NON-GOVERNMENTAL ORGANIZATION'S ACTIVITIES ON PIT LATRINESCONSTRUCTIONPROJECTS IN AKUEM VILLAGE, BY SAMARITAN'S PURSE, SOUTH SUDAN

BY

ERICK KIBET MUTAI

THIS RESEARCH PROJECT REPORT IS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS OF THE AWARD

OF DEGREE OF MASTER OF ARTS IN PROJECT

PLANNING AND MANAGEMENT OF THE

UNIVERSITY OF NAIROBI

2016

DECLARATION

I hereby declare that this research project report is my original work and has not been presented for any award in any other university.

SIGNATURE …… **DATE ……**

NAME: Erick Kibet Mutai

REG NO: L50/80494/2015

This Research Report is submitted for examination with my approval as the university supervisor.

SUPERVISOR:

SIGNATURE …… **DATE ……**

NAME: **Dr. Stephen Okelo**

Lecturer

Department of Extra-Mural Studies

University of Nairobi

ACKNOWLEDGEMENT

I appreciate the entireFirst I acknowledge my supervisor Dr. Stephen Okelo for his guidance on format and writing of the Research report. His unlimited ideas and perspectives helped me to complete my report.

I want to appreciate the Department of Extra-Mural Studies, University of Nairobi, for the opportunity accorded to me and their great assistance during writing of this project.

I would like to appreciate the many friends, relatives, and colleagues who have made this happen through motivation, sharing experiences and encouragement.

Last but not least, thanks are to God for my life and good health during Project and Report writing.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS AND ACCRONYMS

CHP	Community Health Promoters
CLTS	Community Total Led Sanitation
CRS	Catholic Relief Services
DFID	Department for International Development
JMP	Joint Monitoring Programme
MDG	Millennium Development Goals
NBS	National Bureau of Statistics
SSB	Stabilized soil blocks
OCGS	Office of Chief Government Statistician
OCHA	United Nations Office for Coordination of Humanitarian Activities
PHAST	Participatory Hygiene and Sanitation Transformation
SPSS	Statistical Package for Social Sciences
UNICEF	United Nations Children's Emergency Fund
VIP	Ventilated improved Latrine
WASH	Water Sanitation and Hygiene
WEDC	Water, Engineering and Development Centre
WHO	World Health Organisation

ABSTRACT

The focus of this study was toinvestigate Non-Governmental Organization's activities on pit latrines construction projects in Akuem village, by Samaritan's Purse, South Sudan. The objectives of the study were to examine how NGO motivational activities influenced construction of pit latrines in Akuem village South Sudan, to determine how Provision of materials by NGOs influenced construction of pit latrines in Akuem Village, South Sudan, to establish how use of locally available materials by NGOs influenced construction of pit latrines in Akuem Village, South Sudan and to evaluate how training of latrine owners influenced construction of pit latrines in Akuem Village, South Sudan. Literature was reviewed on NGO motivational activities on construction of pit latrines, Provision of materials by NGOs on construction of pit latrines, use of locally available materials on construction of pit latrines and training of latrine owners on construction of pit. The target population in the study was latrine owners in Akuem Village, South Sudan who have been supported by Samaritan's Purse international Relief. The sample population was 80 in total selected using random technique. Data was collected by administering a questionnaire. The quantitative data was analyzed using SPSS and presented in tables. This study found that motivational activities directly influenced construction of latrines with87% of the latrine owners having been motivated to construct latrines mainly by Non-Governmental organisations who contributed to 69.6% of them all. It was found that provision of materials influenced construction of latrines to completion with 42% agreeingwhile a significant 43.5% strongly agreeing making a total of 85.5%. Use of locally available materials was found to have influenced construction of pit latrines with 85.5% of respondents having used them while 82.6% positively saying that use of locally available materials influenced construction of pit latrines and58% having been motivated by NGOs activities to construct latrines using such materials. Training of latrine owners was found to have positive impact on their construction skills with 46.4% of respondents thinking itimproved construction of latrines against 4.3% that thought otherwise. Although majority of the respondents had not received training on latrine construction, those who had received mostly got it from NGOs accounting 58.3%. This study concluded that motivational activities, provision of materials, use of locally available and training of latrine owners by NGOs positively influenced construction of pit

latrines. The research recommended that other agencies should also take proactive action in activities which influence members of the community to construct latrines and studies done on best materials and technologies for latrine construction.

CHAPTER ONE

INTRODUCTION

1.1 Background Information

Use of latrines tends to improves health of users by reducing the incidences of diarrheal diseases like cholera and dysenteryhence reduced child mortality(Waddington, Snilstveit, White and Fewtrell, 2009).Not only does use of latrines improve health but also increase dignity among users due to privacy while answering call of nature (O'Connell, 2014). Whereas some countries have 100 percent access to sanitation, there has been a big improvement in access to latrines in Africa and other developing countries in the last few years which have in turn improved its use (Morella, Foster and Banerjee, 2008). Low cost latrines have been very instrumental in increasing the access and ownership among poor communities in rural areas and low cost housing in urban developments (The World Bank, 2012).

Most European countries have developed sanitation facilities and the use of pit latrine has reduced tremendously. In a report published by Women in Europe for a Common Future, Deegener, Samwel and Gabizon (2006) indicated that European's need for latrines is extremely different from developing world. The main objectives in their latrine construction is to separated urine from feces to ensure that the wastes are utilized later as fertilizer and furthermore reduces the possibility of foul smell from the latrines.According to Deegener, Samwel and Gabizon (2006), some of the materialsused in constructing these latrines include, bricks, stone, gravel, wood, metal bars, screws, nails, iron sheets and cement. In Scotland, High quality latrines for schools are constructed using commercially available materials and fixed with flush doors (Burton, 2013). In essence, most of these materials are available in hardware shops. Financial capability of the latrine owners determines its completion because most materials are bought and contractor hired. It has been further noted that most European countries have stopped using pit latrines and are now using toilets and improved latrines which separates wastes (Bouchet, Harter, Paicheler, Araujo and Ferreira, 2002).

Latrines commonly used in some rural areas of Mexico is composting latrine. According to Esray, Andersson, Hillers and Sawyer (2001), composting latrines are environmentally friendly and can only be constructed once then reused for several years. It has twin pit where one is used till full then changed to the other pit and allow waste in the full one to decompose. Some of the materials used include brick, concrete block, stone,poles and bamboo for Lining. Latrine Slab is made of wood andmortar/earth, concrete which is mostly reinforced but in some cases not reinforced. Esray and others (2001) found that composted waste from these latrines are used as fertilizer in farm hence most people in rural farms have been motivated to construct them by its benefits. Masonry skills are required to line the pits and cast a reinforced slab. However, not all latrine owners in rural Mexico have such skills hence have to hire skilled personnel to work for them (Esray, et al, 2001).

Improved sanitation coverage in Nigeria has been on the decline from 30% in 1990 to 28% in 2012 (WHO and UNICEF, 2014). Abogan (2014) on the other hand indicate that improved sanitation coverage of Nigeria is at 32 percent. The most common latrine is non improved latrines which constitute a 73 percent of those used by residents. They include pit latrine with no slab. However, poor communities have been helped by various aid agencies to improve their latrines. AccordingZakka (2007), Wateraid helped communities in Benue and Bauchi States in Nigeria to construct simple latrines using locally available materials mainly in areas where soils are loose. These materials included hardwood, mud blocks and bamboo for lining, concrete slab, woven palm fronds for superstructure and grass thatch. Through this project, Wateraid technicians helped community members developed their technical skills in constructing simple pit latrines and arborloo. Communities were motivated through CLTS and pilot projects which proved to be successful (Babatope and Ogbeide, 2007).

In Urbanizacao, Maputo, Mozambique, the level of development of sanitation has greatly improved with the aim of reaching the millennium development goals representing a wide population of Mozambique. In this area, all houses have latrines and open defecation is rare. Most households have pit latrines; some have flush toilets while some have septic tanks. According to WHO & UNICEF (2010), Most of the latrines are lined

using old oil drums and old tire for squatting slab. Generally, the superstructure is constructed by local materials used for house construction including wood and grass. Majority of the households pay for the maintenance of their latrines especially emptying. However, these latrines are in deplorable conditions despite their abundance. Improved latrines are recommended which use more technically stable materials including concrete slab, honeycomb bricks for pit lining and superstructure walling. Skills on improving latrines and intensive hygiene promotion are needed too to complement existing latrine (WHO & UNICEF, 2010).

According to a report by UNICEF and World Health Organization (2015), Kenya has its fair share of sanitation challenges with improved sanitation access at 30 percent while 12 percent of the population is still practicing open defecation the rest use unimproved sanitation facilities. This represented a negligible progress from 1990 status on millennium development goals.Current construction and improvement of latrines in rural areas in influenced by decrees of administration backed by public health act and the relationship between good health and good sanitation which has increased due to intensified campaign (Water and Sanitation Program-Africa, 2014). Cultural and religious believes also plays key role in some areas. Majority of the simple pit latrines in rural areas were constructed using locally available materials including thatch, iron sheets, sackcloth, maize stock/stem, wattle and mud or any other leftover materials. A few cases of VIP latrines are common especially in schools and households with higher financial capacity. Lack of technical capacity hinders many latrines owners to construct quality pit latrines in rural parts of Kenya. Several pit latrines are prone of collapse, flooding and attack by termites because of poor design and choice of materials. Several NGOs have been instrumental in enabling rural populations to access latrines through training and provision of much needed materials and finances (Alexander, Oduor, Nyothach, Laserson, and others, 2014).

Tanzania's rural sanitation is still among the lowest in Africa with access of 15.6% in terms of improved latrines while the rest of the population use unimproved latrines and open defecation (The World Bank, 2014). According to Thomas, Holbro and Young (2013), Tanzania is not on truck to achieve MDG of 65 percent of improved sanitation by

2015. Some of the unimproved latrines are not lined with slab made of wood and earthed, hessian and palm fronds are used for constructing superstructure.It has been proposed that sanitation in Tanzania needs to go hand in hand with water supply. However, there is big knowledge gab in construction of water and sanitation schemes. Materu and Mkanga (2006) noted that NGOs through community motivation based programs and some government agencies have played a big role in building capacity of latrine owners towards successful implementation of various latrine construction projects. To improve the situation in most rural and informal settlements in Tanzania, there has been a push for coordinated response between government, private sector and aid agencies in provision of materials and the much needed technical training. This will help in legislation and provision of finances and the much needed materials and skills (Thomas, Holbro and Young, 2013).

Access to latrines is still a big challenge for school going, non-school going children and adults in most rural parts of South Sudan the highest being 15% in some areas (Joseph, 2014). The situation is worse for pastoral communities living in the semi-arid areas. According to WSP (2004) field report, lack of access to latrines or toilets in schools and homes is due to lack of financial capacity of the concerned parties. However, constructing latrines using locally available materials reduces its cost hence poor communities can be helped to construct with little financial support (Otieno, 2012). In Northern Bar el Ghazel, South Sudan, Tearfund has been instrumental in helping vulnerable households to access water and sanitation facilities (Kooy and Wild, 2012). According to Tearfund (2012), Nothern Bar el Ghazel has been an important receiving point of returnees from Sudan since signing of Comprehensive Peace Agreement in 2005. However, this has not been accompanied by sufficient construction of WASH facilities leading to strain on existing ones and continued open defecation. Tearfund (2012) was the pioneer aid agency to start providing service for returnees ranging from sinking boreholes, construction of schools and temporary sanitation facilities. Kooy and Wild (2012) have indicated that Tearfunds activities have been complemented by The DFID WASH Capacity Building Programme which aimed at enabling returnees manage their WASH related issue including correct use and repairing of latrines. These and other aid agencies got government support latter in their areas of operation leading to subsidies and

security.To construct latrines, aid agencies provided slab while the households construct the superstructure using locally available materials and their basic skills(Kooy and Wild, 2012).

1.2 Statement of the Problem

Several non-governmental organisations have been instrumental in construction of pit latrines for poor communities around the world. However, several misdoing on the constructed pit latrines occur. Some of the misdoings include incomplete latrines, lack of local initiative and ownership, poor quality pit latrines and completed but unused pit latrines. NGOs have come forward to construct latrines of good quality to completion and ensure local ownership hence communities can use and avoid continued open defecation. Some of these projects still fail despite efforts by various NGOs.Best practices by NGOs are replicated in several projects but still the rate of success in construction of pit latrines has not reached its optimum especially in conflict prone and rural areas. Some communities share pit latrines which are poorly constructed, incomplete or not improved at all despite being supported by aid agencies.Constant review of activities which lead to construction of pit latrines helps some NGOs to continue recording success in implementation of their projects while others fail. This study was aimed at investigatinghow motivational activities,provision of materials, use of locally available materials and technical training of local latrine ownersby NGOs influence construction of pit latrines in Akuem Village, South Sudan.

1.3 Purpose of the Study

The focus of this study was toinvestigateNon-Governmental Organization's activities on pit latrines construction projects in Akuem village, by Samaritan's Purse, South Sudan.

1.4 Objectives of the Study

1. To examinehow NGO motivational activities influence construction of pit latrines in Akuem village South Sudan.
2. To determine how Provision ofmaterials by NGOsinfluence construction of pit latrines in Akuem Village, South Sudan.
3. To establish how use of locally available materials by NGOs influence construction of pit latrines in Akuem Village, South Sudan.

4. To evaluatehowtrainingof latrine ownersinfluence constructionof pit latrinesin Akuem Village, South Sudan.

1.5 Research Questions

1. How does NGO motivational activities influence construction of pit latrines in Akuem village South Sudan?
2. Howdoes provision of materials by NGOs influence construction of pit latrines in Akuem Village, South Sudan?
3. How does use of locally available materials influence construction of pit latrines in Akuem Village, South Sudan?
4. Howdoestraining of latrine owners influence construction of pit latrines in Akuem Village, South Sudan?

1.6 Significanceof the Study

Several rural households in African and other developing countries have had challenges in constructing latrines because of financial challenges. Through this study, contributions of motivation, material acquisition and trainingneeds in construction of latrines came up with better ways of doing it.Challenges in Procurement of commercial materials ought to initiate a dialogue between the government and aid agencies working in Akuem hence enable provision of cheap and quality latrines to the residents for construction of pit latrines.

Water and sanitations projects initiated by NGOsunder Community Led Total Sanitation have been instrumental in ensuring poor people can construct simple latrines using cheap and locally available materials (Mehta& Bongartz, 2009). To determine how use of these materials contributes to construction of latrines makes NGOs plan better for future projects. To replicate these projects or modify them in other places, it was important to investigate the influence provision of materials have in construction and completion of latrines. The Water, Sanitation and Hygiene (WASH) initiated projects in Akuem Village, South Sudan served as good basis for investigation and documentation. This is because majority of materials which are used in the area are sourced locally.

To initiate, construct and successfully complete a pit latrine, one has to have a motivation and the necessary skills. Through this study, various ways of motivating and

mobilizingmembers of community in Akuem Village, South Sudan came out hence help government and aid agencies duringfuture mobilization. Skill gabs wereidentified too hence plan how best to bridge them for the benefit of the local community. Furthermore, construction of latrines cannot add value if no one uses them, Akuem residents benefit by identified motivational activitieswhich will utilized in promoting construction and use of latrines.

1.7 Delimitations of the Study

The study was carried out and restricted to Akuem Village, Northern Bar El Ghazel State, South Sudan. It targeted beneficiaries of Sanitation Projects initiated by Samaritan's Purse international relief and those who were not supported but have constructed latrines. The study looked into availability of materials used for constructing latrines. Technical capacity of people constructing the latrines was also looked at and their financial capacity to buy materials which were not available. Locally available materials which were utilized for construction of various sections latrines were sort and analysed as well all motivating activities which informed construction and use of latrines.A questionnaire was administered to gather various data concerning the dimensions under study.

