

**FACTORS INFLUENCING OPEN DEFECATION FREE STATUS IN  
AREAS PRACTICING COMMUNITY LED TOTAL SANITATION: THE  
CASE OF CHIWALA AND NKAMBO CHIEFDOMS OF MASAITI  
DISTRICT**

**BY**

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Requirements of the Degree of Master of Public Health-Environmental Health  
Science

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## **DECLARATION**

I, **Gertrude Kangwa** hereby declare that the work presented in this study as a requirement for the award of the Master Degree in Public Health at the University of Zambia, has not been presented anywhere, either partially or wholly for any other Master degree course and is not currently being presented for any other master degree award except where acknowledged.

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## CERTIFICATE OF APPROVAL

This dissertation of Getrude Kangwa on **Factors Influencing Open Defecation Free Status in Areas Practicing Community Led Total Sanitation: The Case of Chiwala and Nkambo Chiefdoms of Masaiti District** has been approved in partial fulfilment of the requirement for the award of the Degree of Master of Public Health-Environmental Health by the University of Zambia.

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## ABSTRACT

Zambia adopted Community Led Total Sanitation approach with the aim of ending open defecation and to reduce sanitation related diseases in the rural parts of the country. About 74.2 percent of households in rural areas have no pit-latrines as a result most of them either use the surrounding bush or cultivating areas. Furthermore, 80 percent of the diseases are associated with open defecation. The main aim of this study was to assess Open Defecation Free (ODF) status and factors that influence the sustainability of ODF status practices in Chiwala and Nkambo Chiefdoms of Masaiti District.

Concurrent study design was used which involved households survey of 368 households from the villages of Chiwala and Nkambo Chiefdoms that were either declared or verified to be ODF. Qualitative data was also collected from the same communities through focus group discussion, households in-depth interviews and key informants interviews of CLTS focal persons. Quantitative data was analysed using Excel and STATA version 13 while qualitative data was organised using NVivo Software version 10 and analyzed using a thematic method.

The study revealed that sustainability of Open Defecation Free (ODF) status was at 26 percent in Chiwala Chiefdom and 82 percent in Nkambo Chiefdom considering all the ODF indicators or criteria. It also showed that there was a reduction in sanitation related diseases. Participants also reported that it was more convenient to use the latrines because they were found within yard of house. The use of latrine was considered as a respectful practice, the increase in awareness of contamination of water sources were some of the factors suggested to have influenced ODF status. In addition, frequent visits by traditional leaders and sanitation Action Group members, reduction in sanitation related diseases and the role of traditional leaders-using punitive measures against offenders were motivating community members to sustain the ODF status. Some of the barriers of ODF sustainability status were inadequate water supply, inadequate supervision by traditional leaders and individual factors such as laziness and negative attitude. The study concluded that Nkambo Chiefdom had effective sustainability of ODF compared to Chiwala Chiefdom that had ineffective sustainability of ODF status.

**Key Words:** Community Led Total Sanitation, Open Defecation, Open Defecation Free, Barrier, Motivator and Hand Washing Facility.

## **DEDICATION**

I dedicate this research work to my mother Estella Nsofwa Chikutwe, Auntie Felistus Kasonde Musabanga, brothers and sisters for their encouragement, love, compassion, care and support which have necessitated the successful completion of this document. To them I say thank you very much and may the Almighty God continue to protect, guide and bless you richly.

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## ACRONYMS /ABBREVIATIONS

CATS	Community Approaches for Total Sanitation
CLTS	Community Led Total Sanitation
CSO	Central Statistical Office
DC	District Council
DHO	District Health Office
EHT	Environmental Health Technologist
HWF	Hand Washing Facility
JMP	Joint Monitoring Program
MDG	Millennium Development Goal
MLGH	Ministry of Local Government and Housing
MOCTA	Ministry of Chiefs and Traditional Affairs
MoH	Ministry of Health
NRWSP	National Rural Water and Sanitation Programme
OD	Open Defecation
ODF	Open Defecation Free
SAG	Sanitation Action Group
UNICEF	United Nation International Children Emergency Funds
W.H.O	World Health Organization
WSP	Water Sanitation Programme

## DEFINITION OF TERMS

**Barrier:** Obstacle towards the sustainability of open defecation

**Community Led Total Sanitation:** An integrated approach to achieving and sustaining open defecation free status without the support of any external hardware subsidy (Kar, 2008).

**Hand Washing Facility:** a container with a hole hanged upside down to a fork stick placed near the latrine.

**Motivator:** Stimulus for using latrine, hand washing Facility and maintaining Open Defecation Free status.

**Open Defecation Free Status:** When no faeces are openly exposed to the air in a village by ensuring Every household has improved pit-latrines and every member of the household uses it and every household has a hand washing facility is provided with water soap or ashes.

**Open Defecation:** Refer to defecating in the open and leaving the shit exposed

**Tippy taps:** A hand washing facility made from using either 5 or 2.5 litre containers, 2 or 1 litre water bottles provided with Foot-lever that allows the bottle to be tipped and water to come out of a hole in the front of the container

# CHAPTER ONE

## INTRODUCTION

### 1.1 Background

Community sanitation is a challenge which is universal. Since 1990, there has been a slight increase in the number of people accessing improved sanitation from 54 percent to 68 percent translating into about 2.4 billion people still not having toilets (Sah and Negussie 2009; Bongartz 2010; United Nations International Children Emergency Fund (UNICEF) and World Health Organisation (WHO), 2013). Some 842,000 people in low and middle-income countries die as a result of inadequate water, sanitation and hygiene each year representing 58 percent of the total deaths caused by diarrhoea diseases. Furthermore, diarrhoea has remained the major killer even though it is preventable. Better water, sanitation and hygiene would prevent deaths of about 361,000 of children below the age of 5 years (UNICEF and WHO, 2015). Open Defecation perpetuates the vicious cycle of disease and poverty. Therefore, countries where Open Defecation is most widespread have the highest number of deaths of children below the age of 5 years as well as the highest levels of malnutrition and poverty due to big disparities of wealth (UNICEF and WHO, 2015).

However, Sub-Saharan Africa has made slight progress, with sanitation coverage rising from 24 percent to 30 percent by 2015. In 47 countries, less than half of the population has access to toilets or improved latrines while hand washing has still remained low. Thus despite improvements gained in the 2015 Millennium Development Goals (MDG) targets to halve the proportion of the population without access to improved sanitation facilities, this has been missed by almost 700 million people (UNICEF and WHO, 2013).

According to Central Statistical Office (CSO) et al (2015), approximately 5.9 million Zambians have no access to improved sanitation with rural areas accounting for only 19 percent of households having access to adequate sanitation facilities. Thus lack of access to improved sanitation, safe water and inadequate hand washing facilities all contributes to the high prevalence of diarrhoea among children below the age of five years.



The Zambian Government with technical and financial support from Department for International Development (DFID), UNICEF and other partners are implementing the 3 Million Zambia Sanitation and Hygiene Program (3MZSHP). Community Led Total Sanitation (CLTS) programme is a key component. The programme aim is to contribute to the attainment of the millennium development goal on water and sanitation. Additionally, this was also to assist 3 million people consistently have improved sanitation facilities and adopt hygiene practices as well as provision of education through child friendly sanitation and hygiene facilities in schools, in rural districts (Yeboah-Antwi, 2014).

Community Led Total Sanitation (CLTS) approach was adopted to facilitate a process of empowering local communities to stop Open Defecation in order to build and use latrines without the support of any external hardware or subsidies (Kar and Chambers, 2008, Zulu et al., 2010; Morris-Iveson and Siantumbu, 2011). Therefore, the primary purpose of CLTS is to eliminate Open Defecation and motivate communities to adopt latrine usage. The success of this approach is shown by widespread achievements of creating Open Defecation Free (ODF) communities (Kar and Chambers, 2008).

The villagers are trained to facilitate triggering process in communities which causes them to realize that they are eating their own feaces because of lack of adequate pit-latrines and hand washing facilities in various communities. After triggering, the communities usually decide to form Sanitation Action Group (SAGs) or sanitation Champions to be responsible for monitoring sanitation activities such as building latrines and provision of hand washing facilities in the villages (Kar and Chambers, 2008). The champion with support from the Chiefs, Councilors and Environmental Health Technologist (EHTs) follow up triggered villages until they attain Open Defecation Free (ODF) status, verification and certification is conducted by Team comprises of D-WASHE members under delegation of Provincial – Department of Housing and Infrastructure Development (P-DHID).

The certification of the Chiefdom or village is approved if 90 percent or more of the households visited meet the ODF criteria. If the result of the certification procedure is positive, all villages in the Chiefdom with verification documentation will be certified. If less than 90 percent of the households visited meet the ODF criteria, then certification is not granted to the Chiefdom or

village, but new dates for repeating the certification procedure may be set. The figure below shows the typical flow of ODF process.

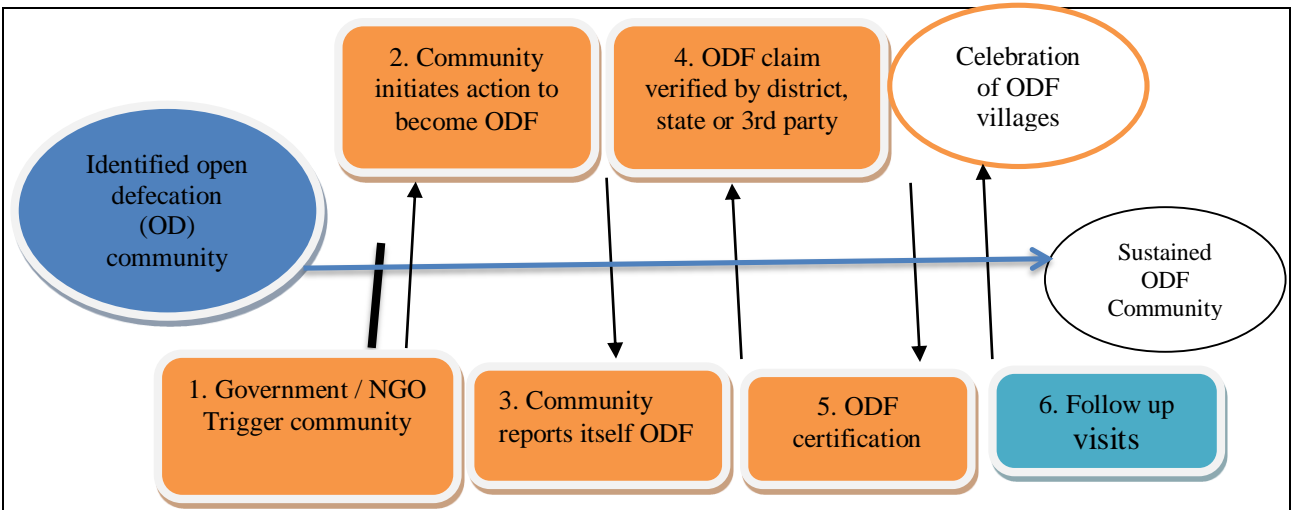


Figure 1: Typical Flow of ODF process, Thomas and Bevan, (2013)

According to Thomas and Bevan (2012), countries differ on the requirements for certifying communities to be ODF status. Zambia uses the latrine and hand washing related indicators (availability of latrine, signs of use of latrine, superstructure to provide privacy, latrine with smooth cleanable floor, drop hole cover, availability of hand washing facilities and water with soap/ash) for a community to attain ODF status (Morris-Iveson and Siantumbu, 2011; Thomas and Bevan, 2013)

When assessing ODF sustainability at community level the initial set criteria of ODF status certification is used to determine the sustainability of ODF status (Tyndale-Biscoe et al, 2013). Thus, failure to maintain the above mentioned indicators implies that a community has not sustained Open Defecation free status and therefore the members are considered to be eating each other's feaces or their own feaces (Kar and Chamber, 2008). As such, communities after achieve the ODF status are expected to use and maintain latrines in hygienic manner by replacing full pits and repairing damaged pit-latrines. Therefore, the communities must show signs of moving up the sanitation ladder by upgrading household latrines by providing slabs (Kar and Chamber, 2008). This study assessed factors that influence the sustainability of ODF status in ODF declared and verified villages of Chiwala and Nkambo Chiefdoms.

