ASSESSMENT OF MAGNITUDE OF LATRINE UTILIZATION AND ASSOCIATED FACTOR IN RURAL SETTING OF HETOSA WOREDA, ARSI, OROMIA, ETHIOPIA: A COMPARATIVE STUDY

By: DAMTEW ARADO BEDADA (BSc)

ADVISOR

Dr. ABERA KUMIE (PhD, MSc)

A THESIS SUBMITTED TO SCHOOL OF PUBLIC HEALTH, COLLEGE OF HEALTH SCIENCES, ADDIS ABABA UNIVERSITY FOR PARTIAL FULFILLEMENT OF THE REQUIREMENTS FOR THE MASTERS DEGREE OF PUBLIC HEALTH

ADDIS ABABA UNIVERSITY

JUNE 2017

ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCES

SCHOOL OF PUBLIC HEALTH

Thesis submission

Name of investigator	Damtew Arado Bedada
Advisor	Dr. Abera Kumie
Title of the research	Assessment of magnitude of latrine utilization and associated factor in rural setting of Hetosa Woreda, Arsi, Oromia, Ethiopia: A comparative study
Study area	Hetosa Woreda, Arsi, Oromia, Ethiopia

ACKNOWLEDGEMENTS

I am very grateful to Dr. Abera Kumie who advised me how should go about my research, and encouraged and assisted me through proposal writing to finalization of this thesis within the given time schedule.

I would like to thank the Addis Ababa University School of Public health administration for approval of this title to assess magnitude of latrine utilization among ODF and NODF communities and financial support.

I would to thank the Oromiya regional Health Bureau, Addis Ababa, Ethiopia, which provide me permission letter to undertake the assessment in the region.

I would like also to thank staff of Hetosa Woreda health office for their facilitation and coopration during data collection and providing all necessary secondary information and documents related to the research.

My thanks also go to all data collectors, supervisors and respondents or representatives of the communities for their deserve my deepest appreciation for their active participation and cooperatives.

I would like to say thank you all my friends and relatives Mr. Dawit Daniel (Assella Health Center), Gemechu Gudina (oromiya regional health Bureau) and Mr Tadu Bezu (Private consultant) for their assist and better support during data entry, clearing and analysis.

Finally yet importantly, I would like to thanks W/ro Sihin Leggesse, who at the highest time-shared my family responsibility. All my relatives and friends also deserve my utmost gratitude for helping me do the research work.

Contents

LIST OF FIGURES

`

LIST OF TABLES

ABBREVIATIONS/ACRONYMS

CLTS Community led total sanitation

CLTSH Community led total sanitation and Hygiene

UCLTSH Urban Community Led Total Sanitation and Hygiene

EDHS Ethiopian Demographic and Health Survey

FMOH Federal Ministry of Health

HEP Health Extension program

HEW Health Extension Workers

HMIS Health Management Information System

HWTSS Household Water Treatment and Safe Storage

JMP Joint Monitoring Program

MDG Millennium Development Goal

MEDHS Mini Ethiopian Demographic Health Survey

NODF Non-Open Defecation Free

OD Open Defecation

ODF Open Defecation Free

OR Odds Ratio

SNNPR Southern Nation Nationalities Regional State

ToT Training of Trainers

UNICEF United Nations Children Fund

WaSH Water, Sanitation and Hygiene

WHO Wold health Organization

ABSTRACT

Background: Proper disposal of human excreta remains a challenge of under developed country like Ethiopia. Poor utilization of latrine or open defecation is a serious health risk practice, which increase risk of communicable disease transmission. In Ethiopia, since country introduced the heath extension program, later community led total sanitation, and hygiene that focused to end open defecation, so that number of households accessed latrine facility were showed good progress. However, Level of latrine utilization and associated factors were not well known, which was the same as the study area. Therefore, this study employed to find evidences to show the current situation of latrine utilization and factor affecting in the study area.

Objective: To Assess Magnitude of Latrine Utilization and Associated Factors In Open Defecation Free and Non-Open Defecation Free of Rural Communities of Hetosa Woreda, Arsi Zone, Oromia, Ethiopia.

