DETERMINANTS OF COMMUNITY LED TOTAL SANITATION AND HYGIENE IN IMPROVING WATER, SANITATION AND HYGIENE; THE CASE OF HALABA SPECIAL WOREDA, SOUTHERN, ETHIOPIA.

M.Sc. THESIS

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DETERMINANTS OF COMMUNITY LED TOTAL SANITATION AND HYGIENE IN IMPROVING WATER, SANITATION AND HYGIENE IN HALABA SPECIAL WOREDA, SNNPR, ETHIOPIA.

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Approval Sheet-I

This is to certify that the thesis entitled **"Determinants of Community Led Total Sanitation and Hygiene in improving Water Supply, Sanitation and Hygiene in Halaba Special woreda, SNNPR, Ethiopia"** submitted in partial fulfillment of the requirements for the degree of Masters of Science in Biosystems and Environmental Engineering with specialization in Water Resource Engineering and Management, is a record of original research carried out by Bikila Hika under my supervision, and no part of the thesis has been submitted for any other degrees. The advice and help received during the course of this study have been duly acknowledged. Therefore, I recommend that it be accepted as fulfilling the thesis requirement.

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Approval sheet-II

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We, the undersigned, members of the Board Examiners of the Final MSc Open Defense by Bikila Hika have read and evaluated his thesis entitled " **Determinants of Community Led Total Sanitation and Hygiene in improving Water, Sanitation and Hygiene in Halaba special woreda, SNNPR, Ethiopia**" and examined the candidate. This is therefore, to certify that the thesis has been accepted for the partial fulfillment of the requirements for the degree of Master of Science in Water Resource Engineering and Management.

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Final approval and acceptance of the Thesis is contingent up on the submission of its final copy to the council of Graduate Studies (CGS) through the candidate's department or school of graduate committee (DGC or SGC).

DEDICATION

I dedicate this thesis manuscript to my beloved wife Sr. Mekdes Fitebo & My Children (Abredagn Bikila &Antu Bikila) who have supported me for this success & courage to dream a better future. It is also dedicated to my father Hika Gershe and my mother Damitu Debisa for their great endurance sustenance in the success of my life and great interest to the modern education.

STATEMENT OF THE AUTHOR

By my signature below, I declare and affirm that this Thesis is my own work. I have followed all ethical and technical principles of academic in the preparation, data collection, data analysis and completion of this Thesis. Any scholarly matter that is included in the Thesis has been given recognition through citation.

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BIOGRAPHICAL SKETCH

The author was born on October 12, 1983 in Jimma Rare woreda, Horo Guduru Zone of Oromia Region, Ethiopia. He attended his elementary school at Burka Hobo and Secondary school at Gedo high school and Ambo Comprehensive Secondary School in Gedo and Ambo town respectively then; he joined Haramaya University in Advanced Diploma in 2003 and graduated with Public Health (Environmental Health). And he Joined Jimma University in 2009 and graduated with Bsc in Public Health (Environmental health) in 2013.

Soon after graduation from Haramaya University, he was employed by MoH in Oromia Regional State Borena zone, Yabello woreda Heath center. Then he joined different humanitarian organizations; GOAL international in Ethiopia, CARE International in Ethiopia and currently working in International Rescue Committee (IRC) international in Ethiopia since November 2007. In the meantime, he joined Hawassa University, School of Graduate Studies in 2014 to pursue his MSc study in Water Resource Engineering and Management.

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ACRONYMS

BoH	Bureau of Health
CESCR	Committee on Economic, Social and Cultural Right
CLTSH	Community Led Total Sanitation and Hygiene
CSA	Central Statistical Agency
DHS	Demographic and Health Survey
FGD	Focus Group Discussion
HEWs'	Health Extension Workers
JMP	Joint Monitoring Programme
KII	Key Informant Interview
MoH	Ministry of Health
MDGs	Millennium Development Goals
NGO	Non-Governmental Organization
OD	Open Defecation
ODF	Open Defecation Free
PHAST	Participatory Hygiene and Sanitation Transformation
SNNPRS	Southern Nations, Nationalities and People Regional state
SPSS	Statistical Program for Social Science
UN	United Nations
UNESCO	United Nation Educational, Scientific and Cultural Organization
UNDP	Unite Nation Development Program
UNICEF	United Nations Children's and Education Fund
WASCOM	Water and Sanitation Committee
WASH	Water Sanitation and Hygiene
WHO	World Health Organization

ABSTRACT

Ethiopia is undertaking the Community Led Total Sanitation & Hygiene approach in the past 10 years. However, only very few researches have been conducted. This research was aimed at identified difference among the communities where Community Led Total Sanitation and Hygiene implemented and the determinants. The study was done by cross-sectional study using close ended questionnaire for the sampled households and triangulated the information by interviewing the key informants. As per the target for the thesis, majority of the respondents (93%) were female & 61% of them illiterate. The average household size of the study area is 6.95 which is higher than average population size of the Country. Of the sampled respondents 94% of them has access to safe water supply pipe/public water tap whereas the average water per capital consumption was 8.7% l/p/d which is very small. On the other side, 29% of HHs' stated that their water source are unfit for drinking. From the sampled 59.7% of the respondents store their drinking water at HH while the rest not. The major determinant for the HH water storage practice is; container unavailability, the material cost and the amount of water they collect too small. As stated in the finding most respondents use latrine for excreta disposal while only 3.3% practice open defecation. On the other side, the sanitation status of the latrine those observed are poor like they have no superstructure/shelter, slab and handwashing facility. The major determinants that hindered the resident community to improve their Water Supply, Sanitation and Hygiene includes 45% Economic shortage, 22% poor knowledge, 18% initial and maintenance cost, 8% human labour, and the rest 4% and 3% family size and comparative preference to defecate in field/bush respectively. Hence it concluded that the Community Led Total Sanitation and Hygiene very profound to improve the Water Supply, Sanitation and Hygiene particularly in mitigating Open Defecation Free whereas the technical feasibility factors, the socio-economic factors are major determinants while environmental factors insignificant relatively as investigated in the study area.

Key words: Community Led Total Sanitation and Hygiene, cross sectional, determinant, Respondents, water supply, latrine.

CHAPTER ONE

Introduction

1.1. Background

UN General Assembly resolution, the UN Human Rights Council affirmed that adequate water and sanitation is a right to life and human dignity in September 2010 (UN-Water Decade Programme on Advocacy and Communication, September 2010). Access to safe drinking water has long been a central aim of public health and international development policy. The Sustainable Development Goals (SDGs) included target 6c to 'By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations ' (UN, 2013). Diarrheal diseases kill approximately 1.5 million children under age five annually, representing the second leading cause of death and the leading cause of malnutrition for this age group which easily preventable by safe water & improved sanitation. Reducing the prevalence of diarrhea in developing countries requires expanding access to improved water and sanitation facilities and improving hygienic practices that contaminate water (World Health Organization. Diarrheal Disease Fact Sheet, August 2009).

Sanitation and drinking-water are universally accepted as being essential for human life, dignity and human development. However, sanitation and drinking-water issues have not in the past received the high-level political attention that they deserve as some studies shows (UNDP, 2006).

This right is recognized in international legal instruments and provides for sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses (CESCR, 2002).

Evaluations of water supply development projects during the united nation (UN) Water Decade showed that non sustainability of water supply projects and facilities left the majority of the target populations without access to adequate water supplies or sanitation facilities (Rotival, 1991).The Sustainable Development Goals (SDGs) set out to "by 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation." The slow pace of progress has been leading to a search for innovative

responses, including social motivation approaches. One example of this type of approach is ‘Community-led Total Sanitation’ (J. Crackers, R. Rowe, 2012).

A number of donors, international non-governmental organizations (NGOs) and UN agencies, in recognition of this, came together to raise the political profile of sanitation and drinking-water following the lead of the UN human Development report (UNDP, 2006) in highlighting some of the principal shortcomings within the international architecture. These include the lack of a single international body to speak on behalf of sanitation and drinking-water.

To reduce this burden, recently different efforts have been undergoing at global, regional, national and local levels to improve the challenges of Water, Sanitation and Hygiene both by government, international aids and private partners.

Community-led total sanitation and hygiene is an approach led by the community to achieve better sanitation, improved hygiene and drinking water management in analyzing the sanitation, hygiene and water sources situation of their villages and to produce commitment and create action plans to become in better status and to do this through their own efforts.

Thought the approach currently implemented in many areas around the globe, there are few scientific researches which shows the impact of CLTS (V. Venkataramanan, 2012).

CLTS is a sanitation behavior change intervention that was developed by K. Kar (Dr.) in Bangladesh in the late 1990s (Kar and Chambers, 2008). It was developed in response to unsustainable supply-driven Water, Sanitation and Hygiene programs.

Community-led total sanitation (CLTS) emerged in the year 2000 as a participatory approach to address open defecation. CLTS aims to generate emotional reactions to open defecation during a community meeting such as shame, fear and disgust and to elicit collective action on sanitation. CLTS is now a well-established approach that has been implemented in over 50 countries. Many, such as Ethiopia, included it in their national policy.

