ASSESSING THE COMMUNITY LED TOTAL SANITATION APPROACH IN ACHIEVING OPEN DEFECATION FREE STATUS AMONG RESIDENTS OF KATIKAMU SUB COUNTY LUWEERO DISTRICT

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DECLARATION

I Namyalo Josephine do hereby declare that to the best of my knowledge, this is truly my original research work and has never been submitted to any University or Institution for the award of a Masters Degree or any other academic qualification.

Signed.....jnamyalo.....

Date.....6th/Dec/2016.....

APPROVAL

This is to certify that the dissertation of Josephine Namyalo on *"**Assessing the community led total sanitation approach in achieving open defecation free status among residents of Katikamu sub county - Luweero district**"* has been done under my supervision and is now ready to be submitted for defense in partial fulfillment of the requirements for the award of a Master of Public Health Degree of IHSU with my approval.

Signed: .....

JOHN BOSCO ALEGE.

(SUPERVISOR)

Date.....December 9, 2016

DEDICATION

I wish to dedicate this work to Dr .Aggrey Byamukama & Mrs. Doreen Byamukama, my God given parents who have made me who I am today, for their endless love, support and encouragement throughout my life. Thank you both for giving me strength to reach for the stars and chase my dreams

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First and foremost, I thank the Almighty God for the blessing of life, grace, friends and family

I wish to extend my sincere gratitude to Dr .Aggrey Byamukama & Mrs. Doreen Byamukama, my parents who have made me who I am today, for their endless love, support and encouragement throughout my life. Thank you both for giving me strength to reach for the stars and chase my dreams.

District Health Officer, Luweero District for allowing me to carry out this research in the District communities. Special thanks go to all household Heads and Key informants that offered their time for interviews.

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

OPERATIONAL DEFINITIONS

Community Led Total Sanitation (CLTS) CLTS Approach is an innovative tool for mobilizing communities towards complete elimination of open defecation (OD). Communities are therefore facilitated to conduct their own analysis and appraisal of open defecation thereby taking their own action to become Open Defecation Free (UNICEF, 2013).

Open Defecation (OD) Open defecation refers to the practice whereby Individuals go out into fields, forests, bushes, open bodies of water and other open places rather than using the toilet to defecate (UNICEF, 2013).

Open Defecation Free (ODF) "Open defecation free" (ODF) is a term used in CLTS Programmes to mean the practice where community members use sanitation systems other than the practice of Open Defecation. In this study, ODF means no visible feces found in villages/communities after the communities' construction and effective use of latrines

Rural Community (RC) According to the World Bank 2010, rural communities refer to groups of people living in rural areas as defined by national statistical offices. It is calculated as the difference between total population and urban population.

ACRONYMS

AWD	Acute Watery Diarrhea
CLTS	Community Led Total Sanitation
FGD	Focus Group Discussion
HHs	Households
JMP	Monitoring Program
KI	Key Informant
KII	Key informant Interviews
MDG	Millennium Development Goal
NETWAS	Network for Water and Sanitation
NGOs	Non Governmental Organization
OD)	Open Defecation
ODF	Open Defecation Free
OR	Odds Ratio
RC	Rural Community
SDG	Sustainable Development Goal

SLTS	School Led Total Sanitation
SPSS	Statistical Package for Social Scientists
UN	United Nations
UNICEF	United Nations Children's Fund
VHTs	Village Health Teams
WA	Water Aid
WHO	World Health Organization
WSP	Water and Sanitation Programme

ABSTRACT

Background: Open defecation can lead to public health problems most especially in areas where people defecate openly in bushes, gardens, rivers and other water bodies. Nonetheless, even with the availability of toilets, people still need to be convinced to desist from open defecation and use toilets. Therefore, the need for behavior change is critical in addition to the provision of toilets; this has been attempted through the use of programs like the Community-Led Total Sanitation (CLTS).

Objective: The purpose of this study was to assess the contribution of the community led total sanitation approach in achieving open defecation free status among residents of Katikamu Sub County - Luwero district

Methods: This was a mixed methods cross sectional study. Both qualitative and quantitative data was collected for this study. Simple random sampling was used to sample out seven of the nine present parishes. In each of the sampled parishes cluster sampling was used to map out the parishes; in this procedure the parishes were clustered into rural parishes and urban parishes. Systematic sampling was used to select households with the eligible respondent who was a household head. Structured interviews were conducted to collect quantitative data from the respondents. Focus group discussions were conducted in this study in order to triangulate it (have more than one method and therefore type of data to rely on) in order to achieve higher reliability of the results. The quantified data was then transferred to Statistical Package of Social sciences (SPSS) computer package for data analysis. Qualitative data was analyzed using content analysis

Results: When asked whether the household of or any of his house hold members with the exemption of infants had eased themselves in a place other than a latrine or toilet, more than three quarters of them denied this occurrence 327(85.2%). More than half of the respondents 245(63%) reported that a member of the CLTS program team had come around their area to check on the condition of latrines before the CLTS sessions started. Majority of the respondents noted that their household members were involved in the CLTS programme (72.1%), that the CLTS facilitation had helped them in realizing the importance of having a latrine 334 (87%). The importance of CLTS in having an ODF household was shown by the CLTS facilitators to the respondents according to 325 (84.6%) of them and lastly, it was also reported that the local authorities in Katikamu had been supportive all through the CLTS process (88.3%).

Local resources for construction of latrines were possessed by the majority of the respondents (n = 226, 58.9%). For the respondents who owned latrines, resources for the maintenance of those latrines were owned by the vast majority of them (n = 295, 84.8%). Man power for pit latrine construction was also reported to be available by most of the respondents (n = 240, 62.5%). Resources for pit latrine construction and maintenance did not have a statistically significant relationship with open defecation status in Luwero district ($p<0.05$).

Seven CLTS activities had statistically significant contributions to the open defecation status of residents in Katikamu Sub County. These were whether anyone came around to check on the condition of latrines before the CLT sessions started ($X^2 = 8.784$, $p = 0.000$), whether CLTS facilitation helped in realizing the importance of having a latrine among the respondents ($X^2 = 5.528$, $p = 0.019$), whether was easy to attend CLTS follow up sessions ($X^2 = 17.390$, $p = 0.000$), the Officials who did the CLTS follow-up ($X^2 = 16.757$, $p = 0.000$), whether follow up was done on the outcome of CLTS ($X^2 = 28.959$, $p = 0.000$), whether the Community was declared ODF ($X^2 = 3.859$, $p = 0.049$), and whether the respondents felt shame and disgust during the triggering sessions ($X^2 = 15.417$, $p = 0.000$). Respondents in areas where someone came around to check on the condition of latrines before the CLTS sessions started were less likely to practice OD (OR = 0.362). This was the same for Individuals who said that CLTS facilitation helped in realizing the importance of having a latrine (OR = 0.540), and those for whom it was easy to attend CLTS follow up sessions (OR = 0.596)

Conclusion: Open defecation is low but still existent in about 2 of every ten residents in Katikamu Sub County. The community led total sanitation program is effective in Katikamu Sub County with some minimal gaps in the pre triggering and follow phases. Resources for latrine construction are available; however this does not affect ODF status. The community led total sanitation program activities have a significant effect on the ODF status in Katikamu Sub County.

CHAPTER ONE: INTRODUCTION

1.0 Introduction

This chapter presents the background to the study, a statement of the problem; it also highlights the study objectives, research questions, the significance of the study, the scope of the study and conceptual framework.

1.1 Background to the study

Open defecation can lead to public health problems in areas where people defecate in fields, urban parks, rivers and open trenches in close proximity to the living space of others (JMP - WHO/UNICEF, 2015). Getting rid of open defecation is the major aim of improving access to sanitation internationally and is a proposed indicator for the Sustainable Development Goals achievement in any country. Nevertheless, even when toilets are available, people still need to be convinced to desist from open defecation and use toilets. Therefore, the need for behavior change is critical in addition to the provision of toilets (Clasen, 2014); this has been attempted through the use of programs like the Community-Led Total Sanitation (CLTS).

Community-Led Total Sanitation (CLTS) is an approach where facilitation –using participatory methods– enables communities to analyse their sanitation conditions and the risks of open defecation and thus triggers a desire in the community to take their own action and become Open Defecation Free (ODF). CLTS spread fast within Bangladesh where informal institutions and NGOs are key. Both Bangladeshi and international NGOs adopted the approach. The Water and Sanitation Programme (WSP) of the World Bank played an important role in enabling spread to neighboring India and then subsequently to Indonesia and parts of Africa. Over time, many other organizations have become important disseminators and champions of CLTS, amongst them Plan International,

UNICEF, Water Aid, SNV, WSSCC, Tear fund, Care, World Vision and others. Today CLTS is in more than 50 countries in Asia, Africa, Latin America, the Pacific and the Middle East, and governments are increasingly taking the lead in scaling up CLTS. At least 16 national governments have also adopted CLTS as national policy.

Although OD was not directly mentioned in the United Nation's Millennium Development Goals (MDGs), reductions in OD were critical to achieving MDG Target 7C that aimed to "halve, by 2015, the proportion of people without access to safe drinking water and basic sanitation" (WHO, 2012) and are known to be critical to achieving the Sustainable Development Goals. Despite some progress that was made globally, the WHO/UNICEF Joint Monitoring Program (JMP) for Water Supply and Sanitation (the official United Nations group that was assigned to monitor progress towards the MDG Target 7C) stated that "it was unlikely that the world would meet the MDG sanitation target by 2015" (WHO, 2012). In 2010, more than 2.5 billion people still lacked access to improved sanitation, which is defined by the JMP as sanitation facilities that hygienically separate human excreta from human contact.

The United Nations estimates that there are 2.5 billion people who still do not use an improved sanitation facility and a little over 1 billion practicing open defecation (UN, 2013). In 2011, almost two thirds (64%) of the world, relied on improved sanitation facilities. Since 1990, almost 1.9 billion people have gained access to an improved sanitation facility. The greatest progress has been made in Eastern Asia, where sanitation coverage has increased from 27% in 1990 to 67% in 2011. This amounts to more than 626 million people gaining access to improved sanitation facilities over a 21-year period. However, current trends show that sub-Saharan Africa and Southern Asia still struggle with low sanitation coverage (UN, 2013). In sub-Saharan Africa, 44 per cent of the population uses either shared or unimproved facilities, and an estimated 26 per cent practices open defecation while

in Southern Asia, the proportion of the population using shared or unimproved facilities has declined to 18 per cent but open defecation remains the highest of any region (39 per cent).

Improved facilities include flush or pour-flush toilets (flushed into a piped sewer system, septic tank or pit latrine), ventilated improved pit latrines, pit latrines with a slab and composting toilets (WHO, 2012). Unimproved sanitation includes flush or pour-flush toilets that do not flush into a piped sewer system, septic tank or pit latrine; pit latrines without a slab or open pits, bucket latrines, hanging toilets or hanging latrines, shared or public facilities and open defecation (WHO, 2012). In order to meet the sanitation MDG, sub-Saharan Africa will need to have 64% of its population covered by improved sanitation facilities, and the current trend indicates it will achieve only 32%. Only 9 countries on the African continent are on track for such reduction, and only 2 of those 9 are in sub-Saharan Africa (WHO, 2012).

By 2012, Uganda had a total of 3.2 million people without toilets/latrines, while 13.8 million Ugandans used unsanitary conditions and disposed fecal waste unhygienically (UNICEF, 2012). In Uganda, Plan-Uganda initiated CLTS in 2007 (USAID, 2007). Later that year, the initiative was launched in various districts with training support from Plan-Kenya and Network for Water and Sanitation (NETWAS), a Ugandan networking organization in the water and sanitation sector. This started with a national level training programme targeting District-level government staff, Village Health Teams (VHTs) and selected community members. Plan-Uganda then introduced CLTS within supported communities in the Districts of Lira, Kamuli, Tororo, and Luwero. There has been a high level of community enthusiasm and, to date, more than 50 villages supported by Plan have been declared Open Defecation Free (ODF)–where every household uses a latrine as a safe method of excreta disposal. As of October 2010, about 65% of rural Ugandans had access to safe water, while in urban areas the figure stood at 67%. Improvements have been achieved with respect to

sanitation and hygiene but in the same year, 30% of the Ugandan rural population still did not have access to latrines and thus continued to practice open defecation. In the Plan-Uganda programme areas (Kamuli, Tororo, Lira and Luwero districts), the 2010 WASH Sector Performance Report places all four districts at over 70% sanitation coverage. Kamuli is mentioned as among the best, with Tororo and Luwero lagging. (Plan, 2011)

However, the latest report by the World Bank points that open defecation is still a challenge among sections of the population especially those in rural areas. Currently, at least 3.2 million Ugandans have no latrines at all and their place of convenience is the open space, according to the latest Work Bank report (World Bank, 2016). The report indicates that another 13.8 million Ugandans use unsanitary or shared latrines. This poor sanitation is costing the country at least sh389bn annually.

1.2 Statement of the Problem

In 2007, CLTS was implemented in Luweero District, which consequently led to an improvement in latrine coverage in the district, where coverage rose from 30 percent in 2007 to 70 per cent in 2012 (Susan, 2012). The initial target of the program was to achieve 100% open defecation free communities in the district by the end of the 3 years meaning that every single household in a particular village had to have and use a sanitary latrine for defecation at all times. However a household survey by Water Aid for pit latrines carried out between April 2009 and June 2009 that included 77533 households revealed that 77.6 percent of the households were found to have pit latrines. This represented an increase by 4.6 percent compared to 73 percent for 2008. Pit latrine coverage was highest in Luwero town council at 89.7 percent, while lowest in Butuntumula Sub County in Katikamu. A more recent survey by Plan (2015) in Luweero district revealed that out of the 42 villages only 34 (81%) had been certified as ODF, with latrine coverage ranging from 67% to 90%. The sub-county with the lowest baseline latrine coverage, Katikamu, still had the lowest absolute increase in latrine coverage after CLTS activities (Plan, 2015) and as such the highest rate of OD as compared to other Sub Counties. This therefore puts into question the contribution of the Community Led Total Sanitation Program to the eradication of OD more so in Katikamu Sub County.