## **1.2 Statement of the Problem**

Zambian has not met the set sixty percent as a target for the rural households to have access to toilets and hand washing facilities with soap or ash by 2015 despite the government commitment to ensure Open Defecation Free (ODF) status countrywide by 2014 (Zambia Water and Sanitation Program (ZWSP), 2012). Furthermore, the access and use of improved sanitation in the country is still low (25.4 percent), with urban coverage being at 35 percent and 19 percent for rural areas (CSO et al, 2014).

A report by UNICEF (2013) revealed that since the introduction of CLTS in 2007 in Zambia, 8,000 out of 47,000 (17percent) village's country wide had been declared Open Defecation Free. Another ODF sustainability check by UNICEF in 2012 on the Eastern and Southern Provinces revealed that ODF sustainability was less than 10 percent while hand washing practice was 39 percent. Although this approach is being implemented in the district and a number of villages' certified to be ODF, diarrhoea still remains the third main cause of morbidity and mortality in the last three consecutive years especially in children (Masaiti DHO Action Plan, 2015). The low sustainability of ODF and hand washing is one of the probable contributing factors to the high incidence of diarrhoeal and other hygiene related diseases such as cholera, typhoid as well as environmental enteropathy in some communities of Zambia practicing Open Defecation (ZWSP, 2012). Information is scarce on the sustainability of ODF status and hand washing practices in Zambia particularly Masaiti district (UNICEF, 2013). It was therefore important that a study to assess factors influencing sustainability of ODF status was conducted in the villages that were certified to be ODF as a means of re-assessing ODF status.

## **1.3 Rationale of the Study**

This study is important because it acts as a means of assessing of ODF status in the previously declared ODF villages in the two Chiefdoms of Masaiti districts. Furthermore despites the villages being declaration ODF, scarcely information exist on sustainability of ODF status in the areas. It was therefore important assessing factors that influence sustainability ODF status in Chiwala and Nkambo Chiefdoms of Masaiti District. The information that has been obtained may assist community members, local authority and other Non-Government Organisations implementing the CLTS programme.

## **1.4 Research Question**

1. What is the ODF sustainability status in Chiwala and Nkambo Chiefdom?
2. What factors influence sustainability of ODF status in Nkambo and Chiwala Chiefdoms?

## **1.5 General Objective**

To assess factors influencing the sustainability of ODF status in Chiwala and Nkambo Chiefdoms of Masaiti District

## **1.6 Specific Objectives**

1. To assess the Open Defecation Free (ODF) status of Chiwala and Nkambo Chiefdoms of Masaiti district.
2. To explore the factors that influences the Open Defecation Free status in Chiwala and Nkambo Chiefdoms.

## **1.7 Conceptual Frame Work**

SaniFOAM conceptual framework has been identified as a helpful tool in analyzing behaviour toward sustainability of Open defecation free status. SaniFOAM stands for Focus, Opportunity, Ability and Motivation (Divine, 2010). In this study area of focus was the villages that were declared Open Defecation Free villages in Chiwala and Nkambo Chiefdoms of Masaiti. This was done to see whether the two Chiefdoms have sustained ODF or reverted OD. It looked at the factors that influence behavior towards sustaining ODF status under the subheadings of opportunity, ability and motivations as seen in figure 2. The determinants under the subheadings of opportunity, ability and motivation were discussed in accordance with the findings.

In this study, only some determinants under the subheadings mentioned above were found to be appropriate. These are access/availability, product attributes, sanctions/enforcement under opportunity while affordability and knowledge under ability. Other determinants were emotion/physical/social under motivation.

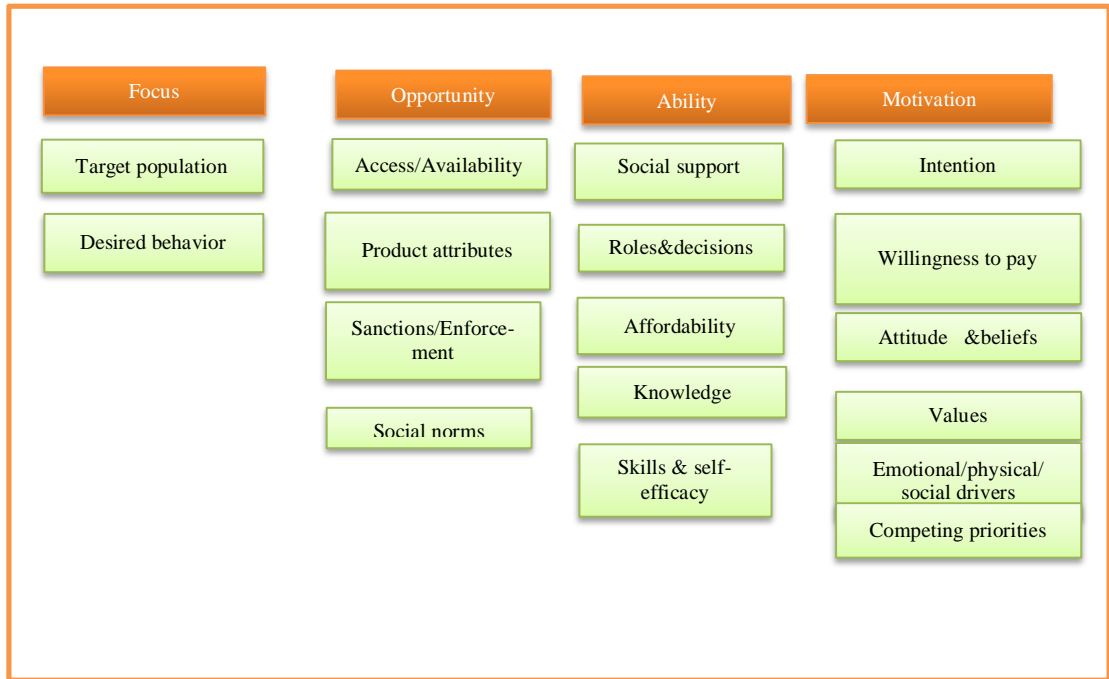


Figure 2: SaniFOAM Conceptual Framework

## **CHAPTER TWO**

### **LITERATURE REVIEW**

This section reviews literature that has been studies carried out worldwide, Africa as well as in Zambia. It focuses on Open Defecation Free status and the factors that influence the ODF status and motivating factors and barriers to adoption of hand washing practices.

#### **2.1 Open Defecation Free Status**

The ODF status sustainability problem has been observed in some countries. According to studies conducted in Bangladesh, Nepal and Nigeria on sustainability and equity aspect of total sanitation approach revealed that latrine coverage in communities that attained ODF status ranged from 15 percent to 93 percent. Similarly, in communities where ODF was to be achieved, ODF status ranged from 38 percent to 90 percent. This is evidence that Open Defecation was still practiced in villages despite being triggered almost at same period of time (Tyndale-Biscoe 2013; Evans et al, 2009). There were similar findings in the study conducted in Ethiopia, Kenya, Sierra Leone and Uganda on ODF status in 116 villages. Results indicated that 87 percent of the 4960 households still had a working toilet. The results further revealed that only 27 of the 116 villages had toilets while 89 villages had slippage rate between 2 percent and 57 percent (Cavill et al., 2015). The studies also revealed that CLTS was very effective for building simple pit latrines because none of the households had moved up the sanitation ladder.

Mukherjee (2009), Mehta and Bongartz (2009) and Venkataramanan (2012), all agrees that CLTS was very good uptake of latrines construction but doubted the sustainability of attained ODF status. Furthermore, the triggering process of CLTS was questionable because it failed to eliminate the pathways of faecal – oral diseases due to basic design of simple latrines (Bauby and Flachenberg 2014, and Mukherjee 2009). Similarly, a study conducted in Malawi revealed that CLTS did not yield significant result when compared with the initial latrines coverage to the time when study was being conducted (Phiri et al 2015:3). These studies are inconsistent with findings of Wardoyo (2010), showed that availability of latrines reduced the incidences of diarrhoeal diseases. Thus according to Bramley and Breslin (2010), the failure of ODF sustainability was because of ineffective monitoring that weakened the potential of the initiative.

## **2.2 Technological Factors that Influence the ODF Status**

According to studies conducted in Indonesia and Cambodia revealed that there was little data on latrine quality, durability and sustainability of ODF status as well as technology (UNICEF 2013). The other issue of concern was the provision of technical advice to villages and individual households on the construction of simple latrines using local materials so as to develop the sense of ownership, commitment and innovation (Kar, 2008). Hence, lack of technical advice during latrine construction often resulted in badly constructed latrines because of using non-durable materials and poor designs. Furthermore, this led to unhygienic conditions, pit collapse and latrine abandonment (Bevan, 2011). Similar concerns were raised on the regular repair and rebuilding costs faced by rural households that used non-durable sanitation facilities. This was because poor households had to repair and rebuild their sanitary facilities on a fairly regular basis (WSP, 2011; and Bevan 2011), particularly those living in areas experiencing heavy rainfall and seasonal flooding or high groundwater levels. However there was little evidence on the costs of repairing and reconstructing latrines and unnecessary burden placed on the poor (Plan Nepal 2007; UNICEF 2011, and Robson, 2012). According to Bauby and Flachenberg (2014), Community Led Total Sanitation and Participatory Hygiene and Sanitation Transformation (PHAST) approaches when used together proved to be very effective in raising awareness on the importance of accessing improved sanitation and increasing the willingness to build latrines without any incentives. According to Plan Nepal (2007), UNICEF (2011) revealed major enablers and barriers of sustainability ODF status as availability of land, materials, labour, local soil & ground conditions, technical advice and knowledge.

## **2.3 Social, Cultural and Economic Factors Influencing ODF Status**

The social, cultural and economic factors affect the ODF and hand washing practices. These include cultural norms, taboos, values and human attitudes. A study conducted on open defecation in rural communities on cultural values that reinforced its practice revealed that open defecation was surrounded by cultural taboos and beliefs that were particularly related to ethno-linguistic groups who lived within the same area (Water Aid, 2008).

The study conducted by Routray et al., (2015) in rural coastal Odisha revealed that constructing of latrines by male heads was for their female members especially newlywed, daughter-in-law whom

they believed that they spent a lot of time at home. Providing a latrine also meant protecting and preserving dignity, privacy and security of their new daughter-in-law/bride. The beliefs that faeces are impure also caused some people to consider using the toilet within the house as 'sin' because idols and pictures of gods that are revered are kept and worshiped in every house and having toilets within and near the house made the entire house impure (Laungani, 2007).

A similar study by Arku (2010), it shows that about 92 percent of the respondents believed that clean water was more important than toilet facilities. This was in addition to the facts that people were unable to construct toilets because it was not part of their culture to pay money to use toilet facilities. Furthermore, the impact of social norms on safe disposal of faeces was also associated with open defecation because some community members felt that they were influenced by others to defecate in the bush with belief of being good. This situation led to the old, weak and sick people without support end up disposing their excreta badly (Devine, 2010).

According to Mafuya (2010), people in the rural community believed that the use of toilets was of western origin and therefore prefer using the bush. A study conducted in Malawi revealed that some people went back to open defecation because they believed that it was a taboo to mix faeces with in-laws (UNICEF, 2012). In a similar study conducted in Zambia, revealed that In-laws, different generations and opposite gender were some of the barriers to using the toilets Lawrence et al, 2014).

In addition, lack of funds was also the major economic factor contributing to unsafe sanitation. To either build a new or maintained the existing structures was a challenge (Mafuya, 2010; Tyndale-Biscoe et al, 2013). Devine (2010), also revealed that households with strong financial pressures usually place less value on sanitation and were not motivated to acquire a toilet facility. According to Tyndale-Biscoe et al., (2013) and Cavill et al., (2015) revealed some of the motivators for maintaining ODF status as privacy, security, convenience and comfort while de-motivators were financial constraints, lack of support, maintenance and frequent repairs. However, health was perceived as construction and sustainability of latrines because of reduction in the number of visits they made to the health facilities which resulted in saving of time and money (Tyndale-Biscoe et al, 2013; Cavill et al, 2015).



