according to the United Nations and WHO, a toilet facility becomes unimproved when it is shared among more than one household (UNICEF, 2006). However, earlier findings were also in line with the general conclusion by the GSS in 2010 that, water closet usage was much higher in the urban areas than the rural areas. According to the Ghana Statistical Service, generally, 31.5 percent of the urban population use water closet whereas only 11.8 percent of the entire rural population in the municipality used water closet (See Table 12).

Table 13: Usual type of toilet facility used by household

Type of toilet facility	Urban	Rural	Total
	%	%	%
Shared pit latrine	4.3	2.1	3.2
Own pit latrine	8.5	4.2	6.4
Shared improved pit latrine	48.4	82.5	65.5
Own improved pit latrine	5.3	9.0	7.2
Shared flush toilet	18.6	1.1	9.8
Own flush toilet	14.9	1.1	7.9
Total	100.0	100.0	100.0

Source: Field Survey

Table 14 indicates the number of households that depended on public toilets as their place of defecation. Within the rural area, 81.0 percent reported that they use the public latrines whiles in the urban area, an opposite observation was made. Here, 38.8 percent reported using the public latrines even though the usage of public toilets is not dependent on the type of locality. This is

because, averagely more households in the urban area under study had a toilet facility of their own than their rural counterparts. The fact that more rural households still depended greatly on public latrines showed how low they still lie on the "sanitation ladder", compared to the urban areas as suggested in the literature by WHO. Widely used in Ghana, public latrines in particular tend to be dirty and squalid, with feces lying around squat holes which emit heat, gases and bad odours, believed to cause ill health (Obika et al., 2002). It was therefore not surprising the national cholera outbreak the country experienced this year, the worst of its kind. According to the New Juabeng Municipal Health Directorate, sixty one (61) cholera cases were recorded since the outbreak of cholera from June to August this year. The good news however was that, no cholera related death was recorded in the municipality. However, cholera, diarrhoea, typhoid fever, and malaria which are all caused by sanitation continue to be among the top ten causes of morbidity in the municipality. Similarly, in their study, "Behavioral indicators of household decision-making and demand for sanitation and potential gains from social marketing in Ghana", Jenkins and Scott (2007) found that over half (58.2%) of the sampled households used public toilets while 14 percent practiced open defecation with only 11 percent having their individual household toilet facility. Again, Atuahene, (2010), also reported that 66 percent of the household surveyed used public toilets (KVIP, Aqua-Privy Toilet and Vault Chamber) thereby suggesting the dependence of most households on public latrines in most societies.

Table 14: Household usage of public latrine

Response	Urban	Rural	Total
	%	%	%
Yes	38.8	81.0	59.9
No	61.2	19.0	40.1
Total	100.0	100.0	100.0

Source: Field Survey

Ideally, every household should own a toilet facility located within the house or not far from the house as proximity is of great importance to accessing a toilet facility, the shorter the distance to a toilet facility, the better. Therefore the average distance from households to their various toilet facilities was explored in this study. The average distance from households to their various toilet facilities was recorded in minutes as shown in Table 15 for both communities. In the urban area, more than half of the households (64.9%) spent between 1-5 minutes in accessing the toilet facility while only 5.3 percent spent more than 16 minutes, the highest recorded. Likewise, within the rural area, about one-third (33.9%) spent between 1-5 minutes in accessing the toilet facility while 16.4 percent of the total population spending 16 minutes and above. Therefore, households in the urban area spend lesser time to access a toilet facility than their rural counterparts-, perhaps due to the fact that more urban households had access to their own toilets in their houses than rural dwellers.

Table 15: Average distance from household to toilet facility

Time (mins)	Urban	Rural	Total
	%	%	%
1-5	64.9	33.9	49.3
6-10	21.8	28.6	25.2
11-15	8.0	21.2	14.6
16+	5.3	16.4	10.9
Total	100.0	100.0	100.0

Source: Field Survey

Sanitation preferences among respondents

The adoption decision for any sanitation technology or option starts with development of 'preference' for a sanitation improvement over one's present defecation practice. Sanitation preferences capture purchase motivation and the expected relative advantages, benefits, and reasons (perceived utility gain) for wanting a sanitation improvement (Jenkins & Scott, 2007). This section therefore explores the sanitation preferences of respondents in the two study communities and the various reasons for the preferred sanitation facility. Again, the section included responses from the Municipal Assembly on issues of preferences as well.

The majority of households in the rural area (76.7) percent reported that they prefer having their own improved pit latrine (KVIP) whereas 14.3 percent preferred having their own flush toilet. In the urban area as well, about half of the respondents (48.9%) also preferred having their own improved pit latrine while 45.2 percent preferred their own flush toilet. Again, in both communities per their choice of preference recognized the need to move up the rungs on the

"sanitation ladder" thus, their choice of improved facilities. Likewise, a study by Atuahene (2010) indicated similar findings on respondents' preference for a sanitation facility where the majority, preferred KVIP. On the contrary, in a related literature, the first choice preference, 45.9 percent of those surveyed was personal flush toilets, with 30.0 percent desiring shared flush toilets and 6.6 percent desiring public flush toilets (Spencer, 2006). From the findings of the Wash Marketing Project Kampong Speu Baseline Survey in 2010, the flush/pour-flush latrine was clearly the most preferred latrine technology amongst latrine owners and non-owners with 94.6 percent and 97.6 percent respectively preferring such sanitation facility. (Lien Aid & World Toilet Organisation, 2010)

There are a variety of reasons that household desire personal flush toilets, but other studies have reported reasons such as cleanliness, privacy, health and prestige (Jenkins & Scott, 2007). It was potentially problematic that more than 80 percent of the residents in these communities (Kley, Olowe, Lower west & Lower East) in Prampram desired some form of flush toilets because the area did not have a reliable piped water supply (Spencer, 2006)

Table 16: Households preferred toilet facility

Toilet facility	Urban	Rural	Total
	%	%	%
Own pit latrine	1.6	2.6	2.1
Shared improved pit latrine	2.1	5.8	4.0
Own improved pit latrine	48.9	76.7	62.9
Shared flush toilet	2.1	05	1.3
Own flush toilet	45.2	14.3	29.7
Total	100.0	100.0	100.0

Source: Field Survey

Furthermore, a one-way ANOVA between-group with post-hoc test was run to find out if there was a significant difference in the mean score on monthly income across households preferred toilet facility. The results, ($p = 0.00 < 0.05$) indicates a significant difference in the mean monthly income and preferred toilet facility of households). Hence, preferred toilet facility depended greatly on level of income of household

In addition, a chi-square independent test was also run to establish if any, the significant relationship between the type of locality of households (rural or urban) and the type of toilet facility preferred. The results, ($x^2 = 47.45$, $p = 0.001 < 0.05$) shows a significant relationship between the type of locality of

households and the type of toilet facility preferred. Thus the locality of households influences the type of toilet facility preferred.

According to the environmental health officer of the municipality, the type of toilet facility constructed for both rural and urban settlements within the municipality by the assembly depended greatly on two main factors, thus the type of environment and who is sponsoring the project (donor agency). According to him, public latrines or toilet facilities usually provided by the assembly were meant for public places such as markets, lorry stations, recreational centres and schools (basic level) and not for household use. In the past however, the assembly used to construct "communal pan" latrines which have now been banned by the government. Thus, currently the common types of toilet facilities constructed in the municipality are septic latrines (aqua-privy) and the water closet or pour-flush latrines. In some cases, some NGOs provide what is called, "Enviro loo" and KVIPs but mostly in the rural areas of the municipality.