The culture of OD if not prevented might put the residents of Katikamu and Luweero district at large at the risk of sanitation-related diseases such as cholera, diarrhea and typhoid, among others. Most importantly, there is no clear documentation on the contribution of community led total sanitation approach on sanitation practices among the communities in Luwero district. Therefore this study sought to assess the contribution of Community Led Total sanitation Approach in achieving Open Defecation Free status among the residents of Katikamu sub county - Luwero District.

1.3 Study objectives

1.3.1 General objective

To assess the contribution of the Community Led Total Sanitation approach in achieving Open Defecation Free status among residents of Katikamu Sub County - Luwero district

1.3.2 Specific objectives

i. To establish the prevalence of open defecation among residents of Katikamu Sub County - Luwero district
ii. To determine the Community Led Total Sanitation activities implemented in Katikamu Sub County - Luwero district
iii. To determine availability of local resources for achieving open defecation free status among households in Luweero District
iv. To establish the relationship between Community Led Total Sanitation activities implemented and the status of open defecation among residents in Katikamu Sub County - Luwero district

1.4 Research questions

i. What is the status of occurrence of open defecation among residents of Katikamu Sub County - Luwero district?
ii. What are the Community Led Total Sanitation activities implemented in Katikamu Sub County - Luwero district?
iii. What are availability of local resources for achieving open defecation free status among households in Luweero District.

iv. What is the relationship between Community Led Total Sanitation activities implemented and the status of open defecation among residents in Katikamu Sub County - Luwero district?

1.5 Justification of the study/Significance

In Uganda, the increasing deaths of infants due to diarrheal diseases mainly caused as a result of poor sanitation and poor fecal disposal mechanisms are still high. The CLTS Approach has been considered as a means of improving sanitation and lowering diarrheal diseases in areas where it has been implemented such as Luwero. Through its mechanisms of creating "shame and disgust" in communities, practicing open defecation and unsanitary practices thereby encouraging people to build, use and maintain affordable latrines thereby improving sanitation.

The CLTS approach has been in Uganda since 2007, with an intention of improving the health of populations. However, as evidenced, the sanitation situation in the country is still lacking despite the implementation of the approach in Luweero District rural communities. There is also no clear evidence of CLTS approach's role in creation of Open Defecation Free Communities in the District of Luweero. This study will be valuable to research organizations, Health ministries, students and other International organizations as expressed below:

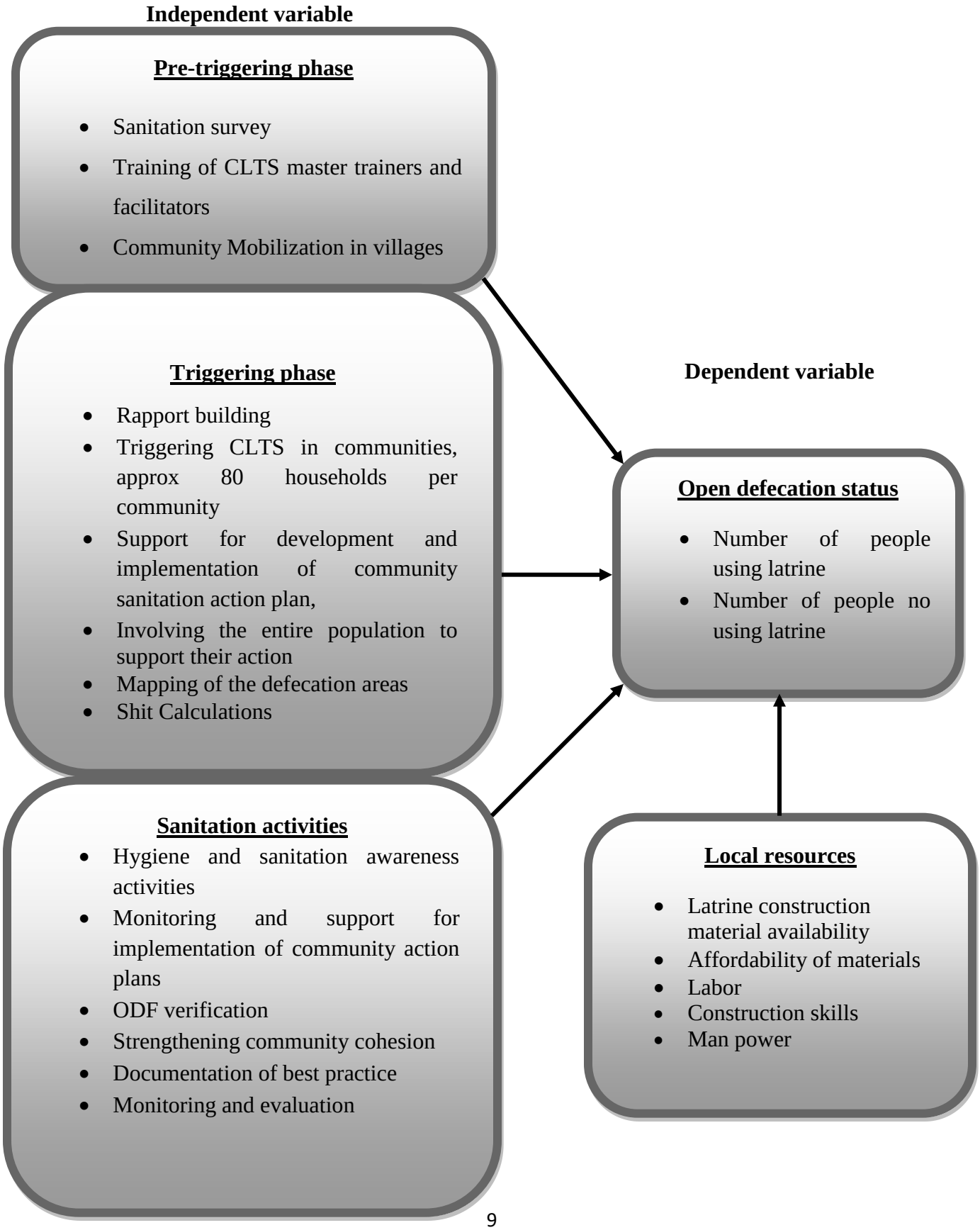
Findings from this study will be used by the policy makers in the Ministry of Health to develop the appropriate sanitation strategies for households

The findings will also enable the health Organizations to get appropriate feedback from households regarding their involvement in the CLTS sanitation approaches among the community.

The study findings will add to the pool of knowledge regarding the effectiveness of Community Led Total Sanitation Approaches. More so, the study will identify areas that require further research for persons interested in CLTS.

The findings will be used in policy formulation and by leaders in enforcing other decisions that will foster sanitation in and attainment of Open Defecation free status by households in the communities

1.6 Conceptual framework



CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

This chapter presents a review of literature to the study. The literatures was sourced from a variety of sources including online libraries like BMC, PLOSone, PubMed, CINHAL and peer reviewed journals pertaining to open defecation and Community Led Total Sanitation.

2.1 The status of occurrence of open defecation

The practice of open defecation (hereafter, OD) facilitates the transmission of pathogens that cause diarrheal diseases – the second leading contributor to the global burden of disease, as measured in disability-adjusted life years (DALYs) (WHO, 2008; Clasen, 2010; Garrett, 2008). It is estimated that 1.7 billion cases of diarrhea occur every year, causing approximately 800,000 deaths among children under 5 years of age worldwide (WHO, 2015; UNICEF, 2012). It is estimated that 1.1 billion people – 15% of the global population – still engage in OD (WHO/UNICEF, 2012).

The majority of OD practices, referred to in national surveys as defecating in fields, forests, bushes, bodies of water or other open spaces, take place in rural areas of low-income countries. Even though the proportion of people practicing open defecation in sub-Saharan African has decreased by 11% from 1990 to 2010, the absolute number of people practicing OD has actually increased by 33 million over the same time period, due to population growth (WHO/UNICEF, 2012). In 2010, OD was practiced by 8% of the urban population and 35% of the rural population in sub-Saharan Africa (WHO/UNICEF, 2012).

Findings by Deise (2013) suggest that only a limited number of countries in sub-Saharan Africa have made significant progress towards reducing OD prevalence and only one country among 34

countries analyzed, Angola, is expected to end OD by 2015. In the subset analysis after excluding the countries with per capita GDP > $1,000, a higher level of per capita aid disbursement for WSS was positively associated with a reduction in OD prevalence.

About 60% of people worldwide who defecate in the open live in India. In rural India, 70% of households do not own a toilet (Census, 2011). Because many people who own latrines do not use them, an even higher fraction of people defecate in the open. 90% of households in India that lack a toilet or latrine live in rural areas. Widespread open defecation is killing hundreds of thousands of children per year, and stunting the physical and cognitive development of those who survive (Research institute for compassionate economics, 2016).

In rural India, 70% of households do not own a toilet or latrine. Indian rates of open defecation are uniquely high, much higher than in many poorer countries. In poor regions like sub-Saharan Africa and South East Asia, households are increasingly investing in latrines. The UNICEF-WHO Joint Monitoring Project (JMP) reports that about 35% of people in sub-Saharan Africa and 21% of people in South East Asia defecated in the open in 2012. This means that India is home to a disproportionate and increasing share of people who defecate in the open; about 60% of people worldwide who defecate in the open live in India (JMP, 2012).

In Indonesia, in about 1.7 percent of the population in rural areas, 2.3 million people were estimated to live in the 1,279 Open Defecation Free (ODF) villages, also known as *desa*. While her proportion of ODF villages appears relatively low, Indonesia ranks third in the Middle East region behind Timor-Leste and Cambodia. The number of people living in ODF villages in Indonesia is estimated to quadruple that of any other country in the region (Mukherjee, 2012).

Indonesia has a moderate ODF success rate: 17 percent of all triggered villages have been declared ODF according to the government monitoring system. Other development agencies and programmes report higher figures (WSP, Plan and UNICEF). These higher rates, of ODF success rates ranged from 28-43 percent, but some of these figures referred to triggering ODF sub-villages (*dusun*), whereas the lower overall ODF success rate reported by the government figures reflects the greater difficulty of triggering entire villages (*desa*). Large numbers of CLTS facilitators have been trained in Indonesia: UNICEF reported training 400 sanitarians, 100 facilitators from faith-based organizations; and 30 institutional facilitators. The national government has run several CLTS training of trainers' courses. In addition, most of the large programmes have trained substantial numbers of CLTS facilitators. Some experienced districts (local governments) such as Lumajang in East Java, have run CLTS training courses for NGOs and staff from other districts (PLAN, 2013).

A cross-sectional study conducted in Alaba special district in Ethiopia revealed that households have limited access to sanitation and hygiene information. It also informed the importance of communication and behavioral factors in the sanitation and hygiene information access and level of latrine utilization (Regassa, 2011). Another study conducted in rural community of Hulet Ejju Enessie district, showed that latrine coverage in 2006 was 90%, and most (61%) households had traditional pit latrines (Anteneh, 2010). In Ethiopia, still the national open defecation rate in 2010 was 62% (53% rural, and 9% at urban) (WHO/UNICEF, 2012). The proportion of households with private improved toilet facilities was only 8%, 14% in urban areas and 7% in rural areas (WHO/UNICEF, 2012). According to 2011 WASH report, the total latrine coverage in Tigray was 87%, and the utilization rate was only 34% (Admasu, 2011)

Odisha, in eastern India, is among the lowest performing states in terms of latrine coverage (Ghosh, 2013). In 2011, 85 % of rural households (HHs) defecated in the open and latrine coverage increased

marginally by seven percentage points between 2001 and 2011, reaching 22 % (Census of India, 2011). Those that own a latrine often do not use it regularly (World Bank, 2011). Usage of latrines all over India is not encouraging. A national survey in 2010 found that even in villages designated open defecation free (ODF), up to 50 % of newly constructed latrines were not used (World Bank, 2011). In some high coverage villages in Odisha, 83 % of households had toilets, but only 48 % reported using them (UNICEF, 2012). Similarly, an evaluation of the TSC in Odisha in one district (Puri) found that 37 % of members of households with latrines reported never using them and less than half of household members who reported using their latrine did so always (Barnard, 2013).

2.2 Community Led Total Sanitation activities implemented

CLTS emerged in Bangladesh in early 2000s; it was developed by Dr. Kamal Kar. CLTS is a participatory answer to traditionally subsidized sanitation programmes that have not succeeded in getting people to want, build, pay for, and use latrines. The approach promotes 100% open defecation free (ODF) communities in order to minimize the risk of disease spread through breaking the cycle of faecal-oral transmission of germs. CLTS is unlike most conventional sanitation approaches which simply aim at providing sanitary facilities. It changes people's behavior by shifting mindsets–to focus their desire for, and triggering them to build a sanitation system themselves. Largely as a result of the rapid spread of the CLTS approach in Bangladesh, the country attained its Millennium Development Goal (MDG) target for sanitation. CLTS was also introduced with successful results in Cambodia, Ethiopia, Indonesia, Tanzania, Uganda and other countries (Tear fund, 2010).

In China, CLTS was introduced in 1995 by Plan-China in Shaanxi Province (PLAN, 2011). Following this initiative there was a dramatic rise in improved sanitation coverage in rural areas from a baseline of only 15 percent in 1995 to 56 percent in 2010 (PLAN, 2011) . A significant

proportion of the rural population in China continued to use unimproved sanitation facilities, but this has reduced from 72 percent to 28 percent, with the open defecation (OD) rate estimated at only 2 percent in rural areas. Nevertheless, due to the high population more than 4 million rural households practiced OD, and a further 86 million rural households used either unimproved or shared sanitation facilities. OD is limited in rural areas of China because of the long history of using human excreta as organic fertilizer in farming.

It has been reported that 93 percent of rural human excreta is used as organic fertilizer, with most households using some form of latrine to collect the excreta (JMP, 2012). However, some research suggests that the use of human excreta is now practiced by only around 30 percent of the population in Shaanxi province (PLAN, 2012). Further progress was made in July 2012, when UNICEF and the Chinese government organized another training workshop in Jilin province to build capacity for a CATS programme in 50 villages of five provinces. This puts the level of implementation of CLTS at 15% of the provinces of China since China has 33 provinces (PLAN, 2013).