Community-Led Total Sanitation and Hygiene (CLTSH) is based on the principle of triggering collective behavior change in active participatory way. In this approach, communities are facilitated to take collective action to adopt safe and hygienic sanitation behavior and ensure that all households have access to safe water source, sanitation facilities and improved hygiene practices. This approach helps communities to understand and realize the negative effects of poor sanitation and Hygiene hence empowers them to

collectively find solutions to their sanitation and hygiene situations. In the process, the community is triggered of the consequences of poor sanitary and hygiene practices, commits itself to finding own solutions, and finally is liberated from open defecation by having well understanding about water, sanitation and hygiene (Kar et al. 2008).This helps in creating a receptive environment for the adoption of improved practices in personal hygiene, safe handling of food and water as well as safe confinement and disposal of excreta and waste.

This approach fosters innovation and commitment within the community and motivates people to build their own sanitation infrastructure, manage their water sources and improve their hygiene behaviour, without depending on external financial or material assistance.

As few researches shows CLTS is more effective in communities where it is used as the only approach to promoting hygiene and sanitation, some African countries like Nigeria. (An Evaluation of Water Aid's CLTS Programme in Nigeria, 2007)

1.2. Statement of the problem

Ethiopia is among the countries implementing the community Led Total Sanitation and Hygiene in whole country since 2006. There are approximately 38 million people practicing Open Defecation (OD) in Ethiopia and the Ethiopian Government commenced CLTSH programme in 2006 and is currently being scaled-up across the country (UNICEF, Fact sheet, Ethiopia, 2014). Ethiopia also has clear policies and institutional support mechanisms for CLTSH (J. Crocker & R. Rowe, 2012).

According to the 2014 WHO/UNICEFJMP report, 73% of Ethiopia's urban and 77% of its rural population used unimproved sanitation facilities, with 8% in urban and 43% in rural communities practicing open defecation. In the other also, the Ethiopian DHS survey in 2014 estimated that 82.5% of the urban and 97.5% of the rural population had no access to improved sanitation and 8.7% of urban and 37.5% of the rural population practiced open defecation.

Halaba faces water scarcity problems due to the deep wells are the only options to provide safe water supply for the community. The water supply and sanitation coverage was 43% and 14% respectively (Woreda Water Resource Office Report, 2016).

The Halaba special woreda latrine coverage is 81% regardless of their standard but the improved latrine is about 16% only (Woreda health Office report, 2017). The CLTSH

approach implemented in 46 kebeles and yet not implemented in 32 kebeles of the woreda. The Halaba woreda affected by diseases outbreaks like Cholera and one of the hotspot areas recurrently. The Halaba Special Woreda soil property is mainly sandy which can be damaged and the others are also silt and ash (white, volcanic) characterized by high water infiltration capacity and fragility. Such unstable soils may cause latrine pits to collapse easily. In line with CLTSH implementation improvement has been observed (this is supported by some researchers but there was no strong justified with data base), (Helpdesk Report, in Africa, May 2013) but it needs scientific research to see clearly the improvement and the challenges for the CLTSH implementation. Therefore, it is very important to assess the impact of CLTSH approach in improving the Water, Sanitation and Hygiene and what are the profound determinants as well, in case of Halaba special woreda, SNNPR.

1.3. Objectives:

1.3.1. General objective:

To examine the improvement of Water, Sanitation and Hygiene (WASH) due Community Led Total Sanitation and Hygiene approach and its determinants in Halaba Special Woreda, SNNPR, February 2017.

1.3.2. Specific objectives:

- To investigate the Community Led Total Sanitation and Hygiene to improve Water supply, Sanitation and Hygiene in Halaba special woreda targeted study area;
- To identify the determinants affecting the Community Led Total Sanitation and Hygiene in in terms of technical feasibility, Socio-Economic and Environmental factors to improve Water supply, Sanitation and Hygiene (WASH) in Halaba special Woreda targeted study area.

1.4. Research questions:

The research proposed to address the below questions;

- What are the improvements seen regarding Water Supply, Sanitation and Hygiene due the CLTSH approach undertaken?
- What are the determinants affecting the CLTSH implementation in terms of technical feasibility, Socio-Economic and Environmental factors to improve Water supply, Sanitation and Hygiene?

1.5. Significance of the Study

This study investigated the CLTSH importance to improve the Water, Sanitation and Hygiene in the rural communities, and identified determinates in order to improve the Water Supply, Sanitation and Hygiene (WASH). The findings will be also an inputs on the areas of CLTSH for the actors to improve the WASH challenges and problems. It helps also to provide recommendation and conclusions depending on the findings for the future CLTSH interventions and researches.

CHAPTER TWO

2. LITERATURE REVIEW

‘‘We shall not finally defeat AIDS, tuberculosis, malaria, or any of the other infectious diseases that plague the developing world until we have also won the battle for safe drinking water, sanitation and basic health care.’’ K. Annan, former UN Secretary General

2.1. Water, Sanitation and Hygiene (WASH) Globally

Lack of access to safe and clean water is locked in the heart of the poverty. Even though the issue of water is observed as a general problem for both the urban and the rural population, women bear the greatest burden because of their social gender roles including collecting water for their households (Rose, 2009). Diarrhoea, worm infestation and eye and skin infections are diseases related to water and sanitation. About three million children die from a single diseases; diarrhea each year. Each of the three common worms (roundworms, whipworms and hookworms) is estimated to infect more than 500 million people. Roughly 6 million people have become blind from trachoma, an eye disease. (Bundy D.A.P, 2013).

Safe drinking water and adequate sanitation are the basic right of every citizen and are vital for improving health and alleviating poverty. Inadequate access to safe water combined with poor sanitation and personal hygiene practices have detrimentally impacted upon the health and quality of life of millions of peoples, especially the poorest and most vulnerable. In the other side, the development of Water, Sanitation and Hygiene Sector “will produce healthy manpower, additional income generation and less health expenditure on treatment of diseases,” (National Planning Commission, 2002).

The UN says guaranteeing a proper water supply is vital in eradicating poverty. It says the absolute daily minimum amount of water a person needs is 50 liters, which include 5 liters for drinking, 20 for sanitation and hygiene, 15 for bathing and 10 for preparing food. However, because of scarcity, millions of people try to exist on 10 liters a day. Achieving these goals requires sustainable economic and social development in developing countries. However, WHO (2003) also notes that most of the constraints to development increasingly tied to water.

In 2015, it is estimated that 663 million people worldwide still use unimproved drinking water sources, including unprotected wells and springs and surface water. The majority of them now live in two developing regions. Nearly half of all people using unimproved

drinking water sources live in Sub-Saharan Africa, while one fifth live in Southern Asia. (JMP Report UNICEF, 2015).

In 2015, it is estimated that 2.4 billion people globally using unimproved sanitation facilities still. There are now twice as many people using unimproved sanitation facilities in sub-Saharan Africa than in Eastern Asia. The nearly 700 million people who would have been served if the MDG target for sanitation had been met is equal to the number of unserved people in Sub-Saharan Africa. (JMP Report UNICEF, 2015).

In adopting, the Sustainable Development Goals (SDGs) countries pledged to ensure availability and sustainable management of water and sanitation for all by 2030.

2.2. Water, Sanitation and Hygiene (WASH) in Ethiopia

Access to water supply in Ethiopia is amongst the lowest in Sub-Saharan Africa and the entire world. While access has increased substantially with funding from external aid, much still remains done to achieve the Sustainable Development Goals by ensure availability and sustainable management of water and sanitation for all by 2030, to improve sustainability and to improve service quality (WHO and UNICEF, 2008). Provision of safe and sufficient water supply and adequate sanitation services are indispensable components in the sustainable development of Ethiopia's urban and rural socioeconomic wellbeing. At present, most of the population does not have adequate and safe access to water supply and sanitation (WSS) facilities. As a result, over 70% of the contagious diseases in the country are water borne/based diseases. Source of most of these diseases could be traced back to inadequate Water supply system facilities (MoWR, 2001). Ethiopia has been trying to supply potable water to its population, without great success, for more than a century. While water for agricultural use has attracted high levels of investment, water resource management for domestic supply has been relatively neglected, especially before the post imperial period. Even today, rural water supply programs, which affect the majority of the country's population, have not been given sufficient attention (Rahmato, 1999).

The water distribution systems in the country are commonly inadequate. The problem is associated partly with unfavorable topography, seasonal fluctuation of the water reservoirs, low capital investment, and lack of efficient water governance among concerned authorities. Quite frequently Ethiopian planners emphasize the agronomic, engineering, or technical aspects of water projects, while giving less attention to governance and participation of stakeholders. Rahmato (1999) observed that among the

main reasons given for the slow progress in water supply services in the 1980s (but still relevant today) are the lack of comprehensive water legislation, inadequate investment resources, and the lack of a national water tariff policy.

The Ministry of Water Resources (MoWR, 2009) estimates that 33% of water supply schemes in Ethiopia are non-functional at any time, with negative impacts on coverage and universal access due to lack of funds for operation and maintenance, inadequate community mobilization and commitment and a lack of spare parts (Moriarty et al., 2009).