## **2.4 Environment and Ecological Factors that Influence ODF Status**

According to Hanchett et al (2011) as cited by Civill et al. (2015) in Sustainability and CLTS: Taking the Stock' revealed that frequent harsh conditions (cyclones, floods, tidal surges, monsoon rains, landslides or tornados) led to pits collapsing and this discouraged people from constructing new toilets and either reverted to OD or constructed toilets of poor standards. Similarly, according to Morris-Iveson and Siantumbu (2011), revealed similar results, in a study conducted for example in Siywa village in Kaoma district of Zambia, the village was declared ODF in late 2010, however due to heavy floods 24 out of 33 toilets constructed under CLTS collapsed. Thus as a result of this some households decided against re-constructing of latrines as they felt it was too much trouble.

People who stay near the body of water such as seas, lakes, rivers and streams, undermine the adoption and continued use of toilets because these body of waters are convenient for OD and cleansing. Furthermore, lack of space to replace or dig new toilets in densely populated areas also diminished ODF status sustainability (UNICEF, 2013). The study further revealed that 57 percent of households did not use latrines in areas previously declared ODF while 28 percent either practiced digging and bury or share latrines (UNICEF, 2013).

## **2.5 Hand Washing Practice**

Globally, the prevalence of hand washing was 19 percent (WHO, 2013) while in the Sub-Sahara Africa it was between 3 percent and 29 percent (Curtis et al. 2009; and Tyndale-Biscoe et al., 2013). These findings are similar to those conducted by UNICEF (2012) in Southern, Chipata and Copperbelt provinces of Zambia that showed that the hand washing coverage was less than 29 percent. Hand washing with soap is the cheapest and simplest way of diseases prevention and it also known to reduce the occurrence of gastro-intestinal infections, respiratory infections, trachoma, helminths and skin infections in poor settings (Curtis, 2007 Fung and Cairncross 2008). Hand washing with soap is an important component of good sanitation and hygiene. Thus when a community is not practicing hand washing, it means that community is not considered to be ODF (Mehta and Bongartz, 2009).

## **2.6 Factors Influencing Hand Washing Practice**

According to Devine et al. (2010); the availability of water and soap at centrally located place was some of the drivers of hand washing. Therefore, people who had access to water and soaps practiced hand washing after using toilets compared to those who had difficulties in accessing the commodity. According to (Devine, 2010) setting hand washing as a priority was difficult because communities significantly feared HIV/AIDS and malaria compared to diarrhoeal disease because of the belief that it did not causes death (WSP , 2007).

A study conducted in Senegal on Global Scaling up of Hand washing project, indicated that women who had good knowledge of key hand washing times understood the importance of hand washing with soap (Devine et al., 2010) Another study that was conducted in Ghana revealed that nurture, social acceptance and disgust of faeces and especially their smell were some of the motivators of hand washing (Scott, 2007). Thus maintaining of hand washing and keeping toilets hygienic depended on the availability of water (Civill et al., 2015).

Furthermore, in another study that was conducted in Uganda on hand washing also indicated that hand washing with soap at critical time was not a common practice either in the general community or in schools. This was despite history of promotional activities around water, sanitation and hygiene (WSP, 2007). It also revealed that the levels of hand washing with soap for children (6-13 years) after defecation at home was lower than at school suggesting that the school environment facilitated hygiene behavior, possibly due to constant reminders and peer influence.

## **CHAPTER THREE**

### **METHODOLOGY**

This section explains the various methods that were used in the study; study design, study site and population, sampling methods and sample sizes, data collection techniques and tools. Furthermore, it looked at data quality control, data processing and analysis as well as ethical consideration.

#### **3.1 Study Design**

A Concurrent design was used in this study; both quantitative and qualitative data was collected concurrently (Cresswell and Clark 2006). This was because quantitative data was for generalization while qualitative data was for in-depth understanding of the community perspective on the ODF sustainability. The triangulation was done at discussion since the two sets of data were collected and analysed concurrently. The researcher collected data from the same villages. Quantitative data was to meet objective one while qualitative data was to meet objective two. Quantitative and qualitative data was collected together for a period of one month (from 16<sup>th</sup> November to 20<sup>th</sup> December 2017). Quantitative data was collected in the last two weeks of the month of November and Qualitative data was collected in December. This was done in order to reduce participants' bias which could influence the participant's responses during the focus group discussion Luzzo (1995) as cited by Cresswell and Clark (2006). Quantitative data was collected by the Principal investigator with help of 3 research assistance while qualitative data was collected by principal investigator.

#### **3.2 Study Site and Population**

The study was conducted in Chiwala and Nkambo Chiefdoms located in Masaiti district. District covers a total area of 5,383 km<sup>2</sup> with a total population of 103,857 people of which 51 percent are male and 49 percent female. The district has 20,511 households of which 4,466 are female headed with an average household size of 6 persons (CSO et al, 2010). The total households in villages where the study was conducted are 2557.

The district shares borders with six districts and one international border with the Democratic Republic of Congo. There are three Chiefdoms in the district, Nkambo, Mushili and Chiwala. The

main economic activity in Masaiti is small scale agriculture, engaged in; crop production, poultry and livestock as well as fish farming with the main crops being maize, sorghum, groundnuts, sweet potatoes, beans and cassava. The education level of Masaiti population attained primary education is 61.4 percent for male and 30.7 percent for female. The low levels of education among women in the district may be attributed to early marriages. Thus according to CSO, et al (2010), this situation hinders female participation and advancement as men dominate access and control production such as; land, finance, poverty, decision making and power.

The study population was villages in Chiwala and Nkambo Chiefdoms with households being the sampling unit.

Table 1: Dependent and Independent Variables

Variables	Indicator	Scale of measurement
Dependent		
ODF sustainability status	The percentage of households with the presence of; latrine, signs of usage, drop hole cover, privacy, smooth and cleanable floor, hand washing facilities with water and soap/ash	Ordinal <ul style="list-style-type: none"> <li>• Low ODF status = Below 50%</li> <li>• Medium ODF status = 50% - 89%</li> <li>• High ODF status = (Above 90%)</li> </ul>
Independent (Explanatory) Variables		
Age	Age of Respondents	Continuous
Gender	Being male or female	Nominal
Marital status	The state of being Single, married, Divorced/ separated , widow/widower	Nominal
Educational level	Highest level of education attained per each respondent	Nominal
Occupation	Source of income for livelihood per each household	Nominal
Household size	Number of persons residing per each household	Continuous

### 3.3.0 Phase 1: Quantitative Component

#### 3.3.1 Sample size calculation

The following formula was used to calculate the sample size for households:

$$n = \frac{NZ^2p(1-p)}{e^2(N-1) + Z^2p(1-p)}$$

Where:  $e = 0.05$  (precision at 5 percent)  $N = 2557$  (Population of households in the two chiefdoms),  $Z = 1.96$  (95% level of confidence)  $P = 0.19$  proportion of the population having the condition of interest  $n = 216$  Households, Design effect of 1.7 (CSO et al, 2015)

Therefore the sample size will be:  $216 \times 1.7 = 368$

#### 3.3.2 Sampling

Cluster sampling method was used; villages were used as clusters and households as sampling unit. Chiefdoms were randomly sampled using probability proportion to their sizes. A list of villages that were declared to be ODF (villages that met the ODF criteria) was made for both Chiefdoms. Thus a total of 23 villages (clusters) were selected, 11 in Chiwala and 12 Nkambo Chiefdoms. The lists of households in the villages were obtained both from Community leaders and from the Health Centers, Environmental Health Department. An equal number of households (16) were sampled for participation in each village. A total of 176 households were sampled in Chiwala Chiefdom and a total of 192 of households in Nkambo Chiefdom which brought the total sample size to 368 households. To select the households for participation in the survey, a simple random sampling was used. A total number of the head of households were written on the small piece of papers were folded and placed in the box, then shaken and thereafter the names were picked until the 16<sup>th</sup> household was reached.

#### 3.3.3 Data Collection Methods

An observation checklist was used to check for indicators of ODF status at household level, availability of latrines, signs of using the latrines, presence of drop hole covers, provision of privacy, latrines with smooth cleanable floors and presence of hand washing facilities with water and soaps plus other hygiene related parameters.

During the quantitative data collection the Researcher used the Chiefs as the gate keeper through the help of Ministry of Chiefs and Traditional Affairs (MOCTA) instead of Headmen who could have informed their subject about the research to be conducted in the villages in advance hence provide needed requirements. This was done in order to have a true picture of what was happening in the villages in terms of ODF status.

### **3.3.4 Data Analysis**

Data collection tools were reviewed by the principal investigator at the end of each data collection day and checked for accuracy as well as completeness. A descriptive analysis was used. Quantitative data were used to generate descriptive information such as proportion and frequencies. These were used in evaluating and making comparisons between the different variables of the study.

The community coverage of adequate latrines and hand washing facilities were calculated as the number of households with adequate latrines divided by total number of households in the community. Similarly, coverage of hand washing facilities was also calculated as number of households with hand washing facilities divided by the total number of households. A household was considered as having adequate latrine if it was provided with a drophole cover, cleanable floor as well as a superstructure. ODF status sustainability was also calculated as number of households in villages that had adequate latrines and hand washing facilities with soap/ashes. Analysis was performed using Microsoft excel and Stata vision 13 to assess the current ODF sustainability status and results from this study was compared with previously certified and verified ODF status. Villages that were 90 percent and above were the only villages that qualified to be certified ODF. Villages with households below 50 percent that met all ODF indicators were classified as low ODF status while villages with households 50 percent to 89 percent were classified as medium ODF status and above 90 percent as high ODF status.

## **3.4.0 Phase 2: Qualitative**

### **3.4.1 Sampling and Data Collection**

All the participants for Focus Group Discussion (FGDs), In-depth Interviews at household levels and key-informants interviews were recruited purposely. Participants who were recruited were those who lived in the villages since 2009 when CLTS was introduced in the Chiefdoms.

Additionally, people who were believed to have information about their communities and they were willing to share. Participants for FGDs and In-depth interviews were recruited from the villages where the FGDs were conducted with the help of the Neighborhood Health Committee Chairpersons from the Health Centres. Villages where FGDs and In-depth interviews conducted were Ndikele, Ulu and Chamina of Nkambo Chiefdom while Kawama, Chiwala and Chamunda Villages in Chiwala Chiefdom.

The FGDs and interviews participants consisted of male adults and female adults who were either married or unmarried. The age of the participants for FGDs ranged between 22 years to 77 years while that of the In-depth interviews conducted at community level ranged between 30 years to 70 years. The selected participants were informed of the study a day before the day of the FGD and in-depth interviews to enable participants prepare for the interviews. The FGDs were conducted by the Principal Investigator with two experienced assistants that observed and recorded dynamics of the groups during the discussion. During the FGD discussion, participants were allowed to discuss given themes and emerging ideas were probed further until there were similar responses from the participants.

### **3.4.2 Data Collection Tools**

The data collection tools that were used in this study was unstructured questionnaire for In-depth interviews, interview guides for FGDs and semi-structured for Key informants. These tools were used to collect data to meet the qualitative objectives.

### **3.4.3 Focus Group Discussion**

Six Focus Group Discussions were conducted in total in ODF sustained and reverted villages. Three FGDs were conducted in Nkambo Chiefdom and other three in Chiwala Chiefdom. One FGD was conducted at Chamina village and consisted of headmen and headwomen who were drawn from seven villages of Nkambo Chiefdom. The other two FGDs were conducted in Ulu and Ndikele villages with both male and female participants. In Chiwala Chiefdom; three FGDs were conducted, one in each Village that is Chiwala, Kawama and Chamunda villages. FGDs were conducted to obtain wealth detailed information and deep insight on the factors that influence ODF status and also the motivating and barriers to adoption of hand washing. FGDs participants range from six to ten people and were conducted for not more one hour 30 minutes.