CLTS Approach is an innovative methodology for mobilizing communities to completely eliminate open defecation (OD). Communities are facilitated to conduct their own appraisal and analysis of open defecation thereby taking their own action to become ODF (UNICEF, 2013). The concept of CLTS dates back as early as (Before Christ) times. According to Deuteronomy 23:12-13, that reads, "*Designate a place outside where you can go to relieve yourself. As part of your equipment have something to dig with, and when you relieve yourself, dig a hole and cover up your excrement"* (International Bible Society, 1984).

In modern times, the CLTS concept was pioneered by Karmal Kar in 1999, working in conjunction with the Village Education Resource Centre in support of the Water Aid programme in Bangladesh.

Ever since then, this approach has been introduced in many countries in Asia and Africa. Evidence suggests that there is a likelihood that CLTS may possibly become a self- propelling movement because input costs are low (UNICEF, 2013). CLTS is, for that reason, based on the principles of a community led development concept emphasized by the following assumptions; It is the right of a community to be in position to influence the decisions that are made about it, The community best knows and understands its issues and therefore their participation in delivering and planning for solutions makes growth most effective and meaningful, Developing CLTS capacity and ownership at community level makes development sustainable and more cost effective.

At the heart of CLTS lies the recognition that in the past many sanitation projects were unsuccessful because they assumed that the provision of subsidised toilets would result in improved sanitation and hygiene. The underlying assumption is that once people are convinced about the need for sanitation, they construct their own toilets according to the resources available (financial, land and so on). This approach does not require high subsidies for toilet construction from governments or external agencies. However, financial and institutional support is required for facilitation, monitoring, evaluation and mobilisation. What is also crucial is an understanding of the individual or collective 'triggers'. The principle here is a 'sanitary mirror' that will enable individuals to see the unsanitary conditions of their existing lifestyle. This leads to an ignition process that should lead to collective behaviour change (Kar 2005, Kar & Pasteur 2005, Kar & Bongartz 2006, Kar & Chambers 2008).

According to UNDP (2006), in ensuring the success of CLTS program, the following conditions must be in place: Positive attitudes and behaviors of the facilitators. According to Kamal Kar (2008), these are of paramount importance. He argues that the paramount choice in triggering CLTS is a combination of empathy, boldness, humor and fun. He is also of the view that it requires a hands-off approach, not lecturing or teaching, but facilitation to enable the people to confront their revolting realities; The

responsive support of institutions is also of great importance. Consequently, any disbursement-driven and top-down target approach is liable to undermine CLTS. Two immense dangers cited are the large sums of money, because CLTS needs reasonably little, and rapid enrollment as well as inadequate orientation, socializing and training of staff. This will therefore require some form of restraint which is difficult in most bureaucracies; Furthermore, grass-root community action makes a difference in any sanitation program. Success stories have shown that people at the distraught end of the sanitation crisis that is; those that lack even the basic sanitation have caused change from the grassroots. At the same time, near universal participation relies on the existence of a combined perception of benefits and an acceptance of combined responsibility to unlock those benefits.

Steps and principles in the ignition of CLTS

The basis of CLTS is stimulating a collective sense of disgust and shame among the community members as they confront the basic facts about mass open defecation plus its negative impacts on the whole community. The basic hypothesis is that no human being can stay indifferent once they have learnt that they have ingested other people's feces. In general, communities react strongly and instantly strive to find ways to change this through their own endeavors.

CLTS involves no subsidies. Subsidies only induce an attitude of external dependence and expectation. Neither does CLTS recommend latrine models. Rather, it encourages the capacity and inventiveness of the community. The plan is to encourage and ignite a self-motivated desire to change behavior.

Certain sections of the population will have particular motivations for the need to change their status quo. For instance: Families that own toilets realize that they are also as prone to fecal-oral contamination as a result of the actions of those who do not have. For the homeless and landless

people, they are often criticized and abused for defecating in other people's land and/or homes. For the young girls and Women, they may suffer the most from the lack of privacy in open defecation while religious leaders recognize the insignificance of wearing clean clothes as they are dirtied by human excreta. The drive and strong feelings to act among these different sections of the population cannot be ignored. These groups could however be encouraged to form pressure groups in order to encourage others to change. The key to success is the approach and attitude of the facilitator.

The main aim of CLTS is to trigger self-realization among the community members about a need to change their behaviors, so the facilitator must not advise or lecture on sanitation habits, and must not provide external solutions with respect to models of latrines. The goal of the facilitators is to purely help community members witness for themselves that open defecation has appalling consequences and creates an unpleasant environment. In that case, it is up to the community members to decide on how to deal with the OD problem and also take action.

This approach is normally very difficult for the "educated outsiders" who find it a challenge to overcome their impulse to teach about sanitation and tell people what to do. The best facilitators tend to be the local people who have learned the CLTS Approach from first-hand experience and hence have not developed this habit of "teaching". Community facilitators can be given a short training and some resources for example transport to reach other communities and a reasonable fee for their work. Therefore, communities that need to scale up CLTS need to consider the availability of locally available materials, knowledgeable community facilitators and the feasibility of people digging low cost latrines.

Steps taken in Triggering CLTS in villages

CLTS Triggering follows a series of steps; namely; i) Introduction and rapport building ii) Participatory analysis, iii) Ignition moment, iv) Action planning by community and v) Follow up.

Introduction and building Rapport

The first stage of the process is arrival at the villages. One needs to explain the purpose of their visit and build rapport with the community. Discussion with a few community members during an informal walk through the village (a 'transect walk') can be started. The aim of this is to motivate people in order to carry out a more extensive sanitation analysis involving the entire community. There are different ways of initiating a discussion about village sanitation and open defecation. One can start with a few people they meet on the way and they ask them to have a walk together behind the houses, near the river, in the bushes, or other open places where people are most likely to defecate. Small gatherings in such peculiar places will soon attract others. It is here that questions on triggering can be asked such as "whose shit is this? Those that have defecated in the open can also be asked to raise their hands and suggestions are made to return to the spot where they defecated to see if the shit is still there. Once the group's interest is aroused, they can be encouraged to call other members of the community together.

Mapping of the defecation areas

Mapping involves drawing a simple map of the community to locate the different households, the resources to be used in the mapping exercise such as seeds, sticks, leaves plus other easily available resources, and to also stimulate discussion. It is a very useful tool for getting all village members involved in a visual and practical analysis of the community's sanitation situation. The community

members will therefore need to identify a large open area of ground where the map can be drawn. It is also essential for the facilitator to encourage creativity and make the mapping exercise fun.

During the mapping exercise, each and every household should be invited to locate themselves on the map, for instance by locating a leaf or stone and use it to mark the ground and indicate if they have latrines or not. The open defecation areas could be marked and lines drawn in order to connect them to households that visit them. The map can then be used to highlight many things. Attention is drawn on how far people have to walk to defecate plus the times in a day and the dirtiest households. The map should therefore be a means to a better community understanding of the sanitation situation and not an end in itself. The map, which is then transferred to a manila and hung in an open area in the community to remind the community to take action, also serves as a monitoring tool and hence creating a sense of competition amongst the population to construct their own latrines.

Shit Calculations

Calculating the fecal amount produced helps to demonstrate the magnitude of the sanitation crisis for instance, calculating the density of human excreta generated by each household or individual per day. Households can use their own local measures and methods for calculating how much they are adding to the problem. The number of households can then be added up to produce a numerical figure for the whole population. A daily figure can then be multiplied to depict how much shit is produced per week, per month or each year. These quantities are then added up and totals of shit may surprise the community.

Ignition moment

The most important point in the process of triggering CLTS is attained when the community reaches a collective realization that due to open defecation, everybody is ingesting each other's faeces, and this will continue except open defecation is totally stopped. It is specifically at that moment that the facilitator should thank the people for the analysis and conclude.

Community action and follow up

Proper ignition of CLTS sparks off urgent collective community action which reduces open defecation practices extremely fast and might achieve 100 per cent open defecation-free status in communities within a few weeks to a few months, depending on the size of the community. It is generally either instant or never. However, follow-up is also important in order to ensure that CLTS is sustained and improvement in latrine usage is made over the long term. In addition, to ensure that people do not revert to their old behaviors once their total sanitation has been achieved, the community needs to decide on a penalty for those who continue to practice open defecation. Over time, once there is a gradual behavior change of the community; Once families start using toilets, they get used to the convenience, safety and comfort, and therefore do not want to go back to open defecation again. This behavior change rather than the construction of quality latrines is the key to sustainability of the CLTS approach.

CLTS further focuses on igniting a change in sanitation behavior by the whole community rather than promoting latrine construction. It does this through a process of social awakening stimulated by facilitators and recognition that collective benefit can encourage a more cooperative approach. Further, CLTS promotes wider community development to meet the diverse social needs and solve problems through the cohesion built. The role of CLTS on people's sanitation practices in the

community has been given little attention in terms of research and documentation as a means of promoting proper sanitation and hence improving the lives of people especially the infants and mothers, which could improve maternal and child health (UNICEF, 2013).

2.3 Availability of local resources for achieving open defecation free status among households

According to a study carried out in Nelvoyy, Southern India in 2007 on Water handling, sanitation and defecation practices, respondents confirmed that the resource for building toilets were not in place, yet the need to maintain toilets was eliminated by open defecation. They further stated that construction of toilets was very expensive due to the scarcity of water (Kalyan & Rajiv, 2007)

Availability of resources for building and construction skills is known to increase demand for the household latrines (WSP, 2002). In a study carried out in Nairobi,it was discovered that respondents had an expensive notion of what constituted a latrine. Male respondents were asked to state the features of an inexpensive and stable Latrine,75% stated that the overall cost of building a latrine was more than 1000 US dollars.This suggested that these people could not use local resources to build latrines. In addition,marketing of sanitation should be done ,with the use of local resouces to overcome barriers and prejudices through the local governments (WSP,2004).

According to another recent experimental study in rural Indonesia, respondents were also asked how much they would spend on a “cheap” Latrine. The average respondent reported that a minimum cost of only Rs 4,492 was required (Cameroon & Bahl, 2013). Technologies have also proved to be maintained and adopted when readily available local resources are used for their construction, hence increasing ownership and reducing costs. Available materials lead to better upkeep and maintenance hence increasing sustainability. The community managed peri-urban and rural sanitation program in Kerala district offered no other choices, however, the local committee members helped to find local

materials and negotiated for the best prices from the local sector. This low local cost design was then used as the local construction standard. Unit costs were two-thirds that of the public programme and half that of the World Bank. If households were not able to afford a full model, they used temporary local materials for the outhouse (Kurup, 1996)

In a study on Latrine construction under the Government of India's Total Sanitation Campaign which was implemented in 1999 under the rural development department, key components included construction and usage of household latrines, putting up structures in schools and holds public institutions, provision of subsidies to poor houses that fell below the poverty line, creating production centers that would provide locally appropriate technologies and carrying out Information, education and communication activities to stop open defecation (Sophie & Peppin, 2014). However,it has been proven that Subsidy provision in stopping Open Defecation has been ineffective and local resources used to construct latrines has provided sustainability.

In a survey carried out in Kenya on improving household knowledge and sanitation, observations were made about households using local materials in construction of latrines such as reeds, old mosquito nets, iron sheets, polythene sheets, bricks, mud, cement and motor (Wasnga, 2014). However,(Sanitation services and products must not only be available and readily accessible, but they must also have the level of quality plus other positive attributes sought after by the target populations. Product attributes are defined as the subjective perceptions concerning the physical components of the latrine and the perceptions of the practical use of products (Berkowitz et al. 2000; Rogers 2003).

In Malawi, findings from a global review on the influence of open defecation and ownership of Latrines in Rural households, discovered negative perceptions regarding the safety, quality, hygiene

and comfort of latrines that reinforce the practice of open defecation and hence hinder decisions to invest or build latrines. Generally, most negative attributes of latrines were in reference to unimproved latrines. Latrines were perceived as having low durability, constant relocation and requiring frequent maintenance. Latrines were also perceived as risky and unsafe. There was fear that people, especially children, would fall into the pit/the ground will cave in, which would cause the user to sink into the defecation site. There was also a perception that latrines were difficult to clean, unhygienic, and emanated bad smells. For instance, in Meghalaya, 56 percent of the households believed that a key disadvantage of using a latrine was the malodor. With these negative perceptions concerning latrines, open defecators more often describe their behaviors as more comfortable and a pleasant experience (O'Connell, 2014).

In Ghana, there was a successful implementation of a new CLTS approach. It was built on communal capital and also petitioned to self-respect and inner strength and of the community members (Mahbub, 2008). Communities became Open-Defecation Free and in the triggered communities, every household in the community acquired sanitary latrines. Emphasis was put more on sanitation and hygiene rather than counting latrines. This was the most outstanding shift in attitude. Moreover, people no longer waited for subsidies and handouts. Households confidently built latrines with their own resources. Since then, the Approach has had an impact in rural communities in countries all over the world. In effect, CLTS is regarded as a potentially better option than the subsidy driven approaches for achieving Open defecation free communities (Lantei & Eugene, 2011).

Under the above survey, the intervention was delivered through a local NGO partner and Water aid. Six local NGOs were contracted in the Implementation of the intervention in the seven blocks of Puri district in association with local government. .Implementing NGOs were each assigned between

four and twelve villages. Each NGO selected one cluster coordinator and village Motivator, being responsible for two villages. Cluster coordinators were in charge of management and implementation of the programme in all the villages. The Village motivators were also recruited from the project area in order to facilitate mobilization activities and coordination of latrine construction logistics in villages. The Village motivators and coordinators attended a 3-day training course organized by Water Aid. The training enclosed the key essential elements of the Total Sanitation Campaign and technical aspects of latrine construction. Community mobilization constituted of preliminary meetings with village leaders to explain the CLTS program, formation of CLTS team, baseline assessment, sanitation and hygiene and socioeconomic status of the village. In most villages, committees were established after one or two meetings. These included VHTs, L.C personnel, teachers and other opinion leaders. The average number of members chosen in each committee was 12 (in the range 5 to 16) and 40% of CLTS Facilitators were women (Sophie & Peppin, 2014).

In South Sudan, international capacity was brought to the country by PLAN International to conduct the training of master trainers along with facilitators who trained the local people. During training, triggering of the communities for CLTS also took place. This helped the participants in gaining hands on experience with CLTS. Over 400 facilitators were trained in implementation of CLTS including the training of 145 County and Payam level administration staff, along with 150 local leaders (Payam administrators, chiefs and church leaders) (Ahmad, 2012).