1.8 Limitations of the study

This study encountered various challenges during its undertakings. Language barrier was one of the key limitations. According to Winrock International (2012), the literacy levels in Aweil East, South Sudan where the village which project was carried out is at a disappointing 21%. With the rate not only withstanding, a small percentage could only understand English. For this reason, locals who understood both the local language and English wereengaged as a research volunteer assistant to help in translating.Akuem is a remote village in Nothern Bar El Ghazal State in South Sudan hence its accessibility is a big challenge. I visit the site once during data collection hence clarification required had to be sort onsite or send colleagues later. To conduct all the activities, the field visit was utilized as much as possible.Insecurity in South Sudan has been a big impediment to projects being implemented by international agencies. In 2013, several aid agencies stop providing vital aid due to re-emergence of violence between two opposing camps in new South Sudan government in December 2013 (Astill-Brown, 2014). Insecurity

interferedwith data collection timetabledue to cancellation of flights. We also feared that South Sudan could slide back to conflict anytime since current reconciliation talks between government and rebels kept stalling because of mistrust among partners (Tinsley, 2015). This came to pass when soldiers loyal to the presidents and those loyal to the vice president clashed in Juba on 9th to 12th of July (Aljazeera, 2016). Field visits were conducted when the situation in the country was deemed safe. United Nation News Centre which provides real time updates to aid agencies working in South Sudan wasused to assess the situation before the visit was made (United Nation News Centre, 2016).

1.9 Assumptions of the Study

1. There was to tranquility in South Sudan during the time of pre visit, data collection and analysis.
2. The respondents and participants in the study answered questions in the questionnaire honestly and to the best of their abilities and Translation of response from ethnic dialect to English did not alter the information contained
3. The research tools which were administered during data collection were accurate to the level it was intended.

1.10 Definitions of Significant Terms

Completion- the action or process of finishing something

Construction- the building of something

Initiation- the action of beginning something

Locally available - found in nearby area

Mobilisation - act of marshaling and organizing and making ready for use or action

Motivation- desire or want that energizes and directs goal-oriented behavior

Provision- supplying something for use

Pit Latrine- a type of toilet that collects human feces in a hole in the ground

Training - the action of teaching a person a particular skill or type of behavior

CHAPTER TWO

LITERATURE REVIEW

Literature was reviewed on NGO activities on construction of pit latrine.Literature was categorized in to four sections according to the themes. NGO Motivation activities on construction of pit latrine werereviewed. Literature on NGO provision of materials was review. Literature on use of locally available materials and literature on training of latrine owners was reviewed.

2.1 Concept of Non-Governmental OrganisationMotivational ActivitiesonConstructionof Pit Latrines

Jenkins and Curtis (2005) found that in Benin, communities were motivated by various factors to construct and use latrines. Open defecation is associated with subsequent eating of feces by pigs. This has led to pigs disturbing residents while defecating openly in bushes hence found the need to build latrines. Another major reason is to avoid embarrassment from visitors who come and are made to defecate openly. When visitors use latrine, the owner gain more respect and dignity hence use these facts to mobilize communities into constructing latrines. These findings were supported by those of Thys, Mwape, Lefèvre, Dorny, Marcotty, Phiri, Phiri, and Gabriël (2015) where, respect and dignity was found to be the main motivating factor towards building and using latrines. They found other factors too which included the shrinking of bushes due to increased use of land for agriculture and situational difficulties like when it's raining or when one has diarrhea. However, there were cultural factors which contributed negatively. In Benin, feces of father-in-law and daughter in-law should not meet making it had for them to share a latrines hence prevalence of open defecation when there is one latrine in an household (Thys et al, 2015).

This is supported by a World Bank (2012) report which indicates that People who defecate in the open feel embarrassed, humiliated and ashamed when seen answering the call of nature hence the urge to construct a latrine. In rural settings, several people do not own latrines but the embarrassment, humiliation and shame always come in hence the option/need to construct latrine does not come at a better time. This was evident in Kenya where 42 percent of respondents felt embarrassed when the latrine they had ceased to be

in use because of it being filled up or otherwise rendered not usable (World Bank, 2012). In this regard, this study found out that construction of latrines was motivated by several factors.

In a research review conducted by Kathryn O'Connell (2014), for the World Bank on What Influences Open Defecation and Latrine Ownership in Rural Households, access and availability was found to be one of the factors that influence the use of latrines by rural communities in the countries studied. Conteh and Hanson (2003) found out that the extent to which latrine and its service are perceived to be found has great influence on its use. It was clear that if a person does not have a latrine at workplace or at home, open defecation was the only alternative for him or her. According to Kar and Chambers (2008) in Cambodia latrines were found to be situated only in far areas from places of residence of these rural communities mainly in schools, pagodas and towns. Places of work in Cambodia is mainly farms whereas some communities live away from their farms hence could be having only one latrine at their homestead and non at the farm. In countries like Kenya and East Java, it was found that not 100% of people who had latrines used them. However, a small percentage was still defecating openly especially those who lacked them (O'Connell, 2014). In Ethiopia, use of latrines was determined and motivated by its availability. Those who had latrines used them in their homestead while thosewho did not have them were likely to defecate openly (Fry et al, 2015).

According to Deal & Watasa (2009), a vital issue which concerned access to latrine is its functionality. Most household owning latrines do not necessarily have them in good working condition. Hence not all people in areas of study accessed working latrine. Some of the latrines which were not functional were reported to be full, overflowing, in need of repair, or infested with maggots which posed threat to health of its users. In a report by PricewaterhouseCoopers (2009), 20 percent of latrines in in the areas under study in Tanzania experienced a time in the year when their latrines were not usable. Whereas in Bihar India, 11 percent of the latrines observed were not functional on the day of study (O'Connell, 2014).

Once a pit latrine is constructed to completion, there is no guarantee that it was tooptimize as per the expectation of the person constructing or the proponent of the latrine. O'Connell (2014) argues that several researches which were studied shows that

several products of such latrines did not meet the expectations of the users hence most of them opted for open defecation. Features of these latrines and their practicality to the users in given social and economic settings determine their importance and use. There are several negative perceptions about quality safety, comfort, and hygiene of the latrines which were studied. It was further found that the latrines were not durable and required frequent maintenance and sometimes relocation. Improved latrines were found to easily collapse, overflow and were perceived as unsustainable. It was also seen to be unsafe and risky especially to children and people with disabilities. In some cases, some latrines had collapsed with users inside requiring them to be rescued (O'Connell, 2014). In such cases, it was found that the slab was made of logs which rot and became weak within four years (Deal & Watasa, 2009).

Various respondents in Tefera's (2008) study had varied reasons for building their current latrines. With majority in Mirab Abaya building because the old ones were full while only 19% in Alaba had the same reason. The leading reason for such construction in Alaba was to improve health of their families which amounted to 61.2 percent of the respondents. Tefera (2008) found out that only 34.95 percent did so because of improving the health of their families. Further to this, the main reasons for building a latrine for the first time and those building them for the second or more time varied. Those who were building for the second or more time mainly wanted to replace the full ones, those destroyed by floods or to improve the quality while those building for the first time mainly wanted to improve the health of their families (Tefera, 2008).

Hebert (2010) did a rapid assessment in East Africa and found various factors to influence acceptability and construction of arborloo latrines in Kenya, Uganda, Ethiopia and South Sudan. Need to improve family health come as the first one after people were made aware of the link between their health and use of latrines. According to Hebert (2010), there were six major reasons which led to acceptance, construction and use of arborloo latrines in these countries. These factors included arborloo and PHAST training which was conducted by CRS to its staff partners, community health workers and local government's officials on the relationship between sanitation and family health. Access to cheap and durable slab was a key factor especially when construction of arborloo commenced and the governments in South Sudan and Ethiopia supported their production

and distribution. The larger populations were influenced by use of model families which were first supported to construct and then their latrines used to demonstrate to the rest. Exchange visit was found to be another factor especially in Ethiopia. CRS facilitated government officials and opinion leaders to visit successful projects in other places before rolling out the project in their areas of jurisdiction. Access to seedlings was also an important factor when it came in during decommissioning of filled latrines since they were planted on them. Finally, government policy and support was found to contribute positively to the success of construction of latrines in Ethiopia, Kenya and Uganda (Hebert, 2010).

According to O'Connell (2014), emotional, social and physical drivers also play a key role in initiation, construction and use of latrines. In Cambodia, latrines are found to be more comfortable than open defecation since it is a customized environment while bushes have thorns and dirt from environment (O'Connell, 2014). Privacy turned out to be a big motivating factor towards constructing and owning a latrine. It is important for women and girls to use latrines to maximize privacy while answering the call of nature hence avoid exposing their private parts. She further noted that not only is it important for women and girls to use latrines but also for men who want to protect their families. Improved privacy is an important reason why several people construct latrines in rural areas. In Bihar, Kenya and Cambodia, 45 percent of people constructed latrines mainly because of privacy while the rate in Rajasthan was 56 % (O'Connell, 2014).

Affordability has affected construction of latrines in several rural areas. People who do not have financial capacity cannot construct latrines. For this reason, simple, cheap and easy to construct latrines were introduced by CRS in Ethiopia in the name of arborloo which cost lest and easy to construct (Fry et al, 2015). In the study conducted, CRS provided the most expensive material which is concrete slab the households had to just devote their time and use locally available material to construct them. This was preceded by training. This concept is supported by findings by Uddin, Ronteltap and Lier (2013) in Bangladesh where they found that affordability motivated household to adopt flood resistant latrines. Simple technologies and cheap materials motivated latrine owners to upgrade their latrines to be flood resistant. Whereas in Uganda, Deal & Watasa (2009) observed that most people do their latrine construction after harvest. This is the time they

have enough money to purchase materials and pay a contractor. However, for peasant farmers, the proceeds from their small scale farming is still not enough to cater for their basic needs hence cannot spare much to construct latrines (Deal & Watasa, 2009).

However, Kar and Chambers (2008) found that the most unique and most effective method to motivate people to construct and use latrines has been Community Total Led Sanitation (CLTS). CLTS has been used to trigger disgust and resulted in people taking collective action to eradicated open defecation through latrine construction and correct use. This process is aimed at igniting sense of concern rather than constructing latrines. In effect, community members take responsibility with little external support. The duo documented occurrences in Bangladesh, Cambodia, India, East Timor and other Asian countries where open defecation has been rampantthen use of CLTS changed (Kar and Chambers, 2008).

This is supported by work of O'Loughlin el al. (2006) which summarized that the best approach to motivating people to construct latrines is not to construct for them but rather have them feel the need. In such a case, the households will find whatever the material available to use in the construction. When the people feel the need it becomes easy for them to come together with emergence of situational/ natural leaders who will take the sanitation problem as a common one hence find valuable and homegrown solutions through construction using locally available materials (WHO & UNICEF Joint Monitoring Programme (JMP), 2014). The same approach was used in Ethiopia as documented by Tefera (2008). CLTS is a technique which has gained popularity in most aid agencies working in WASH (Newborne and Welle, 2005).

2.2 Provision of Materialsby NGOs on Completion of Pit Latrines

In construction projects, resources including human, financial and material play an important role in timely and quality delivery of the infrastructure. Construction materials have played key roles in major projects such as transportation (Jimoh, Abhulimen and Kubeyinje, 2013).Materials have been classified into different categories which include metal, ceramics, polymers, elastomer, glasses and composites.Completion of projects has been found to depend on availability of materials to some extent. According to Abdul and Yahya (2006), delay in delivery of construction materials, poor quality and lack of alternatives delay completion of construction projects. In some cases, the materials are

modified, omitted or the undertaking left incomplete. These findings are complemented by Zou, Zhang and Wang (2006) who identified inflation of prices of construction materials, imbalance between supply and demand, and depletion of key natural resource as one of the greatest risk in construction projects. These risks force clients to enter into appropriate contract with the contractor or supplier to ensure that the materials were available through the entire period of the project (Zou, Zhang and Wang, 2006).

However, Ren, Atout and Jones, (undated) found out that there are several other factors which influence completion of projects other than availability of construction materials. These factors include mobilization, availability of technical staff, government regulations, poor communication between contractors and subcontractors, duration of construction not enough, late payments, incomplete contract document, incompetent contractor staff, mistakes during construction, unavailability of equipment on request, political interference and unexpected weather conditions among others.In projects funded by Catholic Relief Services (CRS) in Ethiopia, arborloo latrines implementation was successful since slabs were provided and the households used locally available materials to construct superstructure and roof. Fry et al (2015) noted that when the government withdrew subsidies to CRS for the supply of slabs, the project collapsed and the community members who had not constructed left them underway because of lack of slabs. In this regard, government policies led to lack of key material hence latrine construction did not lead to completion (Fry et al, 2015).

A study done by Boisson, Sosai, Ray, Routray, Torondel, Schmidt, Bhanja, and Clasen (2014), indicated that lack of materials contributed a lot to incompletion of latrines under construction in Rural India. These pit latrines were being constructed under supervision of two local non-governmentalorganisations and funded by WaterAid under India's Total Sanitation Campaign with the aim of increasing access to latrines among poor people. These findings indicated that residents and implementing agencies faced stiff competition from large companies which bought sand in bulk and pushed prices up. For this reason, they could not complete their latrines because of lack of sand and some started to use the incomplete latrines. Other people used less sand or low quality sand which led to poor works. These findings are supported by a study which was done in Uganda by Deal &

Watasa (2009), where they found out that completion of pit latrines was influence by availability of materials especially in rural settings. Latrine owners bought materials then latrine construction artisan would construct based on the materials provided resulting to complete, incomplete and low quality latrines (Deal & Watasa, 2009).

Deal & Watasa (2009) also found that majority of responded preferred latrines which were hygienic and durable. Some of the materials they wished to use in constructing them include concrete for slab, bricks for wall and iron sheet for roof which provided maximum hygiene. Such materials are not available in rural areas but could be bought from hardware shops in major shopping centers. The nearest shopping center was 5-10 km and most people transported their materials using bicycles. Bricks, sand and gravel were available in most locations while wire mesh, iron sheets, cement and reinforcing steel were sourced from the shopping centers. With growing demand for construction of latrines, large quantities of gravel were required from other places hence reducing the cost. The materials which were sourced locally could be easily transported using wheelbarrows especially when a single latrine is being constructed resulting in timely completion of latrines (Deal & Watasa, 2009).

A desk review done by O'Connell (2014) for The World Bank Group supports the above studies. Availability ofmaterials and hardware supplies were been found to be a greatly influence the access and use of latrines by rural communities. This is important because these factors determine if a latrine can be upgraded, improved or constructed from the beginning. O'Connell (2014) found that two thirds of households in Bihar in India that own latrines did not have quality materials for constructing them but used locally available one which were modified. As per these studies, the perceived availability of materials varied with location. In areas of Meghalaya in India, 34 percent of latrine owners and 46 percent of improved latrine owners found these materials available. In Rajasthan 53 percent of household had materials and labor for latrine construction and 60 percent of them, perceived materials to be available in plenty. However, In Tanzania, the rate is higher at 80 percent of household perceived that the materials were available (PricewaterhouseCoopers, 2009).

However, O'Loughlin, Fentie, Flannery and Emerson (2006)revealed that other impending issue to completion of latrines to be inappropriate technologies and lack of involvement of the households in decision making. Bringing in technologies which have worked in other places does not necessarily contribute towards building latrines to completion. This is because the households do not feel the ownership and will not work towards its success even if materials are available. For this reason O'Loughlin el al. (2006) emphasized the need to do proper community mobilization aimed at raising awareness before any community latrine construction project is commenced. Further trainings should be done during maintenance of latrines on materials, appropriate technologies and standards which can be used to rebuild latrines when old ones are full or when they collapse. They further proposed that community support should be encouraged to help those who are vulnerable including orphans and the elderly both in collecting materials and in actual construction (O'Loughlin et al. 2006).

To Support findings by O'Loughlin el al. (2006) is a paper presented in 26th WEDC Conference in Dhaka, Bangladesh in the year 2000 wherelack of materials is not considered as a big factor to latrine completion. In the paper, Barasa (2000) argues that all wastes are food for next process of making new material. All waste can be utilized to a new material for latrine construction or any other intervention aimed at improving lives of people. He gave the example of waste polythene bags which was a nuisance in Daadab refugee camp which through innovations, women woven poly mats were used as screen used for construction of superstructure of latrines. For this reason, lack of innovation contributes towards incompletion of latrines rather than lack of materials (Barasa, 2000).