Methods:- Methods:- A community based cross-sectional study was conducted on 1170 (522 from ODF and 648 from NODF) households. Participants selected through multistage random sampling technique. Pre-tested interviewer administered structured questionnaire and observational checklist were used to collect data. The collected data were coded and entered using Epi-Info 3.7.3 and analysis was done using SPSS version 21. Bivariate and multivariate logistic regressions used to identify the associated factors for proper utilization of latrine facilities.

Result:- Overall latrine utilization was 947 (81%) which was differed by ODF status of kebeles. Household latrine utilization in ODF kebeles was 459 (88%) and 488(75%) at NODF kebeles. Household found in ODF kebeles [AOR: 2.33, 95%CI(3.19-12.59)], Privately owning latrine [AOR: 2.4, 95%CI (1.06-5.44)], presence of latrine wall for privacy [AOR: 3.48, 95%CI (1.96-6.16)], easily cleanable latrine floor [AOR: 2.64, 95%CI (1.53-4.56)], presence of literate mothers/wife [AOR: 2.23, 95%CI (1.33-3.75)], presence of higher level studied student [AOR: 2.22, 95%CI, (1.26-3.91)], privately owning latrine [AOR:2.4, 95%CL (1.06-5.44)] factors showed statistically significant associated with satisfactory latrine utilization.

Conclusion and recommendation: Latrine utilization in ODF Kebeles was significantly greater than that in NODF communities. Latrine utilization in households was affected by mother/wife education, presence of latrine wall for privacy, household found near to health facility and climate ecology condition. Post-triggering follow-up and checking CLTSH process at local level, increasing frequency of health extension worker in households visit and school community to increase student involvement on hygiene and sanitation program are recommended.

1. INTRODUCTION

1.1. BACKGOUND

Open defecation is a big problem in the developing world. Globally 2.4 billion people do not use an improved sanitation facility. Approximately 1 billion people practice open defecation, which most live in just three regions. The highest proportions found in South Asia (40 %) and Sub Saharan Africa (25 %) and lag far behind the rest of the world (1).

Sub-Saharan African showed slower progress in sanitation coverage, reaching 31% in 2015 from 24% in 1990, whereas south Asia increased coverage to 49% from 22% in the same period (1).

Ethiopia is one of the lowest sanitation coverage currently only 6.3% of households (15.9% in urban and 3.9% rural) access to improved sanitation facilities not shared with other households and more than 93.7% of households (96.2% rural and 84.1% urban) access to unimproved and shared latrine facility. It also identified that, 32.2% of households (38.8% of rural and 6.9% urban) live without toilet facility(2, 3).

Oromia is one of regional state of Ethiopia among low coverage in latrine access and utilization. The fact sheet of 2014, estimate indicates that Oromia's sanitation coverage were the least among four big regions (SNNP, Amhara, Tigray and Oromiya) those have relatively the same geographical setting. This finding can the status of sanitation of the woreda's going to this study undertaken (2)

Different findings undertaken in relative Woredas of Ethiopia identified major factors affecting latrine access and utilization. Among them; socio-demographic factors, presence of school age children, education status of husband and wife, family income, duration of latrine owned, latrine condition and availability of construction material(4, 5).

The ministry of health of Ethiopia has adopted community led total sanitation (CLTS) to be implemented in the country thought its Health Extension program (6). As a result, recent reports reveal that, using the CLTS as a promotion tool, many rural villages have been declared to be Open Defecation Free (ODF), however off-track to achieve sanitation program (1). In ODF community, it assumed that all community members utilize latrine and none open defecation free (NODF) kebeles expected household without latrine and observation of human feces. So that this study planned to investigate magnitude of latrine utilization in ODF and NODF kebeles in Hetosa Woreda, Arsi zone, Oromia.

1.2. Statement of the problem

In Ethiopia up to 80% of the disease burden related to poor sanitation and hygiene. Different evidences indicate that hygiene interventions including hygiene education and promotion of hand washing can lead to a reduction of diarrheal disease up to 45%.