The sensitization of local leaders and their support for CLTS made it easier for facilitators to apply the CLTS tools among the community. Before the sensitization it was undesirable for one to bring shit in a meeting. Apart from being a taboo, it was also interpreted as another form of humiliation to people who have previously suffered other forms of indignity during the war. During the triggering

sessions facilitated by the local leaders, almost all village members turned up for the sessions, where local chiefs were advocating for construction of latrines (SNV, 2011).

According to a global survey by Plan International, knowing and having a mason to help in latrine construction and building is essential in achieving ODF communities. This is important in instances where labor is relied upon in order to build latrines, where there is a challenging landscape, deeper pits are required. In some countries, up to 90% of households report to using masons to construct latrines. The importance of knowing where to find local resources including labor is a determinant of latrine ownership and achieving ODF status of communities. However, perceived availability of masons varies by study. For example, Perceived availability of masons ranges from 34 % of ordinary latrine owners and 46% of improved latrine owners in Meghalaya, 73% of the households in Rajasthan, 80% of the households in Bihar and 85% of households in Tanzania. In Meghalaya, Latrine construction and improvement is barred by difficulty in finding a mason. (Cited by 23% of the households) (Kamar, 2008).

Furthermore, Findings from a global review also cited affordability as one of the factors that influence Latrine ownership. Affordability is one's ability to pay for a sanitation service or product and be able to engage in a Sanitation behavior (Foreit 2000). Affordability is influenced by various factors, including time of year, household income, access to credit, availability of cash, and availability of correctly priced sanitation options in an area. Affordability can be actual or perceived. Considering the latter case, knowledge about the accurate costs of a latrine may be an associated factor. Wealth assessments are anticipated across all reports and hence indicate that people without latrines are more likely to be poorer than those on the higher sanitation ladder. Nevertheless, both latrine owners and open defecators constantly mentioned cost as an obstacle to building and upgrading the facilities as a key barrier to construction/improvement. Latrines are perceived by

people as expensive to build, particularly when associated with deeper pits or cement. Latrines were also alleged to be more expensive to build during certain seasons, for example during the rainy seasons as construction is perceived as challenging due to flooding. There were also challenges with accessing credit to pay for the latrines. For instance, in Tanzania, 43 percent of the non-latrine owners from the poorest wealth quintile cited "inability to save" as a main barrier to latrine building or carrying out latrine improvements. Among the open defecators, the supposed cost of constructing a latrine may be too high that latrine attainment is inconceivable .For instance, a member of a focus group in Kenya stated, *"This year I have no money to spend on anything but food. It rained too much last year and our cassava crop has failed."* For unimproved latrine owners, problems' regarding high cost of labor and materials, coupled with lack of savings and access to credit, prevents improvements/maintenance from being made. Constraints are additionally exacerbated by lack of formal credit mechanisms towards home improvements. In summary, barriers to affordability are linked with the levels of income, lack of finances, savings and limited credit options towards home improvement, and the actual versus perceived expenses of building a latrine (O'Connell, 2014).

2.4 The relationship between Community Led Total Sanitation activities implemented and the status of open defecation

In Philippines, CLTS was introduced in 2008 by Water and Sanitation Programme (WSP) in Eastern Samar. Since then, CLTS spread to eight out of 80 provinces in the Philippines, a 10 percent geographical coverage. However, CLTS progress was concentrated in a few provinces with active CLTS programmes. More than half of the triggered communities were found in Northern Samar and Sarangani provinces, and very limited activities occur outside these main programme areas (Robinson, 2012). About 0.5 percent of the rural population (50,000 people) in the Philippines live

in the 211 communities (*purok* or *sitios*) were triggered by CLTS, with 0.1 percent (8,500 people) estimated to live in ODF communities. The comparatively large rural population and the limited scale of CLTS in the Philippines meant that it was yet to have a discernible effect on regional and national sanitation. Nonetheless, the national ODF percentage was ranked sixth in the region (behind Timor-Leste, Indonesia, Lao PDR, Cambodia and Viet Nam (Robinson, 2012).

In Africa, Sanitation coverage is known to be lower in rural areas than the urban areas, standing at 45% and 84% respectively (SCOTT, 2008). People's sanitation practices are directly related to disease outbreaks in that if a higher potion of the community practices Open Defecation, there will be higher cases of diarrhea and hence more deaths. In Africa, CLTS was introduced in 2002 in principle though it took effect in 2007, when Kamal Kar facilitated two trainings in Tanzania and Ethiopia for PLAN-RESA (Region of East and Southern Africa). Since then, CLTS has been introduced in 32 countries, in many cases following initial training by Kamal Kar. International NGOs such as Water Aid, Plan, World Vision and Netherlands Development Organization plus other UN agencies such as World Bank's Water and Sanitation Programme (WSP) and UNICEF have adopted CLTS as their method of choice in sanitation programmes. This has yielded good initial results. There are now many attempts by governments in Uganda, Kenya, Ethiopia, Zambia and Malawi as well as large institutions such as UNICEF to scale up CLTS. There is also increased interest by Research and academic Institutions as well as practitioners in undertaking applied research to assess and learn from past experiences.

The rate at which CLTS has been taken up in Africa is very promising. At AfricaSan in Durban, February 2008, just one year after the introduction of CLTS to the continent, there was already widespread recognition of the potential of this approach. The sense that 'something very remarkable had happened with CLTS,' reverberated through many of the speeches, presentations and

discussions at the conference (M.M, 2002). The consensus was that 'business as usual' would fail to make real and lasting improvements to the lives and well-being of the 300 million Africans who were still lacking access to improved sanitation, and indeed many countries could hardly afford the sanitation hardware subsidies associated with traditional approaches. A different way of tackling the sanitation crisis was needed, and CLTS seemed to be meeting the challenge. The Africa San event and the follow-up workshop one year later in March, 2009 in Mombasa raised many questions and challenges for CLTS (Ahmed, 2002). As with any new approaches then and especially with one that had spread as fast as CLTS had done, there were issues that emerged as it was rolled out and adopted.

Ending Open Defecation (OD) is not only a matter of access to sanitation facilities but also involves motivational drivers such as well-being, prestige, and situational goals (Hicklings, 2010). There is an increasing significance in motivating people to end OD, as evidenced by the United Nation's new Sanitation Drive 2015, an advocacy campaign which works towards ending OD. Along these lines, approaches are being implemented in a bid to reduce OD. Sanitation Approaches, therefore aim to empower communities as a whole to become 'OD free'. This is in contrast to past approaches which focused on individual households, total sanitation approaches target communities as a whole (Clasen, 2010).

In addition, total sanitation approaches such as CLTS promote use of local sanitation options that are based on available and affordable resources hence reducing the role of hardware subsides. This approach (CLTS) aims to raise awareness of the risks associated with OD and generates a collective sense of intolerance towards OD (Chambers, 2009). A number of questions remain regarding the effectiveness of this approach, especially in urban areas where communities may be less cohesive. There are also questions about the durability of the sanitation systems built as they are often

inadequately constructed. Nevertheless, it has been suggested that total sanitation approaches such as CLTS can result in rapid, significant improvements, and holds promise for decreasing open defecation in sub-Saharan Africa (Milward, 2011).

Deisel Galan carried out various studies to estimate changes in open defecation prevalence between 2005 and 2010 across countries in sub-Saharan Africa after the implementation of the Community Led Total Sanitation Approach (CLTS); to examine the association between national level indices and changes in OD prevalence; and assess how many countries can achieve 'ODF status' by 2015 after the implementation of CLTS (Deisel, 2013). From 2005 to 2010, Ethiopia experienced the utmost reduction in its Open Defecation (OD) prevalence (by 22%), followed by Angola (by 21%) and Sao Tome and Principe (by 10%).Based on the trend (2000–2010), 6 of the 34 countries are projected to reach equal to or less than 10% OD by 2015 and only one country; Angola, may achieve an "ODF" status by 2015: Angola (0 percent), Uganda (4 percent), Zambia (6percent), Malawi (7 percent), Mali (7 percent) and Democratic Republic of the Congo (10 percent) (WHO, 2008) .After 2015, 4 countries may possibly continue to have greater than 50% OD, including Burkina Faso (53 Percent), Chad (59 percent), Namibia (53percent) and Niger (81 percent).These findings hence suggest that just a limited number of countries in the sub-Saharan Africa have made a considerable progress towards reducing OD prevalence after the implementation of CLTS (Deisel, 2013) .

In Ethiopia, an initial effort towards CLTS led to a total of 2648 latrines being constructed within 8 months at a standard cost of one dollar per latrine. This was also the cost of facilitation. Fura Kebele in Ethiopia has 1265 households. It achieved an ODF environment by building 465 household pit latrines and eight communal latrines for visitors and passers-by. The Community penalizes offenders through making them scoop it with their hands! Preliminary reports indicate a significant reduction

in diarrheal incidences and very rare cases of Acute Watery Diarrhea (AWD) incidence in the kebeles in Ethiopia where the CLTS approach was implemented (Bibby, 2007).

When Plan Tanzania initiated the CLTS Approach in Sangabuye in 2007, community members did not own many household or public latrines. The prevalent myth was that when a family member shared the same place for defecation, they would bring misfortune to the family. As a result of the CLTS initiative, a significant change was seen in Sangabuye. Within three months, 93 percent of the households in 14 sub villages in Sangabuye ward had constructed latrines as compared to 43.9% who had latrines before the CLTS programme was initiated. As a result of these improvements, communities with latrines regained a sense of pride and were very aggressive to members without latrines. There are expectations that 100% of all households in the remaining villages in Sangabuye ward will have attained an ODF status by April 2017 (Nederland, 2012).

In Cambodia, CLTS was introduced by CONCERN in 2004, but was not followed up. Plan Cambodia and UNICEF started implementing CLTS at a larger scale in 2006. CLTS has since spread to 11 out of 23 provinces in Cambodia (introduced in 48 percent of the provinces). Cambodia has had a high ODF success rate with 40 percent of the triggered communities being declared ODF. However, no formal process has been agreed for ODF verification yet. ODF villages are declared by the community in union with the provincial rural development offices when 100 per cent toilet coverage is reached (Roberts, 2007).

In Mongolia, CLTS was introduced by the World Vision in September 2011. Two CLTS training Workshops were held, and UNICEF planned to implement CATS in its 2012-2016 country programme. The CLTS programme was a new approach in Mongolia. UNDP and the Red Cross have WASH programmes in Mongolia that did not utilize the CLTS approach. CATS involved a

range of interventions including School Led Total Sanitation (SLTS), CLTS and Sanitation marketing. A total of 15 CLTS facilitators were trained in Mongolia by World Vision, with five of these facilitators reported to be very active. Only one small, peri-urban community in Mongoli. About ten (10) small, periurban communities were triggered during CLTS training events, but no other information was available on CLTS progress (Kar 2011).

Using Community-Led Total Sanitation (CLTS), World Vision is implementing a five (5) year project (running from 2011 to 2016) in Traditional Authority Nthondo in Ntchisi District in Central Malawi. Nonetheless, roughly two years after the CLTS triggering only 6 villages (13%) of the 46 villages had attained open defection free (ODF) status. The study was therefore carried out with the aim of exploring the reasons for low attainment ODF status. Data was collected through household focus group discussions, questionnaires, key informant interviews Literature review. Chi square tests were used to examine the relationship of the CLTS Programme and ODF status. The study found that 40.1% of households were ODF. No association was found between ODF status and; sex ($p=0.114$), age ($p=0.862$), level of education ($p=0.983$), knowledge of the characteristics of ODF household ($p=0.177$), annual household income ($p=0.557$), knowledge of the benefits for not defecating in the open ($p=0.348$) and knowledge of modes of transmission of ODF related diseases ($p=0.241$). The study, on the other hand, established an association between ODF status and the number of follow up visits ($p=0.026$) after CLTS triggering. The study concluded that the triggering process did not achieve the collective behavior change in the community to take collective action (Chanatwa, 2015).

In Nigeria, the Water Aid project introduced CLTS into its sanitation programmes in 2005, and had implemented it in 98 rural communities at the time of the research in 2008. The sample frame of the 2008 study was the 44 project communities where CLTS had been implemented during the 2005-

2007 period. Eight of these communities were randomly selected for the study, with three selected from the high performing strata (defined as latrine coverage greater than 95 per cent), two from the median performers (latrine coverage between 30 and 95 per cent), and another three from the low performing communities (latrine coverage below 30 per cent). Prior to the CLTS interventions, latrine coverage was less than 20 percent in all but one of the communities.

Following the interventions, three of the communities were declared Open Defecation Free (ODF), and the latrine coverage in other five communities ranged from 11-86 percent. On the other hand, 18 percent Open Defecation (OD) was found in the third ODF community, due mostly to the presence of temporary tenants that had no latrines, and had not been counted during the CLTS process. Additionally, the study discovered that 71 semi-nomadic *Fulani* households had been excluded from the CLTS process in Duhuwa region. The ODF status had been declared among the *Hausa* households, despite 76 percent of the *Fulani* households continuing to practice OD (Burton, 2007).

CHAPTER THREE: METHODOLOGY

3.0 Introduction

This chapter describes the study area, the study population, the study setting and design, the sampling procedure and sample size, the selection criteria, study variables, data collection instrument and their validity, quality control techniques that were employed the data collection and analysis procedures, ethical considerations and the plan for dissemination of findings.

3.1 Study Design

This was a mixed methods cross sectional study. Both qualitative and quantitative data was collected for this study. This study was based on such a design because: its quantification characteristic helps in consistent benchmarking (Bryman, 2004). The cross-sectional study design was preferred because it could generate data quickly and allow for simultaneous collection of data on the various variables. Triangulation with both qualitative and quantitative data was done as well.

However, cross-sectional studies usually lack internal validity (Bryman, 2004) and thus the researcher attempted to respond to this concern through the qualitative component of this study. In this study therefore, the qualitative data more so that pertaining to the experience of the residents with the CLTS program was used to enrich the descriptions generated by, and or from the quantitative data and thus build the picture of the contribution of CLTS on the open defecation status, better. In doing so, aspects of a phenomenological study design to research were employed to guide qualitative data collection and analysis. A descriptive study focuses on gaining more information about research conducted within a particular field of study to provide a picture of situations that naturally happen (Burns, & Grove, 2005, p. 232).