Ethiopia is the first country in Africa in Open defecation practice and 2nd next to India (Global WHO/UN Water, 2010).The majority (35.6%) practiced open defecation, implying that the country is far from the MDG target for access to improved sanitation (56%) (Abebe et al., 2015). Ethiopia has made tremendous progress toward universal water, sanitation and hygiene access in the past decade, but still significant challenges remains unaddressed which varies from place to place.

Our country, Ethiopia among those countries do not meet the MDG even though in moderate progress, (JMP, WHO and UNICEF, 2015). Besides, it needs to strive in more to achieve the Sustainable Development Goals (SDGs') that the Ethiopia committed also.

2.3. Water Sanitation and Hygiene (WASH) in SNNPR

SNNPR had one of the lowest sanitation and hygiene coverage levels in the country, the extent of the regional budget allocated to sanitation and hygiene was amongst the lowest at only 0.4% of the health budget. The scope of education on sanitation and hygiene was at time limited, due to lack of appropriate strategies for community education and mobilization. The approach to sanitation and hygiene in the region was supply driven, with health authorities raising the expectations of households that incentives to improve the practices would be provided by government. The Bureau of health recorded that, therefore, HH demand for sanitation and hygiene services had been low (Shiferaw, 2003).

Sanitation coverage is quoted to be 38% in rural areas and 57% in urban areas. In the rural areas, long queues around safe drinking water points are common. Some 60% rural households have access to latrine facilities compared to 80% in urban areas (national figure 63%). Local environmental conditions, such as loose soils, high groundwater tables, floods, termites attacking construction timber, and lack of timber threaten. However, to make the lifetime of latrines short; i.e. questions do arise as to the sustainability of this

wave of latrine construction (e.g. need for technical innovative improvements) if HHs are not to drop off the sanitation ladder and stop using latrine (BoH, 2016).

Government and non-government organization have dedicated considerable resources to improve sanitation and hygiene in southern region. For example, the BoH in 2003 launched a new health care plan to provide quality preventive health services in an accessible and equitable manner to all segments of rural population through a comprehensive Health Extension Program (HEP). One of the focal point of this program is hygiene and environmental sanitation and Health extension workers are working at the kebele level in order to promote proper and safe excreta disposal system in household throughout the region (Alula, 2008). The non-functionality of the available latrines estimated to be greater than 80% in the country (Gebreselassie, 2007) which is likely the same in the region. If this trend of non-functionality of sanitation facilities continues, the risk of fecal-oral transmission and the mortality rate of children due to poor sanitation increase.

The predominant water supply technology used in SNNPR is on-spot spring approximately 31.7% of the population with access to safe water supplies in rural area is served by spot spring followed by shallow wells which is 31.2%. The functionality rate for improved water supply in SNNPR is reported to be 72.95% in rural water supply schemes. However, it has been noted that about 27% of the water supply schemes are non-functional at any given time. The causes for non-functionality are; technical break down (45%), low yield (21%), management/financial problem (20%) and others like water quality (14%) (BoWI, 2016).

However, lack of sustainability of project aggravated the existing poor coverage of water and sanitation implying negative impacts on coverage and on the attainment of the plan. At the end of 2005, access to water supply for rural part of SNNPR was 38.7%. However, due to the efforts made by governmental and non-governmental organization, the number of people with access to potable water supply increase from 38.7% to 58.7%, at the end of 2014 (BoWI, 2016).

To improve the water, sanitation and hygiene different approaches implemented in different countries including Ethiopia. But, they have different limitations that hindered them not to meet the expected changes. (Sah and Negussie, 2008).

2.4. Effectiveness of Community Led Total Sanitation and Hygiene (CLTSH)

As UNICEF reports 69 of 308 project communities attained open defecation free (ODF) status in Ghana two years after project implementation. There was 4.21% increase in access to sanitation over two years where the CLTSH implemented.

Case studies and qualitative research have found CLTS to be an effective means of empowering communities in attaining open defecation free(ODF) villages (Chambers, 2009; Kidanu and Abraham, 2009; Sah and Negussie, 2009). Besides, the data for the progress of 8 districts that was done in Ethiopia have recorded great in the Annual Operations Report on sanitation. Overall, the national latrine coverage was increased from 63% to 74.24% during the period. This is an increase of 11% which is 3% above the target for the indicator (HEART), May 2013. But, according to the 'Handbook on CLTS', total sanitation targets a multitude of hygiene behaviors, including ending OD, hygienic toilet use, hand washing at appropriate times, hygienic food and water handling, and safe disposal of feces (Kar and Chambers, 2008).

A government-led programme in the SNNPR (Southern Nations Nationalities and Peoples Region) achieved successes preceding CLTS (The Health & Education Advice & Resource Team (HEART) report, May 2013).

As researches shown, in some countries like Nigeria, a range of evidence that CLTS is an effective approach to establishing hygiene and sanitation practice (An Evaluation of CLTS Programme in Nigeria, 2007). Also as data from Ethiopia on a CLTSH plus hygiene promotion interventions showed a decrease an open defecation from 64% to 40% from 2005 to 2009 (Abebe et al. 2015)

Therefore, it is very important to evaluate to what extent this approach is improving the Water, Sanitation and Hygiene; what are the profound determinants as well; in case of Halaba Special Woreda, SNNPR.

The main sources of believed safe water in the woreda are deep bore holes (with water tables in the 150-300 meters range) and rainwater harvesting. In very few areas hand pumps exist for institutions like health centers.

In this thesis, a case study of Halaba Special woreda CLTSH program in improving water supply, Sanitation and Hygiene was evaluated and determinates for the CLTSH also identified.

2.5. Determinants affecting the CLTSH to improve WASH

As few researches shown, CLTS is more effective in communities where it is used as the only approach to promoting hygiene and sanitation, some African countries like Nigeria (An Evaluation on CLTS Programme in Nigeria, 2007).

As the study finding shown, due to the implementation of CLTSH approach below positives improvements seen toward WASH;

- Impressive improvement in hygiene and sanitation – many more toilets constructed with hand-washing arrangements, refuse disposal, clean premises, clean environment
- Community feel proud about the positive changes yet aware need to do more
- All the institutions involved are working and aware of their respective roles
- Majority of people involved are committed
- Community has confidence in Water and Sanitation Committee (WASCOM)
- People are changing habits – sharing others' toilets instead of open defecation
- Local materials are used instead of concrete slabs

In the other side there are different determinants that makes community practice open defecation, poor hygienic and poor household water management (Dejen et al., 2015) revealed the bad smell of a latrine, lack of privacy if the shelter is inadequate, childhood habits that are hard to break and many more even though different from place to place depending on determinants like Behavioral, Demographic, Geographic, Climatic, Social, Cultural (life style and religious), Economic (Affordability) and the facility related. And also the study done in India shows that the reasons for open defecation like the toilet construction incompleteness, poor construction toilet, lack of awareness, habit of open defecation, and preference for an open environment for defecation (Cronin A, 2013).

Indeed the study carried out in Dilla town showed that the factors that associated with the extent of latrine utilization were socio-demographic factors, environmental factors and Behavioural factors (Asfaw et al., 2015).

The study showed that the extent of latrine coverage and utilization in CLTSH implemented was greater than that of CLTSH non-implemented kebeles (Negasa et al., 2015)

There are different challenges still to improve the Water, Sanitation and Hygiene status of the peoples among, population growth which double almost in sub-Saharan Africa, inequalities between rich and poor and male and female, less political commitment, poverty and climatic changes.

The Most causes for not using the toile regularly, is due to the fact that the alternatives (i.e., toilets) are not available or not clean, safe, and attractive.

CHAPTER THREE

3. MATERIALS AND METHODS

3.1. Description of Study area and Period

Halaba is one of the four special woreda in the Southern Nations, Nationalities, and Peoples' Region of Ethiopia. It is named after the Halaba people, and covers part of their homeland. It is Located in the Great Rift Valley. Halaba is bordered on the south by an exclave of Hadiya Zone, on the southwest by the Kembata Tembaro Zone, on the west and north by Hadiya Zone, on the north east by Lake Shala, and on the east by Oromia Regional state; the Bilate River, which is its major body of water, defines its western boundary. The administrative center is Halaba Kulito.

The administration center of Special Woreda Halaba, Halaba Kulito, is located 90 kms south-west of Hawassa (see map in Figure 1). The altitude range is from 1,554 to 2,149 meters above sea level. The climatic zone of the woreda consists of mainly mid-land (weinadega) (86% of woreda) and low-land (kola) (14%).The mean annual temperature ranges from 17 to 20°C. The main soil type in Halaba is mostly sandy, silt and ash (white, volcanic) characterized by high water infiltration capacity and fragility (Halaba Special Administration Office, 2016). Such unstable soils may cause latrine pits to collapse.

Administratively, the woreda is organized into 78 kebeles, 2 urban and 76 rural. Based on the 2007 Census conducted by the Central Statistical Agency of Ethiopia (CSA), this woreda has a total population of 232,325, of whom 117,291 are men and 115,034 women. With an area of 994.66 square kilometers. A total of 49,028 households were counted in this woreda, which results in an average of 4.74 persons to a household, and 47,205 housing units.

Population growth is estimated at 3% per annum. The proportion of male to female was about 49% to 51% respectively.