A different set of perspective in findings by O'Connell (2014) relates to affordability. Most people in rural settings of developing countries do not afford to construct latrines. The affordability is a real or perceived barrier to construction of latrine. However, most household who do not have latrines were poorer than those with latrines. Financial ability too has different perspective from lack of access to credit to lack of household income. This result to the family's inability to purchase the required materials and pay for the skilled manpower required to construct latrines. O'Connell (2014) observes that 43 percent of non-latrine owners in Tanzania from poorest quintile expressed that inability to

save or lack of credit was their main barrier to constructing latrines. Further observed in Kenya was the high cost of construction materials against low income. Lack of finances further affected improvement of latrines. Most pit latrines required regular maintenance and lack of it or poor maintenance lead to deterioration of their conditions leading to disuse hence some people opting for open defecation. Therefore, affordability barriers have strong correlation with levels and fluctuation of income, lack of savings, lack of financing and limited option to access credit among the poor(PricewaterhouseCoopers, 2009).

However, in Ghana, Ntow (2012) found that several latrines were left incomplete because latrine owners could not dig pits to the required depth. This was attributed to the extensiveunderlying strata which covered the entire areas where the project under study had been implemented. It was found that pit diggers tried different sites for areas with lower level of strata hence leading to several pits which did not lead to completion. In this area, lack of material was not the cause of latrine incompletion but the unfavorable geographical conditions (Ntow, 2012).

2.3 Use of locally AvailableMaterials on Construction of Pit Latrine

There are various alternative materials which have been proposed by a number of authors through design and research that is suitable for construction of latrines. The materials which are alternative for various components include bamboo which can be used for both lining and slab. Others are sawn timber which can be used for doors and superstructure. Reed (2012) indicated that timber can be used in various parts including roof, doors and even lining of pits. This is complemented by a study done in Uganda by Deal & Watasa (2009) which they found that some of the alternative materials used included logs for floor/slab, wood for walls and roof, grass for thatching and other materials for door. Alternative materials can be locally available naturally while others can be recycled from used materials to ease construction of pit latrine. These include plastic bags, scrap metals and old canvas. Other alternative materials which are used for different purposes in latrine constructionare grass, banana leaves and papyrus reeds which work well for both superstructure and roof (Deal, 2010).

Reed (2012) indicates that various materials are used together with others like wood framework and papyrus reeds covering the wall. Fry et al (2015) on the other hand found

out that using grass or reeds needed sticks to be tied using strings to form a framework first for the superstructure then grass or the reeds are tied to the framework using same organic string from plants.To complement these findings is the use of wooden poles and mud blocks for superstructure in a documented CLTS project conducted in Nampula Province in Mozambiques (Amaka, 2010).

Bhargava (1992), provide several combinations for superstructure construction for any kind of latrine when one cannot afford bricks, blocks and cement mortar. First, he proposes washed jute or a thick plastic sheet enclosed on bamboo framework then he also proposed wooden framework and filled with mud. On the other hand, Brikke, and Bredero (2003) supports the use of wood covered with mud for superstructure wall. Another favorable combination is that of date palm matted with bamboo frame to give a cheap alternative for superstructure just like the one suggested by Reed, (2012) for a simple latrine design. Finally, walls made of slates or small stones collected randomly on the hills. Slate is recommended more than other types of small stones because of its regular formation which eases its usage (Bhargava, 1992).

Barasa (2000), found out that there was a new alternative material used for lining of pits in Hagardera, Daadab refugee camp in Kenya. Sand bags were used as a cheaper alternative to concrete, metal, plastic and wood which was perceived to be expensive considering the number of latrines being constructed.His findings are complemented by designs made by Reed (2014) which indicate that sandbag provide a cheap option for lining in areas where the ground is not stable.These options have been used in refugee camps in Kenya and Sudan. He further indicated that bamboo and cane are good and cheap but can only be used when a latrine is not intended to be used for a long time. However, an alternative, cheap and long lasting material for lining pits has been found to come in the form of stabilized soil blocks (SSB). Stabilized soil blocks is a mixture of Red soil, clay, cement and water which are compressed in a mechanical machine then allowed to cure for between 14 and 21 days before being used (Muinde, 2012).

In Uganda, Deal & Watasa (2009) found that the technology used was the common latrine or traditional pit latrine which is built over unlined pit using logs and mud for slab. These materials provided cheaper alternative to the expensive reinforced concrete. Reed (2012) observed that Ferro cement is cheaper and lighter than reinforced concrete.

Healsoproposed wood and plastic as another alternative which is easy to use. Clay, porcelain, plastic bags, metal and poles can be used either independently or to complement each other for better strength and finish.In Mirab Abaya and Alaba Ethiopia, Tefera (2008), found out that materials used in these two locations were a combination of commercial and locally available. Those who constructed their slab/floors with wood were 77.5 percent while those who used concrete were 7.25 percent. However, the most unique and viable alternative material for constructing latrine slab has been found to be Bamboo in Eastern and Southern Africa. Bamboo is complemented using mud on some cases where users are financially able, they use concrete (UNICEF, 2014). Wood was also found to be the cheaper alternating to concrete slab in Ethiopia which contributed to timely completion of pit latrines (Fry et al., 2015).

Superstructure is the most visible part of latrine which can determine external quality. According to Deal & Watasa (2009), the walls are made of wattle and mud. These materials are the best alternative for traditional Pit latrines which was found to be common in Tororo, Uganda. This kind of latrines is easy and cheap to construct and is suitable for places where people have limited financial capacity. However, this type of latrine was not suited to all geographical terrains and soils. The study observed that these latrines have a short life span of between two to three years but still preferred by many people in Tororo because of its affordability. Furthermore, most of the artisans can only built this type of latrines and the quality of these latrines depends majorly on the materials provided for construction and minimally on the skills of the person constructing.This is supported by a study conducted Tefera (2008), in Mirab Abaya and Alaba, Ethiopia where wood and in some cases, wood and mud were used for walls of superstructure. The second most utilized locally available material used here was banana leaves for the walls which were utilized by 16 percent of respondents (Tefera, 2008). Finally, Bamboo and mud is used as the best alternative to bricks and cement mortar in Mozambique (Amaka, 2010).

In Mirab Abaya and Alaba Ethiopia, Tefera (2008) further found out that 31.85 percent of respondents in these two areas used banana leaves for roofing mainly to protect users from sunlight. This is because the leaves were suitable to protect from rain. Another material used for roofing of latrines is grass. Grass is popular in roofing of houses in

Africa. Hansch (2003) emphasized in his report that locally available materials were the best alternative to cheap latrines listing grass as one of the most abundant and easy to use.In Ethiopia, Fry et al (2015) found that the most available alternative roofing material is grass. However, National Bureau of Statistics (NBS) and Office of Chief Government Statistician (OCGS), Zanzibar, (2014) found out that more people used coconut leaves for both roofing houses and latrines at the coast of Tanzania mainland and Tanzania Zanzibar as an alternative material to iron sheet. These findings are complemented by those in a Community total led sanitation (CLTS)project carried out in Nampula, Mozambique where coconut leaves were popular in roofing of houses. Participants in the study identified coconut leaves as the most suitable alternative material for roofing pit latrines (Amaka, 2010).

Latrine door has been found to be important especially for latrines which are used by many people with both genders.According Hesperian (2012), doors provide the most needed privacy in emergency situation and should be kept close both when in use and while not in use. Wood is the most common door for both simple and improved pit latrines. According Reed (2014), improved latrines use sawn timber material to construct doors. However he proposesoffcuts, beaten tins and bamboo strips as cheap alternatives for latrine doors. Franceys, Pickford & Reed (1992) found other different cheaper option in addition to beaten tins and bamboo strips. In situations where no solid materials are available, curtains made of sack cloth, joined rugs and old clothes are used (Franceys, Pickford & Reed, 1992).

2.4 Training ofLatrine Owners on Construction of Pit Latrines

Various studies have been done to ascertain the capacity of households to construct latrines. Most of the studies have indicated that there was little or no capacity at all. According to Boisson el al. (2014), aid agencies play a big role in building capacity of people to construct their own pit latrines in parts of India. This is because few or none of them could construct simple pit latrines without technical support from outsiders. However, they cited shifting of trained masons for pit latrine construction to other lucrative construction jobs.This findingis complemented by documented findings by PricewaterhouseCoopers (2009) in Tanzania where it was found out that several household and latrine providers had technical capacity to construct pit latrines which had

been imparted on them by various aid agencies. However, in the case of Tanzania, not all trained people left for other lucrative jobs but continued providing the service to the people who needed. Moreover, these artisans where specialized in using a wide range of materials (PricewaterhouseCoopers, 2009).

Worku Tefera conducted an extensive study in 2008 to establishlatrines and their utilization in two villages in Ethiopia. Tefera (2008) found out that about 97% of responded in Mirab Abaya and 76.3% of those in Alaba had constructed latrines in their life while the remaining had not attempted. Majority of the people who had constructed latrines had been supported by either Community Health Promoters (CHP) or their Administration council. Only a few people who had better financial capability were able to hire professional carpenters and masons to help the construct superstructure and slab respectively. For this reason, simple pit latrine was the most popular among respondents because basic technical skills for construction wererequired and its low cost. A few cases had VIP latrines especially for the people who had improved financial capability (Tefera, 2008). The significant difference in latrine coverage and capacity was attributed to educational level which was higher than Mirab Abaya (Ethiopian Kalehiwot Church, 2005).

Deal& Watasa (2009) observed In Uganda that residents worked together with latrine provision contractors. However, contractors reported that up to fifty percent of their customers did not pay fully for the services rendered. This makes them to be conscious when taking up jobs to construct, repair or upgrade latrines with the fear of not being paid. Such incidences pushed the skilled masons to other construction jobs which not only have a reliable income but also is available throughout the year. The masons take latrine construction as a side job because of its seasonal nature and only do so to supplement income from their regular construction jobs (Deal, 2010).

In Tororo, Uganda, capacity of the local latrines providers varied with type of latrine being constructed. In one of the locations, Deal & Watasa (2009) found that the artisans did not have the capacity to lay concrete to improve slabs of existing latrines. However, in a place called Molo, a team of latrine providers who had basic training in masonry had the knowledge and capacity to do concrete works. These were majorly sort by clients

who had the capacity to buy materials for laying down concrete either to improve existing pit latrines or construct new ones. It was further found out that several local trading centers had technical institutions which trained various artisans including masons. However, these masons engaged in general construction works rather than purely latrine construction. All the masons who were engaged in construction of latrines did not have formal training but they acquired them through exposure and working with trained masons. Deal & Watasa (2009) proposed that it was important to introduce trained masons into pit latrine construction without phasing out pit diggers who have been in business for long for the sake of sustainability. This could only be done by placing pit diggers under the supervision of trained masons (Deal & Watasa, 2009).

Onsite training of latrine construction providers was done in India by various agencies which were involved in community latrine provision (Boisson et al. 2014). However, the same challenge was faced in Tororo Uganda was faced in India where experienced masons ran away to more lucrative jobs in commercial building construction (Deal and Watasa, 2009; Boisson et al. 2014).In Bangladesh, flood resistant pit latrines required trained and experienced mason to effectively construct (Uddin, Ronteltap and Lier, 2013). This is attributed to the use of concrete for the slab and ring beam which is not easy for a layman to carry out.However, latrine owners contributed in the construction by digging pits and construction of superstructure (Uddin, Ronteltap and Lier, 2013).

Amaka (2010) has indicated in his study that members of the community in Mozambique had limited technical capacity and could only construct simple pit latrines. This resulted in poor coverage of sanitation facilities. However, aid agencies have been instrumental in building the capacity of residents in one Mona District where some community members including women received basic training on pit latrine construction (Amaka, 2010).Need for training is complemented by Joseph's (2004) findings who proposed training of more residents in water and sanitation development by government officers and NGOs.Technical skills possessed by latrine providers and households were seen to be a big factor in choosing the type of sanitation design and the level of uptake of a given technology in Ethiopia. Change agents and aid agencies were encouraged by WaterAid to transfer technical skills to the local markets through manuals, guidelines, tools and equipment for promoting cheap options for constructing latrines (Ayele, 2005).

Hebert (2010), unearthed one other important challenge on technical capacity in East African where women headed household could not dig up deep pits for constructing latrines. Community norms dictated that men ought to help women who do not have husbands in construction work. However, women in the areas of assessment indicated that men did not want to help them at all. Women lacked the physical strength do dig pits hence relied upon men to help. A small number of women 7 of 45 interviewed could dig the pit, move slab and construct a superstructure. In general, Hebert (2010) found out that there was varying degree of understanding construction of arborloo latrines in East Africa depending on the level of campaigns and trainings by HygienePromoters.Involving government employees in these trainings increased its legitimacy. CRS involved various government staff and health workers in training on the construction, maintenance and use of arborloolatrines and stressed the need to expand capacity building to other members of the community who are not part of the project (Hebert, 2010).

According to Tefera (2008), CLTS became the turning point against open defecation. Members of the community then became aggressive in getting solution which then helped them in building latrines with locally available materials. CHP only helped them to build their capacity in building latrines through public health standards and with time, their technical capacity had improved. While in a project implemented by CRS, community members were required to use their basic skills to construct latrines after CLTS was conducted. However, masons were trained on how to cast doomed shape slab to be distributed to the latrine owners (Fry et al. 2015).

CLTS has gained approval as the best way to unlock people's potential in community sanitation. Ntow (2012) found out in Ghana that while a project on CLTS was being implemented, community members took a leading role in mobilization and construction of latrines after successful triggering by support agencies. One of the challenges faced was the inability to dig dip pits for latrines because of the rocky ground. For this reason, it was evident that the community members lacked the capacity to dig latrines in such conditions. However, before the training started, some community members with little knowledge of CLTS were identified and given further training. Not only were they able to transfer the knowledge to the other community members but also unlock other

knowledge which would have been otherwise hidden from the facilitators. Further training and innovation on technical undertakings was recommended since the existing knowledge did not sufficiently ensure successful latrine construction (Ntow, 2012).

2.5 Summary of the Literature and Gaps

There are several factors motivate people to initiation, construction and use of pit latrines. Different authors found different reasons in different locations. Access and availability of latrine was found to greatly determine if people use them. People who have them are found to use them more than those without. Lack of comfort in open defecation came out clearly in two ways; disturbance from animals which eat feces and presence of dirt and thorns in bushes. This has influenced some people to construct and use pit latrines. Embarrassment associated with open defecation and dignity associated with use of latrine has contributed a lot to construction and use of pit latrines. Quality of pit latrine and its functionability is considered as an important aspect for people to use them since some could be hazardous. Some people have been reported to construct latrines because the old ones were full, flooded or broken down and they want to ensure the health of their families is not affected by lack of pit latrine.

Participatory Hygiene and Sanitation Transformation (PHAST) approach has been used to influence communities, local administration and opinion leaders to support pit latrine construction initiatives. Other strategies used to motivate people include providing materials, using model latrines, exchange visits, government policies and support, and providing seedlings for planting on decommissioned latrine pits. Matching available materials with appropriate technology has contributed positively to construction and use of pit latrines. Finally, community total led sanitation (CLTS) has been found to be the most effective method of encouraging people to construct latrines through their own initiative while using locally available materials in several parts of the world. All the factors and conditions vary with place and culture and in the forthcoming research; unique motivations are expected to come out.

Availability of quality materials has been found to not only affect completion of pit latrines but also of other infrastructural projects. Availability of materials has different dimensions depending on the project and the materials in question. These dimensions

include delay in delivery, poor quality, depletion of a given natural resource and lack of alternatives. All these lead to either delay in completion, poor quality work or lack of completion at all. There are other factors which lead to lack or poor access to quality pit latrine construction materials. Some are government policies, political instability and weather conditions. Availability or access to quality construction materials vary from place to place with varying reasons. In some cases competition for such material determines availability. Other people lack money to buy them or they have other priorities for the little money they have. Distance from hardware shops which are mostly situated in urban centers play a role in access and availably of materials too. However, other authors view availability of materials as a perception within a person or group of people. They claim materials are abundant and can be harnessed through use of appropriate technology.