Quantitative

Quantitative research is a formal, objective, systematic process in which numerical data was used to describe variables, examine relationships among variables, and determine cause and effect interactions between variables.

Qualitative

The qualitative approach is usually chosen when the researcher aims to understand a lived experience for several individuals about a concept or the phenomenon (Creswell, 2005). Using this approach the researcher sought to gain insight through discovering the meaning attached to a given phenomenon (open defecation) therefore a qualitative design was found applicable to assess the contribution of CLTS on the open defecation status.

3.2 Study Population

The study was done in Luwero district whose headquarters are in Luwero Town Council a road distance of about 64 km along the Kampala – Gulu highway. Luwero district has two counties is divided into ten sub counties and three Town councils namely Luwero, Wobulenzi and Bombo. The study was specifically done in Katikamu Sub County located in Katikamu county and which is made of up 9 praishes namely; Wobulenzi, Bamunanika, Kalule, Luweero, Balita, Kiziba, Bombo, Zirobwe and Butuntumula. The study population was all household heads who are residing in Katikamu Sub County – Luwero district

Target population

The target population was all residents of Katikamu Sub County – Luwero district

Accessible population

The accessible population was all adult residents of Katikamu Sub County – Luwero district

3.2.1 Eligibility Criteria

Inclusion

Household heads who were residents of Katikamu Sub County – Luwero district; Household who voluntarily consented to participate in the study; Household heads aged 18 years of age and above

Exclusion

Household heads who for any health condition were not in position to respond to the questions with no discomfort; The House hold heads that declined to consent were excluded; Household heads who were absent from the household at the time of data collection; Households that was headed by minors (below 18 years)

3.3 Sample Size Calculation

The Kish and Lisle (1965) method of sample size determination was used to estimate the sample size

$$\text{Sample size (n)} = \frac{Z^2 \text{ x } p(1-p)}{d^2}$$

Where:

n is the sample size in the study

z is the Z score for the 95% confidence level which is equal to 1.96

p is the proportion of Proportion of Households that are ODF=50 %(0.5). Since this proportion was not known, 50% was assumed.

d is the degrees of accuracy which is set at 0.05

Thus, $n= 1.96^2*0.5(1-0.5)/0.05^2$

$n=3.8416*0.25/0.0025$

$n=384$

Therefore 384 household heads were selected to participate in the study according to the above sample size determination.

3.4 Sampling Procedures

Stage one: Study sites

Katikamu Sub County is made up of nine parishes that is; Wobulenzi, Bamunanika, Kalule, Luweero, Balita, Kiziba, Bombo, Zirobwe and Butuntumula. Simple random sampling was used to sample out seven of the nine present parishes. In each of the sampled parishes cluster sampling was used to map out the parishes; in this procedure the parishes were clustered into rural parishes and urban parishes. This was done in order to get an overall representation from both the rural residents and the urban residents in the parishes. In each cluster, 2 villages were sampled randomly and the sampled parishes 2 villages will also be randomly selected.

Systematic sampling was used to select households with the eligible respondent who was a household head. A household head was defined as an adult who was found to be in custody or guardianship of the household members at the time of the study. The total number of households in each of the selected villages was obtained from the Local Chairperson (LC- 1) and the sampling

interval was calculated for each village through dividing the total number of households per village by the number of households targeted for inclusion in each village. The LC-1's household was the starting point for sampling in each village.

3.5 Study Variables

Dependent variable

The dependent variable was ODF status of the households in Luwero District.

Independent variable

The independent variables were the CLTS program activities which included indicators like: Pre-triggering phase activities, Triggering phase activities and Sanitation activities plus resources.

3.6 Data Collection Techniques

Structured Interviews

Structured interviews were conducted to collect quantitative data from the respondents (household heads). During these interviews, researcher administered questionnaires were used and during this process, the researcher read out a question and the response options from which the respondents chose without giving detailed opinions. These interviews were conducted with respondents who had been sampled in the systematic sample as described in section 3.5 above.

Focus Group Discussions (FGD)

Focus group discussions were conducted in this study in order to triangulate it (have more than one method and therefore type of data to rely on) in order to achieve higher reliability of the results. Focus group discussion participants were randomly selected from communities with exclusion of those who had taken part in the structured interview. Two focus group discussions, each with eight (8) participants was carried out in two separate parishes and each FGD was audiotape-recorded. Two focus group discussions were considered because by focus group number three, saturation had been

reached. The household heads were grouped in a secluded area within the household neighborhoods, and the researcher lead the discussion, making sure they understood the purpose of the discussion.

3.7 Data Collection Tools

The instrument employed to collect quantitative data was the structured questionnaire while qualitative data was collected using FGD guides and key informants. The use of multiple data collection instruments ensured validity and reliability of data generated through triangulation. The questionnaire consists of five sections. The first part was composed of questions about the participant's socio-demographic and household characteristics. The second section was about the open defecation status, the third was about the CLTS program activities and the forth was about local resources for CLTS. The un structured key informant interview and focus group discussion guides were used to collect mainly qualitative data from Local council leaders or any other CLTS Facilitator and in a good position to provide reliable information about the CLTS approach and ODF Status of communities.

3.7.1 Validity of Instrument

To ensure the validity of the questionnaire and the focus group guides, draft copies were given to three peers who reviewed all questionnaires in order to ensure that all information's are correct and valid. After this review, the questionnaire, KII guides and focus group guides were sent to the researcher's supervisor for further review. From the responses in the pre-test study, it was clear that respondents understood the questions as they were fully and well answered.

3.7.2 Reliability of Instrument

To ensure reliability of the instrument used for the study, a pre-test testing was conducted in one village located in Bamunanika parish. The researcher chose this parish because the residents therein

exhibited the same characteristics as those in Katikamu parish. This pilot study was a much smaller version of the proposed full study. Its main purpose was to refine the questionnaire (Burns & Grove 2001:49).

The questionnaire and key informant interview guide was pretested in 5 households in Wobulenzi Town Council. During this pretesting, the principal researcher was present in person to identify the unclear questions and the gaps in the tools. The necessary adjustments were made to the satisfaction of the principal researcher and the research supervisor. This was done to ensure validity and reliability of the tools. For purposes of ensuring data quality the following precautions was dully taken.

To ensure completeness, the research team was urged to ensure that the administered questionnaires are fully filled before being packed while the responses to the interview guide questions are crosschecked before leaving the interview area. For confidentiality, data hardcopies was locked a cabinet while electronic files were assigned passwords only known by the principal researcher and the research supervisor.

3.8 Data Analysis Procedure

Quantitative analysis

The questionnaires was edited for accuracy, completeness and uniformity then coded. Coding was involved in the categorization and quantification of data by assigning numerical values to the various categories in order to facilitate the statistical representation of data. The quantified data was then transferred to Statistical Package of Social sciences (SPSS) computer package for data analysis. In giving clear interpretations figures, table and charts was used. An item-by-item analysis of data was conducted. The percentage of the total sample responding to each question was given. The scores

assigned to the responses were easily analyzed using frequency counts. Also, tables were presented with descriptions and discussions of some major aspects that addressed the research questions raised.

To establish the relationships between variables (independent and dependent), descriptive cross-tabulations at the 0.05 level of significance. Cross-tabulation analysis, also known as contingency table analysis, is most often used to analyze categorical (nominal measurement scale) data. A cross-tabulation is a two (or more) dimensional table that records the number (frequency) of respondents that have the specific characteristics described in the cells of the table. Cross-tabulation tables provide a wealth of information about the relationship between the variables (Andersen, 1980). The variables that were significant at the bivariate level were later fitted in logistic regression model and the results were reported using Adjusted Odds Ratio, (AOR) and 95% Confidence Intervals (CI).

Quantitative analysis

The qualitative data was transcribed into English text by the principal investigator by replaying the recorded interview. Different ideas in the text were merged in their thematic areas and a thematic framework analysis was employed manually. The NVIVO software was used for coding and organizing data pertaining to the CLT program activities and its presumed contribution to open defecation status in Katikamu Sub County.

Analysis of Data from FGDs

The interview data was analyzed using content analysis, initially: the researcher studied the field notes, reduced the tapes into transcripts and carefully read through them. This was done to look for themes and similar ideas or responses to the questions posed to the respondents of which the respondent's information or speeches was translated into specific categories for the purposes of analysis. Thematic analysis involved condensing each response into similar themes and patterns for

easy evaluation and analysis of the data. Furthermore, statements from respondents that were clear and concise were transcribed and quoted directly as verbatim.

3.9 Quality Control Issues

In order for quality control to be ensured, serial numbering of each page of the questionnaire was done before issuing. This was vital in minimizing incidences of page/paper loss. An identification number was given to each interview guide questionnaire to enable the researcher to trace the respondent if needed. Training of the research assistants, who helped the researcher to collect data, especially in administering the questionnaires to household heads, was done in data collection techniques. To ensure validity of the questionnaire items, the questionnaires were given to the supervisor and research experts who were asked to comment on the clarity of the questions. In addition, they were asked to comment on the question's ability to gather the information required for the set objectives. Their comments were incorporated in the final questionnaire.

3.10 Ethical Issues

Prior to conducting the study, the researcher considered the ethical principles of anonymity, privacy, informed consent, voluntariness and confidentiality.

Ethical approval was got from the Institute of Health Policy of International Health Sciences University.

Informed Consent, official permission to collect data from the households was obtained from the Luweero Local Council Authority and from the individual households selected into the study. The participant was fully informed of the purpose of the assessment, the methods that was used, the nature of the questions that was asked, and the risks and benefits of participating. Participation, in an assessment is completely voluntary. Household heads who were above 18 years signed a consent

form to show their willingness of participation. An individual had the right to refuse to participate in the assessment and may decide to withdraw at any time.

Privacy, data was collected in a setting where privacy was ensured and where respondents felt comfortable.

Confidentiality was assured during the whole time of the assessment. Members of the assessment team did discuss any aspect of the assessment. The identities of the participants were coded and no names of participants were used. Questionnaires did not contain information that was used to identify the participants, and they were kept in a locked cabinet until data analysis was done.

The researcher observed all ethical views required in conducting the research.

3.11 Limitations of the study

During the data collection process, some research assistants found a problem in areas where some Household heads could not respond to some questions, hence limiting access to some information and provision of inaccurate data in other cases.

3.12 Plan for dissemination

Upon approval, the study findings are to be availed to the International Health Sciences University Library, Luweero District authorities, the selected households and any respondent who are interested. Key stakeholders like WHO, UNICEF, PLAN International and UNDP are to be communicated to as well. The findings will also be possibly published on the internet with various research journals.

CHAPTER FOUR: RESULTS

4.0 Introduction

This chapter presents the findings of the study as obtained from the field exercise using the methods described in the previous chapter. The results have been both tabulated and presented in figures in some instances. The chapter begins with a description of the respondents' (House hold Heads) socio-demographic characteristics followed by the objectives of the study.

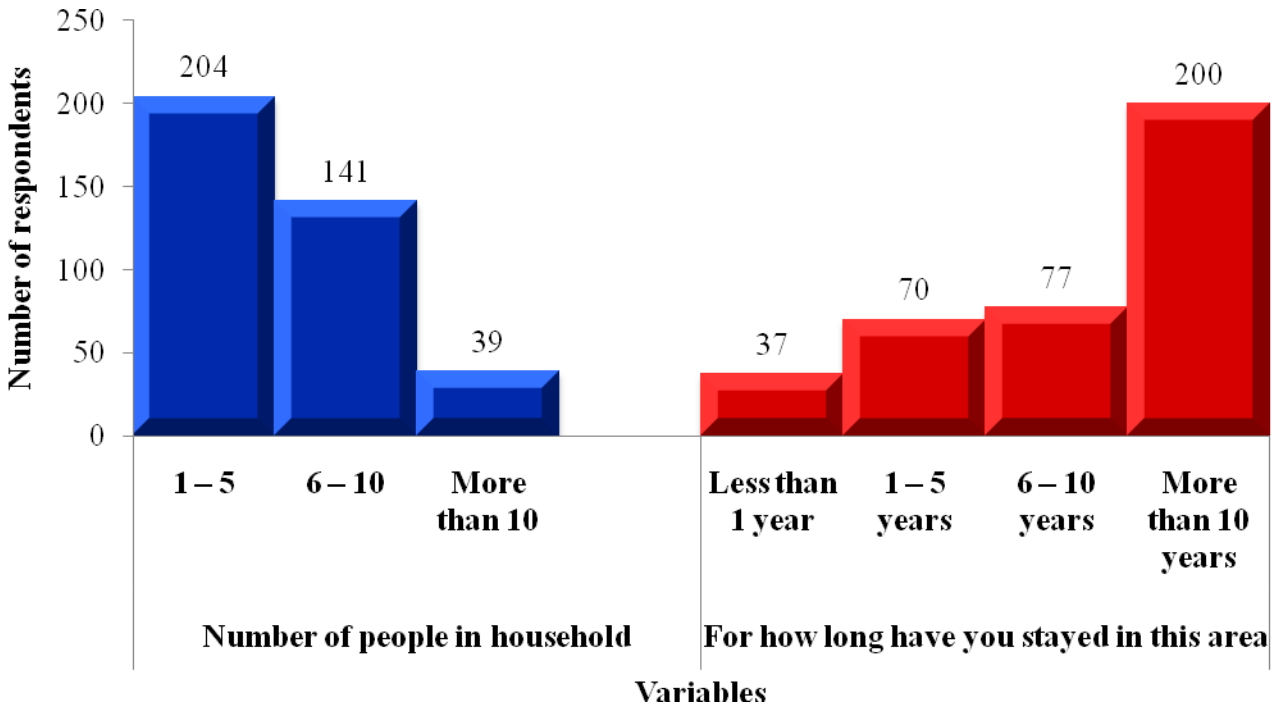
4.1 Socio demographic characteristics of the respondents

Table 1; Socio demographic characteristics of the respondents

Variable	Response	Frequency	%
Age			
	18 - 25 years	126	32.8
	26 - 33 years	107	27.9
	34 - 41 years	63	16.4
	42 - 49 years	72	18.8
	> 49 years	16	4.2
	Total	**384**	**100.0**
Education level of household head			
	None	29	7.6
	Primary	290	75.5
	Secondary	65	16.9
	Total	**384**	**100.0**
Main source of income for this household			
	Crop husbandry	217	56.5
	Animal husbandry	78	20.3
	Business	79	20.6
	Teacher	10	2.6
	Total	**384**	**100.0**
Religious affiliation in the household			
	Catholic	134	34.9
	Protestant	107	27.9
	Muslim	81	21.1
	SDA	21	5.5
	Orthodox	22	5.7
	Born again	19	4.9
	Total	**384**	**100.0**

Table 1 above shows the demographic characteristics of the respondents who met the inclusion criteria of the study and later participated. It is seen that the largest proportion of them was aged between 18 – 25 years 126(32.8%). About three quarters of the respondent population had been educated up to only primary level by study time 290 (75.5%), more than half of them were dependant on crop husbandry as the main source of income 217 (56.5%), whereas the respondents who belonged to the catholic religious denomination were the majority 133 (34.9%).