### **3.4.4 Key Informants Interviews**

Semi-structured questionnaires were used to facilitate interviews with individual experts CLTS focal person from the two Chiefdoms. The key informants provided rich information on factors that contributed to maintaining ODF or go back to OD, motivating and barriers to adoption of hand washing with soap. The key informant questions were similar to those asked during the focus group discussion, but was phrased using more open-ended language and probed deeper into the intentions motivations and barriers related to maintaining the ODF status and adoption of Hand washing practices (DiCicco-Bloom and Crabtree, 2006).

### **3.4.5 In-depth Interview**

Six In-depth interviews were conducted at household level within villages that has sustained their ODF status and those that reverted. This was because data saturation was reached as participants continued to give the same responses during the interviews. The purpose of conducting In-depth Interviews was to have deeper insights on factors that influence ODF status and know the motivators and barriers to adoption of hand washing practices. It helped exploring key motivators and opportunities that are present in ODF communities.

### **3.4.6 Analysis of Qualitative Data**

NVivo software was used to manage data and the analysis process. The thematic analysis was used to analyze qualitative data after verbatim transcription. Thematic analysis refers to search for themes that come out as being important to the description of the phenomenon (Fereday and Muir-Cochrane, 2006). After data collection, it was transcribed and entered into the NVivo software to aid the Principal Investigator in organizing and examining the possible relationship. Figure3 shows the study design from data collection to discussion.



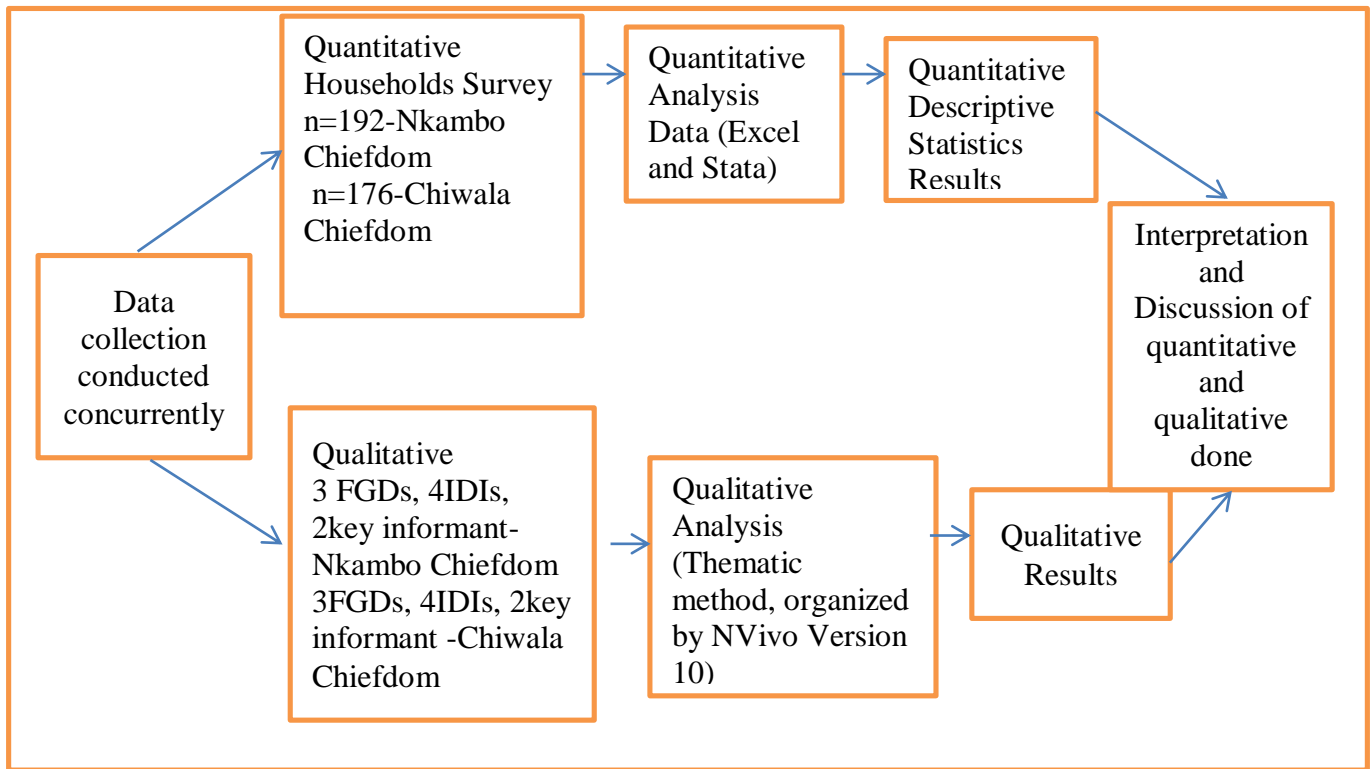


Figure 3: Study design

### 3.4.7 Data Quality Control and Validity

All interviews were voice recorded with recording device and stored on the computer to enhance accurate analysis of data. During interviews, handwritten notes were also taken, including non-verb reactions of participants. The validity of data was checked throughout the research project. According to Denscobe (2003), indicates that there was no absolute way to verify if the interviewee was honest or not in an interview particularly if the interview concentrated on their perception or feelings. Thus, the Researcher used various ways of proving the data to ensure that validity is enhanced.

### 3.4.8 Inclusion Criteria

The households in the villages that were certified /verified to be ODF from 2009 to 2015 were included in the study. The households that moved from elsewhere to come and lived in sampled villages and they had stayed in sampled villages for more than 1 year were included.

### **3.4.9 Exclusion Criteria**

Households with no eligible respondents (children or people with less than 18years old) were excluded from the study.

### **3.4.10 Pre-testing of Data Collection Tools**

Pre-testing data collection tools were conducted in Mushili Chiefdom which had similar characteristic as for study site. The data collection tools were pre-tested with the view of seeing the effectiveness of the tools and the time the interviews were taking. The pre-testing of data collection tools revealed that some questions were difficult to be interpreted into vernacular language. The problem was rectified by re-phrasing them in the manner that was easy to interpret to the local languages.

### **3.4.11 Ethical Considerations**

This study was carried out according to the stipulations set forth by the Research Ethical Committee. It was explained to the participants that participating in the study was voluntary without any requirements and they were free to withdraw from participation any time they felt like stopping. Further, the participants were enlightened on the benefits and any psychological harm as well as discomforts to their satisfaction prior to being interviewed. The explanations were done in Bemba and Lamba languages that were best understood by the participants.

Consent from participants was obtained and confidentiality was strictly maintained by not indicating the name on the questionnaire and all data was secured under lock and key. Permission was also sought from the Masaiti District Health Office, Masaiti District Council, Chiefs and Head men from the villages where this study was conducted. Lastly the researcher sought approval from ERES Converge IRB.

## **CHAPTER FOUR**

### **STUDY FINDINGS**

#### **4.1 Findings of Quantitative Component**

A household's survey with zero non response rates, the findings are presented using graphs and frequency tables.

##### **4.1.1 Demographic Characteristics of Study Participants in Chiwala and Nkambo Chiefdoms**

The table 2 shows that in Chiwala Chiefdom male respondents were 69 (39.2 percent) while the female respondents were 107 (60.8 percent) compared to 130 (67.7 percent) male respondents and 62 (32.3 percent) female respondents in Nkambo Chiefdom. In this study, the majority of respondents in Chiwala Chiefdoms were between 18 years and 35 years old while in Nkambo Chiefdom the respondents were between 46 to 55 years old. This implies that data was collected from reliable male and female adults. In terms of education level of participants, the majority (52.3 percent) in Chiwala and 56.5 percent in Nkambo Chiefdoms had reached primary education. In both chiefdoms most of the participants were married, in Nkambo Chiefdom, 76 percent of participants were married while in Chiwala Chiefdom 78 percent were married . The majority of participants indicated that they were subsistence farmers with 61.9 percent from Chiwala Chiefdom and 70 percent from Nkambo Chiefdom. The majority of respondents had households sizes that ranged from 4 to 6 with Chiwala Chiefdoms, having 47.2 percent and Nkambo having 40.6 percent.

Table 2: Demographic Characteristics

<b>Demographic Characteristics</b>	<b>Chiwala Chiefdom</b>		<b>Nkambo Chiefdom</b>	
	N=368	n=176	100%	n=192
<b>Gender</b>				
Male	69	39.2	130	67.7
Female	107	60.8	62	32.3
<b>Age</b>				
18-35	52	29.6	21	10.9
36-45	48	27.3	59	30.7
46-55	46	26.1	68	35.5
55+	30	17.0	44	22.9
<b>Education</b>				
No Education	15	8.5	3	1.6
Primary Education	92	52.3	116	56.5
Junior Secondary	34	19.3	43	10.4
Senior Secondary	30	17.1	20	13.6
Tertiary	5	2.8	10	5.2
<b>Marital Status</b>				
Single	16	9.1	25	13
Married	134	76	150	78
Window/Widower	16	9.1	12	6.3
Divorced/Separated	10	5.7	5	2.6
<b>Occupation</b>				
Trade/Self employed	33	18.8	15	7.8
Unemployed	18	10.2	20	10.4
Famer	109	61.9	135	70.3
Employed	16	9.1	22	11.5
<b>Household Size</b>				
1-3	32	18.2	40	20.8
4-6	83	47.2	78	40.6
7-9	42	23.9	55	28.7
9 and Above	19	10.8	19	9.9

### 4.1.2 Open Defecation Free Status in Nkambo and Chiwala Chiefdoms

Table 3 shows the households ODF status in the two Chiefdoms. A total of 368 households were surveyed, 54.9 percent of households sustained the ODF status and 45.1 percent did not sustain.

Table 3: Households ODF status in Nkambo and Chiwala Chiefdoms

Household ODF status	Frequency	%
ODF sustained	202	54.9
ODF not sustained	166	45.1
Total	368	100

### 4.1.3 Indicators of Open Defecation Free Status in Nkambo and Chiwala Chiefdoms

A total of 368 households were surveyed in both Chiefdoms, 192 were in Nkambo in 12 villages and 176 were sampled in Chiwala Chiefdom in 11 villages.

In Nkambo Chiefdom, figure 4 indicates 99.1 percent of households had toilets and 98.4 percent were using the facilities. It was also observed that in this Chiefdom 95.8 percent of households provided drop hole cover to prevent flies entering the pit-latrines and 94.8 percent of households had latrines with smooth cleanable floor. The pit-latrines that were provided with superstructure to provide privacy to the user were 96.9 percent. The households that were provided with hand washing facilities were 90.1 percent and those where water and soaps or ashes were observed had 88.5 percent. Figure 4 shows the ODF indicators.