The reasons for preferring a particular type of toilet facility over the other varied among households within the two localities, rural and urban is as shown in Table 16. Findings of Jenkins and Scott (2007), in their paper "Behavioural indicators of household decision-making and demand for sanitation and potential gains from social marketing in Ghana" suggested that, household made sanitation choices or preferences when they know the advantages, benefits and reasons for doing so. Thus, when they are more educated and informed on the issue at hand. About one out of five households within the rural area (20.1%) preferred a particular type of toilet facility to the others because of proximity while in the urban area, 18.6 percent of households preferred a particular type of toilet facility because of safety and comfort.

However, Jenkins and Scott (2007) recorded convenience, safety, and cleanliness as strong attributes for sanitation facilities preferences similar to the findings of this study.

Furthermore, from the Municipal Assembly's point of view, an official indicated that there were no specific reasons for constructing the above-mentioned types of toilet facilities since it greatly depended on the donor agency sponsoring the project. Nevertheless, since society is evolving and modernization and civilization have caught up with most societies, it was logical for the Assembly to construct modern types of toilet facilities especially in the urban areas. Therefore, it was more likely that, most urban communities within the municipality will benefit from a more improved sanitation (toilet) facilities as compared to their rural counterparts based on the explanation given by the assembly. This widens the already existing gap between urban and rural areas in providing their developmental needs of which improved sanitation is no exception.

Table 17: Reasons for preferred toilet facility

Reasons for preference	Urban	Rural	Total
	%	%	%
Privacy	6.4	13.2	9.8
Comfort	3.2	6.9	5.0
Convenience	18.1	4.2	11.1
Safety	12.2	14.8	13.5
Proximity	14.4	20.1	17.2
Odour prevention	4.8	5.8	5.3
Safety/Comfort	18.6	12.7	15.7
Comfort/Convenience	13.8	7.4	10.6
Privacy/Comfort	3.2	9.0	6.1
Comfort/Hygienic	5.3	1.1	3.2
Safety/privacy	0.0	4.2	2.1
Privacy/proximity	0.0	0.5	0.3
Total	100.0	100.0	100.0

Source: Field Survey

Willingness of households to pay for improved services

This section seeks to assess respondents' level of satisfaction with current sanitation services or conditions as well as their willingness and ability to pay for improved sanitation including issues of satisfaction or dissatisfaction of current sanitation services or conditions. However, in order to ascertain willingness to pay for improved sanitation facilities, issues related to ownership of toilet facilities need to be addressed.

From Table 18, it was reported that most households within the New Juabeng Municipality did not own a toilet facility. Only 15.9 percent in the

rural community and 31.9 percent in the urban area owned toilet facilities. The absence of privately owned toilet facilities within more households in both communities indicated low implementation of some programs, projects and concepts that campaign for privately owned sanitation facilities such as the CLTS, PHAST and sanitation marketing as shown in the literature. In 2012, 24 percent of all households in Ghana practiced open defecation, reflecting the absence of toilet facilities in many dwelling places in Ghana (WHO/UNICEF, 2013). Also, a survey conducted by Spencer (2006) reported that only 22.6 percent of respondents own a personal sanitation facility in the Ga-Adangbe Municipality of Ghana. Again, the low figures recorded from the field confirmed the findings of Ayee & Crook (2003) as well as WHO & UNICEF (2006), which suggested that, private investment in sanitation and household coverage is relatively low and stagnant (less than 30% in urban areas and lower in rural areas). These figures are comparable to other estimates of sanitation coverage in Ghana ranging from 17 percent for urban to 11 percent for rural households with a private toilet. (WHO & UNICEF, 2006) The fact that more households do not own toilet facilities and depended greatly on public toilets within the municipality did not ensure household sanitation security, safe environmental sanitation and good sanitation practices as suggested by the conceptual framework shown in Figure 3.

Table 18: Ownership of a toilet facility

Response	Urban	Rural	Total
	%	%	%
Yes	31.9	15.9	23.9
No	68.1	84.1	76.1
Total	100.0	100.0	100.0

Source: Field Survey

Also, Table 19 shows the various types of toilet facilities owned by the households. In the urban area, exactly half of the toilet owning households (50.0%) owned toilet facilities that were connected to septic tank while 5.0 percent each owned facilities connected to piped sewer system, pit latrine with slab and pit latrine without slab/open pit respectively. On the other hand, within the rural area, 40.0 percent had ventilated improved pit latrine with only 6.7 percent having a piped sewer system toilet facility. According to the WHO 2008, piped sewer system, septic tank and ventilated improved pit latrine are all improved sanitation facilities. Hence the fact that more residents in both communities used such facilities indicated a positive rise on the "sanitation ladder" as suggested in the literature.

Notwithstanding, a chi-square independent test was also run to establish an association between the type of locality of households and ownership of toilet facilities. The results, (x^2 = 13.34, p = 0.00 < 0.05) indicates a significant association between the type of locality of households and ownership of toilet facilities. Hence, urban households owned a more improved type of toilet facilities than the rural households.

Table 19: Type of toilet facility owned

Type of toilet facility	Urban	Rural	Total
	%	%	%
Piped sewer system	5.0	6.7	5.5
Septic tank	50.0	10.0	36.7
Pit latrine	25.0	30.0	26.7
Ventilated improved pit latrine	10.0	40.0	20.0
Pit latrine with slab	5.0	13.3	7.8
Pit latrine without slab/open pit	5.0	0.0	3.3
Total	100	100.0	100

Source: Field Survey

Households without toilet facility reported various reasons for not having their own toilet in Table 20. In the rural area, more than half of the total households, 60.4 percent attributed the condition to the inability of their landlords to provide toilets with 43.0 percent of urban dwellers reporting the same reason. Other reasons for households not owning a toilet facility were lack of space, presence of public toilet, financial difficulties, not households' priority and preferring bush/field. These findings also confirms that of Jenkins

and Scott (2007) who reported economic barriers to improved sanitation such as high costs and savings and credit issues as well as competing priorities and lack of space (Jenkins & Scott, 2007)

Table 20: Reasons for not owning toilet facility

Reasons	Urban	Rural	Total
	%	%	%
Lack of space	25.0	6.9	15.0
Not provided by landlord	43.0	60.4	52.6
Financial difficulties	6.2	11.3	9.1
Not my priority	10.2	1.3	5.2
Presence of public toilet	14.0	20.1	17.4
Prefer the bush/field	1.6	0.0	0.7
Total	100.0	100.0	100

Source: Field Survey

Respondents were asked if there was any payment for accessing the toilet facility. Table 21 reveals that a significant number of households in the rural area (83.1%) reported that they pay before accessing the toilet facility they use. However, in the urban area the majority (60.1%) of households reported that they did not pay any amount in accessing the toilet facility they use. Since more people in the rural area, (81.0%) depended on public latrines; it was not

surprising that 83.1 percent reported paying before accessing the toilet facility as most public latrines charge fees for the maintenance of the facility. On the contrary, only 38.8 percent used the public latrine in urban areas, reflecting in lesser people paying for toilets.

Table 21: Payment for accessing toilet facility

Response	Urban	Rural	Total
	%	%	%
Yes	39.9	83.1	61.5
No	60.1	16.9	38.5
Total	100.0	100.0	100.0

Source: Field Survey, 2014

Subsequently, residents who reported paying for accessing the toilet facilities they used were further asked how much they paid and presented in Table 22. From the Table, all households (100%) within the rural community reported paying 10 pesewas to access the toilet. On the other hand, majority of households in the urban area (80%) paid 20 pesewas before accessing the toilet facility, which was double the amount, paid in the rural area. Again, 18.7 percent paid 50 pesewas, the highest amount in the urban area. Thus, urban settlements paid a higher fee to accessing a toilet facility than their rural counterparts.