Ministry of health of Ethiopia has set ambitious target to achieve 100 per cent sanitation coverage of the country by 2015 and introduce Health Extension Program as community mobilization tool in 2002(7). Later the country adopt and introduce Community Led Total Sanitation in 2006 which helps to empower and mobilize all community members on WASH program (6).

So that, Ethiopia has made a great effort to increase the sanitation coverage of the country and the rate of open defecation reduction was remarkable indicating a 25% reduction per decade for the years 1990-2015(from 92% in 1990 to 29% in 2015) (1). Even though such progress was made, still the country is found among most open defecating 10 countries of the world, 5 in Africa (Nigeria, Ethiopia, Sudan, Niger and Mozambique), and 5 in Asia (1). The recent data Mini EDHS indicate more than half 55% of households (56.7% in rural and 4.4% in urban areas) of Ethiopia access to non-improved sanitation facility (pit latrine without slab or pit latrine). Overall, 35.5% of households (11.3% urban and 39.6% rural) live without toilet facility(2).

In Ethiopia, 3/4 of the health problems of under five children are communicable diseases comes from the environment, specially water and sanitation (8). Diarrhea is leading cause of Under-5 mortality causing 23% deaths and around 44% stunted (9). This may be due to the open defecation and unsanitary condition. The recent Health Sector Transformation Plan (HSTP) also indicates that diarrhea is the second biggest killer for less than five children next to acute respiratory infection(10). In Oromia, as of administrative reports, latrine coverage now greater than 88% and coverage of open defecation free kebeles only 28% of rural kebeles. Beyond administrative report, assessment of latrine utilization and the hygiene behavior of the community were not undertaken.

It hypothesized that people living in the ODF village were higher access and utilize latrine when compared to NODF kebeles. However, previously no enough study undertaken to justify this hypothesis. This study intended to compare magnitude of latrine utilization in ODF and NODF kebeles and all factors that affect latrine and provide recommendation, which could be help police makers to improve intervention of the program.

1.3. Rationale and Significance

Open defecation is a big problem in the developing world. Ethiopia is one the most open defecating 10 countries of the world, 5 of Africa (Nigeria, Ethiopia, Sudan, Niger and Mozambique). Low access and utilization to sanitation is base line cause of hygiene-related diseases like diarrheal disease, which seriously cause morbidity and mortality rates among children. Low latrine utilization is existing gaps of rural community. In ODF kebeles, assumed that high level of latrine utilization and in NODF community expects that low latrine Utilization observation of Open defecation. So that this study intended to find out the reality by comparing, the existing data at house hold level, from ODF and NODF kebeles in different climate condition. This study also investigate different factors facilitate or hinder latrine utilization in both ODF and NODF kebeles. This work also helps to appreciate the basics of ODF status in the utilization of latrine and tangible impact of ODF on satisfactory latrine utilization, which in turn plays a major role in the proper planning, monitoring of sanitation & hygiene activities.

2. LITERATURE REVIEW

2.1. Latrine access

Globally, 2.4 billion people (32%) or almost one third of the world's population, lack access to improved sanitation. Sub-Saharan African showed slower progress in sanitation coverage, reaching 31% in 2015 from 24% in 1990. Inequalities in coverage also exist between rural and Urban Areas. That is 40% of the urban population accessing improved sanitation and only 23%of people in rural areas have access to improved sanitation (1). JMP estimates were based on fitting a regression line to a series of data points from household surveys and censuses. Simple linear regression is use to estimate the proportion of the population accessing improved, unimproved, shared sanitation and undertaking open defecation. So that, limitation of JMP report can be, in rare case may under estimate the fast growing counties progress (face in China) and over estimate for some countries no progress after survey of census(1, 6).