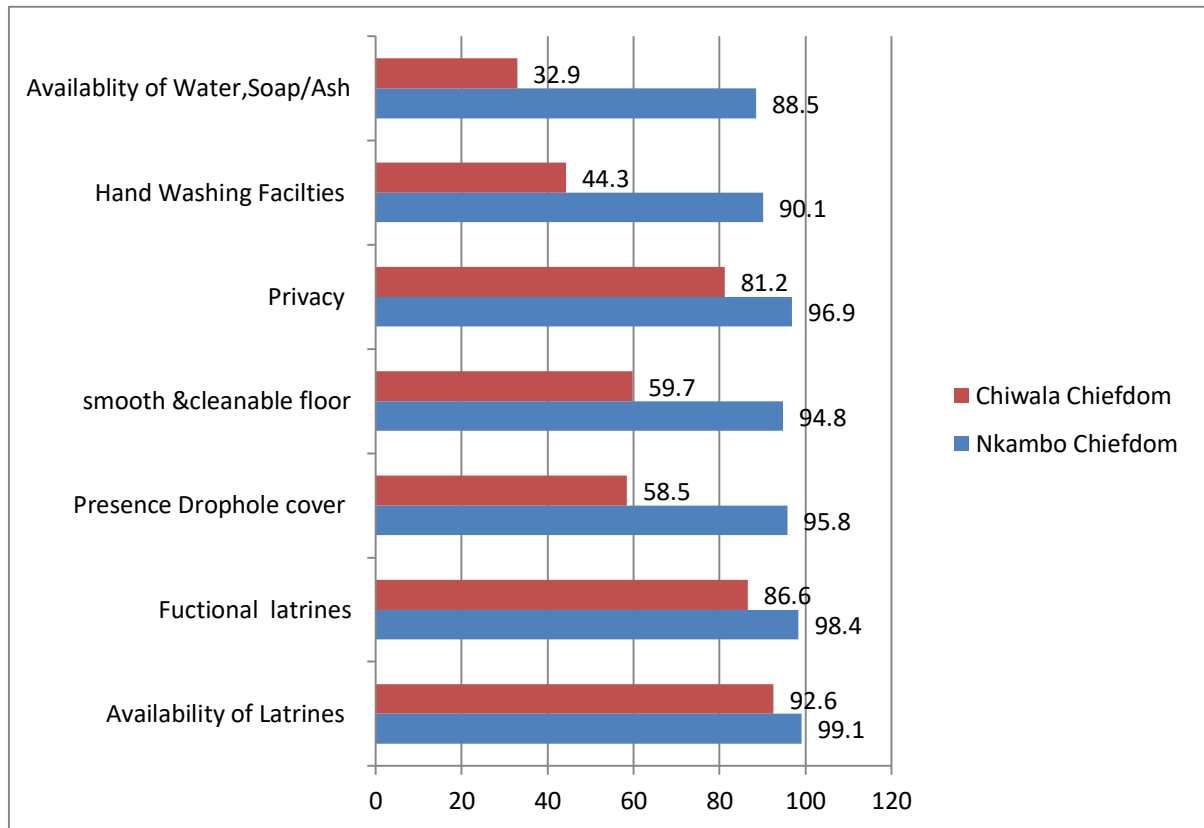


Figure 4: Percentages of ODF status in Chiwala and Nkambo Chiefdom

In Chiwala Chiefdom, 92.6 percent of households had toilets and 86.6 percent of those toilets were being used. Furthermore, 58.5 percent had drop hole covers, 59.7 percent had smooth cleanable floor and 81.2 percent were provided with superstructure to provide privacy. The households that provided hand washing facilities were 44.3 percent and 32.9 percent of these facilities were provided with water and soap/ashes.

#### 4.1.4 Open Defecation Free Status in Villages of Nkambo and Chiwala Chiefdom

The study revealed that in Chiwala Chiefdom, of the 11 villages surveyed, nine (81.2 percent) recorded low ODF status, two (18.2 percent) recorded medium and no Village recorded high ODF status. In Nkambo Chiefdom, a total of 12 villages were surveyed and one (8.3 percent) showed low ODF status, two (16.7 percent) showed medium ODF stand and nine (75 percent) of villages

indicated high ODF status. Table 4 shows the performance of villages in ODF status in the Chiefdom.

Tables 4: Villages that sustained all ODF Status indicators of Chiwala and Nkambo Chiefdoms.

Chiefdoms	No. of Villages	Low ODF status No. & %	Medium ODF status No. & %	High ODF status No. & %
Chiwala n=11	11	9 (81.8%)	2 (18.2%)	0(0%)
Nkambo n=12	12	1(8.3%)	2(16.7%)	9(75%)

#### 4.1.5 Open Defecation Free Status in Chiwala and Nkambo Chiefdoms

The findings in Nkambo Chiefdom indicated that 157 (82 percent) households had sustained the ODF while 46(26 percent) of households in Chiwala Chiefdom sustained the ODF status as shown in figure 5.

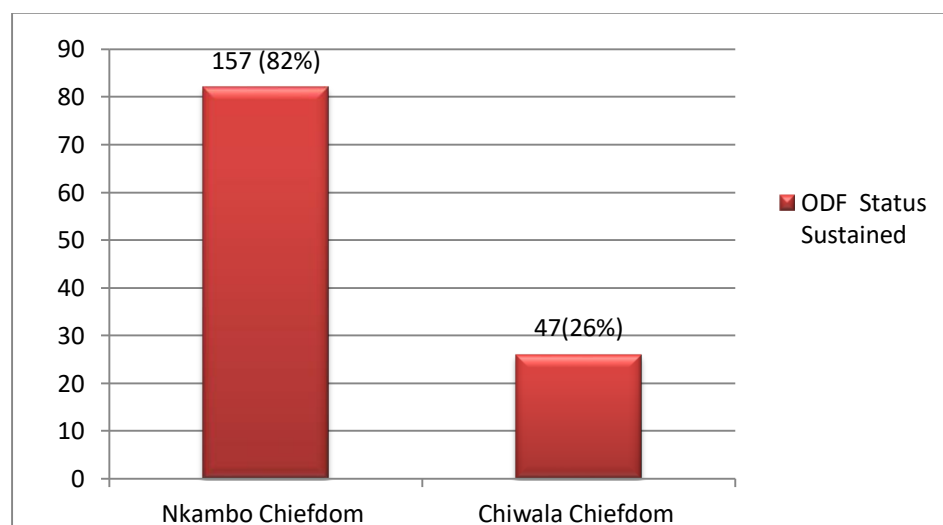


Figure 5: Open Defecation Free sustainability Status in Chiwala and Nkambo Chiefdoms

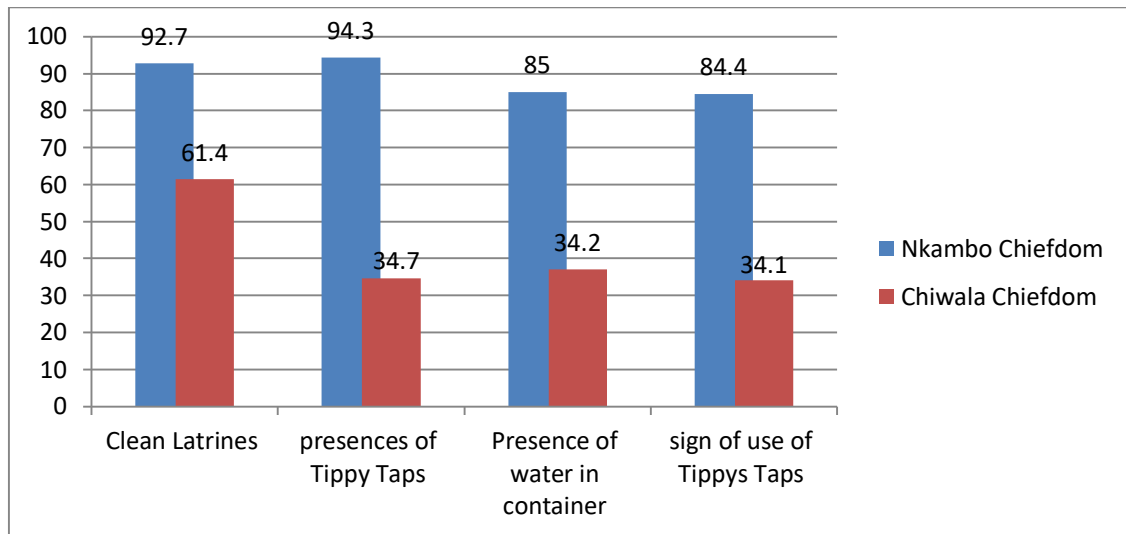


Figure 6: Percentages ODF status related indicators

The study revealed that in Nkambo Chiefdom 92.7 percent of households were found with clean pit-latrines while in Chiwala Chiefdom only 61.4 percent had clean pit-latrines. The most common hand washing facilities that were observed and used in both Chiefdoms was Tippy taps, (84.4 percent in Nkambo Chiefdom and 34.7 percent in Chiwala Chiefdom). On the amount of water found in the hand washing facilities, 85 percent of households had their hand washing facilities provided with water in containers while in Chiwala Chiefdom 37 percent of households had their hand washing facilities with water in the containers.

## 4.2 Findings of Qualitative Component

### 4.2.1 Factor influencing Open Defecation Free Status

Table 5 illustrates the themes that were consistently mentioned by the participants. The most salient factors influencing sustainability of Open Defecation Free status that emerged from the Focus Group Discussions and In-depth interviews conducted in the two Chiefdoms.



Table 5: Factors Influencing Sustainability of ODF Status

Factors Influencing Sustainability of Open Defecation Free Status (ODF)	
Enablers/ Motivators	Barriers
<ul style="list-style-type: none"> <li>• Availability of toilets and hand washing facilities</li> <li>• Cultural and economic status               <ul style="list-style-type: none"> <li>✓ Reduction of sanitation related diseases</li> <li>✓ The use of toilets and hand washing facilities classified as respectful practice</li> <li>✓ The need to effectively manage the welfare of visitors</li> <li>✓ Role of community leadership - punishment by the Chiefs</li> <li>✓ Convenience</li> </ul> </li> <li>• Environmental factors               <ul style="list-style-type: none"> <li>✓ Increased awareness regarding contamination of water</li> </ul> </li> <li>• unsightly and nuisance smells</li> <li>• Frequent Supervision by traditional leaders and Sanitation Action Group members (champions)</li> </ul>	<ul style="list-style-type: none"> <li>• Environmental factors and Limited resources.               <ul style="list-style-type: none"> <li>✓ High Temperature</li> <li>✓ Financial Challenges</li> <li>✓ Inadequate Water Supply</li> </ul> </li> <li>• Goats and termites spoiling hand washing facilities</li> <li>• Inadequate storage container for Tippy Taps</li> <li>• Inadequate transport for supervision and monitoring</li> <li>• Inadequate Supervision by Head men and Head women</li> <li>• Individual factors (attitudes and laziness)</li> <li>• Selling metal drop hole toilet covers to unscrupulous business men.</li> </ul>

#### 4.2.2 Availability of Key Indicators

Qualitative data are presented in themes and sub-themes as shown in table 5 and 6. Verbatim quotations have been used to strengthen qualitative findings.

During the qualitative data collection, participants reported that in both Chiefdoms, households had functional pit-latrines. The pit-latrines were commonly constructed using local available materials such as mud bricks, for the super structure, grass for covering the roofs and wooden rod for making the slabs. In Nkambo Chiefdom, most pit-latrines had smooth and cleanable floor. Pit-latrines had drop hole covers to prevent the flies from entering and leaving pits. Additionally, hand washing facilities, water with either soap or ashes were provided. These were what a 62 years old man and 32 years old woman said:

*“At present many people have tippy taps and toilets. The toilets are molded nicely and look very clean just as they taught us that the toilet is not supposed to be dirty because if you are in the toilet, you should see that even if you carried food, you could eat. Unlike the way it was in the past. The toilets these days are just like those in town.”* (FGD, Nkambo Chiefdoms)

*“....most people did not have toilets and also the issue of putting tippy taps was not there, but at the moment since they are teaching us and so most of us we have.”* (32 years old woman, ID, Nkambo Chiefdom)

In Chiwala Chiefdom, the study revealed that most of the households had pit-latrines and were in use although few provided drop hole covers with smooth and cleanable floors. However on the contrary most of the households did not provide Hand washing facilities and water with either soap or ashes. A 40 year man of Kawama village stated that:

*“The reason why I said that we defeated Open Defecation is because there are very few people who do not have toilets. The toilets we have, but such as lids, hand washing facilities we do not have, because when people are drunk, they think that those things are useless, so they remove them from the place where they were fixed.”*(FGD, Nkambo Chiefdoms)

### **4.2.3 Reduction in Sanitation Related Diseases**

The study finding in Nkambo and Chiwala chiefdoms revealed that disease prevention in the communities were the main reason people in these communities used and maintained the pit-latrines clean. In these Chiefdoms most participants narrated that previously before the introduction of CLTS approach, people used to suffer from diarrhoeal diseases such as Dysentery and diarrhoea. However, participants reported that because they were practicing what they were taught that is using of latrine and maintaining them in the hygienic manner. The people experienced reduction

in diarrhoeal diseases and influenced the ODF status in the positive way. They added that people were no longer using same dishes for washing hands, washing utensils and vegetables because they knew that doing so would lead to diseases. Thus, there were reduction of people suffering from this diarrhoeal diseases and this motivated the people to continue using the hand washing facilities. The following are examples of what participants said influenced them to sustain ODF status in these areas that were implementing CLTS approach.