Table 22: Amount paid for accessing toilet facility

Amount	Urban	Rural	Total
	%	%	%
10p	1.3	100.0	68.1
20p	80.0		25.9
50p	18.7		6.0
Total	100.0	100.0	100.0

Source: Field Survey

From Table 23, almost the same number of households in both communities shared the same view on the importance attributed to getting good toilet facility. In the rural area, 86.2 percent of the respondents reported that, spending money for a good toilet facility was very important to their households while 86.7 percent held the same view within the urban area. Spending money for a good toilet facility was very important to the various households because, lack of basic sanitation indirectly inhibits the learning abilities of millions of school- aged children who are infested with intestinal worms transmitted through inadequate sanitation facilities and poor hygiene. (WHO/UNICEF, 2006) Again, as suggested by the conceptual framework shown in Figure 3, more households would spend money for a good toilet facility to ensure household sanitation security, safe environmental sanitation as well as good sanitation practices such that, they could achieve improved sanitation, healthy life and sustainable development on the whole.

Table 23: Importance of spending money for good toilet facility

Level of importance	Urban	Rural	Total
	%	%	%
Very important	86.7	86.2	86.5
Quite important	13.3	13.8	13.5
Total	100.0	100.0	100.0

Source: Field Survey

Respondents were further asked if they were satisfied with the current services provided or condition of their current toilet facilities in Table 24. It was found that the majority in the rural area (86.8%) reported not satisfied. This finding reflected the dominant use of public toilets in the rural area (81.0%) in Table 14 despite the fact that public latrines in particular tend to be dirty and squalid, with faeces lying around squat holes which emit heat, gases, and bad odours, believed to cause ill health (Obika et al., 2002). However, the majority (63.8%) of households in the urban area where fewer households depended on public latrines also reported that they were not satisfied with the current condition or service provided. Subsequently, a similar observation was made from the findings of the survey conducted by the Lien Aid and World Toilet Organisation in the "Wash Marketing Project, Kampong Speu. From the findings of that survey, 75 percent of non-latrine owners were unsatisfied or very unsatisfied with their current defecation place. However, in that survey,

90 percent of latrine owners who did not depend on public toilets reported satisfied or very satisfied with their current defecation place. (Lien Aid &World toilet Organisation, 2010)

Table 24: Satisfaction with current service/condition

Response	Urban	Rural	Total
	%	%	%
Yes	36.2	13.2	24.7
No	63.8	86.8	75.3
Total	100.0	100.0	100.0

Source: Field Survey

For the 164 and 120 households within the rural and urban communities respectively who indicated dissatisfaction for their current sanitation facility in Table 25, they were asked to provide reasons for their responses. In both communities, the majority of households reported that they were not satisfied because the place was dirty or had too much odour. In the rural area, 39.0 percent reported that, the toilet facilities they used were very dirty and 28.0 percent said there was too much odour emanating from the facilities .Likewise, 35.8 percent of households within the urban area reported dirtiness as their reason of dissatisfaction, while about a quarter (25.8%) attributed their dissatisfaction to strong odour. Thus toilets need to be clean to protect health, because in Ghana, people have a particular need or desire to be neat, clean and not smell, reflecting not just physical but mental and moral purity.(Van der Geest, 1998, 2002) From the findings of a survey conducted by Atuahene, 96% of the respondents who reported dissatisfaction, attributed it to reasons such as emission of offensive odour, toilet not kept clean, lots of houseflies,

and toilet not frequently dislodged, an observation that confirms findings from this study (Atuahene, 2010).

Table 25: Reasons for dissatisfaction

Reason	Urban	Rural	Total
	%	%	%
Too much odour	25.8	28.0	27.1
Very dirty	35.8	39.0	37.7
Gets full early	2.5	1.8	2.1
Lack of water to flush	5.8		2.5
Too much pressure	14.2	1.8	7.0
Dirty/odour	15.8	8.5	11.6
Flies/odour	0.0	11.0	6.3
Flies/odour/dirty	0.0	3.0	1.8
Flies/dirty	0.0	3.0	1.8
Gets full early/odour	0.0	3.7	2.1
Total	100.0	100.0	100

Source: Field Survey

Since most households reported not satisfied with their current toilet facilities (see Table 24), a question was posed to find out households' willingness to pay for improved services or condition. From Table 26, the majority of respondents (77.2%) in the rural community where most households depend on public latrines reported that they were willing to pay more for improved services. Within the urban community however, the majority of households (64.9%) were not willing to pay more, for improved services. As stated in the WTP methodology (CVM) for example, a household

may be willing to pay for a sanitary latrine not only for its direct use values but also for the ancillary benefits associated with the installation of the latrine. The ancillary benefits in this case might be in the form of reduced health burden, social status, or simply improved ambient environment.

Table 26: Willingness to pay more for improved services

Response	Urban	Rural	Total
	%	%	%
Yes	35.1	77.2	56.2
No	64.9	22.8	43.8
Total	100.0	100.0	100

Source: Field Survey

In verifying the significant relationship if any, between households' satisfaction of sanitation facilities and their willingness to pay more for improved services, a chi-square independent test was run. The results (x^2 = 72.25, p = 0.00 < 0.05) indicate a significant relationship between households' satisfaction and their willingness to pay more for improved sanitation services. That is, households are willing to pay more for improved services when they are satisfied and vice versa.

Interventions for improved sanitation

This section seeks to explore the interventions put in place by the New Juabeng Municipal Assembly and other organizations to enhance access to improved sanitation. As indicated earlier, only 15.9 percent and 31.9 percent owned toilet facilities within both the rural and urban communities respectively (see Table 19).

From (Table 27), 73.3 percent reported not receiving any assistance from any organization in building their toilet facility within the rural area. Likewise, in the urban area as well, the majority of households, 91.7 percent reported not receiving any assistance from any organization. Similarly, findings from the Kampong Speu Baseline survey of the Wash Marketing Project indicated that, nearly 30 percent of all latrine owners received assistance from an external organisation in the construction of their latrine, with almost 90 percent of those receiving assistance obtaining free or subsidized latrine materials. Thus in that study, the level of subsidization in the target area was slightly higher than that found in the National Demand Assessment which reported an average of 17 percent latrine subsidy. These results confirmed a high level of household investment, with nearly 78 percent of latrines fully self-financed and privately installed. Few large sanitation investment programmes have been effective in increasing household sanitation in developing countries, yet people in these countries continue to install household toilets on their own without subsidizing (Cairncross, 2004; Jenkins & Sugden, 2006)

According to the Municipal Environmental Health Officer, "*The sanitation situation in the municipality is fairly good since the municipality can boast of about sixty (60) public latrines. However, most households do not have toilet facilities in their various homes; hence if more households could construct their own toilet facilities to complement that of the assembly, there wouldn't have been a sanitation problem in the municipality".* However, the New Juabeng Municipal Assembly has constructed only two (2) public latrines within the last four years as part of its effort to providing improved sanitation within the municipality. However, the environmental health officer on behalf of the assembly could not state the exact cost of constructing a toilet facility

since it varied from one donor to another. Majority of the beneficiaries of these projects do not pay any initial cost as all expenses were born by the assembly and donor. On the other hand, according to an official of the assembly some rural communities pay initial 10 percent of the total cost before construction was carried out. This means that, even though most rural folks are poor and do not earn higher incomes, they are the ones burdened with initial cost before meeting their developmental needs, whereas their urban counterparts are relieved of such cost. Thus rural areas that could not pay the initial 10 percent cost were likely to be deprived of such sanitation facilities. This practice increases the already existing gap between rural and urban areas as far as access to improved sanitation was concerned.