Figure 1; Household size and duration of staying in study area



Further still, most of the household heads interviewed mentioned that their households were composed of people ranging between 1 – 5 in number (204) and that they had been residents of Katikamu sub county for more than 10 years (200).

4.2 Open defecation status in Katikamu Sub County

Table 2; Open defecation status in Katikamu Sub County

Variable	Response	Frequency	%
Household has a latrine			
	Yes	348	90.6
	No	36	9.4
	Total	**384**	**100.0**
If yes above, what type is it			
	Ordinary pit latrine	226	64.9
	Ventilated pit latrine	84	24.1
	Toilet	38	10.9
	Total	**348**	**100.0**
Have you or any of your house hold members eased yourselves in a place other than a latrine or toilet			
	Yes	57	14.8
	No	327	85.2
	Total	**384**	**100.0**

Inquest into the open defecation status of the Katikamu sub county residents revealed that the vast majority of the household had a latrine 348(90.6%). For the households which had a latrine, the most frequent type owned was an ordinary pit latrine 226(64.9%). When asked whether the household of or any of his house hold members with the exemption of infants had eased themselves in a place other than a latrine or toilet, more than three quarters of them denied this occurrence 327(85.2%).

The same sentiments were shared by the key informants, for instance the DHO said; *"Back in the day we had a problem of open defecation in Luwero that is before the implementation of CLTS, so now there are very few isolated cases of OD"*

"As of now, what I can say is we are doing better that how we were before CLTS, many people now know the importance's of using a latrine the excreta disposal so I believe it's a few of them if any that still do open defecation" DHI

The same was also echoed by the village health teams for example a team leader said;

"When we go to the households and ask them whether they have latrines, they say they do but when we ask them to show us the latrines, they do not show them and this is like 2 out of every ten household you visit in this community" VHT. This statement coincides with the quantitative finding that around 85.5% of the population did not practice OD.

Similarly, during the focus group discussions, some respondents noted that open defecation was still an existent but rare habit apparently in the communities. For clarity, during the focus group discussions, the members were told to estimate out of ten how many people they think still practiced OD, this is what they said;

"The truth is before that program came in many people in this community used to ease themselves in bushes and other places as conveniently as they find them but not latrines, but now there is awareness so, that practiced has reduced"

Another one added;

"Yes actually, the rough estimate I can give as someone who had been in this areas for some long time is eight out of 10 people do not practice OD, it is only about 20 people out every 100 that are still doing that for reasons that are many" Household head FGD 1

4.3 Community led total sanitation

Table 3a; Community led total sanitation program activities carried out in Katikamu Sub County

Variable	Response	Frequency	%
Anyone came around to check on the condition of latrines before the CLTS sessions started			
	Yes	245	63.8
	No	139	36.2
	Total	**384**	**100.0**
Received any people sensitizing about CLTS program and how to be part of it			
	Yes	291	75.8
	No	93	24.2
	Total	**384**	**100.0**
Household members involved in the CLTS programme			
	Yes	277	72.1
	No	107	27.9
	Total	**384**	**100.0**
CLTS facilitation help in realizing the importance of having a latrine			
	Yes	334	87.0
	No	50	13.0
	Total	**384**	**100.0**
Easy to attend CLTS follow up sessions			
	Yes	348	90.6
	No	36	9.4
	Total	**384**	**100.0**
Follow up done after a triggering session			
	Yes	350	91.1
	No	34	8.9
	Total	**384**	**100.0**

Table 4.03a above shows the community led total sanitation activities that took place in Katikamu Sub County as reported by respondents. More than half of the respondents 245(63%) reported that a member of the CLTS program team had come around there area to check on the condition of latrines before the CLTS sessions started. At least three quarters of the respondents reported receiving people who were sensitizing them about the CLTS program and how to be part of it (75.8%). Still,

majority of the respondents noted that their household members were involved in the CLTS programme (72.1%), that the CLTS facilitation had helped them in realizing the importance of having a latrine 334 (87%), that it was easy to attend CLTS follow up sessions 348(90.6%), and that follow up had been done by the CLTS team after the triggering sessions 350 (91.1%).

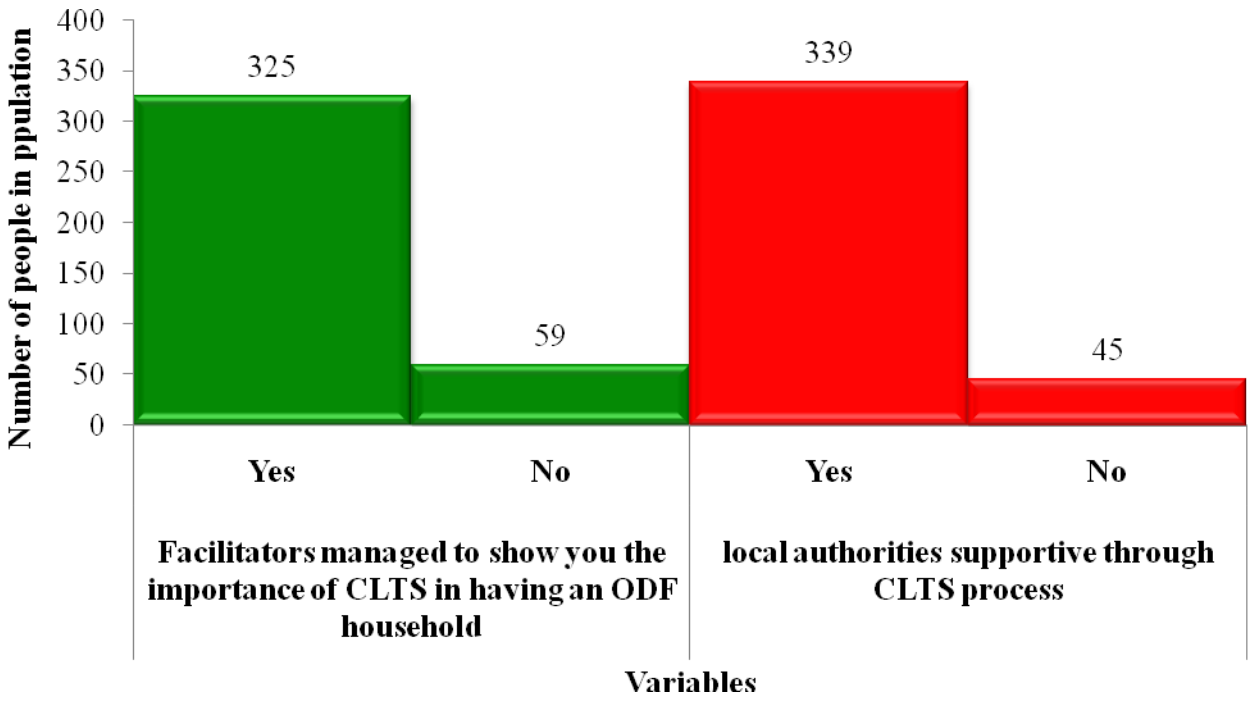
Table 3b; Community led total sanitation program activities carried out in Katikamu Sub County

Variable	Response	Frequency	%
Officials who did the CLTS follow-up			
	Village Health Team member (VHT)	206	53.6
	Local Council member (LC 1)	98	25.5
	District Health Inspector (DHI)	38	9.9
	District Health Officer	42	10.9
	Total	**384**	**100.0**
Community declared ODF			
	Yes	335	87.2
	No	49	12.8
	Total	**384**	**100.0**
If yes, did the facilitator Verify			
	Yes	293	87.5
	No	42	12.5
	Total	**335**	**100.0**
Follow up done on the outcome of CLTS			
	Yes	335	87.2
	No	49	12.8
	Total	**384**	**100.0**
Felt shame and disgust during the triggering sessions			
	Yes	315	82.0
	No	69	18.0
	Total	**384**	**100.0**

It was reported by half of the respondent population that the officials who did the CLTS follow-up were mainly Village Health Teams 206(53.6%), about 87.2% (335) of the respondents said that the

communities they were residing in had been declared ODF, and that this had been verified by the facilitators of the CLTS program (87.5%), Follow up done on the outcome of CLTS was also mentioned to have been done by a big section of the respondents (87.2%), whereas shame and disgust during the triggering sessions was reportedly experienced by majority of the respondents (82%).

Figure 2; Showing importance of CLTS and support from local authorities



The importance of CLTS in having an ODF household was shown by the CLTS facilitators to the respondents according to 325 (84.6%) of them and lastly, it was also reported that the local authorities in Katikamu had been supportive all through the CLTS process (88.3%).

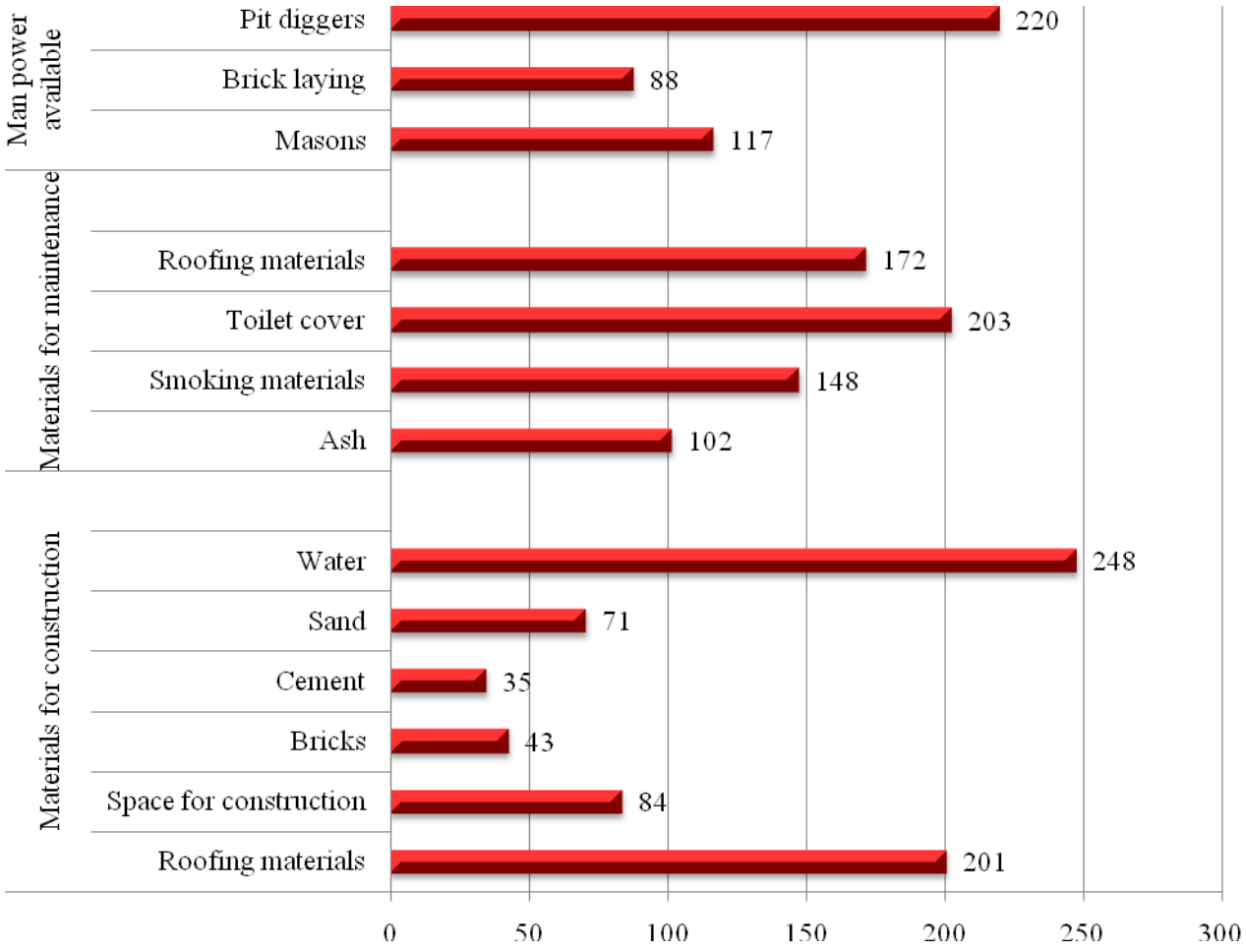
4.4 Availability of local resources for achieving open defecation free status among households in Luweero District

Table 4a; Resources available

Resource	Frequency	%
Have local resources for construction of latrines		
Yes	226	58.9
No	158	41.1
Total	**384**	**100.0**
If you own a latrine, do you have resources for its maintenance		
Yes	295	84.8
No	53	15.2
Total	**348**	**100.0**
Man power for pit latrine construction		
Yes	240	62.5
No	144	37.5
Total	**384**	**100.0**

The results in the table above show that local resources for construction of latrines were possessed by the majority of the respondents (n = 226, 58.9%). For the respondents who owned latrines, resources for the maintenance of those latrines were stilled owned by the vast majority of them (n = 295, 84.8%). Man power for pit latrine construction was also reported to be available by most of the respondents (n = 240, 62.5%).

Figure 3; Type of manpower available, materials for maintenance, and materials available for construction



The results in figure above show multiple responses pertaining to the specific type of manpower available, materials for maintenance, and materials available for construction among the respondents. It is shown that, most of the respondents had pit diggers at their disposal (n = 220), the most frequently mentioned maintenance material for the latrines was toilet covers (n = 203), whereas the construction material reported to be available by most of the respondents was water (n = 201).