The recent data Mini EDHS indicate that, in Ethiopia more than half 55% of households (56.7% in rural and 4.4% in urban areas) access to unimproved sanitation and Only 4.2% of households (10.1% in urban and 2.3% in rural areas) accessed improved toilet facilities that not shared with other households. Overall, 35.5% of households (11.3% urban and 39.6% rural) live without toilet facility (2). Some difference were observed in different findings in the estimation of sanitation coverage largely lie in the lack of agreement of a standardized definition were observed in both data(1, 2).

Government of Ethiopia had set to achieve national target of 100 per cent sanitation coverage in both rural and urban areas and made different effort to achieve it by 2015(7) Even though good progress made, in Ethiopia only 28% of population of the country accessed improved sanitation facilities and 43% were accessed to unimproved sanitation (shared (14%) and other unimproved sanitation (29%)) and proportion of population under take open defecation is 29% and not onrack to meet the MDG target (1). The majority of Open Defecation (OD) practices, as stated in national surveys it take place in fields, forests, bushes, bodies of water or other open spaces, take place in rural areas of low- income countries(1, 9).

Health Extension Program and Community Led Total Sanitation (CLTS) and later health development army were the main tool used by ministry to reach every corner of the country. Rural Health Extension Program consists of 16 preventive health packages of which seven which focused on environmental health activities. So that the ministry used this strategy as the basic tool to

implement WASH program performance and improve the livelihood of population living the rural areas(6, 11).

Oromiya is one of regional state of Ethiopia among low coverage in latrine access and utilization. As fact sheet of UNICEF and WHO 2014, estimate the status and campier the region by EDHS 2000, 2005, 2011 finding, among four big regions (SNNP, Amhara, Tigray and Oromiya) those have relatively the same geographical setting, Oromia's sanitation coverage were the least. i.e. improved and shared latrine coverage SNNP, Amhara, Tigray and Oromiya was 56%,46%,41% and 40% respectively and The coverage unimproved sanitation of the region was also 32%, 17%, 13% and 17% respectively and open defecation status was 12%, 37%, 46% and 43% respectively(9). From this data, we can conclude as Oromiya region lagged behind other region in sanitation access and utilization.

2.2. Latrine utilization

Latrine utilization is the actual behavior that is reflected in a regular practice of using existing latrines for safe excreta disposal. The presence of fresh excreta inside the pit, the presence of foot path to the latrine, and the absence of fecesaround the household were used to measure latrine utilization. An estimate one billion people did not access any facilities at all for excreta disposal and practice open defecation (OD). The highest proportions of population practicing open defecation were found in South Asia and Sub Saharan Africa. Seven out of ten people without improved sanitation facilities and nine out of ten people still practicing open defecation, live in rural area(1). Among one billion estimated to be open defecate; two thirds live in Southern Asia and sub-Saharan Africa. But Southern Asian counties proportion, nearly three times as many as in sub-Saharan Africa (1). Number of people practicing OD in southern Asia has declined moderately from 1990(decreased by 21%), but in Sub Saharan Africa number of people practicing open defecate increased from than in 1990 (increased by 26%)(1, 12).

Ethiopia is among 16 (sixteen) countries reduced open defecation by more than 25 percentage points during the MDG period the largest decrease (64%) in the proportion of the population practicing open defecation (from 92 % in 1990 to 29 % in 2015). Open defecation was practiced by 44.3 million Ethiopians in 1990 and 28.3 million in 2015 – an average reduction of over 4 Percentage points per year over 25 years(1).

2.3. Factors associated with latrine utilization

Assessment undertaken about environmental health status in Ethiopia broadly classify factor related to environmental health in to five major areas, i.e. ***Background factors:*** Social, Economical, Cultural, Physical; ***Institutional factors;*** Responsibilities, Coordination, Integration, Policies, regulations, Organizational behavior; ***Environmental factors;*** Latrine hygiene, Water, Housing; ***Personal factors;*** Education, Occupation And Residence, ***Behavioral factors;*** Community, Individual (13). Among those factors the country has the Health Extension Program and CLTSH to address community based and institutional factor. Later health development army used by ministry to reach every corner of the country to mobilize and empower community to access and utilize latrine by addressing personal factors and behavioral factor in the community(6, 7).