The dominant ethnic group is Halaba followed by Silte; the dominant religion is Islam (94%).

Annual rainfall averagely from 857 to 1,085 millimeters. The economy is largely based on subsistence agriculture in the form of dryland farming and raising livestock, with some agriculture. The main cash crops include Pepper, Maize, Teff, Sorghum, Haricot beans and Wheat. Halaba has 16 kilometers of asphalt roads, 15 kilometers of all-weather roads and

96 kilometers of dry-weather roads, for an average road density of 130 kilometers per 1000 square kilometers (Halaba special Woreda Administration profile, 2016).

The study has been conducted in Halaba special woreda kebeles where the CLTSH undertaken successfully in February 2017. Namely; Wanjana and 1st Choroko kebeles considering the resources and time cost for the research.

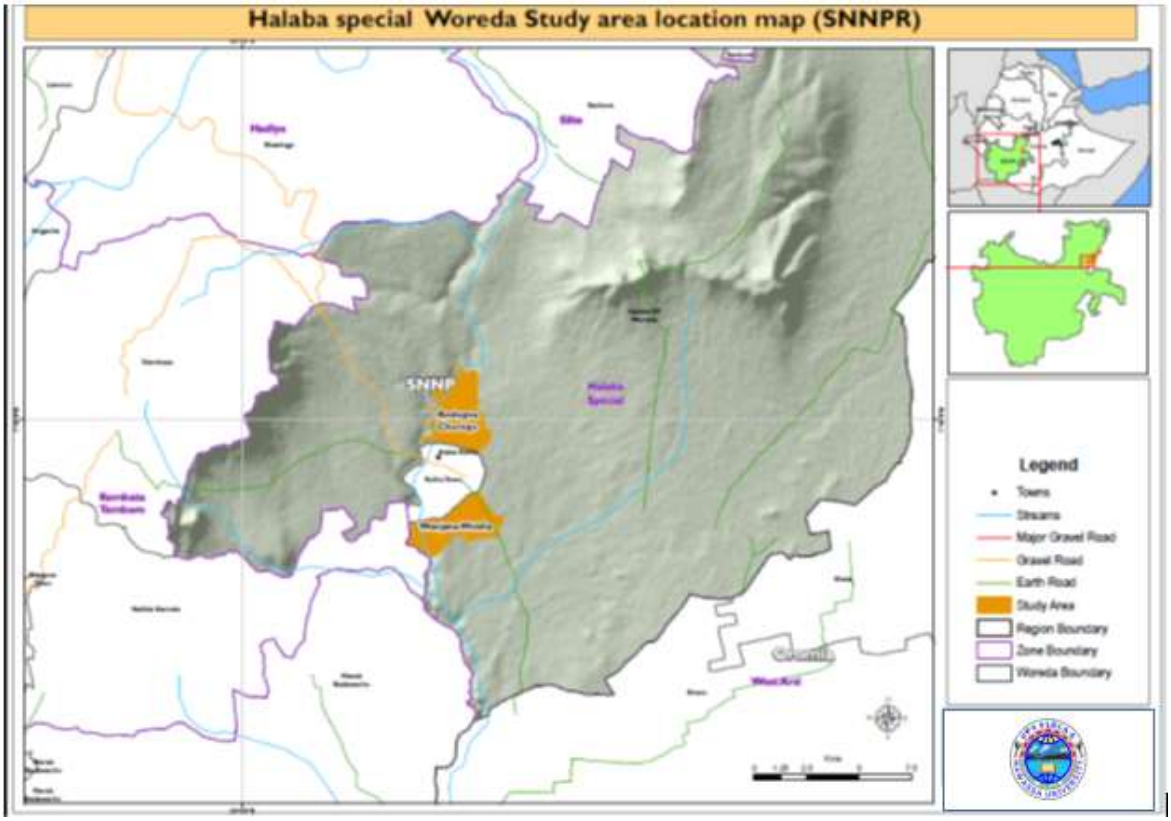

Fig. 1. The Map of Halaba Special Woreda, study area, SNNPR, Ethiopia.

3.2. Study design

To investigate the effectiveness of community led-total sanitation and hygiene and identify the determinants of the CLTSH in order to improve Water supply, Sanitation and Hygiene a cross sectional study design was conducted among the targeted households in Halaba special woreda, SNNPR, Ethiopia.

3.3. Source population

The subject of this study was the household communities like women of the household or girls above 18 years age old since they have more linkage with water, sanitation and hygiene. And the three HEWs' in the respective kebeles and health/water workers of the woreda were interviewed for the qualitative parts. Besides, the observational visit was

carried out for the sample water points and households latrines to triangulate the study information's.

3.4. Sample Population and sample size determination

The study populations' are 4,789 peoples of residence of the study area. From the total of 4,789 of the residence population the sample survey was studied in the correction factor sampling technique (D. Espaut, 2001). For the purpose of the determination of the sample size, the following assumptions have been used.

- Estimated prevalence in the population was 50% (it was taken as 50% of the population has access to water and sanitation facilities and practice safe hygiene practices)
- Desired confidence interval is 95% (5% error risk) the z value 1.96
- Desired precision is $\pm$ 7.3%

$$\text{Dichotic Sample size} = \text{n} = z^2 * \frac{\text{p} * \text{q}}{d^2}$$

$$= (1.96)^2 \text{prevalence} * \frac{(1 - \text{prevalence})}{Absolute\ precision^2}$$

$$\text{n} = \text{z}^2 \frac{pq}{d^2} = 180.22$$

Where n = Maximum sample size

z = 95 % confidence interval (z =1.96).

p =Prevalence of 50%

q = 1-p

d = Absolute precision of 7.3%

No correction was applied since the sample size is less than 10% of the total population. But 7.3% of the sample households added to the sample size in the event because some households may stop midway through their interview after they begin. Thus, the total sample size were **181.**

3.5. Study variables

The variables in this study are

- Water supply provision at household level, latrine utilization and handwashing practice.

- The determinants of CLTSH to improve WASH: There are three domain having their categories.

Technical feasibility factors	**Socio-Economic factors**	**Environmental factors**
• Accessibility, appropriateness of the facility, • Quality and quantity.	• Behavioural factors: • Demography factors: • Economic factors: • Cultural/habitual preference	• Flood and soil character • Attacked by termites

3.6. Data collection

3.6.1. To investigate the effectiveness of CLTSH to improve WASH

The study was carried out by interviewing and observation of those targeted interviewee household members with semi-structured close ended questionnaire, key informant interview and Focus group discussion using the checklists as data collection instrument. The questionnaire that developed in English was translated to Amharic and the data collector's interview the targeted HH and discuss with the targeted respondents after checked by back translation to English with another translator to assure consistency. After each of them filled the questionnaire, it collected and seen for correction immediately by the supervisor and researcher. The respondents of the interview also observed having the observational checklist by the researcher/candidate student and woreda health office assigned person to ensure the data collection quality. The candidate student/scholar and supervisor from the Woreda health were participated in discussing & collecting from the key informants and focus group discussion. And also they were supervise the data collectors and ensure the quality of the data by checking every day.

Totally six data collectors hired (primary school teachers who fluently speak language of the study area) and these enumerators trained on the data collection technic in Halaba Kulito town for one day inclusive of the field practice.

3.6.2. Determinants of CLTSH to improve WASH

The study have been carried out interviewing 181 targeted respondents and observation of the facilities using the pre-designed questioner and check lists

respectively. To ensure the data quality the interview was managed by the trained data collectors and the observation was carried out by the candidate researcher. And every day the collected data checked for correctness and completeness. The determinants categorized under three major domains (technical feasibility, social-economic and environmental) and will be presented in such way during reporting.

3.7. Pre-test

For the validation of the data, the questionnaires and check lists were pre-tested in the communities where those not targeted for the study. Hence depending on the feedbacks while the pre-tested questionnaires corrected and utilized for the final research thesis.

3.8. Ethical Consideration

A letter of permission to conduct the research is required from ethical committee of university (Hawassa University) based on proposal submitted to the faculty. Before data collection the permission requested from the woreda health office and an informed verbal consent were asked from the respondent. Hence the academic honesty and confidentiality has been kept.

3.9. Operational definitions

- **CLTSH:** Changing sanitation and hygiene behavior of communities towards open defecation free environment, hand washing practice and keeping drinking water safe. This is done through a process of social awakening stimulated by facilitators from within or outside the community. The approach concentrates on the behavior of the community as a whole rather than on individuals.
- **Open defecation free (ODF) -** an environment wherein no feces is openly exposed to the air. It describes a state in which all community members practice use of latrine at all times and a situation wherein no open defecation is practiced at all. ODF is a term used in CLTSH to describe the attainment of 100 percent latrine coverage and use by all families in a village, including small children.

3.10. Data analysis and interpretation

An Analysis was made by using the SPSS Version 20 statistical package. Bivariate correlation analyses were employed to examine the relationships between outcomes and explanatory variables for possible confounding factors. The data encoded manually and analyzed by using SPPSS version 20 and the summary of the analyses also interpreted using the SPSS and the result of the research interpreted for final report preparation.