Notwithstanding, the assembly's dissatisfaction of the current sanitation situation, they are willing to improving the situation. However, there were no clear policies and interventions put in place by the assembly to improve the situation. According to the Environmental Health officer, the assembly depended greatly on donor agencies or sponsorship in constructing most toilet facilities. Thus, the Assembly can only do more if there were more donor agencies and sponsorship packages for such projects since the sanitation situation of the municipality was of great importance to the assembly. Moreover, the assembly acknowledged the assistance from some non-governmental organizations and the community water and sanitation agency. The assistance varied from technology, construction materials; labour, design and capacity building just to mention a few.

With reference to the framework that informed the study-"conceptual model for environmental sanitation programme in Figure 3, the availability of loans and other organizational assistance to households for private toilet

construction form part of the better sanitation policies and programs that can enhance improved sanitation, healthy life and sustainable development.

Table 27: Assistance for building toilet facilities

Response	Urban	Rural	Grand Total
	%	%	%
Yes	8.3	26.7	14.4
No	91.7	73.3	85.6
Total	100.0	100.0	100

Source: Field Survey

Again, the majority of households in the communities admitted that availability of a microfinance loan (as intervention) would aid them in the construction of their own toilet facilities. Thus from Table 28, 61.4 percent reported that they needed a loan to be able to put up their own toilets. In the urban area as well, 46.3 percent wanted a microfinance loan to assist them in the construction of toilet facilities. Provision of microfinance loan for toilet construction could be a strategy of prompting households to purchase a latrine and also promote the adoption of a behaviour that will improve the health or well-being of the whole society as suggested by Weinreich (1999) in the literature.

Table 28: Consideration of microfinance loan for toilet construction

Response	Urban	Rural	Total
	%	%	%
Yes	71.9	72.5	72.2
No	28.1	27.5	27.8
Total	100.0	100.0	100

Source: Field Survey, 2014

There is a direct relationship between improved water and sanitation and improved health, as evident in the literature (Montgomery and Elimelch, 2007). Therefore, the study went further to assess the top ten (10) Out Patient Department (OPD) Cases (causes of morbidity) over a five year period from 2008 to 2012 in the New Juabeng Municipality to identify the hygiene related diseases and thus the need for ensuring improved sanitation.

From Table 29, it was observed that Malaria was consistent as the leading cause of sickness in the municipality under the years reviewed followed by Upper Respiratory Tract Infections and Hypertension. Even though Diarrhoea was recorded as the sixth most reported OPD case between 2008 and 2012, there was still the need to improve sanitation and inculcate good hygiene practices to reduce the situation as sanitation is a critical part of breaking the faecal-oral transmission route for many Diarrhoea and other illness, illustrated in the "F-diagram"- Figure 2 (Hunt, 2001). Other hygiene related disease reported among the top ten (10) cases was Skin Diseases and Intestinal Worms. However, there were no Cholera cases recorded among the top ten (10) OPD cases under the years reviewed in the municipality suggesting good

hygiene behaviour. Notwithstanding, there were 61 cholera cases in 2014, in the NJMA.

Table 29: Top ten morbidity (OPD) cases in NJMA

Year	No.	Disease	No. Recorded
2008	1	Malaria	163254
	2	Upper Respiratory Tract infection	12354
	3	Hypertension	8421
	4	Skin diseases	8123
	5	Intestinal worms	7543
	6	Diarrhea diseases	6542
	7	Diabetes mellitus	4523
	8	Other Acute Ear infection	2351
	9	Anemia	1295
	10	Home accident & injuries	1023
2009	1	Malaria	142748
	2	Hypertension	40968
	3	Upper Respiratory Tract infection	30032
	4	Rheumatism & other joints pains	26487
	5	Skin diseases	17496
	6	Diarrhea diseases	13904
	7	Diabetes mellitus	10357
	8	Intestinal worms	9947
	9	Acute eye infection	9718
	10	Other Acute Ear infection	7471
2010	1	Malaria	121796
	2	Upper Respiratory Tract infection	43779
	3	Hypertension	33717
	4	Rheumatism & other joints pains	31784
	5	Skin diseases	20972
	6	Diarrhea diseases	19454
	7	Intestinal worms	12958
	8	Acute eye infection	10048
	9	Diabetes mellitus	8610

	10	Anemia	8307
2011	1	Malaria	112338
	2	Upper Respiratory Tract infection	57737
	3	Rheumatism & other joints pains	40564
	4	Hypertension	33192
	5	Skin diseases	31427
	6	Diarrhea diseases	21386
	7	Acute eye infection	14705
	8	Intestinal worms	11727
	9	Anemia	11610
	10	Other Acute Ear infection	8934
2012	1	Malaria	119065
	2	Upper Respiratory Tract infection	54926
	3	Rheumatism & other joints pains	33287
	4	Skin diseases	26126
	5	Hypertension	24042
	6	Diarrhea diseases	21832
	7	Acute eye infection	13418
	8	Anemia	10468
	9	Intestinal worms	9922
	10	Acute Urinary tract infection	8593

Source: **New Juabeng Municipal Health Directorate – Health Information Unit (2014)**

Challenges in providing improved sanitation

The final objective of this study was to examine the challenges faced in providing for improved sanitation within the New Juabeng Municipality especially from the assembly's' perspective. Hence, this section presents the various challenges confronted in an attempt to providing improved sanitation as well as some suggested solutions to overcoming the challenges. On the whole, the assembly believes that there is a great gap existing between the rural and urban communities within the municipality as the former is lacking greatly in access to improved sanitation.

The various challenges that the assembly faced in providing improved sanitation (toilet) facilities varied in both settlements (rural and urban). In the assembly's view, the greatest challenge it faced was inadequate funds. According to an official of the assembly, there were not enough funds to carry out most developmental projects since the assembly's internally generated funds (IGF) was very low and not able to support most of such projects. Hence, the assembly depends largely on donor support. Therefore where there are none, then development projects come to a halt. This challenge cuts across both the rural and urban areas.

Secondly, there was the problem of acquiring land for toilet construction. The assembly usually faces great difficulty in acquiring lands for the building of such facilities .This challenge was more pronounced in the urban areas than the rural areas.

Again, there was low level of motivation on the part of the assembly in providing additional facilities due to the poor condition of already provided or existing facilities. According to Environmental Health Officer of the

assembly, the poor maintenance culture in most communities (both rural and urban) leads to bad conditions of existing facilities, and does not motivate the assembly to provide more toilet facilities. Also, most people in the rural areas do not pay to patronize these toilet facilities in spite of the fact that it has become an income generation avenue for the assembly. Therefore, all things being equal, more of such facilities would be built in the urban areas where it will generate a lot of revenue than the rural areas where the patronage is low. This contributes to the widening of the already existing gap between the two areas as far as provision of sanitation is concerned.

From the responses of the official in charge of sanitation at the municipal assembly, it was evident that, the assembly did not have better sanitation policies, programmes and projects in place which could lead to household capacity building and knowledge in providing a lot more sanitation facilities at the household level to ensure household sanitation security and safe environmental sanitation as indicated by the conceptual framework shown in Figure 3.