Alternative materials vary with place, design and component of pit latrine. These are mostly those which are readily available and need appropriate technology to utilize them. Some of the alternative materials used for pit lining include sand bags, bamboo and stabilized soil blocks. Slab or floor of a pit latrine can be constructed using logs and mud, Ferro cement, wood, plastic, clay, porcelain, metal and bamboo. In some cases, users place concrete on top of these constructed slabs to increase strength and improve hygiene. Superstructure can be constructed from jute fabric, plastic sheet, bamboo, reeds, wattle and mud, banana leaves and grass in different combination and availability. Roof of a latrine has a number of alternative material too which include banana leaves, grass and coconut leaves. Pit latrine should have a lockable door too but when the recommended materials are not available, offcuts timber, beaten tins, bamboo strips and curtains made from sack cloth or joined rugs can be used. Correct use of these alternative materials ensures construction of quality simple pit latrines to completion.

Technical skills required to construct pit latrine vary with the design, geographical conditions and the material available. The skills determine the quality of latrine after completion too. In most of the researches, owners were found to poses little technical skills which could enable them to construct simple pit latrines. Therefore, external support was required or provided. The most sort skill has been found to be masonry

which is required for casting slab or placing concrete floor, walls or lining pits. In most cases masons were sort or a few selected locals were trained on slab and concrete works hence pass the skills to others. Some areas were reported to have technical institutions which trained masons but most of them did not engage in latrine construction and the few who did so, ran away sometimes to more lucrative commercial construction due to non-payment or irregular supply of work.

Traditional pit latrine owners were generally found to have the basic skills necessary to construct simple pit latrines while those with improved latrines hired contactors and other worked with them to reduce the cost. Several agencies which implemented sanitation projects trained masons or latrine owners on basic skills before construction commenced. However, women headed households are the most disadvantaged because they lacked the physical strength to dig pits. Nevertheless, some men helped them. Community Health Promoters (CHP) were instrumental in giving out the required standards for construction of latrines. Their knowledge helped latrine owners to stick to public health standards while constructing household latrines. Finally, the most useful skills have been harnessed through CLTS which ensured community members felt the need to have latrine hence used their own innovative ways to construct simple pit latrines using locally available materials.

All the researches gave varied materials, motivations and skills but none was unique to Akuem, South Sudan. No single research was conducted to unearth the issues in question in South Sudan despite being mentioned a few times. Materials commonly used were found by different authors to be similar for same designs of latrines but no latrine design was tackled in South Sudan except arborloo which was not detailed. Influence of availability and quality of material on pit latrine completion varied with place with some being caused by lack of money while other used inappropriate technology. No research was found that has been conducted on the same in South Sudan. Alternative materials are considered to be those which are readily and locally available. However, appropriate technology play key role in choosing them. Access, cultural, policy, skills and peer pressure comes out as some of the reasons which push people to construct latrines. South Sudan has been in conflict for sometimes and reasons could be different from those found

in other places. Finally, pit latrine construction skills are seen to be limited for latrine owners and always need help. This could be the case in the project area being studied. However, no research has shown. It is important to conduct a study to find out if some of the finding of these authors will come in or there are other unique findings.

2.6 Conceptual Framework

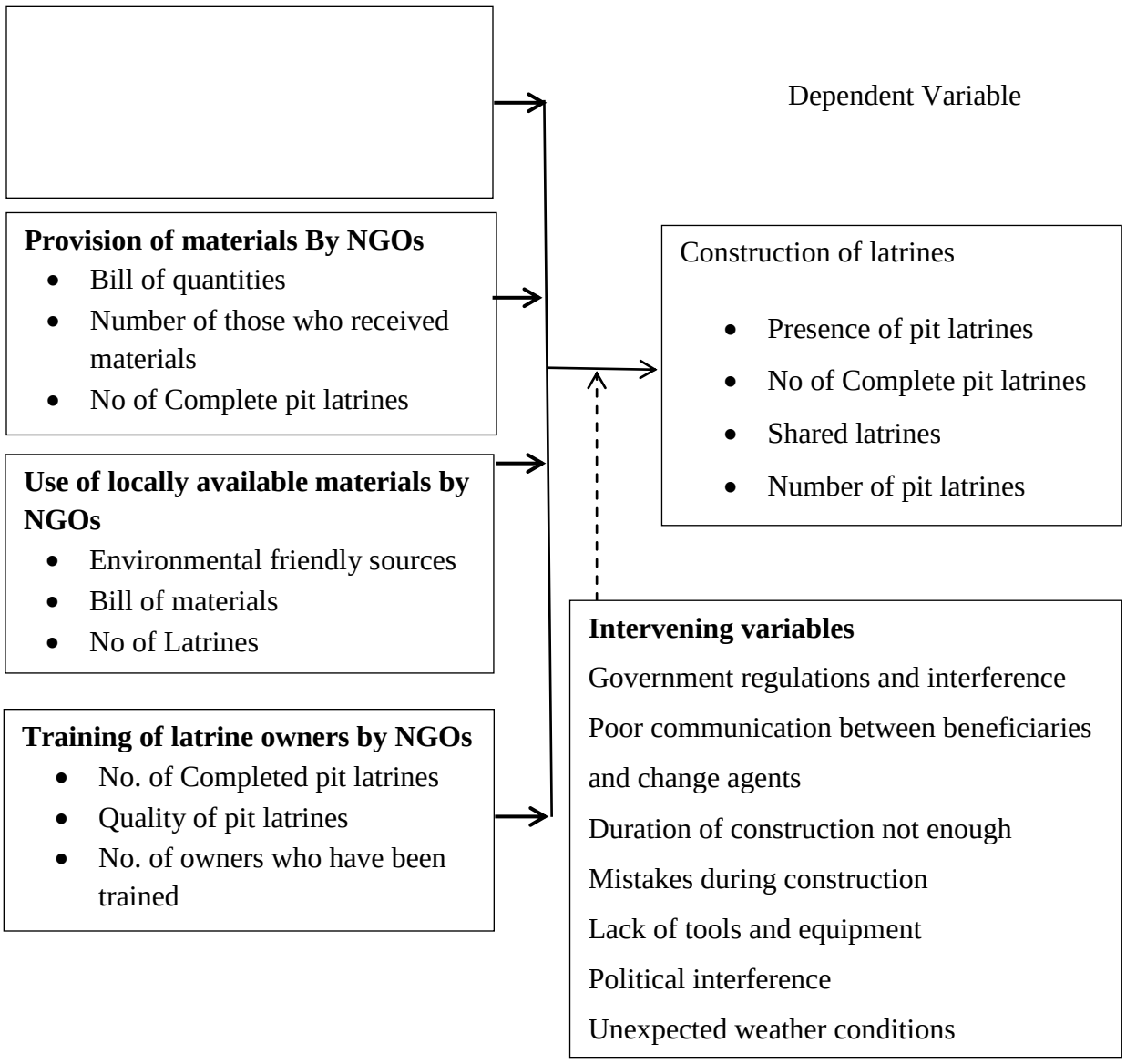


Figure 1 Conceptual Framework

Source: Author (2016)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlines the methodology, procedures and modalities that were used in the study. It covers research design, determination and identification of the population, sample size, sampling design, sampling procedure, the instruments of data collection, sources of data, methods of data collection and methods of analyzing the data that were used.

3.2 Research Design

Considering that the main purpose of the study was to determine the influence of various NGO activities on the construction of latrines constructed by residents, descriptivesurvey design was used. This is because we quantifiedvarious NGO activities that play part in construction of latrines. These were technical training, provision of materials, use of locally available materials and motivation activities. The survey covered residents who constructed latrines in their homesteads while the information sort was background of the respondents, source of materials used in construction, challenges and their technical capacity to do so. Furthermore, the survey included financial capacity, external support received and their opinion on availability of local materials, provision of materials, motivation and training. This is because descriptive survey helped to cover a wide range of issues under investigation or study (Potter, 2003).This study aimed at observing and describing practices by NGOs which influenced in any way construction of pit latrines.

3.3 Target Population

Polit and Hungler (1999) refer to the population as an aggregate or totality of all the objects, subjects or members that conform to a set of specifications. In this study the population was latrine construction beneficiaries of Community Led total Sanitation project conducted by Samaritan's Purse in Akuem Village, South Sudan in 2015. Majority of the people who own latrines in this area were supported in one way or the other by NGO's. The latest project had 150 beneficiaries hence the 150 beneficiaries were targeted.

3.4 Sample Size and Sampling Procedure

This section represents sample size and sampling procedure

3.4.1 Sample Size

The people targeted in the WASH projects have varied over time based on latrine coverage and available funds. In this study, weretargeting at least 80 latrine owners who were chosen randomly from those who were benefited from Samaritan's purse WASH project. According to Mugenda & Mugenda (2003) a sample of 30% is appropriate for descriptive studies. This covered cover the entire village.

Table 3.1 Sample size

Study group	Population	Sample size	Percentage
Latrine owners	150	80	53.3

3.4.2 Sampling Procedure

Random sampling technique was used to restrict the possible samples to those which are within the expected range by ensuring that all parts of the population are represented in the sample in order to increase the efficiency.

3.5 Research Instruments

Questionnaires were used to collect data from the respondents. A tested and revised questionnaire wasadministered to the selected respondents. The target of respondents was 80; however, only 69 of the questionnaires were returned. All the respondents wererequired to fill their questionnaire within their homestead where the person administering had time to look at the latrine and take photos of them where possible. Before the questionnaire was administered, the respondents were briefed first on what needs to be done, why and for how long (Nichols, and Childs, 2009). The data in the questionnaire were both open ended and closed ended. Others weredescriptive hence captured opinion of the respondents. To effectively facilitate data collection, a translator who understoodboth English and the local Nuer language accompanied the researcher (Eisenhardt, 2002).

3.5.1 Pilot Testing

A questionnaire was designed and tested before being used. The design considered all the queries and opinions of the respondents. Pilot survey was used for testing by administering it first to a few people in a similar but different location. The people used in the pilot survey were of same background with the people whom the main survey was conducted. Pilot survey helped to unearth the inconsistencies, wording problems and other inappropriate questionswhich had been put in the questionnaire during design. Revision of the questionnaire was done before administering.

3.5.2 Validity

Pilot testing as indicated above give us validity of the data collected using questionnaire. This ensuredthat the information collected was right by using right questions, translators and supported with photographs. Content validity was ensured by drafting questions at each section to collect information in different perspectives regarding the objectives and theme of the section. These questions werevalidated and used elsewhere, though in a modified format.

3.5.3 Reliability

To ensure that the information collected was reliable, same data was collected using a different person at different times during pilot testing. The data was tested for correlation using correlation analising. The correlation is found to be strong, the instrument was to deemed reliable and ready for use. Correlation coefficient of 0.7 was used to judge validity.

3.6 Data Collection Procedure

In order to collect data from the field, an authorization letter from the university was sort to show that the data collection is intended for academic use. This letter was used to seek permission from the local government and Samaritan's Purse International relief whose

project was being used for the study. When the permit had been obtained, we went ahead to administer the questionnaire to the sample population.

Questionnaires administered by research assistants were used to source the information, particularly because they provided wide range of queries. Questionnaires were delivered to targeted participants and guided to fill them at their convenience. Table 3.2 shows the questionnaire return rate

Table 3.2 Questionnaire return rate

Study group	Population	No. Targeted	No. of participants	Return rate
Latrine owners	150	80	69	86.25%

3.7 Data Analysis

The questionnaires were checked for completeness and consistency of information at the end of every field data collection day and before storage. The quantitative data from the completed questionnaires werecleaned, re-coded, classified and tabulated. Statistical Package for Social Sciences (SPSS) was used to analyze the quantitative data. The findings of the study were then presented in frequency distributions and percentage tables. In addition, the findings were presented in a narrative form.

3.8 Ethical Consideration

During data collection and analysis, ethics were adhered to. Utmost respect was accorded to the respondents during data collection with consideration of their status, culture and language. Local leadership was recognised to ease engagement with the population. Finally the findings and recommendations werepresented to the relevant bodies that will use them to first benefit the community which the study was conducted and secondly to help other communities which are similar to the one in Akuem Village, South Sudan.

3.9 Operationalization of Variables

Table 3.3Operationalization of Variables

Objectives	Variables	Indicator	Measuring scale	Means of analising
To examine how NGO motivational activities influence construction, of pit latrines in Akuem village South Sudan.	Independent: NGO motivational activities Dependent: construction, of pit latrines	No of latrines Local initiatives Limited supervision	Ordinal, Nominal	Descriptive
To determine how Provision of materials by NGOs influence construction of pit latrines in Akuem Village, South Sudan	Independent: Provision of materials by NGOs Dependent: construction, of pit latrines	No. of beneficiaries Bill of Materials No of Complete pit latrines	Ordinal, Nominal	Descriptive
To establish how use of locally available materials by NGOs influence construction of pit latrines in Akuem Village, South Sudan	Independent: use of locally available materials Dependent: construction, of pit latrines	Environmental friendly sources Bill of materials No of Latrines	Ordinal, Nominal	Descriptive
To evaluate how training of latrine owners influence construction of	Independent: training of latrine owners Dependent:	No. of Completed pit latrines Quality of pit latrines No. of owners	Nominal, Ordinal	Descriptive

pit latrines in Akuem Village, South Sudan	construction, of pit latrines	who have been trained	

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION INTERPRETATION AND CONCLUSION OF FINDINGS

4.1 Introduction

This study was to establish how NGO activities influenced construction of pit latrines in Akuem Village, South Sudan. To establish this, the researcher studied the projects which have been implemented by Samaritan's Purse in the said village. The objectives of the study were to examine how NGO motivational activities influenced construction of pit latrines in Akuem village South Sudan, to determine how Provision of materials by NGOs influenced construction of pit latrines in Akuem Village, South Sudan, to establish how use of locally available materials by NGOs influenced construction of pit latrines in Akuem Village, South Sudan and to evaluate how training of latrine owners influenced construction of pit latrines in Akuem Village, South Sudan. This chapter brings out data analysis presentation and interpretation of the information obtained during field work. Frequency tables and percentages are used to present data.

4.2 Questionnaire Return Rate

Questionnaire response rate is important in establishing whether the survey is sufficient for an academic study. Questionnaire response rates helps to determine whether a study is valid and reliable in reference to the entire population. For this reason, the researcher issued questionnaires to 80 latrine owners against a population of 150; however, not all questionnaires were returned. The results of the response rate are tabulated below.

Table 4.1Questionnaire response rate

Questionnaire Response	Frequency	Percent
Yes	69	86.25

No	11	13.75
Total	**80**	**100**

Table 4.1 shows that the study established a response rate of 86.25%. The researcher had issued a total of 80 questionnaires of which 69 were returned fully filled while 11 were not returned because of reasons beyond control of the researcher. The study targeted 80 respondents. According to Baruch (1999), response rate of 85% for face to face questionnaire surveys are considered to be good enough and a minimum of 75% should be accepted. On the other hands, Babbie (2002) indicates that a response rate of 50% is adequate for any survey hence 86.25% was even better. The rate of response rate was important because if it was lower, it would not have represented true picture of willingness of the respondents.

4.2.1 Definition of the Respondentby Gender

The research was interested in establishing the gender of the respondent becausegender determines roles played by the people and rate of acceptance to change.Consequently, the researcher asked the respondents to state their gender and the result are as shown 1n table 4.2.

Table 4.2Gender of the respondents

Gender	Frequency	Percent
Male	42	61.3
Female	27	38.7
Total	**69**	**100**

Table 4.2 showsthat 42 (61.3%) of family heads among the respondents were male while 19(38.7%) were women. This indicated clearly that majority of family heads in Akuem Village, South Sudan were men representing just over 60%. The response rate was 100% with respect to the number of questionnaires which were completed.These findings can be attributed to Patriarchal society which put men ahead of women in allissues which pertain to family decisions and activities. The presence of considerable number of

females can be attributed to the conflict going on where men have left their women to fight while a few others go grazing cattle.