CHAPTER FOUR
RESULTS AND DISCUSION

4.1. General information

As female are more responsible regarding the water, sanitation and hygiene issues and they have more access, a family Mother are preferred as possible to respond for the HH interview. If the family Mother/head female unavailable the eldest girl or boy above 15 years age interviewed. Therefore, as the result shown 79% respondent were family head female, 14% eldest girl and the rest 7% boy.

Table 1. The respondent identity, marital status and their educational back ground.

Variable	option	No. of respondents	Percentage (%)
Respondent identity	Female Mother	143	79
	Female >15 age	26	14
	Boy >15 age	12	7
Respondent marital status	Single	34	19
	Married	147	81
	Divorced/widowed	0	0
Educational status	Illiterate	111	61.3
	Primary	63	35
	Secondary	7	3.9
	Tertiary	0	0

As the finding shown, the sample household visited do have 1258 population of the residence, 648 peoples (51.5%) are literate regardless of their educational level and the rest 48.5% are illiterate. On the other side, the average population size per household of the study area shown 6.95.

The monthly income of the respondents majorly 300-600 and 601-1000 which is 63HHs' (34.8%) and 61HHs' (33.7%) respectively. The rest 38HHs' (21%) and 19HHs' (10%) get above 1000 and below 300 revenue per month respectively.

Table 2. The monthly income of the respondents

Income category in ETB	In number	Percentage
<300	19	10
300-600	63	34.8
601-1000	61	33.7
>1000	38	21

In general as shown the number of illiterate respondents 61.1% and almost 93% of the respondents were female. Therefore, it is clear that the female access to education still remain back, but looks improved when compared to the EHS (2005) report which was 2/3 of women compared with 2/5 of male do not have any formal education. The income of the sampled HHs' 300-600ETB and 601-1000ETB per month which is 34.8% and 33.7% respectively. As stated in the finding the cost that the community the money they invests for WASH related alone; major of them 221 to 400ETB and a few of them invest 651-860ETB.

4.2. Water supply

Regarding the water source, 170HHs' (93.9%) have access to safe water source which is water tap which is from borehole. The rest 18HHs' (6%) mainly use water from sellers. The response that collected from 4 key informants respondents mentioned as when the piped water supply not provided "we had travelled to Kulito town to get clean water which took us 2hrs travel for a single trip and we pay also 10 to 20ETB per 20 liter capacity Jerican hence majorly we depend on seasonal river and pond water sources". There major barrier that they stated were cost and distance from their residence.

The average water consumption was 8.7 l/p/d which is under minimum standard. From these, only 8.3% (15HHs) collect 20-35 l/p/d, 38% (68HHs') collect 40-55l/p/d, 21% (38HHs') and 33% (60 HHs') collect above 75l/p/d. Of the samples only 5% (9HHs') consume at least or above 15l/p/d capita consumption. Inadequate drinking water adversely affects personal hygiene, clean food preparation and housing sanitation, hence favoring the transmission of water borne and water washed communicable diseases. An adequate amount of water is that which is needed to satisfy metabolic, hygienic and

domestic requirements usually about 15 liters of safe water per person per day. This minimum quantity, however, vary depending on whether it is an urban location or rural and whether warm or hot climate. Perhaps this is why the WHO (2008) described basic human water need to be 20 to 50 liters of uncontaminated water daily.

From the samples, 53HH (29.3%) responded as their water source physiologically unfit for drinking which were like salty in taste and have bad smell whereas 70.7 responded as suitable for drinking. But residents of the study area mentioned previously their water source were rivers and ponds which turbid and unsuitable physiologically as the key informants from the community and woreda health office (Sanitation and Hygiene focal person) stated.

Table 3. The respondents concerning their water source physically

Variable	Respondent in No.	Percentage (%)
Turbid	1	0.6
Salt	37	20.4
Bad smell	14	7.7
Bad Odor	1	0.6
Looks clean	128	70.7
Total	181	

Regarding Household water treatment methods, 45.3% of the total households treat their drinking water in any way at household level, of which 41% treat their drinking water by adding chemicals, 2.2% by let their water to be settle, and 1.1% by straining through cloth, but the rest 54.7% (99HHs) mentioned that they never treat their drinking water at household level but to compare with the previous history no data available in this regard.

The sample households those responded as they store water at their home level 108HHs' (59.7%) of which 74HHs' (41%) by Jerrycan container, 28HHs' (15%) by plastic bucket container and 7HHs' (3.9%) by pot container whereas the rest 73HHs' (40.3%) do not store their domestic water at home level by any container.

Access to safe water (piped or public tap) is 93.9% which is much higher when compared with the data EHS (2016) shown which is only 57% rural HHs' has access to an improved sources of drinking water (piped water).

Only 29% of the respondents has complain on the physiological water quality parameter problem which are salty and bad smell. Apart from quantities consumed, water quality compromised by various factors that require measurement. Some factors such as physical, chemical and bacteriological processes because the quality of surface water to vary during the years (WHO, 2010). Water quality is a measure of the condition of water relative to the requirements of one or more biotic species and to any human need or purpose and it is most frequently used by reference to a set of standards against which compliance can be assessed. Monitoring the quality of water facilitates; evaluation of nature and extent of pollution, effectiveness of pollutant control measures, water quality trends and prioritization of pollution control efforts (Diersing-Nancy, 2009).

Only 45.3% respondents investigated as treat their drinking household water in any way at home by point of use water treatment options which is less practiced even though the household water treatment is very important to ensure their water quality. Water that is microbiologically safe at source or other point of distribution is subject to frequently & extensive faecal contamination during collection, transportation and storage in the home (Wright et al., 2004) thus the household water treatment is very crucial.

4.3. Sanitation

The sampled respondents as revealed 88% (159 HHs') use the family latrine, 9.4% (17HHs) use small holes, 3.9% (7HHs') use the shared/group latrine and 0.6% (1HHs') use public latrine whereas only 6.6 (12HHs') responded as practicing open defecation.

Besides, 156HHs' (86.2%) uses the latrine regularly for all their family members and 20HHs' (11.05%) do not use the latrine regularly for all their family member.

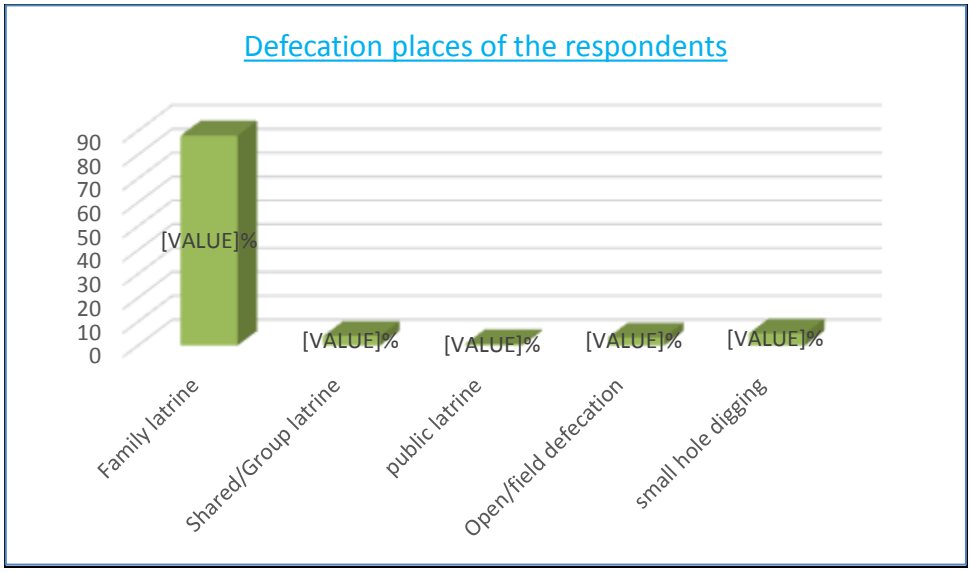

Fig. 2: The human excreta disposal facilities of the respondents

The families those do not use regularly their family latrine, the determinants that hindered them not to use regularly the latrine; uncovered properly (7.2%), Far from home (3.3%), Far from farm/working area (0.6) and bad smell (0.6%) while the rest (88.4%) use regularly.

Table 4. The determinants that hindered respondents not to use their latrine regularly

Variable	in Number	in Percentage%
Far from home	6	3.3
uncovered properly	13	7.2
Far from farm/working	1	0.6
Bad smell	1	0.6
Use regularly	160	88.4

The sampled households' latrine that observed for cleanness; 122HHs' (67%) superstructure uncovered, 22HHs' (12%) slab covered poorly, 36HHs' (20%) seat/squat improper, 120 (66%) do not have door/locks, 105 (58%) have no handwashing facilities and 18 (9.9%) feaces available on/near the latrine slab.

As the respondents stated major of the sampled households invests per latrine 201-400ETB 62HH (34.3%) and 401-600ETB 58HHs' (32.04%) where as those invests 601-800ETB were 24HHs' (13.3%). In detail see the figure below.