In solving the above-mentioned challenges, the assembly believes that, there should be the broadening of the Public-Private Partnership (PPP) in order to allow for more private agencies to construct and operate the toilet facilities which could be on Build-Operate and Transfer (BOT) bases.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter concludes the research journey by presenting the summary, major conclusions, findings drawn, make relevant recommendations and indicate the limitations and areas for further research.

Summary of the study

The study was design to assess the urban-rural differences in achieving the Millennium Development Goal for sanitation in the New Juabeng Municipality in the Eastern Region of Ghana. The study adopted descriptive study design and used a mixed method approach to investigate the two selected communities namely, Koforidua and Akwadum representing urban and rural areas respectively. Systematic and purposive sampling methods were adopted to select relevant respondents. These included household heads, staff from the Municipal Environmental Health Unit and other opinion leaders. From the respondents, questionnaires and interview guides were used to collect the required data and analyzed to produce the needed results.

Main findings of the study

Based on the objectives of the study and the results and discussion, the following are the main findings emanating from the study:

- It was found that there was a huge sanitation gap existing between the rural and the urban communities, as the case of rural sanitation is

appalling. The overall sanitation coverage for Ghana as at 2008 was 12.4 percent which was far lower than what is to be achieved by 2015. Again, more urban population (17.0%) had access to improved sanitation than rural communities (8.2%). However, over the years, there was a steady improvement within the urban areas but the same could not be said about the rural areas;

- The Joint Monitoring Programme (JMP) of the World Health Organisation (WHO) and the United Nations International Children's Emergency Fund (UNICEF) also revealed that, out of the 13.0 percent of the country's population that had access to improved sanitation by 2011, almost 60 percent used shared sanitation facilities considered as unimproved by WHO/UNICEF with 18 percent engaged in open defecation. While, only 6 percent of the urban population engaged in open defecation, about a third (32%) of the rural population practiced open defecation. This suggest a significant gap between urban and rural localities as far as the use of improved sanitation facilities was concerned;
- For the New Juabeng Municipality, it was observed that more households within the urban areas used improved form of toilet facilities than their rural counterparts. Thus, 31.5 percent within the urban area used water closet as against 11.8 percent for the rural households in the NJMA. Also, 17.3 percent used KVIP in the urban areas as compared to 11.2 percent for the rural area. Nonetheless, 36.2 percent and 31.5 percent within both urban and rural communities respectfully depended greatly on public latrines.

- The results of the study also revealed that most households in the rural area within the municipality used shared improved pit latrine, i.e., 82.5 percent and 48.4 percent respectively. This means that most households in the municipality do not use improved form of sanitation facility per the UNICEF/WHO convention;
- Indeed 76.7 percent of the residents in the rural communities reported that, they preferred having their own improved pit latrine (KVIP) whereas 48.9 percent in the urban area also preferred having the same facility. The choice of preferred toilet facility by most households was based on proximity, safety and comfort. It was worthy to note that the level of income of households influenced their choice of facility preferred because the higher a household's income, the more likely that the household would prefer a more improved sanitation facility;
- In spite of the households preferred toilet facilities and the various reasons assigned to them, most households within the NJMA did not own a toilet facility. From the study, only 15.9 percent and 31.9 percent of the rural and urban population respectively did own a toilet facility.
- Households without toilet facilities attributed it to various reasons such as the inability of their landlords to provide them, lack of space for construction, financial difficulties, presence of public latrines and not being a household's priority. It was also revealed that, most households in the rural area (83.1%) paid before accessing the toilet facility they used since majority of them depended greatly on public latrines whereas in the urban area, 60.1 percent of the population on the

contrary did not pay any money before using the toilet since fewer people used the public latrines;

- Even though more households acknowledged the importance of keeping and using good sanitation facilities and reported that they were willing to spend money for a good toilet facility due to its associated health and environmental advantages, the majority of the households were not satisfied with the current sanitation facility or services provided. However, most households were willing to pay for improved sanitation facilities and services.
- One of the main interventions put in place in ensuring that every household at least had a toilet facility of their own was the provision of various assistance such as loans, technology, labour, skill and so on. On the contrary almost all the households selected for the study in the municipality that owned a toilet facility did not receive any form of assistance from any organisation including the government in constructing their toilet facilities. Moreover, the municipal assembly was committed in ensuring improved sanitation within the municipality as it boasted of about sixty (60) public latrines. The assembly therefore believed that, more could be done when other private organisation and institutions such as NGOs partner the government to provide more of such facilities in order to achieve the sanitation target of MDGs by 2015; and
- The various challenges that confronted the assembly in providing improved sanitation (toilet) facilities varied in both settlements (rural and urban). According to an official of the assembly, the greatest

challenge was lack of funds to construct more toilet facilities within the municipality as the internally generated funds was not adequate to support more of such projects. Again, it was very difficult for the assembly to acquire land in putting up toilet facilities especially in the urban areas. Also, there was low level of motivation for the assembly to construct more of such facilities due to the poor maintenance culture for the existing facilities within most communities across the urban and rural communities.

Conclusions

Based on the findings of the study, the following conclusions have been drawn:

- First, there is overall low sanitation coverage in the New Juabeng Municipality and the country as a whole. Additionally, there is a huge sanitation gap existing between urban and rural communities as the urban sanitation situation is far better than that of the rural areas. This is due to the fact that a lot more urban households used improved sanitation facilities than their rural counterparts suggesting that, more attention is given to the urban communities than the rural communities as far as sanitation issues are concerned;
- Second, the first choice preference of sanitation facilities among most households within the NJMA in both the urban and rural communities is to have their own improved pit latrine. Their choice of preference is based on attributes such as proximity, safety and comfort and their level of income as most households will prefer a more improved

sanitation facility having a higher income and vice versa. However, majority of households within the municipality do not own a private toilet facility and depend greatly on public latrines;

- Third NJMA depends greatly on donor agencies and other non-governmental agencies for financial support to be able to provide, improve or maintain the sanitation standards of the Municipality due to inadequate funding. This notwithstanding, most households within the Municipality are willing to spend more money for a good toilet facility and pay more for improved sanitation services because of their awareness of the advantages of practicing good hygiene and the health implications associated with it; and
- Finally, the main challenge to the assembly in executing its duties to providing improved sanitation within the Municipality is inadequacy of funds, even though there are other challenges such as difficulty in securing land for toilet construction and poor maintenance culture exhibited by some communities in relation to existing facilities.

Recommendations

In line with the study findings and the conclusions drawn, the following recommendations are submitted:

- There should be a general public education and sensitization by the government through the various assemblies and other civil society groups on the importance of practicing good hygiene including the use of improved sanitation facilities especially among rural households in order to bridge the urban-rural sanitation gap that is already existing.

Also, .more sanitation policies must be put in place in order to help reduce the numerous sanitation problems that confront the NJMA and the country as a whole. Therefore, the Public-Private Partnership (PPP) policy should be broadened to allow more private hands to be brought on deck to help solve the problem.;

- Hence, there should be the availability of micro finance loans and other forms of assistance by the various assemblies and private financial institutions for households to encourage the construction of more private toilet facilities within the Municipality and the country as a whole since most households do not have their own toilet facilities; and
- Therefore, Governments and donor agencies must simultaneously pursue investments reforms for improved sanitation and make efforts to reach the target focus on sustainable service delivery, rather than construction of facilities alone. They should also empower local authorities and communities with the authority, resources, and professional capacity necessary to manage sanitation service delivery. Thus, governments and their civil society and private sector partners must support a wide range of sanitation technologies and service levels that are technically, socially, environmentally, and financially appropriate.
- Finally, the Government through the assembly must enforce already existing laws or design new by-laws to strictly punish and deal with landlords who build without including toilet facilities in their building

plans or deny them a building permit to a large extent. Thus, laws on discouraging open defecation must also be broaden and upheld.