A report by Woldetsadik (2011) for Action for hunger showed that majority of family heads in Aweil East were men and only few whom husbands had passed on or working away were headed by women. The report further indicates that all major decisions in these areas must be sanctioned by the head of the family who normally is a man.

4.2.2 Length of Residency in Akuem

The research sort to establish the length of time which residents of the village had lived in Akuem because SouthSudan has been in civil conflict for long and most residents have been relatively in state of displacement. The length of time which person stay in one place may determine the rate of acceptance to new developments and social changes. In view of this, the respondents were asked to state the number of years they had lived in the area.The results of the study are in table 4.3.

Table 4.3Length of Residency in Akuem

Time lived in Akuem	Frequency	Percent
0-2 Years	3	4.3
3-5 years	5	7.2
6-10 years	17	24.6
Over 10 years	44	63.7
Total	**69**	**100.0**

In this study, it was found that44(64.6%) of the population studied had lived for over 10 years, 17(24.6%) had lived for between 6 and 10 years, 5(7.2%) had lived for between 3 and 5 years and finally 3(4.3%) had lived in Akuem for less than 2 years,The response rate was 100% in reference to total number of respondents.

According to Concordis International (2012), Violence which erupted in 2010 forced some Northerners to migrate northwards while some Southerners where forced to come back to Northern Barh El Ghazel from Darfur. This agrees with the fact that many Southerners were not displaced hence have lived there for long while the few from Darfur

had lived in Akuem village for a shorter period of time. Pockets of violence have been witnessed but have not affected northern Bahr el ghazel much (Sudan Tribune, 2016). This may explain the low number of respondents who have lived in their residence for shorter period.

4.2.3 Highest Education Level of Latrine Owners

The researcher wanted to find out the highest level of education of respondents because the level of education influence acceptance to change and adoption of new approaches.The respondents were asked to state their highest level of education. The table below shows the results.

Table 4.4Highest Education level of latrine owners

Education level	Frequency	Percent
None	29	42.0
Primary	26	37.7
Secondary	13	18.8
College	1	1.4
Total	**69**	**100**

Table 4.4 shows that 29 (42.0%) of the respondents had not received any education, 26(37.7%) had undergone primary school education with 13(18.8%) having finished secondary school and only 1(1.4%) had pursued college education. The low levels of education can be caused by frequent conflicts, lack of schools, pastoralism, cultural practices and early marriages.

According IOM (2013), there is rampant school drop out in Akuem is at its highest because of long distance to school, migration, family decision and lack of trained staff which might be the reason behind the low levels of education. Woldetsadik (2011) also found that there was little or no education acquired by Residence of Aweil east which Akuem is located. This is similar with the findings of the researcher where majority had no education.

4.2.4 Presence of Latrine in Household

The researcher wanted to establish the presence of latrine in each household because the study targeted latrines owners. It was then important to establish whether the respondents had latrines in their households. The respondents were asked if they had latrines in their households or not. Results are shown in the table below.

Table 4.5Presence of Latrine in Household

Latrine present	Frequency	Percent
Yes	64	92.8
No	5	7.2
Total	**69**	**100**

Table 4.5 shows that 64 (92.8%) had latrines and only 5(7.2%) is did not have latrines in their household.The response rate was 100% of the total respondents. Not all respondents had latrines within their household however; they had communal latrines within their settings. These respondents werealso considered to be latrine owners since they owned the latrines communally.

According to Ternstrom (2013), latrine coverage in Northern Bahr Ghazel is a mere 12%. However, the high percentage in the findings is attributed to the target populations being latrines owners.

4.2.5 Latrine Sharing

Household sharing latrines

The researcher wanted to establishwhether or not household shared latrines because scarcity implicates that household tend to share, that being the case, researcher asked respondentsto state if share latrines or not. The table below shows the results.

Table 4.6Household sharing latrines

Latrine Shared	Frequency	Percent
Yes	66	95.7
No	3	4.3
Total	**69**	**100**

Table 4.6 shows that 66 (95.7%) of the respondents shared latrines with other households while only 3(4.3%) did not share the latrine with other households.The findings reflected

what was expected because several households in the area used latrines while several others lacked them. Ternstrom (2013) found that Latrine coverage in Northern Bahr Ghazel is at 12% forcing majority of households to share latrines.This is seen in the findings in the table which shows that 95.7% of latrines were being shared which has strong relations with Ternstrom (2013) findings.

Number of Households Sharing a Latrine

The number of household sharing a latrine was sort to establish the ratiohouseholds to latrine. For the 95.8% households who shared latrines, each household was asked to specify the number households who shared the latrine. Results are tabulated below.

Table 4.7Number of Households Sharing a Latrine

No. of Households	Frequency	Percent
2 to 5	35	50.7
6 to 10	18	26.1
Over 10	16	23.2
Total	**69**	**100.0**

Table 4.7 shows that 35(50.7%) of the respondents indicated that they shared latrine among 2 to 5 households, 18(27.1%) respondents had between 6 and 10 households sharing latrines, 16 (23.2%) of the respondents indicated that over 10 households shared the latrine they owned.The response rate was 100% of the total respondents. The researcher expected more latrines to share the latrines among households, the findings shows that the latrine coverage had slightly increased.

In his study, Wright (2009) indicated that the presence of household latrines in South Sudan and Specifically in Aweil East was low compared to School latrines. This forced several households to share latrines with communal latrines being more common in other instances. This is shown in the majority of latrines being shared by several households.

4.2.6 Latrine Constructed to Completion

The research sort to find out if respondents had latrines which were constructed to completion since quality of latrine can be judged when it is complete andcompletion

shows sufficiency of resources and will, hence the respondents were asked to state if their latrines were constructed to completion. The results are shown in the table below.

Table 4.8Latrines Constructed to Completion

Latrine Complete	Frequency	Percent
Yes	55	79.7
No	14	20.3
Total	**69**	**100**

Table 4.8 shows that 55(79.7%) had complete latrines while 14 respondents who represent 20.3% were using latrines which were incomplete in one way or the other.Response rate was 100% of the respondents.Some latrines lacked roof which is considered non-essential within sanitation circles hence latrine completion is relative. This is because roof only helps in protecting users from weather.

According to Wright (2009), household latrines in Aweil East were poorly constructed and some incomplete compared to school latrines which were complete and in good shape. Wright (2009) further found that latrines constructed by NGOs were complete and with good quality compared to those constructed by owners. These findings show some relationship with findings found in this study.

4.2.7 Means of Latrine Completion

Owing to the different means of completing latrines under construction, the researcher wanted to find out how respondents completed their latrines. Respondents were asked if their latrines were completed and how they were completed. The results are tabulated presented in table 4.9

Table 4.9Means of Latrine Completion

Means of Completion status	Frequency	Percent
Left Incomplete	14	20.3
Used Local materials	32	46.4
Modified Latrine	23	33.3
Total	**69**	**100**

Results in table 4.9 shows that 32(46.8%) of respondents used locally available materials to complete their latrines, 23(33.3%) of the respondents modified their latrines while and

the remaining 14(20.3%) were left incomplete. The response rate was 100% of the total respondents. Use of locally available materials shows some creativity, acceptance to change and positive will to complete latrines.

According to Tefera's (2008), use of locally available materials helped latrine owners in Ethiopia to complete latrines because aid agencies did not provide all the materials nor did the beneficiaries have the financial muscle to purchase the materials they lacked. Interestingly some respondents left their latrines incomplete which is similar to a case found by Deal &Watasa (2009) in Uganda where a reasonable number of latrines were left incomplete posing health risks.

4.2.8 Quality of the latrine

The researched was interested in finding out the quality of latrines constructed because quality is a result of good workmanship and inputs. Quality of latrine also determines owner's satisfaction. Respondents were asked to rate the quality state of their latrines and theresults were presented in table 4.10

Table 4.10Quality Status of Pit Latrine

Quality of Latrine	Frequency	Percent
Poor	12	17.4
Fair	19	27.5
Good	24	34.8
Excellent	14	20.3
Total	**69**	**100**

Table 4.10 shows that 24(34.8%) expressed that their latrines were good quality, 19(27.5%) said that the state of their latrines were fair while 14(20.3%) considered their latrines to be in excellent state and finally 12(17.4%) indicated that their latrines were in poor state. The response rate was 100% of the total respondents.

Boisson et al. (2014) established that latrine owners who were supported by Aid agencies recorded high levels of quality latrines compared to those who did not receive any support.Uddin, et al, (2013) had made same observation in Bangladesh which complements the findings of this study.

4.3 Motivational Activities on Latrine construction

To examine how NGO motivational activities influenced construction of pit latrines in Akuem village South Sudan, various queries were presented to the respondents. The most important and relevant have been tabulated and discussed.

4.3.1 Latrine Owners who were Motivated

We were interested to establish if latrine owners got external motivation to construct their latrines because motivation leads to performing tasks freely, therefore,the researcher asked respondents to state whether they were motivated or not and the results are in the following table.

Table 4.11Owners who were Motivated to construct latrine

Latrine owners motivated	Frequency	Percent
Yes	60	87.0
No	9	13.0
Total	**69**	**100**

Table 4.11 shows that 60(87.0%) of the respondents were urged to construct latrines and did not construct on their own volition whereas 9(13%) were not urged by anyone to construct the latrines but took the initiative on their own. Those who constructed latrines because they were urged or convinced by third parties were the majority compared to the small number of those who initiated latrine construction on their own.

According to Fry et al 92015), rural communities who practice open defecation must be motivated in different ways in order to accept latrine construction projects or to construct latrines on their own.These are same results found by O'Connell (2014) in a desk study which indicated that residents in third world countries did not have inner motivation and external pressure was need to have them construct latrines.

4.3.2 Source of motivation to construct latrine

The section sort to establish the source of motivation because motivation can come from different entities hence, the respondents were asked to name the entity which motivated them and the results are in table

Table 4.12Source of Motivation

Motivating Entity	Frequency	Percent
Government Agencies	1	1.4
Health Practitioners	13	18.8
NGOs	48	69.6
Other Community Members	1	1.4
Total	63	91.3
Missing	6	8.7
Total	**69**	**100.0**

Table 4.12 shows the different entities that motivated latrine owners to construct their latrines. 48(69.6%) were urged to construct latrines by non-governmental organisations, 13 (18.8%) of respondents were motivated by Health practitioners, 1 (1.8%) latrine owner indicated government agencies as the main motivator, and only one latrine owner (1.8%) got motivation from neighbors or other community members. The response rate was 91.3% of the respondents.

Findings by Boisson et al. (2014) shows that Non-GovernmentalOrganisations played an important role in motivating and supporting rural communities to construct latrines. They observed that their presence and support is felt most compared to other agencies. Findings in this study show same trend where NGOs were recognised as having motivated most latrine owners.

4.3.3 Main Motivation Activity

The researcher sort to know from the respondent the most effective motivation activity in Akuem Village, South Sudan since several activities may have different effective levels. For this reason, the respondents were asked to the state the motivation activity which moved them to construct latrines. The results are in table 4.13.

Table 4.13Main Motivation Activity that Convinced Latrine Owners

Motivation Activity	Frequency	Percent
Health campaign	27	39.1
Hygiene campaign	17	24.6
Privacy and Dignity campaign	12	17.4
Provision of materials	4	5.8
Technical Training	3	4.3
Total	63	91.3
Missing	6	8.7
Total	**69**	**100**

Table 4.13 shows that 27(39.1%) were motivated through health campaigns, 17(24.6%) were motivated through hygiene campaigns while privacy and dignity motivated 12(17.4%) of the respondents. Provision of materials used for constructing latrine helped 4(5.8%) was used by various entities to motivate latrine owners and 3 (4.3%) were convinced to construct to construct latrines through training. The response rate for this query was 91.3%. With environmental and water borne diseases being rampant in South Sudan, health concerns may have had a greater impact. In 2015, there was a cholera outbreak in South Sudan which resulted in deaths of more than 46 individuals and close to 2,000 infections (OCHA, 2015).

These results complements those by Fry et al, (2015) who found that Catholic relief services (CRS) used health campaign to motivate and mobilize community members into accepting construction and use of latrines as the best way to keep their families healthy. Environmental Hygiene was found to be the second most used and effective motivation activity. According to Hebert (2010), link between hygiene and family health plays important role in motivating rural populations to construct latrines

4.3.4 Level of Agreement to Statement 'NGOs Motivation activities influence construction of pit latrines'

The researcher wanted to solicit responses from respondents on the extent of agreement on influence ofNGO Motivation activities on construction of pit latrines because agreement level would show the level of confidence on the said activity. The respondents

were asked to state their level of agreement on the statement"Motivation activities by NGOs had influence on Construction of latrines". The results are in the table below.

Table 4.145 Agreement to NGO Motivation activities influence construction of pit latrine

Level of Agreement	Frequency	Percent
Strongly Disagree	0	0
Disagree	1	2.1
Neutral	7	10.4
Agree	36	52.1
Strongly agree	25	35.4
Total	**69**	**100**

Table 4.14 shows that 36(52.1%) strongly agreed, 25(35.4%) agreed, 7(10.4%) were neutral, and 1(2.1%) disagreed with the statement. There was no respondent who strongly disagreed despite being asked.Response rate was 100%.The findings indicate that presence and absence of motivation activities have effect on construction of activities. Motivation activities have been used in several rural areas to help initiate construction of latrines.

Majority of the respondents indicated that various motivational activities influenced construction of pit latrines which are similar to findings by O'Connell (2014), which indicated emotional, social and physical drivers also play a key role in initiation, construction and use of latrines which must be capitalised while motivating beneficiaries of latrine construction projects.

4.4 Influence of Provision of materials by NGOs on Construction of Pit Latrines

4.4.1 Materials available before construction support

The researcher wanted to know if latrine owners had the materials they used for construction because if one had materials there would be no need to provide them with any hence the respondents were asked to state whether they had materials for construction and theresults are shown bin table 4.15.

Table 4.15Latrines owners who had materials for construction

Have materials	Frequency	Percent
Yes	23	33.3
No	46	66.7
Total	**69**	**100**

Table 4.15 shows that 46(66.7%) had no single material for construction of the latrines while 16(33.3%) had various materials used for construction of latrines prior to construction.Response rate was 100% of total respondents.The lack of materials for majority of residence could have been caused by believes in conventional materials rather than all materials. Ignorance may have also played a key role for several respondentswho lacked construction materials.

As seen in the results, majority of the respondents did not have any construction materials prior to construction of these latrines which is similar with findings by Boisson, et al (2014) which indicated that most communities in developing countries do not have construction materials.

Reason for not having materials

The researcher sort to establish why some latrine owners did not have materials, reasons for lack of materials could be beyond control of the latrine owner. Respondents were then asked to indicate why they did not have them and the results are tabulated below.

Table 6Reason for not having materials

Reason for no Materials	Frequency	Percent
Expensive	30	43.5
No Hardware Shops	7	10.1
Not Supplied	9	13.0
Total	46	66.7
Missing	23	33.3
Total	**69**	**100.0**

Table 4.16 shows that 30(43.8%) perceived the materials to be expensive, 9(12.5%) claimed that they had not been supplied by any entity and 7(10.4%) did not access

hardware shops. Response rate was 66.7% of all respondents.Severalresidentshave no formal source of income, this is compounded by high rate of inflation, these and other reasons could have contributed to several respondents indicating that the materials were expensive.

According to O'Connell (2014), affordability is a big factor to accessing latrine construction materials which is seen in findings of this study too. These are same as findingsby Deal &Watasa (2009) who found in Uganda that community members did not have enough money to procure latrine construction materials.

4.4.2 Latrine owners who received materials

The research sort to establish thenumber of latrine owners who receive materials because materials received would have an impact on construction of latrine. In view of this, respondents were asked if they received any construction materials to help in construction of their pit latrines. The results are in table 4.17.

Table 4.17Latrine owners who received materials

Materials Provided	Frequency	Percent
Yes	57	82.6
No	12	17.4
Total	**69**	**100**

Table 4.17shows that 57(82.6%) received material support for construction while 12(17.4%) indicated that they did not receive any construction materials. The response rate was 100%.