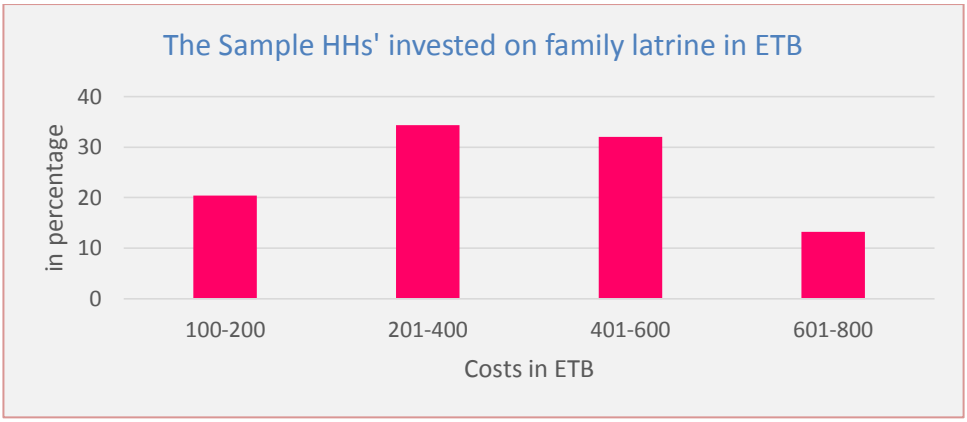

Fig.3 The household investment of the respondents for their family latrine

The previous history of sampled HHs' defecation practice before two year 45% (82HHs') had been used their family latrine, 6.1 (11HHs') used shared latrine, 2.2% (4HHs') used public latrine, 30% (54HHs') used open defecation and 17% (30HHs') used small hole digging.

The technical limitations of the sampled HHs' latrine has been observed/visited that 52% (95HHs') the latrine superstructure uncovered, 49% (88HHs') handwashing facility unavailable, 32% (58HHs') have no water for handwashing, 30% (55HHs') the latrine distant from home, 24% (44HHs') shallow depth of the pit, 23%(42HHs') has bad smell and 16% (29HHs') improper site selection.

Table 5. The technical limitations of sampled HHs' latrine

Variable	Respondent in No.	Respondent in %
Improper site selected	29	16
Shallow pit depth	44	24
superstructure uncovered	95	52
bad smell	42	23
distance from Home	55	30
Handwashing unavailability	88	49
Water shortage for Handwashing	58	32

88% respondents stated as they use their own family latrine and only 3.3% responded as they practice open defecation which is very much lower than EHDS (2016) which was 32% have no toilet facility at all. The open defecation practice is also very much lower than the access sanitation in Ethiopia (Abebe et al. (2015) which was 35.6%. This latrine

coverage mostly achieved due CLTSH implementation in the study area and also research that done in Ethiopia witnessed. (Negasa et al., 2015 and Helpdesk Report: Community-led Total Sanitation in Africa, May 2013).

In the other side, when the respondent previous defecation history seen 36% were defecate in open field while only 41% use latrine. Hence this improvement seen due the CLTSH approach implementation in the area as witnessed in Kidanu, M. and Abraham, B. (2009).

As known having the latrine do not ensure the regular utilization of the latrine. As a result, 11.05% of the respondents did not use their latrine regularly. According to the findings done other places in Eastern Ethiopia, Diretiyara district where CLTSH implemented, inconsistent use of latrine by all family members was observed, and only 47% (176) of the interviewees reported regular use of latrine by their entire family (Tessema RA (2017). The factors that hindered them to use the latrine regularly mentioned sequentially uncovered properly/shelter (7.2%), far from home (3.3%) and bad smell and far from farm/working area comprise insignificant which is (0.6%) each. Even when compared to those use regularly with those stated as they use latrine (regardless of the utilization frequency) the variable is very much smaller which is 86% by 88% which is almost the same with the research done in Dilla town, Asfaw et al. (2015). But still there are determinants that hindering them from regular utilization of their latrine which are technical feasible determinant as stated. These are uncovered properly/shelter and improper location of the household latrine as aforementioned. These problem can also lead to privacy and protection which can be concluded as social aspect determinants and they are almost the same determinates with the study that done in India (Cronin A, 2013).
As shown in table 6, the correlation of current defecation areas of the sampled household, previous defecation history and the challenges to have their own latrine very significantly correlated.

Table 6. The Correlations of defecation areas (current & previous) and their challenges to have latrine

		Defecation area currently	Defecation history before two years	What is the challenge to having latrine
Defecation area currently (2017)	Pearson Correlation	1	.240**	-.087
	Sig. (2-tailed)		.001	.244
	Sum of Squares and Cross-products	141.890	63.094	-16.873
	Covariance	.788	.351	-.094
	N	181	181	181
Defecation history before two years (2015)	Pearson Correlation	.240**	1	-.208**
	Sig. (2-tailed)	.001		.005
	Sum of Squares and Cross-products	63.094	485.370	-74.558
	Covariance	.351	2.697	-.414
	N	181	181	181
What is the challenge to having latrine	Pearson Correlation	-.087	-.208**	1
	Sig. (2-tailed)	.244	.005	
	Sum of Squares and Cross-products	-16.873	-74.558	265.304
	Covariance	-.094	-.414	1.474
	N	181	181	181

**. Correlation is significant at the 0.01 level (2-tailed).

4.4. **Hand washing practice**

Regarding to the Hand washing at critical times 72 % respondents mentioned 3 or more critical times whereas 27% mentioned two and below critical handwashing times (i.e. 91% after latrine use, 85% before cooking/preparing food, 82% before eating, 46% before feeding toddler and 30% after cleaning child).

Table.7. Handwashing knowledge of the respondents

Handwashing knowledge	**In no.**	**Percentage (%)**
After latrine use	164	91
Before cooking	154	85
Before eating	148	82
Before feeding toddler	83	46
After cleaning children	55	30

The materials for handwashing as detergent that the sampled household uses for their handwashing 61% uses both soap & water but 40% uses water alone. The rest 24% uses ash. Moreover, 75.7% do not have fixed handwashing facility for their latrine and the rest 24.3% have it. As the recorded data seen from health extension workers (during KII in Wanja kebele) before the implementation of CLTSH the handwashing facility existence to the household family latrine almost nil. Thus, the CLTSH implementation contribution for the improvement of handwashing facility/device also significant even though not as household toilet construction.

The type of handwashing materials that the sampled households have been using 15% Jerry can, 9.4% plastic bottle and 0.6% pot. To make available these handwashing facilities the responds sated 18.2% spent 20ETB and below, 5% spent 30-40ETB and 1.7% spent 50-60ETB.

Regarding the handwashing knowledge; 72% self-reported as they know three or more handwashing at critical times, where as 27% mentioned two and below the critical handwashing times. Here the knowledge of the respondents look very good. The detergents (essential for handwashing) that the sampled households uses for their handwashing; 60% both soap &water where as 40% uses water alone, this when compared with the Ethiopian Demographic and health survey Report of 2016 very great difference which was only 7% in rural households. (EDHS, 2017). On the other side, interviewers were able to found hand washing facility in 24.3% of households where as in 75.7% residents the handwashing facility unavailable but when compared to the Ethiopian rural community as reported on Ethiopia Demography and Health Survey 2017 very small which was 54.5% in rural community. Besides, the availability of the handwashing facility with soap/ash has significant effect on communicable disease prevention and control.
In general the analysis with ANOVA of the water supply system, Sanitation and hygiene positively related as shown on below table. Hence it shows their interdependence of them.

Table 8. ANOVA results for water supply, Sanitation and Hygiene

		Sum of Squares	df	Mean Square	F	Sig.
Main water source	Between Groups	.441	2	.220	.462	.631
	Within Groups	84.559	177	.478		
	Total	85.000	179			
Defecation area	Between Groups	.258	2	.129	.162	.851
	Within Groups	141.632	178	.796		
	Total	141.890	180			
Hand washing practice	Between Groups	1.332	2	.666	.972	.380
	Within Groups	122.027	178	.686		
	Total	123.359	180			

Photo 1: shows the sample photo current HH latrine with Handwashing, 1st Choroko kebele,Hasan Koricho House

Photo 2: Shows the previous latrine in 1st Choroko Kebele from woreda health office archive

4.5. Determinants of CLTSH to improve Water, Sanitation and Hygiene (WASH)

The household water storage practice, household water treatments and the reasons that hinder them not store significantly correlate (table 9). This finding is agreement to the studies conducted in Ethiopia (Dagnew et al., 2007 and Mengesha et al., 2004).

Table 9. The Correlations of water storage, water treatment at household and factors affect them not to store water at household.

		Water store water practice @ HH level	Water treat at HH	Reason for do not store their water @ HH
Water store water practice @ HH level	Pearson Correlation	1	.437**	-.418**
	Sig. (2-tailed)		.000	.000
	N	181	181	181
Water treat at HH	Pearson Correlation	.437**	1	-.124
	Sig. (2-tailed)	.000		.097
	N	181	181	181
Reason for do not store their water @ HH	Pearson Correlation	-.418**	-.124	1
	Sig. (2-tailed)	.000	.097	
	N	181	181	181

**. Correlation is significant at the 0.01 level (2-tailed).

The water store practice at household level with water treatment at household and water store practice at household level with reason for not store at household level seen as correlated.