Table 4b; Socio-Demographic Characteristics

	Open defecation			
Variable	**Not practiced**	**Practiced**	**Chi square**	**P value**
Age				
18 - 25 years	21	105		
26 - 33 years	16	91		
34 - 41 years	8	55	1.641	0.801
42 - 49 years	12	60		
> 49 years	1	15		
Education level of household head				
None	0	29		
Primary	58	232	22.145	0.000*
Secondary	0	65		
Marital status				
Single	19	117	3.027	0.387
Married	39	209		
Main source of income				
Crop husbandry	33	184		
Animal husbandry	10	68		
Business	15	64	3.027	0.211
Teacher	0	10		
Religion				
Catholic	58	76		
Protestant	0	107		

Muslim	0	81		
SDA	0	21	12.572	0.004
Orthodox	0	22		
Born again	0	19		
Number of people stay in the household				
1 – 5	58	146		
6 – 10	0	141	60.281	0.000*
More than 10	0	39		
For how long have you stayed in this area				
Less than 1 year	15	22		
1 – 5 years	28	42	86.339	0.000*
6 – 10 years	14	63		
More than 10 years	1	199		

**** Statistically significant***

The table above shows bivariate results for the relationship between the Socio-demographic characteristics of respondents and the open Defecation status. From the above results, three socio-demographic characteristics had statistically significant contributions to the open defecation status of residents in Katikamu Sub County. These were the education level of Household heads (p = 0.000), Number of people staying in a household (p = 0.000) and Duration of stay in the area (p = 0.000)

4.4.2 Availability of local resources and the status of open defecation among residents in Katikamu Sub County - Luwero district

Table 5: Availability of local resources and the status of open defecation among residents in Katikamu Sub County - Luwero district

Open defecation status			
Resource	**Practiced**	**Not practiced**	**X^2 P value**
Have local resources for construction of latrines			
Yes	38(16.8%)	188(83.2%)	1.253
No	20(12.7%)	138(87.3%)	0.263
If you own a latrine, do you have resources for its maintenance			
Yes	49(16.6%)	246(83.4%)	1.004
No	9(17.0%)	44(83.0%)	0.947
Man power for pit latrine construction			
Yes	39(16.2%)	201(83.8%)	0.665
No	19(13.2%)	125(86.8%)	0.418

The results in the table above show that resources for pit latrine construction and maintenance did not have a statistically significant relationship with open defecation status in Luwero district ($p<0.05$).

4.5 The relationship between Community Led Total Sanitation activities implemented and the status of open defecation among residents in Katikamu Sub County - Luwero district

Table 6; The relationship between Community Led Total Sanitation activities implemented and the status of open defecation among residents in Katikamu Sub County - Luwero district

Variable	Open defecation status		
	Practiced	Not practiced	X^2 P value
Anyone came around to check on the condition of latrines before the CLT sessions started			
Yes	19(7.8%)	226(92.2%)	8.784
No	39(28.0%)	100(72.0%)	0.003*
Received any people sensitization about CLT program and how to be part of it			
Yes	49(16.8%)	242(83.2%)	2.818
No	9(9.7%)	84(90.3%)	0.093
Household members involved in the CLTS programme			
Yes	46(16.6%)	231(83.4%)	1.750
No	12(11.2%)	95(88.8%)	0.186
CLTS facilitation help in realizing the importance of having a latrine			
Yes	56(16.8%)	278(83.2%)	5.528
No	2(4.0%)	48(96.0%)	0.019*
Easy to attend CLTS follow up sessions			
Yes	49(14.1%)	299(85.9%	17.390
No	6(18.2%)	27(81.8%)	0.000*
Follow up done after a triggering session			
Yes	53(15.1%)	297 (84.9%)	0.005
No	5(14.7%)	29(85.3%)	0.946
Officials who did the CLTS follow-up			
Village Health Team member (VHT)	35(17.0%)	171(83.0%)	

Local Council member (LC 1)	22(22.4%)	76(77.6%)	16.757
District Health Inspector (DHI)	0(.0%)	38(100.0%)	0.001*
District Health Officer	1(2.4%)	41(97.6%)	
Community declared ODF			
Yes	46(13.7%)	289(86.3%)	3.859
No	12(24.5%)	37(75.5%)	0.049*
If yes, did the facilitator Verify			
Yes	47(16.0%)	246(84.0%)	2.643
No	11(26.2%)	31(73.8%)	0.104
Follow up done on the outcome of CLTS			
Yes	38(11.3%)	297(88.7%)	28.959
No	20(40.8%)	29(59.2%)	0.000*
Felt shame and disgust during the triggering sessions			
Yes	37(11.7%)	278(88.3%)	15.417
No	21(30.4%)	48(69.6%)	0.000*
Facilitators managed to show you the importance of CLTS in having an ODF household			
Yes	51(15.7%)	274(84.3%)	0.571
No	7(11.9%)	52(88.1%)	0.450
Local authorities supportive through CLTS process			
Yes	53(15.6%)	286(84.4%	0.634
No	5(11.1%)	40(88.9%)	0.426

**** Statistically significant***

The table above shows bivariate and logistic regression results for the relationship between CLTS activities. Seven CLTS activities had statistically significant contributions to the open defecation status of residents in Katikamu Sub County. These were whether anyone came around to check on the condition of latrines before the CLT sessions started (X^2 = 8.784, p = 0.000), whether CLTS facilitation helped in realizing the importance of having a latrine among the respondents (X^2 = 5.528, p = 0.019), whether was easy to attend CLTS follow up sessions (X^2 = 17.390, p = 0.000), the

Officials who did the CLTS follow-up (X^2 = 16.757, p = 0.000), whether follow up was done on the outcome of CLTS (X^2 = 28.959, p = 0.000), whether the Community declared ODF (X^2 =3.859 , p = 0.049), and whether the respondents felt shame and disgust during the triggering sessions (X^2 = 15.417, p = 0.000)

Table 7: Binary logistic regression for the relationship between Community Led Total Sanitation activities implemented and the status of open defecation among residents in Katikamu Sub County - Luwero district

Variable		CI 95%	
	OR	Lower	Upper
Anyone came around to check on the condition of latrines before the CLT sessions started			
Yes	0.362	1.181	.724
No	1.000		
CLTS facilitation help in realizing the importance of having a latrine			
Yes	0.540	1.834	60.587
No	1.000		
Easy to attend CLTS follow up sessions			
Yes	0.596	.959	4.574
No	1.000		
Officials who did the CLTS follow-up			
Village Health Team member (VHT)	0.119		
Local Council member (LC 1)	0.084		

District Health Inspector (DHI)	0.040		
District Health Officer	1.000		
Community declared ODF			
Yes	0.038	.990	4.193
No	1.000		
Follow up done on the outcome of CLTS			
Yes	0.730	2.780	10.452
No	1.000		
Felt shame and disgust during the triggering sessions			
Yes	0.287	1.774	6.092
No	1.000		

The results in the table above show that respondents in areas where someone came around to check on the condition of latrines before the CLTS sessions started were less likely to practice OD (OR = 0.362). This was the same for Individuals who said that CLTS facilitation helped in realizing the importance of having a latrine (OR = 0.540), and those for whom it was easy to attend CLTS follow up sessions (OR = 0.596). Respondents in areas where Officials who did the CLTS follow-up was the District Health Inspector (DHI) had the least chances of practicing OD (OR = 0.040) whereas respondents in Communities that were declared ODF were less likely to practice OD (OR = 0.038).

CHAPTER FIVE: DISCUSSION OF RESULTS

5.0 Introduction

This chapter presents a discussion of the results obtained by the study in comparison with findings of other studies. The discussion is sectioned following the socio-demographic characteristics of respondents and objectives of the study.

Socio-Demographic Information

From the study, the education level of household heads had a statistically significant contribution to the open defecation status of residents in Katikamu Sub County (P-value =0.000) followed by Number of people staying in a household (p = 0.000) and Duration of stay in the area (p = 0.000). The rest of the socio-demographic characteristics such as age, religion and source of income had no significant relationship to the Open defecation status of residents in Katikamu Sub County

5.1 The prevalence of open defecation among residents of Katikamu Sub County - Luwero district

The prevalence of open defecation among the residents of Katikamu Sub County was found to be 14.8% implying that 2 out of every 10 residents of Katikamu sub county still practice open defecation in fields, forests, bushes, bodies of water or other open spaces. This prevalence of open defecation is lower than what has been recorded in other African and Asian Countries. In rural India, 70% of households do not own a toilet or latrine. Indian rates of open defecation are uniquely high, much higher than in many poorer countries. According to the UNICEF-WHO (2012) about 35% of people in sub-Saharan Africa and 21% of people in South East Asia defecated in the open in 2012. According to WHO/UNICEF (2012) OD was practiced by 8% of the urban population and 35% of the rural population in sub-Saharan Africa. In Ethiopia, the national open defecation rate in 2010

was 46% (53% rural, and 9% at urban) (WHO/UNICEF, 2012). The difference between the results of this study and other mentioned studies is because in most of those studies, the study areas did not have clear cut sanitation programs.

The findings of this study therefore mean that there has been a significant progress made toward reducing OD prevalence in Katikamu Sub County. This could be because of the increased latrine coverage in the study area perpetuated by the CLTS program. The relatively lower rate of ODF is also because of minimal culture and socio economic influences on ODF, whereby culture and tradition do not constrain defecation practices in Katikamu Sub County.

However, the proportion of Katikamu sub county residents still practicing open defecation cannot be ignored given that the CLTS program has been in place since 2007. The implication of this is that there could still be behavioral change challenges among this section of residents which require the CLTS program to urgently tackle. On the other hand, this prevalence of open defecation, could also underpin some loop holes in the sanitation program probably in the pre triggering, triggering or follow up phases.

5.2 The Community Led Total Sanitation activities implemented in Katikamu Sub County - Luwero district

The results of the study showed that Seven CLTS activities had statistically significant contributions to the status of open of residents in Katikamu Sub County. These included whether anyone came around to check on the latrine condition before the CLTS sessions started ($X^2 = 8.784$, $p = 0.000$), if CLTS facilitation was helpful in realizing the significance of having a latrine among respondents ($X^2 = 5.528$, $p = 0.019$), whether it was easy to attend CLTS follow up sessions by respondents ($X^2 = 17.390$, $p = 0.000$), Officials who carried out the CLTS follow-up ($X^2 = 16.757$, $p = 0.000$), whether

there was follow up done on the outcome of CLTS (X^2 = 28.959, p = 0.000), whether the Community was declared ODF (X^2 =3.859 , p = 0.049), and lastly, whether the respondents felt shame and disgust during the triggering sessions (X^2 = 15.417, p = 0.000)

CLTS has spread rapidly and differently around the world. It is most successful when champions (at the village or state level) are present; when local facilitation and mobilization are of high quality and time-intensive (which is an indirect form of subsidization since governments or NGOs need to invest in good facilitation and mobilisation). Usually CLTS is successful in smaller and more homogenous communities that are cohesive and when efforts are made to address the needs of the poor and marginalised (Mehta 2009). Global Communities works closely with communities and encourages them to develop a plan of action to become ODF. CLTS focuses on behavior change needed to ensure real and sustainable improvements and invests in community mobilization instead of hardware. It triggers communities' desire for change, propels them into action and encourages innovation, mutual support and appropriate local solutions, thus leading to greater ownership and sustainability. It accomplishes all of this without external subsidies for latrine construction.

The program includes three phases: First, pre-triggering involves selecting a community and building a rapport. In this study, the pre triggering was well done by the CLTS program officials basing on the information obtained from the residents of Katikamu, only about half of them reported that a CLTS program staff had come around to check on the condition of latrines before the CLTS sessions started. This means that the program activities were triggered in the second phase of implementation without thorough knowledge of the prevailing situation of latrine coverage, sanitation and needs of the intended beneficiaries of the program activities. This is contrary to what has been done in other studies in Ethiopia and Zambia (Alemu, 2009; Harvey, 2008).

Second, triggering brings the community together to discuss open defecation. A series of interactive activities ignites communities to stop open defecation, and the process focuses on stimulating a collective sense of revulsion among community members as they confront the negative effects of open defecation. The results of this study show that the triggering phase in this study was fairly well done given that sensitization was done, and majority of the household members were involved in the CLTS program activities. It can also be confirmed by the fact that majority of the respondents reported feeling shame and disgust during the triggering sessions, and the fact that majority of the respondents mentioned that the facilitators managed to show them the importance of CLTS in achieving an ODF free household.

Third, post-triggering entails developing a concrete action plan and refining it as needed. Similar to studies done in Bangladesh (Ahmed, 2009) and Liberia, the results of this study show that this phase also seemed to be well implemented given that the community was reportedly declared open defecation free by the program authorities, verification of this made by the facilitators and follow ups done to assess the impact of the CLTS program in the area. Nevertheless, even after being declared open defecation free, the study results show that the practice still persisted among a section of the respondents, meaning that the post triggering phase had some monitoring and evaluation gaps.

5.3 Availability of local resources for achieving open defecation free status among households in Luweero District

The results of this study show that here was no statistically significant relationship between the availability of resources for latrine construction and the status of open defecation among residents in Katikamu Sub County ($p<0.05$). This is contrary to what has been found in a study Diallo (2007). This finding means that it did not matter whether a resident had materials for latrine construction or

not in order to practice open defecation. This finding further means that it did not matter whether a resident had materials for latrine construction or not in order to practice open defecation. This is because some of the residents shared latrines (communal latrines) as opposed to having their own as a household and as such owning materials for latrine construction did not affect their defecation practices since they could easily use the communal one. Local resources for construction of latrines were possessed by the majority of the respondents; however this was barely half of the population. This is similar to findings by Alula (2008) in Ethiopia. The implication of this is that not all residents of Katikamu Sub county could avail themselves with the necessary construction materials for latrines and since the CLTS program does not offer these materials, it makes behavioral change among the residents a challenge as they would have no latrines to use. The results further show that the construction materials possessed by the respondents where basic ones including water and roofing materials with few wall and floor construction ones. This means that majority of the residents do not usually construct permanent structures given that sand, cement and bricks were available to a few of them. This is a barrier to the longevity of the constructed latrine and once unusable due to material degradation, one can be tempted to resort to open defecation.