*“Hand washing has brought us cleanliness in our villages. When I come from the toilet or whenever my hands are dirty, I wash hands and then go and touch other things. That way, I prevent diarrhoeal diseases and I have very good health. Now, if I do not wash hands that dirt will bring to me and others diarrhoea or cholera, Like during this rain season with mangoes. When I come from the toilet and immediately I touch a mango that may bring about diarrhoea.”* (Female Adults, IDI, Ndikele village- Nkambo Chiefdom)

*“We appreciate the latrine in that one it has led to the fewer diseases in the community, in past there were lots of diarrhoeal diseases you can see even now, for example if you can go to the nearest clinic here at Chiwala secondary school the cases of diarrhoea have gone down because of stopping open defecation in our villages.”* (Male Adult in Chiwala village - Chiwala Chiefdom during FGD)

#### **4.2.4 Cultural and Economic Factors**

##### **4.2.4.1 The Use of Toilets Classified as Respectful Practice**

Most of the participants indicated that people who had toilets were given respect in the community by fellow adults and children. The participants reported that it was very shameful for adults to be seen going to defecate or be found defecating in the bush. Toilets with a superstructure enabled privacy to the user. Thus, these prompted the community members to continue using and keeping their toilets clean. Participants revealed that it was embarrassing to use another households pit-latrines and people had lost respect especially men. Hence, people continued to build the toilets and providing of the necessary requirements for the pit-latrines. This can be seen from the comments made during the focus group discussion by some participants who said:

*“.... but if I use a toilet it bring respect, I go and hide, no one is going to see me and say ‘there he is seated’ which make it a respectful house, it has got respect. Even though I live*

*in the big house and yet I go in the bush and people see me, then that is the end of respect.”*  
(52 years man in Ulu Village-Nkambo Chiefdom)

#### **4.2.4.2 The Need to Effectively Manage the Welfare of Visitors**

Participants from both Chiefdoms reported that, some household owners constructed and maintained pit-latrines because of visitors. This is because they felt embarrassing for visitors if they had no toilets especially when they received in-laws. According to cultural, not having a pit-latrine indicated that the family was not responsible. Furthermore, most participants revealed that having a pit-latrine brought happiness when they received visitors; as they had nothing to worry about but direct the visitor where the pit-latrine was located with pride. The participants also reported that in-laws were very free to use the same toilet without hesitation like in past. They further added that what was important was to knock before entering the latrine. This was what 58 years woman explained:

*“...In the past what used to happen was sad, when a visitor comes and asks that ‘where is the toilet’ you would be pointing at the neighbors that ‘there it is’ I used to feel bad but now each house has a toilet with a tippy tap, soap or ashes, so even when visitor come, even if he is from town, I do not worry, because we are living well in this village.”* (58 years Woman of Chamunda village, Chiwala Chiefdom during FGD)

#### **4.2.4.3 Role of Community Leadership - Punishment by the Chiefs**

In Nkambo Chiefdoms, it was reported that the chief played a very important role in ensuring that his people built toilets and practiced hand washing. The Chief was sometimes involved in door to door monitoring, supervision and chaired the Sanitation meetings in villages. It was also revealed that people who had no hand washing facilities were reported to the Chief for punishment. This encouraged people to continue with CLTS activities such as putting up hand washing facilities, constructing adequate latrines and keeping surrounding clean because of fear to be reported to the Chief for punishment. This was what was said by some participants:

*“... those who have no pit-latrines and no hand washing facilities, we call them to be warned for not constructing toilets and not providing Tippy taps and that you are bringing problems in my village. Therefore I am taking you to the palace to be punished for not constructing a toilet and putting up Tippy taps. So if I tell them that they fear and construct”*  
(Head Woman - Chiwala Chiefdom during FGD).

*“..Some toilets during rainy season fall down, sometimes toilets collapse inside but the wall remain standing, because of not putting strong rods after digging and not covering the roofs, in the past when toilets collapsed, we did not rebuild, people used to ignore but nowadays there are people who pass through and they are building because they are scared of being punished by the chief”* (Woman in Chamina Village - Nkambo Chiefdom during FGD).

#### **4.2.4.4 Convenience**

The participant reported that during rainy season it was very convenient to use the toilet than the bush. The use of toilets also prevented them from the risk of being bitten by snakes and allowed them to use the toilets any time without any difficult. This was what the two participants narrated.

*“It has brought us goodness because we have toilets and not a situation of going in the bush, for example when the rain finds you in the bush then I come back running without finishing defecating. But now it’s at home, we even have something to cover on top and even if the rains find me while in toilet, it’s ok because it is my toilet. And also, it is not wet inside but dry and clean”* (Woman of Ndikele Village-Nkambo Chiefdom during FGD).

#### **4.2.4.5 Increased Awareness Regarding Contamination of Water Sources**

Participants revealed that in the past, people did not know that when they defecate in the bush that same faeces were ending up in the shallow wells and other water sources during rainy season. They reported that after being taught, they understood that open defecation led to contamination of water source, this influenced them to continue construction and the use of the toilet including hand washing practices in the villages. This can be confirmed by the following reports by some participants who said:

*“Those faeces we used to defecate anyhow used to go in the water, and when it goes in the water when we go and fetch, we used to be sick of diarrhea. Because when rain water comes, it used to go in the wells. So, when we used the water to drink, we used to be sick of diarrhea and cholera. But now that we have been taught, we have toilets diarrhoea and cholera have reduced.”* (58 years old woman of Chamunda Village-Chiwala Chiefdom)

*“..besides that during rainy season, when we had big downpour, because we were using the wells, open wells, the runoff water used to go into the wells as result the water we were drinking was not clean, we needed some chlorine to purify it but now we have served the cost of chlorine and because of this we have continue sustain the ODF”* (63 years old Man of Ulu Village-Nkambo Chiefdom).

#### **4.2.4.6 Unsightly Condition and Nuisance Smells**

The study revealed that unsightly condition and nuisance smells influenced people positively, because it has led to working hard to maintain Open Defecation Free status in the villages. In Nkambo Chiefdom people reported that before they introduced CLTS programme there was lot of excreta and nuisance smells along the streets and near the houses, these attracted flies. Community members have seen the benefits of maintaining ODF status and hence they do not think of going back to Open Defecation. Some participants during the focus group discussion had these to say:

*“I am very happy because in the past the smell which used to come from the areas and near streets where people defecated was horrible, even if the route was the shortest between the two places, we could not pass through but we were forced to divert to a longer route to avoid the area were people were defecating.”* (63 year old Man of Ulu Village-Nkambo Chiefdom).

*“...the flies were so much that whenever someone were eating food they had to use a mosquito net to avoid flies landing on foods but currently situation is that the flies are not many and the smells are no more. We have been encouraged by what is happening now because we have seen change in our villages.”* (54 years old Man of Ndikele Village-Nkambo Chiefdom during IDI)

#### **4.2.4.7 Frequent Supervision and Monitoring SAG (Champion) and Tradition Leaders**

In Nkambo Chiefdom the participants reported that the Chiefs, headmen and women together with SAGs members worked vigorous in ensuring that each household had adequate latrine and hand washing facilities with either soaps or ashes. Furthermore, these traditional leaders and SAGs members were involved in door to door supervision and monitoring. Because of their involvement the villagers got encouraged and saw the significant of practicing hand washing and continued

providing hand washing facilities. This is one of example of many quotes that indicated that the traditional leaders and SAGs were very active. This is what was said: from a

*“... The people, who were chosen in our villages, are working very hard and they do not get tired of going round, after two weeks they come round to encourage us. If they find someone who do not have a tippy tap, they encourage her and she puts it in place, after two weeks again they come round, that’s what has made our village to continue to have good looking latrine and tippy taps, this motivates us.”* (Female Adult,FDG Chamunda village Chiwala Chiefdom)

### **4.3.0 Barriers of Open Defecation Free Status sustainability**

#### **4.3.1 Inadequate Water Supply**

In Nkambo Chiefdom, water was the main barrier to practicing hand washing, it was mentioned by almost all the participants that water sources were very far from the villages. People walked long distances to access water. Some participants for example reported that they were walking 3 to 5 kilometers to fetch water for domestic use. Even though water was a problem in the two Chiefdoms, it was reported more in Nkambo Chiefdom especially in the dry season, beginning from September to December when wells dry up. This made it difficult maintaining latrines clean and practicing hand washing because waiting for long period for people return from fetching water. A Male adult narrated during FGD:

*“The challenges we are experiencing here is only water, but we do work so hard that we continue practicing washing hands and be clean but water is a big challenge that we have. Imagine a situation where people are walking 1km just to have water, others in the other villages walk up to 3km or even 5km to go and fetch water.”* (54 years man Ulu village in Nkambo Chiefdom).

### **4.3.2 Goats and termites spoiling hand washing facilities**

In Chiwala Chiefdom, the study revealed that most of the households did not have hand washing facilities because goats and termites destroyed the tippy taps. This led to some people getting tired of fitting the hand washing facilities. The goats were eating tablet soaps meant for washing hands and also bring down the fork rods were the storage water were fixed. Additionally, fork rods were eaten by the termites. These hindered the people from practicing hand washing. This is what man had to say during IDI:

*“...the rods are a problem because you can put a container to fork rods but the termites eats the rods. Thus, you will find that the containers have fallen down and the stick and string connected to the container are out. So putting fork rods becomes a bother, it is a big problem.”* (Man-Chamunda village Chiwala Chiefdom)

### **4.3.3 High Temperature**

In both Chiefdoms, the study revealed that plastic containers which were direct located on sunlight and remained without water for some time were easily breaking because of high temperature. Furthermore, Participants in Chiwala Chiefdom reported that they were high temperature in the area because of deforestation due farming and mining activities being experienced in the area.

*“...Just as we were saying that the problem of water has become very big in this Nkambo Chiefdom, because of not putting water frequently in the container causes it to break due direct exposure to sun light. When a container rarely has water breaks because of the sun.”* (FGD, Chamina village Nkambo Chiefdom)

### **4.3.4 Inadequate Storage Container for Hand Washing Facilities (Tippy Taps)**

Participants in the two Chiefdoms acknowledged that drunkards were stealing and selling of containers to taverns owner for use to sell opaque beer. This was attributed as a barrier to hand washing because some people could not manage to replace the container once it was stolen by these people and made them to stop practicing hand washing.

*“Containers are difficult to find, that problem is here in the village for stealing containers for tippy taps. It is happening, people with tavern do send the drunkards to find them containers, if he sees that there is no one in view for example children, they gets and goes. But some do not just have the containers”* (Chamina village Nkambo Chiefdom).



### **4.3.5 Lack of Transport for Supervision and Monitoring**

The key informants reported that there was inadequate transport to conduct supervision and monitoring continuation of CLTS activities in the Chiefdoms to enhance ODF status. This led to the reduction of supervision and monitoring visits to villages. The key informants revealed that they had no motor bikes to use for supervision and monitoring of the CLTS activities in villages that are very far.