Limitations to the study

In order to get accurate data for effective data analysis, the validity and reliability of the data collection instruments were not compromised. Thus, pre-testing of the instruments was done to ensure validity and reliability. However, it was very difficult getting the cooperation of residents across the two settlements since previous studies of such nature did not bring them any interventions. Therefore, I had to sensitize them very well to be convinced that this study was for academic purposes. Further, there were some initial financial and budgetary difficulties that confronted the study since it was personally funded but this was rectified when I got support from some family members the Association of African Universities (AAU).

Area for further study

The conclusions and recommendations of this study emanated from the results obtained at the New Juabeng Municipality. It is however suggested that for further research the study be conducted in other parts of Sub- Saharan Africa and Metropolitans, Municipalities, Districts and Agencies (MMDAs) in Ghana to establish same or otherwise outcomes. Again, the study used different methodology with mixed method as the research design thus; different methodologies could be employed to find out if same results and conclusions would be made.

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APPENDICES

APPENDIX A

List of Public Latrines / Toilets 2012-2013 in NJMA

Community / Zone	Area	Type Of Latrine	Functioning	Not Functioning
Akwadum	Clinic Area / La	Water closet		✓
	Faiman	Septic tank	✓	
	Zongo	latrine	✓	
	Clinic Area	Septic tank	✓	
		latrine		
		Septic tank		
		latrine		
Suhyen	Asu Abenaso	Enviro loo	✓	
	Asuo Abenaso	KVIP-1		✓
	Suhyen	Water closet		✓
Jumapo	Ahenbronom	Water closet		✓
	Market1	Septic tank		✓
	Methodist	latrine	✓	✓
	School	Enviro loo		
	Methodist			
	School Zongo			
Oyoko	Oyoko Zongo	Septic tank		✓
		latrine	✓	
	Asaman	Enviro loo	✓	
	Adaneagya	Septic tank	✓	
	Asuogya	latrine		✓
		Septic tank		
		latrine		
		KVIP		

Asokore	Sukuumu Market Fofiase Saloo Zongo	Septic tank latrine Septic tank latrine Septic tank latrine Septic tank latrine Enviro loo Water closet	✓ ✓ ✓ ✓ ✓ ✓	
Koforidua New Town	Community A&B Dagonbahene Acheguda Chief Moshie Zongo Market Water Ladies	Septic tank latrine Septic tank latrine Septic tank latrine Septic tank latrine Water closet KVIP	✓ ✓ ✓ ✓	 ✓
Anlo Town	Market (Big) Market (Small) Agip	Septic tank latrine Water closet	✓ ✓ ✓	
Klu Town	Mortuary	Pour flush KVIP	✓ ✓	
Ada	Ada Magazine	Septic tank latrine Septic tank latrine	✓ ✓	
Effiduase	Effiduase Market Community	Septic tank latrine Septic tank	✓ ✓ ✓	

	Center	latrine	✓	
	Effiduase	Septic tank	✓	
	Sukuumu	latrine	✓	
	Effiduase	Septic tank		
	Sakasaka	latrine		
	Effiduase	Septic tank		
	Oguaa	latrine		
	Effiduase	Septic tank		
	Airport	latrine		
Nsukwao	Maame Dora	Septic tank	✓	
	Kperkordzie	latrine	✓	
	Kandokordzie	Septic tank	✓	
		latrine	✓	
	Old Estate	Enviro loo	✓	
	Junction	Pan latrine	✓	
	Normal	Septic tank	✓	
	Technical	latrine		
	Tanoso	Septic tank		
		latrine		
		Septic tank		
		latrine		
Srodae	Police Lorry	Septic tank	✓	
	Park	latrine	✓	
	Lorry Park	Septic tank	✓	
	Social Welfare	latrine	✓	
	Peugeot Station	Septic tank	✓	
	Accra Station	latrine	✓	
	Juabeng Serwah	Septic tank		
		latrine		
		Water closet		
		Water closet		
Betom	Betom No.7	Septic tank	✓	
	Betom Ohene	latrine	✓	

	Park Presby 'B' (Oguaa) Methodist Sukuumu Jackson Park E.C.M	Septic tank latrine Septic tank latrine Septic tank latrine Septic tank latrine Septic tank latrine Septic tank latrine	✓ ✓ ✓ ✓	
Ogua	Nightingale	Septic tank latrine	✓	

Source: EHD, New Juabeng Municipal Assembly (2014)

Summary:

N.B: There are sixty (60) Public Toilets in the New Juabeng Municipality. Out of this number, fifty-one (51) are functioning whiles nine (9) are not.

The toilets are: Forty-one (41) Septic Tank Latrines

Eight (8) Water Closet Toilets

Five (5) Enviro loo Public Toilets

Four (4) KVIPs

One (1) Pour-Flush Toilet

One (1) Pan Latrine

Those not functioning are:

Four (4) Septic Tank Latrines

Three (3) Water Closets

Two (2) KVIPs

- Accra Station public toilet has been replaced with a new one (which is water closet toilet)

APPENDIX B

Interview Guide for Key Informants at NJMA

Title: Assessing Urban-Rural Differences in Achieving the Millennium Development Goal for Sanitation: The Case of New Juabeng Municipality, Ghana

The Case of New Juabeng Municipality of Ghana

Sanitation Preferences

Q1	What is the assembly's preferred toilet facility that is usually constructed for communities?	
Q2	Why does the assembly prefer building such toilet facility?	
Q3	Where does the assembly usually locate the construction of such toilet facility?	
Q4	Approximately how many such toilet facilities has the assembly constructed over the last four years?	
Q5	What are some advantages of constructing toilet facilities for communities?	
Q6	What are some disadvantages of constructing toilet facilities for communities?	

Assembly's contribution for improved sanitation

Q7	How much does it cost the assembly to construct a toilet facility?	
Q8	Does the beneficiary pay any amount before construction?	
Q9	If yes, how much do they pay?	
Q10	What is the sanitation situation in the municipality now?	
Q11	Is the assembly satisfied with the sanitation situation in the municipality?	
Q12	If yes how satisfied is the assembly?	
Q13	If no, why are you not satisfied?	
Q14	Is the assembly willing to construct more toilet facilities in the municipality?	
Q15	How much importance is investing money in the construction of toilet facilities to the assembly?	
Q16	Does the assembly receive assistance from any organizations in building toilet facilities?	
Q17	If yes, what assistance do you receive from such organizations?	
Q18	If no what will be reason for the lack of donor support to such project?	