However, for the respondents who owned latrines, resources for the maintenance of those latrines were owned by the vast majority of them. This is similar to the findings by Diallo (2007) and O'Loughlin (2006). Latrine maintenance is not a material intensive process or task as there would be little or no construction done in the process, the materials needed are basic, this explains why maintenance materials were owned or accessible to most of the respondents

Man power for pit latrine construction was also reported to be available by most of the respondents, although this was about six out of every ten of them. Latrine construction is a labour intensive activity that entails first of all manually digging a pit at least 20 feet deep depending on the level of

the water table and then later on starting construction and roofing. This therefore requires hired labour absence of which can hinder construction.

5.4 The relationship between Community Led Total Sanitation activities implemented and the status of open defecation among residents in Katikamu Sub County - Luwero district

The CLTS activity as to whether anyone came around to check on the condition of latrines before the CLTS sessions started contributed to the ODF status in Katikamu Sub County ($p = 0.000$). The results show that respondents in areas where someone came around to check on the condition of latrines before the CLTS sessions started were less likely to practice OD. This is because that activity is carried out in the Pre-triggering phase that is characterized by laying a foundation for the proceeding programs in other phases. This pre trigger phase is basically a needs assessment in which the needs of a particular community are assessed by the facilitators. This phase also involves discussion with a few community members during an informal walk through the village (a 'transect walk'). The aim of this is to motivate people in order to carry out a more extensive sanitation analysis involving the entire community. This alone can perpetuate behavioral change among the residents and on top of this, it give the CLTS program officials a thorough picture of what is to be done and how they can do it in the community, thus reducing the incidence of open defecation.

The belief that CLTS facilitation helped in realizing the importance of having a latrine among the respondents contributed to ODF in Katikamu ($p = 0.019$). Individuals who said that CLTS facilitation helped in realizing the importance of having a latrine were more likely not to practice OD. This is because it is these people who will eventually construct a latrine and subsequently use it thus having no chance of practicing ODF. The same applies to residents for whom it was easy to attend CLTS follow up sessions and those who felt shame and disgust during the triggering sessions.

Respondents in areas where Officials who did the CLTS follow-up was the District Health Inspector (DHI) had the least chances of practicing OD ($p = 0.000$); this is because such a person is held in high esteem by the residents who can easily perceive further practice of OD as punishable by the local authorities since one of them is the one who has done the follow up.

The declaration of the Community as being ODF positively contributed to the reduction of OD ($p = 0.049$) in Katikamu because by doing so it creates a perception of embarrassment for a person to defecate openly again and therefore the residents start shunning this vice.

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

6.0 Introduction

This chapter presents the conclusions of the study based on the key study findings for each objective. The chapter also presents the recommendations of the study.

6.1 Conclusion

Socio-Demographic Characteristics

The study established three socio-demographic characteristics had a statistically significant contribution to the open defecation status of residents in Katikamu Sub County. These were the education level of Household heads ($p = 0.000$), Number of people staying in a household ($p = 0.000$) and Duration of stay in the area ($p = 0.000$)

Prevalence of open defecation among residents of Katikamu Sub County - Luwero district

The results of this study show that the CLTS program has had significant impact on the open defecation status in Katikamu Sub County. The prevalence of open defecation among the residents of Katikamu Sub County is only14.8% implying that only 2 out of every 10 residents of Katikamu Sub County still practice open defecation.

Community Led Total Sanitation activities implemented in Katikamu Sub County - Luwero district?

In the CLTS program, all the phases were implemented in Katikamu Sub County including the pre triggering phase, triggering phase and the post triggering phase, with the least well implemented being the pre triggering phase. More than half of the respondents reported that a member of the

CLTS program team had come around there area to check on the condition of latrines before the CLT sessions started. Majority of the respondents noted that their household members were involved in the CLTS programme, that the CLTS facilitation had helped them in realizing the importance of having a latrine. The importance of CLTS in having an ODF household was shown by the CLTS facilitators to the respondents according to majority of them and lastly, it was also reported that the local authorities in Katikamu had been supportive all through the CLTS process.

Availability of local resources for achieving open defecation free status among households in Luweero District

Local resources for construction of latrines are possessed by the majority of the respondents in Katikamu Sub County. For the respondents who owned latrines, resources for the maintenance of those latrines are stilled owned by the vast majority of them. Man power for pit latrine construction is also available by most of the respondents. Resources for pit latrine construction and maintenance do not have a statistically significant relationship with open defecation status in Katikamu Luwero district.

Relationship between Community Led Total Sanitation activities implemented and the status of open defecation among residents in Katikamu Sub County - Luwero district.

Seven CLTS activities contribute to the open defecation status of residents in Katikamu Sub County. These are whether a CLTS facilitator came around to check on the condition of latrines before the CLT sessions started, whether CLTS facilitation helped in realizing the importance of having a latrine among the respondents, ease of attending CLTS follow up sessions, the Officials who did the CLTS follow-up, whether follow up was done on the outcome of CLTS, whether the Community declared ODF, and whether the respondents felt shame and disgust during the triggering sessions.

6.2 Recommendations

- According to the conclusion, the government and the local authorities in Luweero District should put emphasis on education of children at least up to Secondary Level through the Universal Primary Education (UPE) and Universal Secondary Education (USE) ; this will reduce the incidence of open defecation in Luweero District. In addition, sensitization of families concerning the uptake Family planning is essential because it will cause a reduction on family size, hence reducing the chances of open defecation.

- The CLTS program managers should put as much emphasis on the pre triggering phase as the other phases of implementation; this will help improve the program outcomes.

- Although the availability of resources did not significantly influence the status of open defecation in Katikamu Sub County, it is important that the CLTS program considers supplying subsidized latrine construction materials to the residents. This will increase latrine coverage and further reduce the incidence of open defecation

- The findings of this evaluation clearly demonstrate that CLTS is an effective approach to reducing OD and improving hygiene sanitation in Katikamu Sub County. The findings also showed that about there are key factors that need to be taken into consideration for maximum effectiveness.

- Use of behaviour change communication (BCC) materials has been found to be extremely useful and beneficial in the pilot phases in many countries. BCC materials such as posters and flip charts developed during the pilot phase should be improved, translated to the respective languages and used during the training of CLTS facilitators.

- Selecting the right project sites is very important if the project is to be effective. The CLTS facilitators should make it very clear to communities as to why they are being selected, what is expected to happen and what the project is about. It would be better to select the more rural communities, communities adjacent to where CLTS is being or has been implemented and where the subsidy approach has not been used. The communities should be small with less than 3000 population and where the population is larger the communities could be sub divided for more program effectiveness.

6.3 Areas for further Research

During the process of carrying out this study, different areas for further research were cited but were not investigated due to the specific study objectives the researcher took. The researcher therefore recommends the following areas for study that were not handled and will assist filling the gap that might have been created.

- Findings from the study have indicated clearly the level of education is highly associated to the open defecation status of households. Therefore, it is vital in assessing the role of education in achieving open defecation free (ODF) status of households.
- This particular study can also be replicated (re-done) and the scope increased. The study can assess the role of community led total sanitation approach in achieving open defecation free status in urban and rural areas. This will aid in comparison of the extent to which CLTS has led to achievement of open defecation free status in both rural and urban areas.

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APPENDIX I; CONSENT FORM

Consent to participate in this study

Greetings, My name is …..... from the Internal Health Sciences University – Namuwongo - Kampala. At the moment, we are carrying out a study to assess the contribution of the community

led total sanitation approach in achieving open defecation free status among residents of Katikamu Sub County - Luwero district.

Purpose of the study

This study has the purpose of collecting information on the contribution of the community led total sanitation approach in achieving open defecation free status among residents of Katikamu Sub County - Luwero district. You are being asked to participate in this study because you have particular knowledge and experiences that may be important to the study.

What participation involved

If you agree to participate in this study, you will be required to answer series of questions that have been prepared for the study through interviewing in order to obtain the intended information regarding the community led total sanitation approaches in this area and also open defecation free status among residents of Katikamu Sub County - Luwero district.

Confidentiality

I assure you that all the information collected from you will be kept confidential. Only people working in this research will have access to the information. We will be compiling a report which will contain responses from several mothers of children without any reference to any individual. We will not put your name or other identifying information on the records of the information you provide.

Risks

You will be asked questions about factors that are associated with uptake of vaccination services for your child. Some questions could potentially make you feel uncomfortable. You may refuse to answer any particular question and stop the interview at any time. We do not expect any harm to happen to you because of participation in this study

Right to withdraw and alternatives

Taking part in this study is completely your choice. If you choose not to participate in the study or if you decide to stop participating in the study you will not get any harm. You can stop participating in this study at any time, even if you have already given your consent. Refusal to participate or withdrawal from the study will not involve penalty or loss of any benefits to which you are otherwise entitled.

Benefits

The information you provide will help to increase our understanding on the contribution of the community led total sanitation approach in achieving open defecation free status among residents of Katikamu Sub County - Luwero district and communicate the findings to policy makers in the district for improvement and strengthening of the program in this area and the district at large

In case of injury

We do not anticipate that any harm will occur to you or your family as a result of participation in this study.

Who to contact

If you have questions about this study, please don't hesitate to contact:

NAMYALO JOSEPHINE, the Principal Investigator Tel. no. 0703 706 660

Signature

Do you agree?

Participant agrees…… Participant does not agree……..

I ……. have read the content in this form, my questions have been answered, I agree to participate in this study

Signature of Participant…….……

Signature of Research assistant…….

Date of signed consent……

APPENDIX II; STUDY QUESTIONNAIRE

PART ONE; Socio demographic characteristics

1. What is the education level of the household head?

    1. Primary

2. Secondary
3. Tertiary
4. None

2. What is the main source of income for this household?

1. Crop husbandry
2. Animal husbandry
3. Business
4. Others: specify

3. What is the average monthly household income?

……UGX

4. What is the predominant religious affiliation in the household?

1. Catholic
2. Protestant
3. Muslim
4. SDA
5. Orthodox
6. Traditional belief
7. Others: specify

5. How many people stay in this household?

1. 1 – 5
2. 6 – 10
3. More than 10

6. For how long have you stayed in this area?

1. Less than 1 year
2. 1 – 5 years
3. 6 – 10 years
4. More than 10 years

7. What is your age?

1. 18 – 25
2. 26 – 33
3. 34 – 41
4. 42 – 49 years
5. More than 49 years

PART B; Open defecation status

8. Does this household have a latrine?

1. Yes
2. No

9. If yes above, what type is it?

1. Ordinary pit latrine
2. Ventilated pit latrine
3. Eco-san
4. Toilet
5. Others specify……..

10. Have you or any of your house hold members eased yourselves in a place other than a latrine or toilet?

1. Yes
2. No

PART C; CLT activities

Pre Triggering

11. Did anyone come around here to check on the condition of your latrines before the CLT sessions started?

1. Yes
2. No

12. Did you receive any people in this area coming to tell about the CLT program and how to be part of it?

1. Yes

   No

Triggering

13. Was the household or some household members involved in the CLTS programme.

1. Yes
2. No

14. Did you find it easy to attend CLTS sessions?

1. Yes
2. No

15. During CLTS, did the facilitation help you realize the importance of having a latrine?

1. Yes

2. No

16. Did you find it easy to attend CLTS follow up sessions?

    1. Yes
    2. No

17. Did you find it easy to adopt the recommendations of the triggering sessions?

    1. Yes
    2. No

18. If yes to the above, did you find it easy to maintain an ODF Status?

    1. Yes
    2. No

19. Are you aware of any CLTS campaign in the community?

    1. Yes
    2. No

20. Was there any follow up done after a triggering session?

    1. Yes
    2. No

21. Which of the following officials did the follow-up?

    1. Village Health Team member (VHT)
    2. Local Council member (LC 1)
    3. District Health Inspector (DHI)
    4. District Health Officer
    5. CLTS Facilitator

6. Others: Specify…….

22. Was this community declared ODF?

1. Yes
2. No

23. If yes, did the facilitator Verify?

1. Yes
2. No

Sanitation activities and follow up

24. Did anyone return to this household to follow up on the outcome of CLTS?

1. Yes
2. No

25. Did you feel shame and disgust during the triggering sessions?

1. Yes
2. No

26. Did the facilitator manage to show you the importance of CLTS in having an ODF household?

1. Yes
2. No

27. Were the local authorities supportive through CLTS process?

1. Yes
2. No

END

APPENDIX VII: GHANT CHART

The research will cover a period of 18 months from October 2015 to March 2017

ACTIVITY	DURATION IN MONTHS FOR THE YEAR 2014/2015																	
	2014						2015											
	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M

Concept development																		
Proposal writing and approval																		
Training of research assistants																		
Data collection																		
Data entry																		
Data analysis																		
Dissertation writing and submission																		
Dissertation assessment and viva																		
Dissemination of findings																		

APPENDIX VIII: RESEARCH PROJECT WORK PLAN

No,	Activity	Objective	Location	Duration	Input	Target outputs	Risks/ assumption	Responsible person
1.	Research proposal writing and planning	To develop a complete research proposal	UCU Mukono Campus	Three months	• Stationery • Laptop • Projector • Publications	A complete approved research proposal	Resources will be available	Principal investigator
2..	Pretesting the Questionnaire and other tools	To ensure the quality and validity of data collected	Bututumbula in Katikamu Sub-County	One week	• Transport • Logistics • Meals and refreshments allowance	Edited and updated research tools	The chosen setting and participants will be appropriate	Research team
3.	Pre-visit, Selection, Formation and training of the research assistants	-To have a strong and committed team in place for the research project	Mukono	One week	• training materials • Funds • Training venue	2 research assistants trained	Resources will be available	Principal investigator
5.	Data	To collect comprehensi	Households in	One mont	• Transport • Airtime	All questionnair	Resources will be	Researc

	collection	ve and accurate data for the research	Katikamu Sub-county	h	• Lunch • Logistics • Stationery	es and KII conducted.	available Respondents will collaborate	h team
6.	Data entry, analysis, report writing	To generate a research report	UCU Main campus	5 months	• Stationary • Laptops	A complete research report	Resources will be available	Researcher
7.	Dissemination of findings.	To disseminate findings of the research to the stakeholders	University Conferences,NGOs, Communities	4 months	• Stationary • Projector • Facilitation • Conference hall	Comprehensive dissemination of findings	Resources will be available	Research team

APPENDIX IX: RESEARCH APPROVAL LETTER