As the sampled respondents revealed regarding the factors that hindering them to have their own latrine 22% due low awareness, 5% due skill gap to construct latrine, 4.4% preference to defecate in field/open, 2.2% due bad smell, 6.6% due unavailability of construction material, 4.4% flood and termites and the rest 2.2% due initial and maintenance cost. Here we can observe the technical, social and environmental determinants hindering them for not having their own latrine even though their degree level different. These also witnessed by research done in Dilla town, Asfaw et al (2015). Moreover, the FGD that held with women and elders (1st Choroko kebele) agree with hindering factors but they stated the flooding particularly in rain season and type of soil (easily damaged) major hindering factors also.

> "We forced to reconstruct/maintain latrine every year due flooding in the rain season"…women FGD participant

The reasons that the sampled households not having handwashing facility near to the toilet revealed 34% due theft/material taken, 25% material unaffordability, 24% water shortage for handwashing, 23% low awareness and 11% skill to prepare the facility.

Table 10: The determinants for not having handwashing facility

Variable	In number	Percentage,%
Low awareness	41	23
skill shortage to prepare facility	20	11
Water shortage	43	24
Material unaffordability	45	25
Theft/material taken	61	34

Hence from the above result, the socio-economic aspects (low awareness, material unaffordability & theft) and technical aspects (skill shortage & water shortage) stated as the determinants to avail the handwashing facility. Furtherly the determinants of each factors revealed in detail as below sub-titles.

4.5.1. Technical feasibility factor

The average water per capita consumption was 8.7l/p/d which is below the government of Ethiopia as GTP2 which is 25l/p/day even lower than the WHO guideline which should be at least 20l/p/day at emergency. Thus, the quantity of water that identified as technical factor. But, the quantity of water delivered and used for households is an important aspect of domestic water supplies, which influences hygiene and therefore public health as well. (WHO, 2003). Moreover, the UN says guaranteeing a proper water supply is vital to eradicating poverty. It says the absolute daily minimum amount of water a person needs is 50 liters, which include 5 liters for drinking, 20litre for sanitation and hygiene, 15litre for bathing and 10litre for preparing food. However, because of scarcity, millions of people try to exist on 10 liters a day. Achieving these goals requires sustainable economic and social development in developing countries.

The technical factors of the existing latrine as investigated; the latrine superstructure uncovered (52%), handwashing facility unavailability (49%), the pit shallow in depth (32%), has bad smell (23%), and improper site selection (16%). Even though the latrine quantity achieved dramatically but technically failed to meet the latrine standard. Thus, we can understand the CLTSH approach helpful to improve the latrine in terms of quantity while the quality still the area of attention both for the implementers and researchers.

4.5.2. Socio-economic factor

As the sampled HHs' revealed they did not store their water at home they revealed due absence of container 22% (40HHs'), due always the water availability 18% (33HHs'), storage materials cost 14% (25HHs') and the amount of water they collect small 7.7% (14HH')

Of the sampled households that visited and those has their own latrine regarding their latrine cleanness; 122HHs' (67%) superstructure/shelter uncovered, 22HHs' (12%) slab covered poorly, 36HHs' (20%) seat/squat improper, 120 (66%) do not have door/locks, 105 (58%) have no handwashing facilities and 18 (9.9%) feaces available on/near the latrine slab. Hence in addition to, the technical determinants the social aspects (privacy) observed. This also stated on other research (Dejen et al., 2015). As the sampled respondents revealed among the factors that hindering them to have their own latrine the leading factor due low awareness (22%) which mean behavioral factor and 4.4% preference to defecate in field/open which related to habitual practice.

4.5.3.Environmental factor

As aforementioned, the latrine availability hindered by flooding and termites (4.4%) even though insignificant comparative to the other factors as per the household respondents. In contrary the FGD participants mentioned flooding and type of soil (easily damaged) as major hindering environmental factor.

In over all the major factors those hindering the resident communities to improve their water supply, Sanitation and Hygiene stated are 45% due Economic shortage, 22% due poor knowledge, 18% due initial and maintenance cost, 8% human labour, and the rest 4% and 3% family size and prefer to defecate in field/bush respectively. Thus, we can see clearly that the economic is the primary and major factor for WASH improvement. As the survey carried out in Ethiopia Demography and Health shows the single item (soap for handwashing) stated that Households in the highest wealth quintile are almost 9 times as likely to have soap and water as those in the lowest wealth quintile(26% versus 3%).

The factors that affect the household water storage, the factors affect availability of latrine at household and over all factors (economic shortage, poor knowledge, initial/maintenance

cost, human labour and family size) hindering them to improve their WASH over all observed significantly correlated (table 12 below). Hygiene improvement is a comprehensive approach to prevent diarrheal disease by promoting improvements in hand washing, treatment and safe storage of water, sanitation, improved access to water and sanitation technologies and products, and fostering an enabling environment. Studies have documented that hand washing at critical times with soap reduce the risk of diarrheal diseases (Curtis and Cain cross, 2003).

As shown in below table 11, the factor that affect the water storage significantly correlated with challenges with not having latrine at household level and the challenges not to have latrine at household level significantly correlated with factors hindering their WASH improvement.

Table 11. The Correlations of factors affecting to store their water at HH, their challenges not to have their own latrine and factors hindering to improve their WASH

		Factors affect to store their water @ HH	Their challenges not to have latrine @ HH	Factors hindering to improve their WASH
Factors affect to store their water @ HH	Pearson Correlation	1	.227**	.076
	Sig. (2-tailed)		.002	.312
	Sum of Squares and Cross-products	231.613	56.265	15.039
	Covariance	1.287	.313	.084
	N	181	181	181
Their challenges not to have latrine @ HH	Pearson Correlation	.227**	1	.239**
	Sig. (2-tailed)	.002		.001
	Sum of Squares and Cross-products	56.265	265.304	50.773
	Covariance	.313	1.474	.282
	N	181	181	181
Factors hindering to improve their WASH	Pearson Correlation	.076	.239**	1
	Sig. (2-tailed)	.312	.001	
	Sum of Squares and Cross-products	15.039	50.773	170.696
	Covariance	.084	.282	.948
	N	181	181	181

**. Correlation is significant at the 0.01 level (2-tailed).

CHAPTER FIVE

5. CONCLUSION AND RECOMMENDATION

5. 1. Conclusion

As revealed the major (almost all) respondents (93%) were female and 61.1% of them were illiterate. The annual income of the respondent 300-600ETB & 601-1000ETB which is 1st and 2nd respectively.

The safe water access (piped) from borehole was 94% but the water capita consumption low which was 8.7l/p/d. Only 29% of the respondents stated complain on their drinking water physiologically water quality. Concerning the home level water treatment only 45.3% of them practicing point of use household water treatment. 88% of respondents stated as they use their own latrine while only 3.3% of the respondents practice open defecation in the other side when the open defecation history compared to recent (after CLTSH implemented) reduced from 36% to 3.3% and the latrine coverage also increased from 41% to 88% which is more than two times. As the finding shows the targeted areas for the research the access to water, sanitation and hygiene shown improvement particularly the availability of facilities that most probable achieved due the implementation of CLTSH. Because as shown in the results, the coverage of their latrine and water very much smaller before the implementation of the approach. On the other side, regular utilization of family latrine still 11.05% do not use regularly even though they have the facility and the stated factors that hindered them regarding the regular latrine utilization are uncovered/shelter, far from home and bad smell as stated by the sampled people.

The handwashing practice concluded that major of the respondents (72%) mentioned at least three critical times and the rest two and below critical handwashing times. More over while washing their hand 61% sampled respondents stated as they use both soap and water during handwashing.

Besides, the limitations of the technical, their economic status, poor awareness mentioned as major determinants to improve their WASH issues where as the environmental factors stated less/no determinants. And also the illiteracy level of the women played its own role and shows the interdependence of education with WASH. Therefore, the technical

feasibility and the socio-economic factors prioritized as major determinants in this community to improve their WASH problems. Thus, while planning the WASH interventions it is very advantageous to consider these factors as well. Furtherly, the below recommendations very helpful for any actors or researchers in the future.

5.2. Recommendation

Based on the assessments carried out on CLTSH to improve WASH and their determinants; the following basic recommendations may be suggested due the results investigated from the findings:

- As the finding shows the CLTSH approach played great role in improving water access, reducing open defecation practice, improving latrine access thus it is recommended to scale up the approach by improving the limitations like how to improve the latrine structure quality, regular utilization, water consumption per person per day and handwashing facilities those are affordable and acceptable.

- As seen in the finding affordability, poor knowledge and technical support requests stated as those major determinants to improve their Water, Sanitation and Hygiene (WASH) issues thus the simplest and affordable WASH facilities should be promoted with very systematic technical support.

- As the finding shows the households those practice the point-of use household water treatment less than those do not use it, then it is suggested that to aware them about household water treatment or options and also avail the options through social market.

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7. APPENDICES

7.1. HH questioner

I am from Hawassa University. I am collecting information relating to Water, Sanitation and Hygiene for the purpose of academic research in Halaba special woreda. This questionnaire is prepared as an instrument to conduct an academic research for the fulfillment of Masters of Science Degree (MSc) at Hawassa University, Institute of Technology, School of Bio-Systems and Environmental Engineering with specialization in Water Resources Engineering and Management. I would like to talk to you about this, but you can choose not to take part. The interview will take about 30 minutes. All the information we obtain will remain **strictly confidential**. If possible I would like to speak with the female head of the household. If not available, is there a woman over the age of 15 or male head that I can talk to? Thank you in advance!