Q19	What are some challenges the assembly face in providing improved sanitation facilities?	
Q20	Which is the most difficult challenge to the Assembly in providing improved sanitation?	
Q21	Within urban and rural areas in the municipality, where does the assembly find great difficulty in executing such projects?	
Q22	Why the difficulty in such area?	
Q23	How can the Assembly overcome the challenge mentioned in **Q20 above**?	
Q24	What is the way forward for the assembly in providing improved sanitation facilities	

APPENDIX C

Thesis Field Questionnaire

Title: Assessing Urban-Rural Differences in Achieving the Millennium Development Goal for Sanitation: The Case of New Juabeng Municipality, Ghana

IDENTIFICATION

District _____

Sub district _____

Household Number ☐☐

HOUSEHOLD VISIT

Household visit details 0 = household head not home 1 = household head home and consented to interview 2 = household head home but declined/refused	Visit 1 ☐	Visit 2 ☐	Visit 3 ☐
Date of interview dd/mm/yyy ☐☐ / ☐☐ / ☐☐☐☐			
Interviewer Name:			
Supervisor:			
Record starting time (in 24 hours format)	Hours: ☐☐	Minutes: ☐☐	☐☐

Section 1: People living in the household

Line no	Usual residents and visitors	Relationship to head of household	sex	Residence	Age	
	Please give me the names of the persons who usually live in your household and guests of the household who stayed here last night, starting with the head of the household	What is the relationship of (NAME) to the head of the household?	Is (NAME) male or female?	Did (NAME) stay here last night?	How old is (NAME)? If less than 1 year write 0 in the box and give number of months in next column. If age is not known write -99	
Q01.	**Q02.**	**Q03.**	**Q04.**	**Q05.**	**Q06.**	
			M F	Yes No		
01			1 2	1 0	years	months
02			1 2	1 0	years	months
03			1 2	1 0	years	months
04			1 2	1 0	years	months
05			1 2	1 0	years	months
06			1 2	1 0	years	months
07			1 2	1 0	years	months
08			1 2	1 0	years	months
09			1 2	1 0	years	months
10			1 2	1 0	years	months

Codes for Q3: relationship to household head

01=head 04=son/daughter in law 07=parent in law
10=adopted/foster/stepchild

02 =wife/husband/partner 05=grandchild 08=brother/sister/in law 11=not related
03=son/daughter 06=parent 09=niece/nephew/other relative - 99=don't know

Section 2: Household characteristics

No	Question	categories		
NB: I would first like to ask some questions about the head of household and some characteristics of the household.				
Q7	Who is responding to this questionnaire?	Line number of respondent		☐☐
Q8	Has the head of the household ever attended school?	Yes	1	
		No	0	
		Don't know	-99	
Q9	What was the highest level of school the head of the household attended?	No formal school	0	
		Primary	1	
		Jhs	2	
		Secondary	3	
		Tertiary	4	
		Don't know	-99	
Q10	What is the occupation of the household head?			
Q11	Is the household head married	Yes	1	
		No	2	
		Don't know	-99	
Q12	How many rooms in this compound are used by this household?	☐☐		
Q13	What is the approximate monthly income of the household?	☐☐☐☐		
Questions Q13 to Q15 refer to the house and compound of the household				
Q14	What is the main material of the roof? ***Observe and record without asking***	Grass/Papyrus/Banana Leaves	1	
		Thatch	2	
		Zinc/Iron Sheets	3	
		Tiles	4	
Q15	What is the main material of the exterior walls? ***Observe and record without asking***	Grass	1	
		Mud	2	
		Plastered	3	
		Brick/concrete	4	
Q16	What is the main material of the floor? ***Observe and record without asking***	Earth or sand	1	
		Clay	2	
		Wood, bamboo or palm	3	
		Vinyl or parquet	4	
		Tiles or cement	5	

Section 3: Sanitation Preferences

No	Question	categories		Skip
Q17	What kind of toilet facility do members of your household usually use? ***(Tick only 1)***	Shared pit latrine	1	
		Own pit latrine	2	
		Shared improved pit latrine	3	
		Own improved pit latrine	4	
		Shared flush toilet	5	
		Own flush toilet	6	
		No facility/Bush /Field	7	
		Other (specify) _____ _____	8	
Q18	Where do adults in your household usually go to defecate?	Household toilet facility	1	
		Other toilet facility	2	
		Open defecation-near house	3	
		Open defecation-field/bush	4	
		Other, specify _____ _____	5	
		Don't know	-99	
Q19	Where do children in your household usually go to defecate?	Household toilet facility	1	
		Other toilet facility	2	
		Open defecation-near house	3	
		Open defecation-field/bush	4	
		Other,specify _____ _____	5	
		Don't know	-99	
Q20	How many minutes is this place from your house?	☐☐		
Q21	In your household, how are babies' faeces usually disposed of?	Put into latrine	1	
		Put into drain/ditch	2	
		Thrown in garbage	3	
		Burried	4	
		Left in open	5	
		No baby	6	
		Other, specify _____	7	
		Don't know	-99	
Q22	What is your preferred toilet facility?	Shared pit latrine	1	
		Own pit latrine	2	
		Shared improved pit latrine	3	
		Own improved pit latrine	4	
		Shared flush toilet	5	
		Own flush toilet	6	

		Bush/field	7	
		Any type	8	
		Other ————	9	
		Don't know	-99	**Dknw→ Q27**
Q23	Why do you prefer such toilet facility?	Prestige	1	
		Safety	2	
		Privacy	3	
		Comfort	4	
		Most hygienic	5	
		Easy to clean	6	
		Cost effective	7	
		Don't know	-99	
		Other(specify) ————	8	
Q24	Where would you like your preferred toilet facility to be located?	In-house	1	
		Outside the house	2	
Q25	Why do you want your toilet facility inside or outside the household?			
Q26	What particular features do you like the most about your preferred toilet facility? **(*Do not read out options circle those applicable*)**	Looks good/comfortable	1	
		No smell	2	
		No flies	3	
		Don't see faeces	4	
		Easy to clean	5	
		Don't need water to flush	6	
		Less expensive	7	
		Other, specify ————	8	
Q27	What are the disadvantages of owning a toilet facility? ***(Do not read options, circle all that apply)***	Bad smell	1	
		Attracts flies	2	
		Cost to maintain it	3	
		Work to maintain it	4	
		Other people come to use it	5	
		Affects ground water quality	6	
		Over flows	7	
		No disadvantages	8	
		Other, specify	9	
		Don't know	-99	
Q28	What are the advantages of owning a toilet facility? ***(Do not read options, check all that apply)***	Improved hygiene/health/cleanliness	1	
		More privacy	2	
		More comfortable	3	

		Convenience/save time	4	
		Improved safety	5	
		Improved status/prestige	6	
		Guests can use it	7	
		No advantages	8	
		Other, specify	9	
		Don't know	-99	

Section 4: Residence willingness to pay for improved sanitation

Q29	Do you pay for accessing the toilet facility you currently use?	Yes	1	**If No→ Q31**
		No	2	
Q30	How much do you pay?	☐☐☐☐		
Q31	Are you satisfied with the current services provided/ condition?	Yes	1	**If No → Q33**
		No	2	
Q32	If yes, how satisfied are you with your current defecation place?	Very satisfied	1	
		Satisfied	2	
		unsatisfied	3	
		Very unsatisfied	4	
		Don't know	-99	
Q33	If no, why are you not satisfied?			
Q34	Are you willing to pay more for improved services?	Yes	1	**If No→ G36**
		No	2	
Q35	If yes, how much are you willing to pay?	☐☐☐☐		
Q36	How much important is spending money for a good toilet facility to your family's health ***(Read all options, circle only one)***	Very important	1	
		Quite important	2	
		Not so important	3	
		Not important at all	4	
		Don't know	-99	