Findings show that majority of respondents received materials for construction of pit latrines indicating high level of dependency on aid.This was a confirmation of the result of the previous query which several respondents had no materials for construction.According to O'Loughlin et al. (2006), most vulnerable groups can only construct latrines if they receive materials from external source. They also observed that when conducting pilot projects it is good to provide all that is required. Findings of this study agrees with provision of materials for vulnerable groups as found by O'Loughlin et al. (2006)

Entity which supplied the materials

The research aimed at examining which entity provided materials for latrine owners because there may different sources of materials and respondents were asked who supplied them with the materials. The results are shown in the table below.

Table 4.18Source of supplied materials

Source of Supplied materials	Frequency	Percent
Government Agencies	1	1.4
Health Practitioners	4	5.8
NGOs	49	71.0
Other Community Members	3	4.3
Total	57	82.6
Missing	12	17.4
Total	**69**	**100.0**

Table 4.18 shows that 49(71%) received construction materials from non-governmental organisations, 4(5.8%) received the materials from health practitioners, 3(4.3%) received the materials from other community members or neighbors and1(2.1%) received materials from government agencies. The response rate was 82.6%. NGOs have been very instrumental in supporting people in distress for a long time. Results follow the same historical assumption where major humanitarian projects are attributed to NGOs. 71% of respondents received varied materials from NGOs showing that they dominated in this activity aganst other entities like Government agencies.

According to Boisson, et al (2014), Aid agencies supplied material to the poor in India's rural areas. O'Loughlin el al. (2006) want NGOs to provide only essential and not all materials while in Ethiopia, Hebert (2010) made same observation that NGOs were the most present agencies providing material support to poor communities.

Section of Latrine which Received materials were suitable for

The researcher wanted to establish the section of latrine which the received the most materials because sections of latrine have different level of importance and were asked to indicate sections in which the materials they received were most suitable for. The results are in table 4.19.

Table 4.19Section of Latrine which Received materials were suitable for

Section of Latrine	Frequency	Percent
Slab	25	36.2
Superstructure	6	8.7
Roof	1	1.4
All	16	23.2
Slab and Superstructure	6	8.7
Roof and door	3	4.3
Total	57	82.6
Missing	12	17.4
Total	**69**	**100.0**

Table 4.19 shows that 25(36.2%) indicated that they materials were used for slab, 16(23.2%) received materials for all sections of their latrines, 6(8.7%) used the materials for superstructure, 6(8.3%) received materials for both Slab and Superstructure, 3(4.3%) received materials used for roof and door, while only 1(2.1%) used the materials for roof. while. The response rate was 82.6% of the total respondents. The most recommended slab for latrine is concrete slab which is not easily accessed by poor communities in rural areas. This can explain why majority of the respondents had received slabs among the materials provided.

Catholic relief Services provided slabs to rural households in Ethiopia hence helped in construction of latrines to completion by beneficiaries (Fry et al, 2015). According to Barasa (2000), refugees and host community members in Dadaab, Kenya received slabs from NGOs. The finding in this study complements the findings by Fry et al, (2015) and Barasa (2000).

4.4.3 Level of agreement of respondent on the influence of Provision of Materials on Construction of Pit Latrine

The researcher wanted to elicit opinion on the level agreement on the influence of provision of materials by NGOS on construction of pit latrines because level of agreement would show the level of confidence of the said activity consequently, the respondents were asked to state level of agreement and the results are shown in the table below.

Table 4.20Provision of materials by NGO influence construction of Pit Latrines

Level of Agreement	Frequency	Percent
Strongly disagree	1	1.4
Disagree	3	4.3
Neutral	6	8.7
Agree	29	42.0
Strongly agree	30	43.5
Total	**69**	**100.0**

Table 4.20 shows that 30(43.8%) strongly agreed,29(41.7%) agreed,6(8.3%) were neutral and 3(4.2%) disagreed and finally 1 (2.1%) strongly disagreed. The response rate was 100%.

Findings of this study show the level of agreement was high with majority strongly agreeing while a significant number just agreeing. The number of respondents who agreed and strongly agreed totaled to 59 of 69 respondents. This was expected considering the other studies which have been done. According to Boisson, et al (2014), Supply of materials by aid agencies has huge impact on construction and completion of latrines leaving beneficiaries satisfied.

4.5 Use of Locally available Materials on Latrine Completion

Influence of use of local materials by Non-governmental organisations on construction of pit latrines was investigated. Various questions were presented to the respondents to ascertain.

4.5.1 Latrines constructed with locally available materials

The researcher wanted to find outthe number of latrine owners who used locally available materials in construction of pit latrinesbecausethe number would show the level of acceptance for use of locally available materials. Respondents were asked if they constructed any section of their latrines with materials which were locally available. The results are as below

Table 4.21Latrine Constructed with Locally available Materials

Used locally available Materials	Frequency	Percent
Yes	59	85.5
No	10	14.5
Total	**69**	**100**

Table 4.21shows that 59 respondents representing 85.5% used locally available materials to construct their latrines in one way or the other while the remaining 10 (14.5%0did not use such materials. The response rate was 100%.

Most of the residents have constructed latrines using locally available materials. Majority of the respondents used locally available materials because they are abundant and cheap which is also seen in findings by Joseph (2014). In his findings, Joseph indicated that several rural communities in south Sudan had adopted use of locally available materials to construct their latrines. Tefera (2008) also found that several households used locally available materials in one way or the other to construct their latrines.

Sections of latrine which locally available materials were used

The researcher wanted to identify sections of latrine which the locally available materials were used because different materials are suited for different sections hence the Respondents were asked to state the section of latrines which they used such materials to construct. The results are tabulated below.

Table 4.22Sections of latrine which locally available materials were used

Sections of a latrine	Frequency	Percent
Pit Lining	3	4.3
Slab	7	10.1
Superstructure	7	10.1
Roof	13	18.8
Door	6	8.7
All	20	29.0
Slab and Superstructure	3	4.3
Total	59	85.5
Missing	10	14.5
Total	**69**	**100**

Table 4.22 shows that locally available material was used by a good number of respondents for construction of the whole latrine with 20(29.2%) using the locally

available materials to construct all sections of their latrines. there was a significant number 13(18.8%) of respondents who used such materials for roofing only, this could be attributed to the traditional thatching of roofs among the residents. 7(10.1%) used the materials for construction of superstructure, 7(10.1%) used the materials for making slab, 4(8.3%) respondents who used the materials for door,3(4.3%) used the materials for pit lining, while. 3(4.3%) used the materials for both slab and superstructure.The response rate was 85.5% of all respondents.Use of local materials for slab, superstructure and roof by a good number of respondents in addition to those who used it for the whole latrine may have been attributed to the abundance of shrubs, wood, bamboo and reeds in the areas of study. These materials are abundant and free hence mostly used as observed by the researcher in the captured photographs.

Abundance of materials in the area of study enabled respondents to have varied options.The findings are similar to those of Tefera (2008), which shows that use of locally available materials contributed a big deal to construction of pit latrines with all parts of latrine having aparticular material suited for.

Source of Locally available materials

The researcher sort to find out the main source of the locally available materials used by latrine owners because source shows the environmental friendliness of the materials hence the respondents were asked to indicate the main source of their locally available materials. The results are presented in the table below.

Table 4.23 Source of Locally available materials

Source of materials	Frequency	Percent
Bush/Forest	27	39.1
Fields	13	18.8
River banks	11	15.9
Trash Areas	5	7.2
Ruins	3	4.3
Total	59	85.5
Missing	10	14.5
Total	**69**	**100.0**

Table 4.23 shows that bushes or forest was the most common source of locally available materials with a frequency of 27(39.1%), 13(18.8%) got their materials from the fields, 11(15.9%) of the respondents indicated that they got the materials from the river banks, 5(7.2%) collected waste materials from thrush areas while another 3(4.3%) salvaged the materials from various ruins. The response rate to this query was 85.4% of the total. Bushes and forest are still dense in the areas owing to the low level of exploitation taking place which enable residents to have enough materials from these sources. Recycling materials from thrash and salvaging from ruins are seen by environmental cycles as means of environmental conservation.

Most of the sources mentioned were environmentally friendly and are similar to those of Deal &Watasa (2009), who indicated that reeds and logs from swamps and bushes are the best. Materials used for latrine construction did not require logging ormining making them environmentally friendly. According to Joseph (2014), there are several sources of locally available materials South Sudan. These include bushes, fields, swamps and riverbanks.

4.5.2 Entities that encouraged Owners to use Local materials

The researcher wanted to establish how latrine owners decided to use local materials, because not all respondent may have resorted on their own, that being so, the respondents were asked to mention who encouraged or showed them how to use locally available materials. Table below shows the results.

Table 4.24Source of inspirationto use locally available materials

Source of Inspiration	Frequency	Percent
Government Agencies	1	1.4
Health Practitioners	13	18.8
NGOs	40	58.0
Other Community Members	5	7.2
Total	59	85.5
No response	10	14.5
Total	**69**	**100**

Table 4.24 shows that 40(58%) were shown how to use locally available materials by non-governmental organisations, 13(18.8%) were supported to use locally available materials by health practitioners, 5(87.2%) were encouraged by other community members who had used them before and1(1.4%) got the encouragement from government agencies. The response rate was 85.5%.

Findings of this study show that Non-governmental organisations were the most identified proponent of use of locally available materials. These findings are similar to those by Barasa (2000), which indicated that NGOs have been instrumental in proposing and using alternative materials to construct cheap latrines.

4.5.3 Level of agreement on Influence of use of locally available materials on construction of pit latrines

The research wanted to elicit opinion of the respondents on level of agreement influence of use of local materials by NGOs on construction of pit latrines because the level of agreement indicates the confidence level. In view of this, the respondents were asked to indicate their level of agreement and the results were presented on the table below.

Table 4.25Use of locally available materials by NGOsinfluence on construction of pit latrines

Level of agreement	Frequency	Percent
Disagree	3	4.3
Neutral	9	13.0
Agree	23	33.3
Strongly agree	34	49.3
Total	**69**	**100.0**

Table 4.25 shows that34(49.3%) strongly agreed, 23(33.3%) agreed, 9(13%) were neutral and3(4.3%) disagreed that use of locally available materials by NGOs influenced construction of pit latrines. The response rate was 100%.Majority of respondents strongly agreed and another significant number agreed that use of locally available materials influenced construction of pit latrines. Campaigns by NGOs onCommunity total led sanitation (CLTS) have been influential in helping beneficiaries use locally available materials. The project which was studied had used the same approach. This complements findings by Tefera (2008), which shows that use of locally available materials contributed

a big deal to construction of pit latrines. The findings may be attributed to the several contributions made by NGOs in humanitarian support in the areas.

4.6 Technical capacity and training influence on Construction of Pit latrines

This sort examine the technical capacity possessed by latrine owners and how training influenced construction of pit latrines, various questions were posted to the respondents.

4.6.1 Personally constructed Latrine

The researched sort to know the number of latrine owners who personally constructed their latrines because this showed the technical ability and will possessed hence the respondents were asked if they constructed their latrineson their own. The findings are as tabulated below.

Table 4.26Personally Constructed Latrines

Owner constructed latrine	Frequency	Percent
Yes	22	31.9
No	47	68.1
Total	**69**	**100**

In table4.26, we can see that 47(68.1%) of respondents did not construct the latrines themselves and were constructed by other people while 22(31.9%) did construct the latrines themselves.The response rate was 100%. The results indicates that majority of the respondents did not construct the latrines on their own. This may havebeen because they either lacked the capacity or someone opted to construct for them. A significant number of respondents did construct latrines themselves showing some level of free will and presence of technical capacity. The findings are in agreement with findings by Balfour, Otieno, Mutai & Thomas (2014) which shows that majority of residence of South Sudan cannot construct latrines on their own owing to lack of construction skills.

Entity that Constructed Latrine for beneficiaries

The researcherdesired to know the entity that constructed latrines for the respondents who did not construct themselves because knowing the entity which constructed for them helps in identifying the most influential party in provision of construction services suited for construction of pit latrines. Hence respondents who indicated that they did not

personally constructed the latrines, were asked to state the entity which did the construction to them. The results are tabulated below

Table 4.27Entity that Constructed Latrine for beneficiaries

Constructor	Frequency	Percent
Local Artisans	10	14.5
NGO	33	47.8
Neighbors	4	5.8
Total	47	68.1
No Response	22	31.9
Total	**69**	**100.0**

Table 4.27 shows that 33(47.8%) latrines where constructed by Non-governmental organisations, 10(14.5%) of the latrines were constructed by local artisans, and 4(6.3%) were helped by neighbors to construct the latrines. The response rate was 68.1%.Majority of the respondents indicated that NGOs constructed the latrines for them. This may be because most NGOs have specific mandates and objectives and construction of latrines was one of them in this particular case. This is similar to some of the findings in other studies. Tefera's (2008) found that Non-governmental Organisations Constructed latrines for Vulnerable People in Ethiopia and supported non-vulnerable to construct simple pit latrines. However, the people in this study whose pit latrines were constructed by NGOs were not necessarily vulnerable.

4.6.2 Self-Satisfaction of Construction Capabilities

The researcher wanted to know if the latrine owners felt they were skillful because presence of skills helped in construction of latrines therefore;respondents were asked to state the level of satisfaction of their construction capabilities. The results are in table 4.27.

Table 4.28Self-Satisfaction of Construction Capabilities

Construction skill satisfaction level	Frequency	Percent
Very dissatisfied	4	5.8
Dissatisfied	18	26.1
Neutral	17	24.6
Satisfied	24	34.8
Very satisfied	6	8.7
Total	**69**	**100.0**

Table 4.28 shows that 24(34.8%) were satisfied with their construction capabilities, 18(26.1%) were dissatisfied with their capabilities, 17(24.0%) were neutral, 4(8.3%) were very satisfied and 3(6.3%) were very dissatisfied of their construction capabilities. Response rate was 100%.

The findings show that a good number of respondents were satisfied with their construction capabilities and a significant number were dissatisfied hence not many of the respondents were totally incapacitate in terms of construction. According to Balfour et al. (2014) some of the community members in South Sudan had some little skills and were confident that they can construct latrines.

Latrine owners who have received Training

The researcher wanted to know the number of latrine owners who had received training on latrine construction because there were some who had skills; therefore, the researcher asked them to state whether they had been trained. The results are tabulated below.

Table 4.29Latrine owners who had received Training

Received Training	Frequency	Percent
Yes	35	50.7
No	34	49.3
Total	**69**	**100**

Table 4.29 Shows that 35(50.7%) have received training on latrine construction while the remaining 34 (49.3%) had not received any training. The response rate of this query was 100%.

Presence of a good number of respondents may be attributed to trainings which had been conducted by TearFund in entire Aweil East between 2010 and 2011 (Kooy and Wild,

2012). According to Herbet (2010) there has been extensive training of rural communities on simple pit latrine construction in Ethiopia, South Sudan, Kenya and Uganda. However, the coverage is still low. This study found that about 50.7% of the respondents had received training on construction of simple pit latrines and the percentage is high because of the target population having been latrine owners.

Entities that trained Latrine owners

The research wanted to know the entity which contributed most to the training of latrine owners because this would help to know source of most training hence respondents were asked to mention the entity which had provided them with training. The results are as shown in the following table.

Table 4.30Entities That trained Latrine owners

Trained by	Frequency	Percent
Government Agencies	3	4.3
Health Practitioners	8	11.6
NGOs	22	31.9
Other Community Members	1	1.4
Training Institution	1	1.4
Total	35	50.7
No response	34	49.3
Total	**69**	**100**

Table 4.30 shows that Non-governmental organisations had trained 22(31.9%), health practitioners had trained 8(11.6%), government agencies had trained 4(4.3%) of the respondents, while community members had trained 1(1.4%) and finally training institutions had trained 1(1.4%). The response rate was 50.7% of total respondents. The findings indicate that NGOs trained most of the respondents. NGOs have been instrumental in training of latrine owners and construction workers in developing world. This agrees with Amaka (2010) who indicated that aid agencies have been instrumental in training of locals in developing world on construction of simple pit latrines. According to Boisson et al. (2014) onsite training of latrine construction providers by NGOS improves community latrine provision. Catholic relief Services has been training latrine owners on how to construct latrines too in Ethiopia and South Sudan (Herbet, 2010). All

this findings shows and agrees with the findings in this study that NGOs contribute most in training of latrine owners.