*“The challenges we face in our own capacity as focal persons is just the distances in this household I mean villages we go to visit, you find that maybe from where we are here the furthest villages is about 20 kilometer to 23 kilometer, so this is why I said that we go in the village to monitor the champion once twice in the month because we look at the mode of transport. We cannot walk because of long distances” (CLTS Focal Nkambo Chiefdom).*

### **4.3.6 Financial Challenges**

The study revealed that some participants in both Chiefdoms had challenges in replacing water storage containers for hand washing when they are stolen or damaged. This was because the only place they would find containers was in town which was far from the villages. In addition, they needed finances for transport and purchasing containers. The study also revealed that few people managed to buy the 5 or 2.5 liters container of cooking oil, so that they could reuse the containers for storing water for hand washing. This is because most of the people have money once in the year when they sold their farming products such as maize to government. This led to some people picking 75ml water bottle that were thrown by-passers along the road. Furthermore, some participants also complain of lack of money to buy soap and ended up not practice washing hands. These were the quotes from Ulu and Kawama villages during the FGD:

*“You see in the villages most of us manage to have money after one year, when plant then sell. So, we really fight very hard so that we can have soap; we try hard most of the times because if you have soap, it’s a sign of cleanliness. If you wash without soap, then there is nothing that you have removed from the hands.” (Female adult, ULu Village- Nkambo Chiefdom)*

*“...I do not wash my hands when there no tippy tap with soap I will just go” (Man Kawama village - Chiwala Chiefdom).*

### **4.3.7 Inadequate Supervision by Traditional leaders**

Most of the participants pointed out that there was inadequate supervision and monitoring in Chiwala Chiefdom. Participants in this Chiefdom blamed the headmen and women for failure to pay particular attention to their work in the villages. The headmen and women were not reporting the people that did not comply with putting up the hand washing facilities to Chiefs to have them disciplined. Because of this the people in the chiefdom become relaxed and did not follow the teachings of the SAGs.

### **4.3.8 Individual Factors (Attitudes and Laziness)**

The study revealed that some people did not provide the required facilities because of bad attitude and laziness. Some people were unable to construct their own pit-latrines and provide the hand washing facilities even when the materials were easily accessible. Others failed to maintain the pit-latrines in hygienic conditions despite required materials being available. There were also categories of people in the villages who did not put up the hand washing facilities regardless of materials being available because of laziness. Furthermore, it was reported that even after being sensitised by SAGs still some people in some villages were not used to hand washing practice after using the toilet and whenever their hands became dirty.

## **CHAPTER FIVE**

### **DISCUSSION**

#### **5.1 Focus (Access and Availability)**

Access and availability of toilets may have influenced the behavior of community members on the ODF sustainability which was also influenced by availability of local building materials. In this study, it was observed that most of the households in the two Chiefdoms had simple pit-latrines which were constructed using local materials. The few households that did not own pit-latrines shared with their neighbours as they waited to construct their own. Access and availability of pit-latrines influenced the use of pit-latrines at the same time promoting positive behavior towards ODF sustainability. This study is consistent with Triyono (2014) research which revealed that communities with higher numbers of toilets, the behavior of open defecation was also low. The findings according to Astuti (2013) as cited by Junias et al. (2016) also suggested an association between availability of toilets with reduction in open defecation. This is in contrast with WHO/UNICEF Joint Monitoring Program of 2013 findings in the study conducted in East Java where it was reported that some household members were defecating in the open despite owning latrines.

There were great disparities on ODF status indicators between the two Chiefdoms for example in the provision of hand washing facilities for the reason that some materials to make hand washing facilities were not locally available (container). The only place where plastic containers were sold were in town, hence accessing them was difficult. These influenced negative behavior towards ODF status sustainability as prescribed by local authority and according to Chiefdoms by-rules. Encouraging local people to invest in sanitation related businesses can help in providing the needed materials for re-building and upgrading of the sanitary facilities. It is also cardinal to create awareness of suppliers who sell a variety of sanitation hardware.

Goats and termites spoiling hand washing facilities, this was cited mostly in Chiwala Chiefdom to be one of the barriers of hand washing practices. The goats destroyed the hand washing facilities as they tried to drink water from the containers fixed to the wooden rods and also eating tablet soap which they place near the facilities. Termites destroyed the hand washing facilities by eating-up wooden fork were containers are hanged. These findings are similar with Tyndale-Biscoe

(2013). Thus these factors may act as barriers to positive behavior of maintaining ODF status because people may get tired of replacing the hand washing facilities.

Product attributes according to SaniFOAM conceptual frames work are negative perceptions regarding the quality, safety, comfort and hygiene of the facilities. In both Chiefdom, most the participants during the focus group discussion and in-depth interview cited privacy, hygiene and convenient as some of positive product attributes that prompted them to stop the behavior of open defecation and continued sustaining the ODF status. Others also cited unsightly condition in areas where they defecated as one of reason that changed them to stop defecating in the nearby bushes/fields and started construction of toilets which were easy to maintain. Based on these product attributes observed in Chiefdoms, it is very important that the interventions intended to sustain ODF status in the Chiefdoms emphasizes on meeting all the ODF declaration criteria in order to maintain ODF status and stop the transmission path ways of faecal oral contamination and prevent sanitation related diseases. The poor performance shown by households in Chiwala Chiefdom on the ODF set criteria's was due to failures to appreciate the benefits of meeting these products attributes.

It was observed and affirmed by qualitative participants that there was inadequate water supply in the Chiefdoms which made maintaining of pit-latrines clean and practicing of hand washing a challenge because of the domestic works that demanded water. Preserving water for cleaning and hand washing when they had no water for them to drink and serve visitors was a taboo. The present results are similar with the finding by (Civill et al., 2015) which revealed that maintaining of hand washing and keeping toilets in a hygienic manner depended on availability of water. In Nkambo Chiefdom, when it came to preserving of water at household level, people preferred to secure water for drinking as per custom, because people always anticipated visitor or even passers-by at any time. The inadequate water supply raises suspension on the qualities of water the people were using to wash their hands. As a result of inadequate water supply there is higher chance of many people compromising on the use of available water for hand washing or even recycling water. This may put the users of contaminated water at risk of suffering from water related diseases, seeing that when the water is scarcely, the likelihood of contaminating and using contaminated water is higher.

## **5.2 Motivation (Emotional /Physical/Social Drivers)**

The study findings are that frequent monitoring and supervision by champions (SAG) and traditional leaders (headmen and women) was cited by most of the participants as a motivator for practicing hand washing. The participants testified that champions and traditional leaders were very committed on checking and supervising the community members during the implementation of CLTS activities. Thus, this prompted the community members to continue putting up hand washing facilities and practicing hand washing with either soap or ashes. In Nkambo Chiefdom where a number of villages performed better in providing the hand washing facilities, there was evidence of strong leadership that promoted people to continue in the provision of latrines and hand washing facilities. On the contrast, Chiwala Chiefdom lacked this type of leadership that existed in Nkambo Chiefdom and most of the households failed to continue with initial requirements for ODF declaration in the villages. This results agrees with (Chambers, 2009) that champions/natural leader are key to making CLTS activities sustainable. It could be important for the implementers of the CLTS programme to ensure that they build capacity to community leaders and the champions.

Furthermore, transport was a challenge for these people to continue with their responsibility to supervision and monitoring by the local leaders as some villages within the Chiefdoms are in remote areas not difficult to access the households. The external monitoring and supervision by government Officers were not commonly conducted because of inadequate transport, financial challenges experienced at organization level. These findings affect the behavior towards maintaining the ODF status in that people develop the tendency of becoming reluctant when no consistence follow-up is made. These findings are similar with (Kar and Chambers, 2008; Tyndale-Bicsoe et al., 2013 and Phiri, 2014) which revealed that the success of the CLTS programme greatly depended on the well planned follow-up. While the findings in this study is also consistence with finding in study conducted in East Java which revealed that lack of follow-ups was a barrier to collective behavior change to stop open defecation (WSP, 2011). The present study results are in agreement with the previous study conducted by (UNICEF, 2011, Phiri, 2014 and plan Nepal 2007). Furthermore inadequate finances at households level as reported by the participants, suggesting that it's affected the behavior of people to sustain ODF status in Chiwala

Chiefdom. People could not afford to consistently purchase the needed requirements to provide the improved sanitation.

### **5.3 Study Limitation**

The data collection was conducted during the rainy season making some villages not easily accessed. Some household owners were not found home as they were busy farming field work and the researcher had to wait for them to come back. These led to some interviews postponed for another day.

### **6.0 Conclusion**

The study findings suggest that Nkambo Chiefdom sustained the ODF status by 82 percent while Chiwala Chiefdom was 26 percent. The study revealed disparities of the key indicators of ODF status in the two Chiefdoms. Nkambo Chiefdom generally performed much better in all ODF status indicators (presence latrine, latrine use, superstructure to provision privacy, smooth and cleanable floor, drop hole cover and hand washing facilities with water and soap/ashes) compared to Chiwala Chiefdom.

The Sustainability of ODF status was influenced by reduction in sanitation related diseases, respect, latrine being way of managing the welfare of visitor. In addition, Community leaders for example Chiefs played a role of punishing by-rule breakers. Other factors that influenced the ODF status sustainability were Convenience, increased awareness regarding contamination of water and unsightly and nuisance smells. Frequent supervision by champion (SAG) and Head Men, disease prevention and availability of hand washing facilities were some of the motivator for practicing of hand washing with soap/ashes. The study also revealed that high temperature, financial challenges and inadequate water supply were some of the barriers of hand washing practice. Other barriers were goats and termites spoiling Hand washing facilities, inadequate storage container for Tippy taps and inadequate transport for supervision and monitoring, inadequate supervision by traditional leader and individual factors such as attitudes and laziness.

## **7.0 Recommendations**

The recommendations in this section are based on the findings as discussed above and have made to specific stakeholders.

### **7.1 Ministry of Local Government and Housing and Ministry of Water, Sanitation Development and Environmental Protection**

- In order to promote hand washing with safe water in communities, there is need to drill more protected wells and boreholes within the Communities.
- Ministry of Local Government and Housing to come up with a policy that will facilitate CLTS scaling up and enable effective implementation and sustainability of ODF status in areas that have been declared ODF.

### **7.2 Masaiti District Council and Masaiti District Health Office**

- Given that the majority of the participants cited reduction in sanitation related diseases, frequent supervision by champion and traditional leaders, the roles of the traditional leaders-punishment by the Chiefs and toilets seen as respectful practice by most of the participants, these reasons should be emphasized during designing of messages and when holding community sensitisation meetings.
- To include activities in CLTS programme that will encourage local people to consider investing in improving sanitation.
- To emphasize on the provision of hand washing facilities and promotion of hand washing practices especially in Chiwala Chiefdom during the implementation of CLTS activities programme.
- To come up with strategies for maximizing engagement of traditional leaders/communities in promoting sustainability of ODF status.
- To build capacity at community level in CLTS implementation, monitoring and evaluation in response to the nature of local sanitation situation analysis.
- To Monitor and evaluate the effectiveness of CLTS intervention: monitoring behaviour change and health outcomes.

### **7.3 Community**

- The traditional leaders and Sanitation Action Group members must continue with frequent supervision and monitoring of CLTS activities in their respective communities if ODF status is to be sustained.



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## APPENDICES

### Appendix A: Information Sheet

UNIVERSITY OF ZAMBIA  
SCHOOL OF MEDICINE  
DEPARTMENT OF PUBLIC HEALTH

**STUDY TITLE: Factors Influencing Open Defecation Free Status in Areas Practicing Community Led Total Sanitation: The Case of Chiwala and Nkambo Chiefdoms of Masaiti District**

Principal Investigator: Getrude Kangwa

IRB No. 00005948

FWA No. 00011697

I **Getrude Kangwa**, student of Master's Degree in Public Health at the University of Zambia is requesting for your participation in the study mentioned above. The center of the study is to assess the continuation of ODF status and hand washing practice. I would like to explain to you the purpose of the study and what is expected of you. Firstly, your participation in this research is voluntary and you are therefore asking you to participate. Your participation is very valuable because the answers you give will be used to represent other people like you in the Chiefdoms. The information you will provide will not be disclosed to any one and will only be used for study purpose. If you agree, you will be requested to sign the consent form. The study is being conducted by the Researcher (UNZA student).

The research is being funded by the UNICEF Zambia an International Organization that promotes the welfare of children and looks at water and sanitation.