Section 5: challenges in providing improved sanitation

Q37	What types of toilet facility do you know about? ***(Multiple answers possible)***	Flush/pour-flush	1	
		Ventilated improved pit (VIP) latrines	2	
		Pit latrine with slab	3	
		Composting toilet	4	
		Other, specify _____ _____	5	
		Don't know	-99	
Q38	Which of these types of toilet facilities have you learned about for the first time in the past year? ***(Multiple answers possible)***	Flush/pour-flush	1	
		Ventilated Improved Pit (VIP)latrines	2	
		Pit latrine with slab	3	
		Composting toilet	4	
		None	5	
		Other, specify _____ _____	6	
Q39	Where /how do you learn about them? ***(Read options, circle all that apply)***	Community meeting	1	
		Village chief	2	
		Neighbour	3	
		Relative	4	
		Mason	5	
		Radio	6	
		Poster/picture	7	
		Billboard advertisement	8	
		Television advertisement	9	
		NGO/agency worker	10	
		Government representative	11	
		Other, specify _____ _____	12	
Q40	Do you have your own toilet facility?	Yes	1	**If No ⟶ Q62**
		No	2	
Q41	What kind of toilet facility do you have?	Pour flush toilet to :		
		Piped sewer system	1	
		Septic tank	2	
		Pit latrine	3	
		Elsewhere	4	
		Ventilated Improved Pit (VIP) latrine	5	
		Pit latrine with slab	6	
		Pit latrine without slab/open pit	7	
		Composting toilet	8	
		Other, specify	9	
		Don't know	-99	
Q42	What kind of below	Unlined pit	1	

	ground structure does your toilet facility have? ***(circle one)***	Lined pit-beneath latrine	2	
		Lined pit-offset	3	
		Piped sewerage	4	
		Other, specify ———	5	
Q43	What kind of slab does your toilet facility have? ***(Observe ,circle one)***	Wooden slab	1	
		Concrete slab	2	
		Pour flush western toilet bowl	3	
		Other, specify ———	4	
Q44	What kind of shelter roof does your latrine have? ***(Observe if possible, Circle one. If more than one roof material is used choose material that covers the largest area)***	Concrete	1	
		Fibrous cement	2	
		Galvanized steel	3	
		Tiles	4	
		Thatch	5	
		Plastic sheet	6	
		Salvaged material	7	
		No roof	8	
		Other, specify———	9	
Q45	Do you use water to flush your toilet facility?	Yes	1	
		No	2	
Q46	If yes, how much water per day does your household usually need to flush the toilet?	Less than 5 litres	1	
		6 to 15 litres	2	
		16 to 25 litres	3	
		More than 26 litres	4	
		Don't know	-99	
Q47	Do you have enough water to flush the toilet in the dry season?	Yes	1	
		No	2	
Q48	Is the toilet facility you are using now your first toilet facility?	Yes	1	
		No	2	
		Don't know	-99	
Q49	If no, how many other toilet facilities before this one have you built?	☐☐		
Q50	In what ways is your current toilet facility different from the old toilet facility? ***(circle all that apply)***	Pit is now lined	1	
		Walls are improved	2	
		Roof is improved	3	
		Slab is improved	4	
		Has a pan	5	
		Pan is now pour-flush	6	
		Has ventilation	7	
		Has bathing area	8	
		Has hand washing area	9	
		Has door	10	
		Other, specify ———	11	

Q51	Who made the final decision to your first toilet facility built?	Head of household	1	
		Head of household and spouse	2	
		Spouse	3	
		Family together	4	
		Other, specify ———	5	
Q52	Did you receive assistance from any organization to build your toilet facility? *E.g free/subsidized materials or labour, technical advice, loan etc*	Yes	1	
		No	2	
		Don't know	-99	
Q53	What assistance did you receive from the organization? ***(Read options and circle all that apply)***	Free/subsidized materials	1	
		Free/subsidized labour	2	
		Loan	3	
		Technical advice	4	
		Design provided	5	
		Encouragement	6	
		Other, specify ———	7	
Q54	Approximately how much did it cost you to build your toilet facility?	☐☐☐☐		
Q55	Did you build the facility all at one time or in stages?	All at once	1	
		In stages	2	
		Don't know	3	
Q56	How long did it take to complete your toilet facility?	Less than 2 weeks	4	
		3-4 weeks	5	
		1-6 months	6	
		7-12 months	7	
		More than 13 months	8	
		Not yet completed	9	
		Don't know	-99	
Q57	In future, do you plan to make changes/improvements to your toilet facility?	Yes	1	
		No	2	
		Don't know	3	
Q58	What changes/improvements do you plan to make? ***(Read options, circle all that apply)***	Line the pit	1	
		Improve the walls	2	
		Improve the roof	3	
		Improve the slab	4	
		Get pan	5	
		Get pour-flush pan	6	
		Add ventilation pipe to pit	7	
		Build water storage tank(s)	8	
		Build bathing area	9	
		Build hand washing area	10	
		Build door	11	

		Move to inside the house	12	
		Other, specify ———	13	
Q59	Is your toilet facility functioning now?	Yes	1	
		No	2	
Q60	If no why not?	Dirty	1	
		Full	2	
		No water to flush	3	
		Slab broken	4	
		Superstructure broken/missing	5	
		Not finished building	6	
		Used as storage	7	
		Smells bad	8	
		Prefer the bush/field	9	
		Other, specify ———	10	
		Don't' know	-99	
Q61	If not functioning why did you build the facility in the first place? ***(Don't read circle all that apply)***	Program was offering subsidy	1	
		Someone told me I had to	2	
		Had enough money to build	3	
		Sick/old relative	4	
		Construction of new house	5	
		Neighbour got one	6	
		Event(wedding/funeral/new year)	7	
		Had visitors from outside village	8	
		Other, specify	9	
		Don't know	-99	
Q62	What factors contributed to you not having a toilet facility?	Lack of space	1	
		Not provided by landlord	2	
		Financial difficulties	3	
		Not my priority	4	
		Prefer the bush/field	5	
		Presence of public toilet	6	
		Other, (specify) ———	7	
		Don't know	-99	
Q63	Do you have enough public toilets in the community?	Yes	1	**If No skip➔ Q65**
		No	2	
Q64	If yes, approximately how many do you have in the community?	☐☐		
Q65	What do you think will be the reason for the	Lack of political will	1	
		Unavailability of land	2	
		High cost of construction	3	

	lack?	Cheiftaincy disputes	4	
		Not community's priority	5	
		Lack of contractors	6	
		Proposed location too far	7	
		Other, specify ————	8	
		Don't know	-99	
Q66	Does your household use the public toilet?	Yes	1	
		No	2	
Q67	For example, if I return to your house one year from today, how likely is it that you will have built a toilet facility at your house?	No chance	1	**Check if Q40 is NO**
		Low likelihood	2	
		Medium likelihood	3	
		High likelihood	4	
Q68	Would you consider a microfinance loan to put up a toilet facility?	Yes	1	
		No	2	
		Don't know	-99	

APPENDIX D

Source: Krejcie and Morgan (1970)

APPENDIX E

Observation Checklist

Task	Observation
1. Type of toilet facility used by household	i WC ii. KVIP iii Compost
2. Location of toilet facility	i. Outside ii. Inside
3. Number of toilet facility in household	i. 1 ii. 2 iii. 3 iv. 4 iv. 5
4. Source of water available in the house	i. Yes ii. No
5. Availability of soak away system for households with WC	i. Yes ii. No
6. Presence of children's feaces around compound	i. Yes ii. No
7. Presence of facility for hand washing after toilet use	i. Yes ii. No
8. Surroundings of toilet facility	i. Clean ii. Dirty
9. Distance to toilet facility from house	i. Far ii. Close
10. Upper roof of toilet facility	i. Roofed ii. Not roofed