Does training Improve Technical Capacity

The researcher wanted to determine if the training improve skills of latrine owners, because training is aimed at improving technical capacity therefore; Respondents were asked to if the training improved their construction skills. The results are in table 4.31 below.

Table 4.31Training Improved Technical Capacity

Training Improved Technical Capacity	Frequency	Percent
Yes	32	46.4
No	3	4.3
Total	35	50.7
No response	34	49.3
Total	**48**	**100**

Table 4.31 shows that 32(46.4%) said training improved their construction skills while 3(4.3%) said it did not. Response rate was 100%. The results show that almost 100% of the people who had received training believed the training improved their construction skills. This may be attributed with effective training approaches.

According to Herbet (2010) training by Catholic relief services improved construction capabilities of beneficiaries greatly. This agrees with Amaka (2010) who indicated that training of locals in developing world on construction of simple pit latrines had helped to increase access to latrines owing to increased success stories. Results of this attest to the findings by other researchers that training improves construction skills.

4.6.3 Level of Agreement that NGO's Training influence construction of pit latrines

The researcher wanted to establish the level of agreement of respondents on the statement "Training of latrine owners by NGOs influence construction of pit latrines" because the level of agreement indicates the confidence level. Therefore, the respondents were asked to indicate their level of agreement and the results were presented on the table below.

Table 4.32Level of Agreement that NGOS Training influence construction of pit latrines

Level of Agreement	Frequency	Percent
Disagree	4	5.8
Neutral	6	8.7
Agree	29	42.0
Strongly agree	30	43.5
Total	**69**	**100**

From table 4.32, we can see that 30(43.5% strongly agreed that NGO's training influenced construction of pit latrines, another significant 29(42%) strongly agreed while 5(10.4%) were neutral and 3(6.3%) disagreed with the statement. Response rate was 100%.

There respondents who agreed and strongly agree were hence this shows that the statement was deemed true by many. This correspond findings by Boisson et al. (2014) who indicated that onsite training of latrine construction providers by NGOS improves community latrine provision.

4.7 Conclusions of the Study

The study concludes that Motivational activities by Non-governmental organisation influences construction of pit latrines. Motivational activities are instrumental for initiating latrine construction projects and are centered on health and hygiene camping. It is further concluded that there is presence and good access of latrines due to various motivational activities initiated by NGOs and other entities.

Provision of materials influences construction of pit latrines. Most rural communities like those in Akuem lack financial muscle to purchase materials used for construction. NGOs have played an important role in provision of materials which has in effect resulted in construction of pit latrines. Provision of materials also acts as a motivation towards construction of latrines especially for the poor households.

Use of locally available materials result if construction of pit latrines to completion. It was established that majority of latrines were completed by using locally available materials. Furthermore NGOs played key role in encouraging and guiding people to use

locally available materials hence Use of locally available materials by NGOs influenced construction of pit latrines.

Training of latrine owners was found to have only been done to a very small extent. However, those who had been trained (mainly by NGOs) expressed their satisfaction. Hence training improves construction skills of recipients. Training cannot end and this is seen by the large number of recipients who wanted to receive more training and also wanted other artisans to be trained even more. Majority of the m agreed that training influenced construction of pit latrines. This is evident in the number of respondents who expressed that they felt that their latrines were in good conditions. It is concluded that training of latrine owners by NGOs influences construction of pit latrines.

CHAPTER FIVE

SUMMARY OF FINDINGS AND RECOMMENDATIONS

5.1 Introduction

This chapter discusses key data findings of the research. Conclusions are drawn from the various finding and recommendations are made in respect to the conclusions and the focus of the study. Conclusions drawn and recommendations made were aimed at addressing the main purpose of this study which was to establish whether Non-governmental activities influences construction of pit latrines in Akuem Village, South Sudan. The specific objectives of this study were to examine how NGO motivational activities influenced construction of pit latrines in Akuem village South Sudan, to determine how Provision of materials by NGOs influenced construction of pit latrines in Akuem Village, South Sudan, to establish how use of locally available materials by NGOs influenced construction of pit latrines in Akuem Village, South Sudan and to evaluate how training of latrine owners influenced construction of pit latrines in Akuem Village, South Sudan.

5.2 Summary of the findings

The study revealed that majority of the respondents (residents) of Akuem had lived in the area for more than 10 years. It was also established that literacy levels were very low considering that majority of respondents had no formal education. On latrines status, most of the latrines were constructed to completion and were in good conditions; however, most household shared latrines with other households.

5.2.1 Non-Governmental OrganisationMotivational Activities Influence on Construction of Pit latrine

The first objective of this study was to examine how NGO motivational activities influence construction of pit latrines in Akuem village South Sudan. It was established that majority of the respondents had been motivated or urged to construct latrines most of whom would have not constructed. Of those who were motivated to construct latrines, majority had been motivated by NGO activities which campaign on health concerns was the most dominant. Hygiene campaign was the second most effective motivation activity among the respondents. On the influence of motivation activities on construction of pit

latrines, majority of the respondents agreed that motivation activities influenced construction of pit latrines in Akuem village, South Sudan. Interestingly, another considerably big number of respondents strongly agreed leaving only few who either were neutral or disagreed. The key indicator that there was motivational activities which led to latrine owners constructing latrines is the presence of latrines in 66 out of 69 households visited. It was also evident that the number of latrines completed through modification was 23 out of 69signaling improved local initiatives and limited supervision.

5.2.2 Provision of materials by NGOs influence construction of pit latrines

To determine how Provision ofmaterials by NGOsinfluence construction of pit latrines in Akuem Village, South Sudan.It was found that majority (66.6%) of respondents did not have any materials prior to construction of their latrines. However, the few who had materials mainly had those used for construction superstructure. It was also found that majority of those who did not have any materials did not have them because they perceived to be expensive. It was also determined that majority of respondents were provided with various materials which were used for construction of latrines. Majority of the respondents were provided these materials by Non-governmental organisations and materials for constructing slab dominated the list. Finally, it was determined that majority of respondents agreed that provision of construction materials influenced construction of pit latrines. There was evidence of bill of materials through various sections of latrines where the materials were used and majority being the slab. The number of material beneficiaries was 58 (84%). This is also indicated by the number of completed latrines which stood at 55 (79.7%).

5.2.3 Use of locally available materials by NGOs influence construction of pit latrines

The third objective was to establish how use of locally available materials by NGOs influence construction of pit latrines in Akuem Village, South Sudan. The research established that use of locally available materials was rampant among the respondent standing at 41(85.4%). Majority said they used locally available materials in one way or the other to construct their latrines. Locally available materials was used in all sections of

the latrines by the respondents, this was closely followed by those who used them for roofing only. The main source of these materials was found to be forest or the bushes. While some used these materials on own volition, majority were urged, encouraged or shown how to use them by various entities of which Non-governmental topped the list. We also established that majority of the respondents strongly agreed that use of locally available materials influenced construction of pit latrines.Sources of the materials were Bushes/forests, river banks and fields which were all environmentally friendly. However, some were salvaged from ruins and thrush areas which further helped in environmental conservation. The latrines which were modified and using locally available materials was another evidence standing at 16 and 22 totaling to 38 (79.2%) showing that there was effectiveness with use of locally available materials. None of the respondents bought the locally available materials but were just acquired from the surrounding areas.

4.2.4 Training of latrine owners influence construction of pit latrines

The final objective was to evaluate how training of latrine owners influence construction of pit latrines in Akuem Village, South Sudan. It was found that majority of the respondents did not personally construct the latrines; however, a good number did construct the latrines on their own. Of those who did not construct the latrines themselves, Non-governmental organisations was the leading entity which constructed for the respondents. It was further found that most respondents were satisfied with their construction capabilities. Half (50%) of them had received varied training on construction of latrines mainly from non-governmental organisations. They also thought that the trainings improved their construction skills. Finally, it was established that majority of the respondents agreed or strongly agreed that technical training influenced construction of pit latrines. The number of completed latrines was 55 (79.7%). The quality standards of latrines was high too with 19(27.5%) being fair, good being 24(34.7%) and 14(20.8%) were of excellent quality.

5.3 Recommendations

The study found out that Motivation activities Influence construction of pit latrines. It also found that health campaign was the main motivation activity. This research recommends that other agencies also take proactive part in motivating members of the

community to construct latrines using health campaigns and of shunning cultural defecation methods

I was also established that NGOs provided materials for construction of slab to latrine owners because they did not afford. This study should be an increased number of slabs being provided to households owing to its uniqueness and important role it play on a latrine. It further recommends that materials be subsidized so that more community members can afford to buy them and only rely to be provided with the most expensive only.

This study established that majority of latrine owners used locally available materials after being encouraged by NGOs. The study recommends that more members of the community especially the vulnerable should be helped to construct latrines using locally available materials hence increase access to cheap latrines in rural areas.

This study found that training of latrine owners greatly influenced construction of latrine resulting in good quality. It is recommended that the training should reach all the interested community members and not only artisans and latrine beneficiaries.

5.4 Recommendation for Further Research

From the study and related conclusions, the researcher recommends that further study should be conducted on the various types of locally available materials for construction of pit latrine. The study further recommends that research should be carried out on the appropriate technologies suitable for latrine construction before trainings are conducted.

REFERENCES

Abdul Rahman A. and Yahya A. (2006) Delay Mitigation in the Malaysian Construction Industry. *Journal of Construction Engineering and Management, 132(2),* 126-138.

Abogan S.O. (2014). Appraisal of Existing Sanitation Technology in Nigeria; A Critical Review. *Global Journal of Human-Social Science: Geography, Geo-Sciences, Environmental Disaster Management, 14 (1),* 1.

Alexander K. T., Oduor C., Nyothach E., Laserson K.F., Amek N., Eleveld A., Mason L., Rheingans R., Beynon C., Mohammed A., Ombok M., Obor M., Odhiambo F., Quick R., and Phillips-Howard P.A. (2014). Water, Sanitation and Hygiene Conditions in Kenyan Rural Schools: Are Schools Meeting the Needs of Menstruating Girls? *Water, 6,* 1453-1466.

Aljazeera, 2016). *South Sudan crisis: Renewed fighting in Juba*. Retrieved from http://www.aljazeera.com/news/2016/07/south-sudan-security-council-demands-ceasefire-160711043656662.html

Amaka G. (2010). *Documentation of CLTS Experiences with ASNANI in Nampula Province*. Water and Sanitation Program. Retrieved from http://www.communityledtotalsanitation.org/sites/communityledtotalsanitation.org/files/ASNANI_CLTS_report.pdf

Astill-Brown J. (2014). *South Sudan's Slide into Conflict: Revisiting the Past and Reassessing Partnerships.* Chatham House: The royal Institute of International affairs.

Ayele M. (2005). *Water is life, Sanitation is Dignity: Sanitation preference and household latrine designs*. WaterAid. Ethiopia.

Babalobi and Ogbeide 2007). *Capacity Assessmenton Bauchi State Water Board; Evaluation Study of the Plateau State Community Consultation Forums, 2007 and*

Research Study on Urban Water Sector Reform Programmesin Lagos and Cross River States. Lagos.

Babbie, E. (2002). *The basics of social research*. Belmont, CA: Wadsworth Publishing.

http://iomsouthsudan.org/tracking/sites/default/publicfiles/documents/NBeG.pdf

Balfour, Otieno, Mutai & Thomas (2014). *CLTS in Fragile and Insecure Contexts: Experience from Somalia and South Sudan.* United Nations Children's Fund. Eastern and Southern Africa Regional Office

Baruch, Y. 1999. Response rates in academic studies: a comparative analysis. Human Relations 52: 421–434.

Boisson, S., Sosai P., Ray S., Routray P., Torondel B., Schmidt W.P., Bhanja b., and Clasen Y. (2014). Promoting latrine construction and use in rural villages practicing open defecation: process evaluation in connection with a randomised controlled trial in Orissa, India. *National institute of health.* Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4236737/

Brikke, F., & Bredero, M. (2003). *Linking technology choice with operation and maintenance in the context of community water supply and sanitation.* World Health Organization and IRC Water and Sanitation Centre. Geneva: World Health Organization.

Bouchet F., Harter S., Paicheler J.C., Araujo A., Ferreira L.F. 2002. First recovery of Schistosoma mansoni eggs from a latrine in Europe (15-16th centuries). *J Parasitol88:* 404-405.

Burton S. (2013) *Toilets unblocked: A literature review of school toilets*. Scotland's Commissioner for Children and Young People.

Coe G. and Conly S. (undated). *Considerations for Building and Modifying Latrines for Access. USAID C-Change and WASHplus Projects*. Retrieved from http://www.washplus.org/sites/default/files/latrines-access.pdf

Concordis International (2012). *Crossing the Line: Transhumance in Transition along the Sudan-South Sudan Border*. Concordis International Report

Deal, R. (2010). *Sanitation Marketing Programme: Catalogue of Affordable Latrine Options. USAID Hygiene Improvement Project*. Plan Uganda, Kampala.

Deal R. & Watasa S. (2009). *In-depth Supply Assessment Report for the Sanitation Marketing Pilot – Tororo District Uganda*.

Deegener S., Samwel M. and Gabizon S. (2006). *Urine Diverting Toilets Principles, Operation and Construction.* Munich: Women in Europe for a Common Future.

Eisenhardt, K.M. (2002). Building Theories from Case Study Research. In: Huberman, A.M. And Miles, M.B. (eds.) *The Qualitative Researcher's Companion*. London: Sage.

Ethiopian Kalehiwot Church (2005). *Baseline Survey Report on Hygiene and Sanitation Practices of Communities in Goffa, Kucha, and Zalla Districts in SNNPR*, Ethiopia. August 2005.

Evans, B. (2005). *Securing Sanitation: The Compelling Case to Address the Crisis*. Stockholm: International Water Institute in collaboration with WHO.

Esray, S., Andersson I., Hillers, A. Sawyer R. (2001). *Closing the Loop Ecological Sanitation for Food Security*. United Nations Development Program, SIDA, Mexico.

Franceys, R. Pickford, J and Reed, R.A., (1992). *A Guide to the Development of On-site Sanitation.* Geneva: The World Health Organization (WHO), pp.120-7.

Fry D., Mideksa D., Ambelu A., Feyisa Y., Abaire B., Cunliffe K., and Freeman M.C. (2015). Adoption and sustained use of the arborloo in rural Ethiopia: a cross-sectional study. *Journal of Water, Sanitation and Hygiene for Development 5*, 3.

Hansch S. (2003). *What Does It Take To Put Together A Latrine Project?A Practical Guide For The Ngo.* American University.

Harvey, P. A. (2007) *Excreta Disposal in Emergencies: A field manual WEDC*. Loughborough University, UK.

Hebert, P. (2010). *Rapid Assessment of CRS Experience with Arborloos in East Africa*. Catholic Relief Services, Baltimore.

Hesperian (2012). *Building toilets; A Community Guide to Environmental health*. Retrieved from http://hesperian.org/wp-content/uploads/pdf/en_cgeh_2012/en_cgeh_2012_07.pdf

International Organisation for Migration IOM (2013). *Village Assessment Survey Report*. Juba . South Sudan.

Jimoh, S.O., Abhulimen U.I., and Kubeyinje, L.I. (2013). Importance of Engineering Materials inthe Mandate of Iron and Steel Industry. *International Journal of Scientific & Technology Research. Volume 2, Issue 12*, December 2013.

Joseph V. V. (2004). Water, sanitation and hygiene in South Sudan: what needs to be done to bridge the gap? *South Sudan Medical Journal. 7*. 2. Retrieved from http://www.southsudanmedicaljournal.com/assets/files/Journals/vol_7_iss_2_may_14/SSMJ_7_2_WASH.pdf

Jenkins MW, Curtis V (2005) Achieving the 'good life': why some people want latrines in rural Benin. *Soc Sci Med 61:* 2446–2459.