#### **Purpose of the Study**

The study will assess ODF continuation and household hand washing practices in Nkambo and Chiwala Chiefdoms. The information that will be collected will assist Community Led Total Sanitation (CLTS) program implementers and Community members to act appropriately to sustain ODF status and promotion of Hand Washing practices that lead to the health environment and human health.

#### **Procedures**

Households have been selected and any member aged 18years and above from Chiwala and Nkambo Chiefdom has been selected to participant in this study and you are one of them. Know that by you participating you are representing others in this community.

Participating in this study is voluntary, you are not being force to take part in this study, and however this study will provide us with valued information on whether the Open Defecation Free status has continued or not as well as Hand washing practices.

The questions will be about Open Defecation Free status continuation and Hand washing practices, when you wash your hand, your experience since your community attained Open Defecation Free status, motivating factors and barrier to Hand Washing with soap as the routine practice. There is no right or wrong answer to the questions you will be asked and the answers are valued.

### **Confidentiality**

What will tell us will not be revealed to anyone and will be treated as confidential, the information will be kept under lock and key. No name, address, and other personal information will be entered on the questionnaire.

### **Benefits**

There may be no direct benefit for you by participating in this study, but the information which will be obtained will help policy makers formulate a policy on Community Led Total Sanitation implementation, implementer come up with strategies to promote ODF continuation as well as promoting Hand washing practice at community Level.

### **Risk Factors**

There will not be any bodily harm or loss of any provision for participating in this study however during interviews there may be some questions that may seem to be invading on your privacy and part of your time from the busy schedule will be used. The interviews will not take more than 1 hour.

### **Payment**

There is no payment for participating in this study. However transport refund and refreshment will be provided for focus group discussion participants.

**Appendix B: Consent Form for Research Participants**  
**UNIVERSITY OF ZAMBIA**  
**SCHOOL OF MEDICINE**  
**DEPARTMENT OF PUBLIC HEALTH**  
**P.O. BOX 50110**

**Title: Factors Influencing Open Defecation Free Status in Areas Practicing Community Led Total Sanitation: The Case of Chiwala and Nkambo Chiefdoms of Masaiti District**

I.....Being above the age of 18 years hereby consent to participate as requested in this study on maintenance of Open Defecation Free (ODF) Status and Household Practices in relation to ODF Sustainability

1. I have read the information provided.
2. Details of procedures and any risks have been explained to my satisfaction.
3. I agree to audio/video recording of my information and participation.
4. I am aware that I should retain a copy of the Information Sheet and Consent Form for future reference.
5. I understand that:
  - ✓ I may not directly benefit from taking part in this research.
  - ✓ I am free to withdraw from the project at any time and am free to decline to answer particular questions.
  - ✓ Individual information and identity will remain confidential even if this study will be published
  - ✓ The interview may be stopped at any time and without any disadvantage related to withdraw from this study.

The purpose of this study has been explained to me and I understand the purpose, benefits, discomfort, and confidentiality of the study.

I agree/do not agree to participate in the research.

**Participant's**

**signature:.....Date:.....**

Participant's signature or thumb print



**Witness's**

**signature:**.....

Witness's thumb print

I certify that I have explained the study to the participant and consider that he/she understands what is involved and freely consents to participate.

**Researcher's name:**.....

**Researcher's signature:**.....**Date:**.....

Call me <<Getrude Kangwa>> at <<+260-979478203>> if you have questions concerning this study.

Contact the ERES CONVERGE IRB Ethics Office for any ethical queries. The Ethics Committee contact information is: ERES CONVERGE IR 33 Joseph Mwilwa Road Rhodes Park Lusaka. Tel: +260955 155633/4 E-mail: [eresconverge@yahoo.co.uk](mailto:eresconverge@yahoo.co.uk)

**Appendix C: Observational Checklist for Household**

Name of the Chiefdom ..... Name of Village .....

Name of interviewer..... Date of interview.....

NO.	Particular			Yes	No
1	Latrine Present			Yes	No
2	Type of toilet	Ordinary	VIP	Flushed to septic tank	None
3	Signs of use (shit in the pit)			Yes	No
4	Drop hole cover Present			Yes	No
5	Privacy provided for user			Yes	No
6	Smooth, cleanable floor			Yes	No
7	Latrines clean ( No faeces on the floor)			Yes	No
8	Hand Washing Facility			Yes	No
9	Type of Hand washing Facility	Tippy tap	Bucket/Dish with cup	Bucket /Dish	None
10	Water + soap			Yes	No
11	Water + Ash			Yes	No
12	Only Water present			Yes	No

13	Signs of use of Hand Washing Facility			Yes	No
14	Amount of water in the container		Full	Half	Empty
	Questions on Demographic characteristic				
15	Gender of respondent	1. Male 2. Female	Write the Number of the Answer		
16	How old are you?	1. 18 to 35 2. 36 to 45 3. 46 to 55 4. Above 55			
17	What is your marital status?	1. Single 2. Married 3. Widow/Widower 4. Divorced/separated			
18	What is your highest level of education?	1. No education 2. Primary education 3. Junior Secondary 4. Senior Secondary 5. Tertiary education			
19	What is your occupation?	1. Trade/self employed 2. Unemployed 3. Farmer 4. Employed			
20	How many people are living in this household?	1. 1-3 2. 4-6 3. 7-9 4. Above 9			

## **Appendix D: Interview Guide for FGD and Open Defecation Free Sustained Communities**

1. How do you feel about being certified as an ODF community
2. Have you ever had to prevent Open Defecation behaviour since being certified?
3. What do you do to take care of your latrine?
4. Do you feel safe when you go to defecate (either in your latrine or practicing OD)?
5. Are people happy with their latrine because they can defecate in private?
6. What are the main changes in hand washing practices in terms frequency, timing, methods?
7. What are the motivating factors that influence the adoption of hand washing with soap as a routine practice?
8. What key activities trigger the community members to wash hands?

## **Appendix E: Interview Guide for FGD and Open Defecation Reverting Communities**

1. How do you feel about being certified as an ODF community?
2. Have you ever had to prevent Open Defecation behaviour since being certified?
3. Why have Households stopped using latrines and gone back to Open Defecation
4. Have any toilets collapsed since being certified ODF? If so what are the barriers to rebuild?
5. What makes it easy or difficult to build and maintain latrine?
6. What motivates people to use & maintain their latrines?
7. Do some households no longer have hand washing facilities? Why?
8. Do some household no longer use their hands washing facilities? Why?
9. What are the motivating factors are required to maintain hand washing with soap as a routine practice?
10. What can you do to regain your ODF status?

## **Appendix F: Semi- Structure Questionnaire for Key Informant Interviews**

1. a) How often to you monitor the maintenance of ODF status in the community?  
b) What type of support do you provide to the Sanitation Action Group (champion)?  
c) How many members of staff are allocated to sanitation?

- d) What are the skills/experiences/professional backgrounds of the staff?
  - e) Do you think your community is capable enough to sustain ODF status?
2. a) What are the main changes in hand washing behavior frequency, timing, methods you have observed since the introduction of CLTS the community?
    - b) What key activities trigger the community members to wash hands?
  3. What are the motivating, factors that influence the adoption of hand washing with soap as a routine practice?

### **Appendix G: In-Depth Interview Guide**

1. How do you feel about being certified as an ODF community?
2. Have you ever had to prevent Open Defecation behaviour since being certified?
3. What do you do to take care of your latrine?
4. What are your fears / worries in losing Open Defecation Free status?
5. How much does it cost to maintain (clean and repair) your latrine? Is that affordable?
6. Can you afford to maintain your latrine? Could you afford to re-build it if it collapsed or the pit filled up?
7. Did the availability or lack of credit for latrines influence you
8. What are the main changes in hand washing practices in terms frequency, timing, methods that you have experienced or observed in your community?
9. What are the motivating factors that influence you to adopt hand washing with soap as a routine practice?
10. What key activities trigger you to wash hands?
11. What makes it easy for you to practice hand washing?
12. Are there any challenges that you face in terms of being consistency in hand washing, what are some of the challenges?
13. What changes have you observed in hand washing since certification your villages were ODF free?
14. What are some of the benefit of Hand washing

## Appendix H: Demographic Characteristics of Qualitative Participants

<b>NKAMBO CHIEFDOM -ULU VILLAGE</b>		
<b>Focus Group Discussion</b>		
Participant ID number	SEX	Age
1	Male	71
2	Male	31
3	Male	51
4	Male	36
5	Female	31
6	Female	50
7	Female	40
8	Female	35
In-depth Interview	Male	
Key Informant	Male (Teacher )	43

<b>NKAMBO CHIEFDOM – NDIKELE VILLAGE</b>		
<b>FOCUS GROUP DISCUSSION</b>		
Participant ID number	SEX	Age
1	Female	89
2	Male	72
3	Female	63
4	Female	49
5	Male	77
6	Male	52
7	Female	30
In-depth interviews	Female	34

<b>NKAMBO CHIEFDOM – CHAMINA VILLAGE</b>		
<b>Focus Group Discussion</b>		
Participant ID number	SEX	Age
1	Male	74
2	Male	62
3	Male	63
4	Male	43
5	Male	74
6	Female	73
7	Female	63
In-depth interview	Female	30

<b>CHIWALA CHIEFDOM – CHAMUNDA VILLAGE</b>		
<b>Focus Group Discussion</b>		
Participant ID number	SEX	Age
1	Male	65
2	Male	58
3	Female	50
4	Male	58
5	Male	73
6	Male	55
7	Female	48
8	Female	41
In-depth interview		
	Male	70
	Female (HW)	51

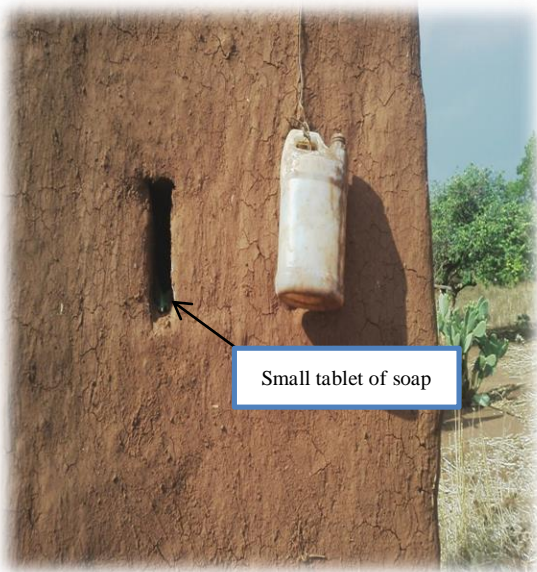
<b>CHIWALA CHIEFDOM – CHIWALA VILLAGE</b>		
<b>Focus Group Discussion</b>		
Participant ID number	SEX	Age
1	Male	65
2	Male	58
3	Female	50
4	Male	58
5	Male	73
6	Male	55
7	Female	48
8	Female	41

<b>CHIWALA CHIEFDOM – CHIWALA VILLAGE</b>		
<b>Focus Group Discussion</b>		
Participant ID number	SEX	Age
1	Female	59
2	Female	22
3	Female	44
4	Female	36
5	Female	54
6	Female	44

<b>CHIWALA CHIEFDOM – KAWAMA VILLAGE</b>		
<b>Focus Group Discussion</b>		
Participant ID number	SEX	Age
	Female	46
1	Female	42
2	Female	43
3	Female	42
4	Female	25

5	Female	43
6	Female	43
7	Female	26
8	Female	26
In-depth interview	Male	40
In-depth interview	Male	39

### Appendix I: Pictures from Fields



Example of Pit-latrine with water container for hand washing in Chamunda village of Chiwala Chiefdom





Tippy Taps provided with ashes



pit-latrine and tippy tap provide with soap in a small bottle at Ulu villages



Pit-latrine inside and outside -Ndikele village of Nlkambo Chiefdom





Tippy tap destroyed by Termites in Chiwala B2 village



A Tippy tap next to a latrine in Miengwe Centre –Nkambo Chiefdom