May I start now? ☐ Yes ☐ No **Begin the interview if the answer is yes**

I. General information:

Interviewer: ----------Date ----------
Checked by: ----------Date----------

Respondents back ground
Woreda: _____
Kebele:_____
Village: _____
Survey #_____

Respondent identity:
- ☐ Mother / Female head of house
- ☐ Female over 15 years
- ☐ Male over 15 years

Respondent Marital status:
☐ Single ☐ Married ☐ Divorced

Respondent's level of education:
☐ Illiterate ☐ Primary (1-8)
☐ Secondary ☐ Tertiary/College/University

How many people in your household can read?
____

1. What is the total family size of this household? ____ People.

2. How many of them are (write the figure):

Age category	Female	Male
Elderly, over 65 years		

Working age (18-64 age years)		
School age children (5-17)		
Children under 5 years		

3. Household income level (ETB /month) is
   - □ < 300
   - □ 300-600
   - □ 600-1000
   - □ > 1000

II. Questions for Water supply related

4. What is the **main** source of **drinking** water for this household? **(ONLY CHOOSE ONE :)**

   - ☐ Tap stand
   - ☐ Rain water collection
   - ☐ Open Well, River or pond
   - ☐ Water sellers
   - ☐ Other _____

5. How much water do you collected yesterday to your family? (liter/ Jerry can)
   - ☐ 10 liters
   - ☐ 15 liters
   - ☐ 20 to 30 liters
   - ☐ 40 to 50 liters
   - ☐ 60 to 70 liters
   - ☐ ≥ 75 liters

6. How do you get the test, smell and Odor of your drinking water
   - ☐ It is turbid
   - ☐ It has salty test
   - ☐ It has bad smell
   - ☐ It has bad odor

7. Do you treat your water in any way to make it safer for drinking?
   - ☐ Yes
   - ☐ No

8. If yes, what do you usually do to the water to make it safer for drinking?
   - ☐ Boiling
   - ☐ Strain through a cloth
   - ☐ Let it stand and settle/sedimentation
   - ☐ Add bleach/water treatment chemicals
   - ☐ Water filter (Biosand/ceramic)
   - ☐ Other_____

9. Do you store your household water safely?
   - ☐ Yes
   - ☐ No

10. If yes, with what container you store?
    - ☐ Jerry can
    - ☐ plastic bucket
    - ☐ Pot
    - ☐ barrel

11. If not, what is the reason?
    - ☐ I do not have the material
    - ☐ The water we get is small
    - ☐ Since always water is available

☐ The storages cost

III. Sanitation related information's

12. Where do you and your family pass stool / defecate now?
☐ Family latrine
☐ Shared or group latrine
☐ Communal (public) latrine
☐ Open field/in the bush
☐ Dig small hole and cover
☐ Other _____

13. If they have a family latrine, do all the family members use regularly?
☐ Yes ☐ No

14. If No, why?
☐ Far from home to use at night
☐ Properly do not covered/ constructed
☐ Far from farming land/working area
☐ Bad smell

15. May I visit the latrine please? (mark by observing the latrine, only those have the latrine)
☐ The super structure do not properly covered
☐ The slap do not covered properly
☐ The seat/ squat do not constructed properly
☐ The latrine do not have door and locks ☐ No handwashing facility
☐ The stool/urine present on the slab

16. How much estimated cost do you invested on your current latrine considering labour & material in ETB?
☐ 100-200ETB ☐ 200-400ETB
☐ 400-600ETB ☐ 600-800ETB

17. If you defecate in the bush, what is the reason?
☐ Human labour to construct latrine
☐ Poor soil condition to excavate latrine
☐ Bad smell of the latrine
☐ Economical problem to work latrine
☐ Space to excavate pit latrine
☐ Water scarcity

18. Where do you and your family pass stool / defecate before 2 years?
☐ Family latrine
☐ Shared or group latrine
☐ Communal (public) latrine
☐ Open field/in the bush
☐ Dig small hole and cover
☐ Other _____

19. If you do not have the latrine what are your challenges? (mark all that are mentioned)

☐ Low awareness about latrine importance
☐ Knowledge how to construct latrine
☐ Preference to defecate in the bush
☐ Bad smell of the latrine
☐ Unavailability of the construction materials
☐ Flood and termites damage

20. What is the technical limitations of the latrine facility? (those has latrine)
☐ Site selection of the latrine
☐ Shallow depth of the latrine
☐Super structure uncovered
☐ Bad smell
☐ Far from the living home
☐ Hand washing facility
☐ Water shortage

IV. Hygiene promotion related information

21. When do you wash hands? [DO NOT PROMPT. Ask 'Any other time?' until the respondent has no other times. Check all that are mentioned.]
☐ After latrine use
☐ Before cooking / preparing food
☐ Before eating
☐ Before feeding a baby
☐ After cleaning a baby's bottom

22. What do you use to wash your hands?
(More than one response is ok)
☐ Water alone
☐ Soap and water
☐ Ash
☐ Soil / sand
☐ Nothing
☐ Other _____

23. Do you have the handwashing facility for your latrine? (please see it)
☐ Yes ☐ No

24. If yes, mention the type of materials please
☐ Jerry can ☐ plastic bottle
☐ Pot/Jar ☐ others (specify)…….

25. If you have the hand washing facility how much it costs you to avail the handwashing facility?
☐ ≤ 20ETB ☐ 30-40ETB
☐ 50-60ETB ☐ > 60ETB

26. If you do not have handwashing facility, what are the reasons?
☐ Low awareness
☐ We do not know how to prepare the facility
☐ Water shortage

- ☐ The materials cost unaffordable
- ☐ The facility may be taken/theft

27. What are the major factors hindering you & your family to improve the Water Supply, Sanitation and Hygiene

☐ Our family size high to address
☐ Human labour for construction
☐ Economic shortage
☐ Poor knowledge
☐ We prefer to use bush

7.2. Focus Group Discussion

	FDG Identification	*Date ___/___/_____*
	Region:	Participant group type:
	Zone:	Total No. of participant:
	Woreda:	Male:
	Kebele:	Female:
	Facilitator name:	**Documenter name:**

Q. N0	Discussion questions:
Water supply	
Q1	What is the current water situation in this community in terms of availability, access, quality, and community practices?
	○ Can you tell me from where you are getting/fetching water? ○ How far from most households is the main water point? Time? Distance? ○ Do you have any concerns about the water source? Functionality? Regular availability? ○ Have you store your water at home level? If not what are the challenges/ hindering factor not doing? ○ How do you find the quality of water? ○ How the people keep the drinking water safe from contamination at household level? ○ What are the key challenges in improving access for water in the community?
Sanitation	
Q2	What is the current Sanitation situation in this community in terms of availability, access quality, and community practices?
	○ How common is open defecation in your community? Why? ○ Where do they go for defecation? ○ When do they do it most often? Day time (or) Night time? ○ Can you raise your hands those of you who have latrine? ○ What prevents other families to construct their own latrines? ○ How can we motivate people to construct latrines? What would be the better strategy? ○ What are the reasons for your community not using latrine? Family size, knowledge level, shortage of materials or technical support?
Hygiene	
Q3	What is the current hygiene situation in this community in terms of knowledge, attitude and practices?
	○ How common is hand washing in your community? ○ Can you tell me the critical hand washing times? ○ What materials/agent do most people use when washing hands? ○ What are the reasons why others do not wash their hands with soap and water? ○ What are barriers for hand washing?
Priority issues in the community	
Q5	What are the main challenges in your community regarding Water supply, sanitation and Hygiene?
Q6	What do you suggest to improve the water supply, sanitation and hygiene problems in your community?

7.3. Key Informants

	KIIs Identification	*Date ___/___/_____*
	Region:	Name of organization:
	Zone:	Name of informant:
	Woreda:	Position in the organization:
	Kebele:	

Q. N0	**Discussion questions:**
Q1	How do you describe WASH program implementation capacity of your organization?
Q2	What are your plans to improve WASH status?
Q3	What are your organization strategies to improved WASH status?
Water	
Q4	How is the availability of water for the existing population? Is it enough?
Q5	How is the quality of water being supplied to the community? (Is it safe for drinking, what are the measures being taken by your organization and the community to improve the quality of water?)
Q6	How is the management of water supply systems in your community? Are/is the local government offices are capable to ensure sustainability of the facilities?
Q7	What are the major challenges to improved water access in the community?
Sanitation	
Q8	How are the open defecation practices in your catchment area? What are the main reasons?
Q9	CLTS approaches: Is there CLTSH approach use to create ODF kebeles? Is the ODF kebele declared?
Q10	How is the latrine coverage in your organization catchment area?
Q11	What are the key challenges in increasing access for sanitation facilities and utilization?
Hygiene	
Q12	What it looks like the practicing of hand washing at critical times?
Q13	What are the main barriers for the community for not practicing hand washing in critical times of hand washing
Q14	How is the soap and detergents utilization?