Kar K. and Chambers R. (2008). *Handbook on Community-Led Total Sanitation*. Plan International (UK). Retrieved from http://www.communityledtotalsanitation.org/sites/communityledtotalsanitation.org/files/cltshandbook.pdf

Kooy M. and Wild L. (2012). *Tearfund WASH service delivery in South Sudan: contributions to peace-building and state-building*. Overseas Development Institute. London.

Materu, L. and Mkanga, M. (2006). *Tracking the Progress of Latrine Provision by Small Scale Providers in Dar es Salaam.*Report prepared for WELL, EWAREMA Consult, Tanzania.

Mehta, L. and Bongartz, P. (2009). Community-led total sanitation (CLTS) across the seas: Experiences from Africa with a special emphasis on Ethiopia. RiPPLE Working Paper 12. RiPPLE: Addis Ababa.

Morella E., Foster V. and Banerjee S. G. (2008). *Climbing the Ladder: The State of Sanitation in SubSaharan Africa.* Washington: The World Bank.

Mugenda O.M. and Mugenda A.B (2003) Research Methods. Qualitative and Quantitative Approaches.Nairobi Act Press.

Mugira, F., (2012). Devoid of Words. A Story of Poor Latrines Told In Pictures. *Water Journalists Africa*. Retrieved From http://waterjournalistsafrica.com/tag/latrines-in-africa/

Muinde M. S. (2012). *An Investigation into the Issues Influencing The Use Of Interlocking Stabilised Soil Blocks In Kenya, A Case Study Of Siaya County* (Unpublished) University of Nairobi, Nairobi.

National Bureau of Statistics (NBS) and Office of Chief Government Statistician (OCGS), Zanzibar.2014. *The 2012 Population and Housing Census: Basic Demographic and Socio- Economic Profile;Key Findings*. Dar es Salaam, Tanzania: NBS and OCGS.

Newborne, P. and Welle, K. (2005). 'Sanitation and Hygiene: Knocking on new doors'. *ODI Briefing Paper No. 13*; December 2006.

Nichols, E. and Childs, J.H. (2009). *Respondent debriefings conducted by experts: a technique for questionnaire evaluation,Field Methods*, 21: 115–132.

Ntow S. (2012). *Community Total Led sanitation in Small Towns: A pilot Project in the Northern Region of Ghana*. Cowater International Inc.

OCHA, (2015). South Sudan: Cholera cases decline as aid agencies join forces to contain the outbreak. United Nation Office for the Coordination on Humanitarian Activities. Retrieved from http://www.unocha.org/top-stories/all-stories/south-sudan-cholera-cases-decline-aid-agencies-join-forces-contain-outbreak

Otieno P. (2012). *Community led total sanitation: Is the non-subsidy approach feasible in South Sudan?* Retrieved from http://www.communityledtotalsanitation.org/blog/non-subsidy-approach-feasible-south-sudan

Otieno P. (2012). *Community led total sanitation: How can poor communities make sustainable use of locally available materials without endangering the environment?* Retrieved from http://www.communityledtotalsanitation.org/blog/how-can-poor-communities-make-sustainable-use-locally-available-materials-without-endangering

O'Connell K. (2014). *What Influences Open Defecation and Latrine Ownership in Rural Households?: Findings from a Global Review*. Washington: The World Bank.

Pickford J. (1995). *Low-cost Sanitation: A survey of practical experience*. London: IT Publications. pp.25-8.

Polit, D.F. & Hungler, B.P. (1999). *Nursing research: Principles and methods*. 6th edition. Philadelphia: Lippincott.

Potter, J. (2003). Studying the standardized survey as interaction. *Qualitative Research. 3*: 269–278.

Reed B. (2012). *An engineer's guide to latrine slabs*. Loughborough University. Leicestershire.

Reed B. (2014). *Simple pit latrines*. Loughborough University. Leicestershire. http://wedc.lboro.ac.uk/resources/booklets/G025-Simple-pit-latrines-booklet.pdf

Reed B. (2014). *Latrine pit excavation and linings*. WEDC, Loughborough University, Leicestershire.

Ren Z., Atout M. and Jones J. (undated). *Root Causes of Construction Project Delays in Dubai. Built Environment Division*, Glamorgan University, Pontypridd, CF37 1DL. Retrieved from http://www.arcom.ac.uk/-docs/proceedings/ar2008-749-757_Ren_Atout_and_Jones.pdf

Still,D. & Louton B. (2012). *Piloting And Testing The Pour Flush Latrine Technology For Its Applicability In South Africa*. Water Research Commission. WRC Report No. 1887/1/12nRetrieved from http://www.wrc.org.za/Knowledge%20Hub%20Documents/Research%20Reports/1887-1-12.pdf

Sudan Tribune, (2016). *Northern Bahr el Ghazal in humanitarian crisis, thousands flee to Sudan.* Retrieved from http://www.sudantribune.com/spip.php?article58314

Tefera W. (2008). *Technical issues of Sanitation and Hygiene in Mirab Abaya and Alaba A case study report from the Southern Nations Region ('SNNPR') of Ethiopia*. Working Paper 2.

Ternstrom B.(2013). *Evaluation of Five Humanitarian Programmes of the Norwegian Refugee Council (NRC) and of the Standby Roster NORCAP*. Ternstrom Consulting

Tesfatsion Woldetsadik (2011). *Nutrition causal analysis Report, Aweil East County, Northern Bahr el Ghazal State, South Sudan.* Action against Hunger (USA), Juba, South Sudan.

The World Bank, (2012). *Formative Research to Identify Key Factors that Influence Adoption and Practice of Sanitation and Hygiene Behaviours in Kenya*. Nairobi: Ipsos Public Affairs.

Thomas J., Holbro N., and Young D. (2013). *A Review of Sanitation and Hygiene In Tanzania*. Maji Safi Kwa Afya Bora Ifakara.

Thys S, Mwape KE, Lefèvre P, Dorny P, Marcotty T, Phiri AM, et al. (2015). *Why Latrines Are Not Used: Communities' Perceptions and Practices Regarding Latrines in a Taenia solium Endemic Rural Area in Eastern Zambia.* PLoS Negl Trop Dis 9(3): e0003570. doi:10.1371/journal.pntd.0003570.

Tinsley R. (2015). Is reconciliation possible in South Sudan? *Transformations: where love meet social Justice.* Retrieved from

https://www.opendemocracy.net/transformation/rebecca-tinsley/is-reconciliation-possible-in-south-sudan

UNICEF and World Health Organization (2015). *Progress on sanitation and drinking water – 2015 update and MDG assessment*. WHO Press, Switzerland.

United Nation News Centre (2016), *News Focus: Sudan & South Sudan*. Retrieved from http://www.un.org/apps/news/infocusRel.asp?infocusID=88

Waddington H, Snilstveit B, White H, Fewtrell L. (2009). *Water, Sanitation and Hygiene Interventions to Combat Childhood Diarrhoea in Developing Countries*. New Delhi: International Initiative for Impact Evaluation.

Water and Sanitation Program-Africa (2004). *Sanitation and Hygiene in Kenya: Lessons on What Drives Demand for Improved Sanitation*. Retrieved from http://www.wsp.org/Hygiene-Sanitation-Water-Toolkit/Resources/Readings/af_kenya_hygiene.pdf

Winrock International (2012). *Aweil Centre County Profile and Strategic Plan. The Republic Of South Sudan Northern Bahr El Ghazal State Aweil Centre.* Winrock Q2 Report FY 2012

Wright A. M. (2009). *Improvement of the Health and Livelihood of Rural Communities in Southern Sudan and the Three Transitional Areas*. European Commission-UNICEF Project

Uddin S.M., Ronteltap M. and , Lier J.B. v. (2013). Assessment of urine diverting dehydrating toilets as a flood resilient and affordable sanitation technology in context of Bangladesh. *Journal of Water Sanitation and Development. (3)*. 2.

UNICEF (2014). Key Findings of a Sanitation Supply Chains Study in Eastern and Southern Africa. WASH Technical Brief.

Zakka C. (2007). Review of WaterAid Nigeria Urban and Small Towns Work in Plateau, Benue and Bauchi States.

Zou P.X.W., Zhang G. and Wang J.Y. (2006). Proceedings from Pacific Rim Real Estate Society Conference. *Identifying key risks in construction projects: life cycle and stakeholder perspectives*.

APPENDICES

Appendix I: Questionnaire for Latrine Owners

	QUESTIONS	RESPONSES	INSTRUCTIONS
1.0	INTRODUCTION AND BACKGROUND		
1.1	Village	……..	INDICATE IN FULL
1.2	Family position	Father……. Mother……	INDICATE IN FULL
1.3	For how long have you lived in Akuem?	Less than 1 year ..... 1 1-2 years …….2 3-5 years …….3 6-10 years ……4 Over 10 years …….. 5	
1.4	How old are you?	……. YEARS	INDICATE IN COMPLETE YEARS
1.5	What is the highest education level that you completed?	NONE …… 1 PRIMARY …… 2 SECONDARY ……..... 3 COLLEGE ……. 4 UNIVERSITY …….. 5	CIRCLE THE MOST APPROPRIATE CODE
2.0	Accessibility and Access to Latrines		
2.1	How difficult is it for you to access a latrine when you need to?	Not at all ……1 Not much ……2 A moderate amount …3 Very much……..4 An extreme amount …5	CIRCLE THE MOST APPROPRIATE CODE
2.2	Does your household have a latrine?	YES …….. 1 NO ……2	

2.3	Do you share the Latrine facility with other households?	YES …….. 1 NO ……..……2
2.4	If YES, indicate the number of households	2 3-5 6-10 More than 10
3.0	Motivational activities on latrine construction	
3.1	If YES, indicate by whom?	Government agencies……1 Health practitioners……...2 NGOs……3 Other community members…...4
3.2	Were you urged and/or supported to construct a pit latrine?	YES …….. 1 NO ……..…2
3.3	What were their main selling points which motivated you to construct a latrine?	1. ……..……. 2. …… 3. …… 4. ……
3.4	Indicate your level of agreement of the statement "Motivation activities influence construction of pit latrine"	❑ Strongly disagree ❑ Disagree ❑ Neutral ❑ Agree ❑ Strongly Agree
3.5	Is there any other way they can use to encourage more people to construct pit latrines?	YES……1 NO……..……2
3.6	If yes, state	……. ……. …….

3.7	Did you construct it to your satisfaction and completion?	YES……1 NO…….……2	
4.0	Provision of materials on Latrine Construction		
4.1	What is the status of your pit latrine?	Poor …….....1 Fair……..……... 2 Good……3 Excellent …….4	
4.2	Did you have the materials to do construction?	YES……..……1 NO……..……2	IF NO SKIP TO Q 4.5
4.4	IF YES, indicate materials for which section.	Pit lining...……1 Slab...……2 Superstructure...…….3 Roof ……..4 Door ……..5	
4.5	Why did you not have the materials?	They were expensive.……..……1 There were no hardware shops…2 Nobody gave us the materials….3	CIRCLE THE MOST APPROPRIATE CODE
4.6	Did you receive any materials support?	YES…….1 NO ……..2	IF NO SKIP Qs 4.10
4.7	Who supplied you with the materials?	Government agencies……1 Health practitioners……...2 NGOs……3 Other community members…...4	
4.8	Which section did you construct with the materials you were given?	Pit lining...……1 Slab...……2 Superstructure...…….3 Roof ……..4 Door ……..5	
4.9	How were you identified as the beneficiary of the materials?	Aged ……..1 Disabled …….2	

		Single Parent family……3 Pilot project ……4	
4.10	How did you complete your pit latrine?	It is incomplete ……1 I used local materials ……2 I modified the latrine…….3	
4.11	Indicate your level of agreement of the statement "Provision of materials influence construction of pit latrine"	❑Strongly disagree ❑ Disagree ❑ Neutral ❑ Agree ❑ Strongly Agree	
5.0	Use of Locally Available Materials on Latrine Construction		
5.1	Did you construct any part of you latrine with materials not bought or supplied by NGOs and other agencies?	YES……..1 NO……..……2	IF YES SKIP TO Q 5.3
5.2	IF NO, would you confirm that you had all the materials required for pit latrine construction?	YES……..1 NO……..……2	
5.3	Which materials were used to construct various parts of the pit latrines and were not supplied or commercially acquired?	Pit lining...……. …… Slab...……. …… Superstructure...……. …… Roof …….. …… Door …….. ……	
5.4	Where did you get the materials?	……	

5.5	Were the materials locally available?	YES……..1 NO……..……2	
5.6	Indicate if there are other materials locally available which you would use to construct various parts of the pit latrines?	Pit lining YES……..1 NO……..……2 Slab YES……..1 NO……..……2 Superstructure YES……..1 NO……..……2 Roof YES……..1 NO……..……2 Door YES……..1 NO……..……2	
5.6	Where did you get the materials?	…… ……..…….	
5.7	Were you encouraged or helped by anybody to use such materials?	YES……..1 NO……..……2	
5.8	If YES, by whom?	Government agencies……1 Health practitioners……...2 NGOs……3 Other community members…...4	CIRCLE THE MOST APPROPRIAT E CODE
5.9	Indicate your level of agreement of the statement "Use of locally available materials influence construction of pit latrine"	❑ Strongly disagree ❑ Disagree ❑ Neutral ❑ Agree	

		❑ Strongly Agree	

6.0	Technical Training on Latrine Construction		
6.1	Did you personally construct your latrine?	YES……...1 NO…… 2	IF YES SKIP TO Q. 6.6
6.2	If NO, who did it?	Local artisans……..1 NGO……..2 Neighbors…….3	
6.3	Indicate your level satisfaction with their technical capability?	Very dissatisfied ….....1 Dissatisfied ……..…..2 Neutral .…….…..…..3 Satisfied …….…...4 Very satisfied ……....5	CIRCLE THE MOST APPROPRIATE CODE
6.4	Is there any training required for artisans to perfect their construction skills?	YES……..…….1 NO……2	
6.5	If YES, State them	Masonry……1 Carpentry …….……2 Pit digging ……..3 General Construction ……4	
6.6	Are you satisfied with your construction capability?	Very dissatisfied ….....1 Dissatisfied ……..…..2 Neutral ……..…..…..3 Satisfied …….….....4 Very satisfied …….....5	CIRCLE THE MOST APPROPRIATE CODE
6.7	Have you received any technical training on pit latrine construction?	YES ……..…1 NO …….. 2	IF YES SKIP TO Q. 6.10
6.8	If YES, From whom?	Government agencies……1 Public Health promoters……...2	CIRCLE THE MOST

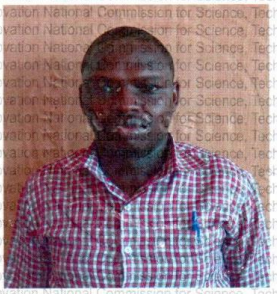
		NGOs……3 Other community members…...4 Training Institution……5	APPROPRIATE CODE
6.9	Did the training improve your technical capacity?	YES ……..…1 NO …….. 2	
6.10	Would you wish to undertake any training to improve your pit latrine construction skills?	YES ……..…1 NO …….. 2	
6.11	Indicate your level of agreement of the statement "Technical training influence construction of pit latrine"	❑ Strongly disagree ❑ Disagree ❑ Neutral ❑ Agree ❑ Strongly Agree	

THIS IS TO CERTIFY THAT:
MR. ERICK KIBET MUTAI
of UNIVERSITY OF NAIROBI, 1418-20200
Kericho,has been permitted to conduct
research in *All Counties*

on the topic: *INFLUENCE OF NON-GOVERNMENTAL ORGANIZATION'S ACTIVITIES ON CONSTRUCTION OF PIT LATRINES IN AKUEM VILLAGE, NORTHERN BAHR EL GHAZEL STATE, SOUTH SUDAN; A CASE OF SAMARITAN'S PURSE INTERNATIONAL RELIEF PROJECTS*

for the period ending:
5th July,2017

Permit No : NACOSTI/P/16/12346/12085
Date Of Issue : 6th July,2016
Fee Recieved :Ksh 1000



.....
Applicant's Signature

.....
Director General
National Commission for Science, Technology & Innovation