According to EDHS the wealth index, latrine utilization rate and education are correlated with wealth quintiles. The data indicate that the poorer societies are less educated and low level of latrine utilization which is stated as facilitative factor for diarrheal disease which is underline cause of child mortality of fewer than five children also increases with poverty(14).

Different studies undertaken on latrine utilization and associated factors, come up with the presence of under five children, presence of people with physical disability, jobs of mother to be farmer, presence of fecesin the back and neighborhood's yard and rarely cleaning of latrine were factors negatively associated with latrine utilization. Educational status of mothers, income, presence of secondary school student, presence of door for latrine, peer pressure, and promotional activity of health extension workers to have own latrine, being model HH, duration of latrine owned and hygienic condition of latrine were identified as factors positively associated latrine utilization(4, 5, 15).

2.4. Community led total sanitation in Ethiopia

Community led total sanitation (CLTS) is participatory approaches tool used to facilitate sustained behavior change to eliminate open defecation by initiating and mobilizing communities in order to bring collective community decision & collective local action. It attempt to work with the entire community rather than with selected individuals and to illuminate OD rather than on the construction of a particular type of latrine. CLTS was pioneered by Kamal Kar (a development consultant from India), in 1999 in Mosmoil village in Bangladesh(16)

2.4.1. Implementation process

Dr.Kamal Kar introduced CLTS program in Ethiopia in 2006 after conducting training in Arba Minch to NGO's and officials. But Started in Ethiopia, in 2007 (2000 E.C) as pilot project in Arba Minch, Shebedino, Lalibala and Jimma(Kersa) (6)

CLTS recently revised in Ethiopia by including an "H" for hygiene promotion approach were focused on changing sanitation and hygiene behavior of communities towards ODF environment, hand washing practice at critical times and keeping household drinking water safe(6). The program were started in the same year in Oromia as a pilot, but in the study area it was started after three year in 2000 by providing training to the professionals.

CLTSH have 4 phases with their steps of CLTSH implementation. *The first phase is* Preparation and planning which is most important phase of CLTSH implementation, which consists of three key steps, which mainly focus on consensus building, planning and capacity building. *Second Phase*, Ignition; It is basic phase of CLTSH were ignition or "triggering" at community level undertaken by a process of facilitated participatory dialogue with communities. The goal is to engage communities in an examination of their sanitation and hygiene practices and empower them to improve their situation collectively. The three basic elements of CLTSH (shame, disgust and fear) have to observe from the community. *The third phase is;* post ignition in which concerted on training, coaching, support and persistent follow-up are required. In phase, more people in a village and kebele leaders expected to involve actively on promoting CLTSH and new behaviors adopted . *The fourth phase;* verification, recognition and scale-up; this phase is the time of reviewing progress monitoring, reporting, rewarding of good performance and scale upping of good performance(6, 11).

2.4.2. ODF Verification process

CLTSH is an important approach for encouraging shared vision, enhancing collective action, and creating demand for improved sanitation facilities, safe hygienic practices and a safe water supply chain. To succeed, CLTSH must be a cross-sectoral effort involving all stakeholders, including HDA/ "natural" leaders from the village, kebele leaders, agricultural development agents, schoolteachers, students, women and children. Such integration and collaboration enhances a sense of ownership and buy-in for the entire community. Thus, depending on the level of

verification and certification (village, kebele, woreda, Zone, Region, national certification), the team should encompass as many actors in the process as possible (11, 17).

According to the Ethiopian ODF verification protocol, ODF kebeles must fulfill 100% of latrines in use; Hand washing facilities are on working order and have water and soap or a soap substitute; Household safe water handling and existing water source/s are well protected from potential contamination by livestock and others, with good drainage(11). According to the government of Ethiopia there are 3,655 kebeles that were declared as to Open Defecation Free (ODF) in EFY 2006 (17). Moving from open defecation to fixed-point defecation achieves little health impact if the latrine is not used by all families, including children, is not maintained, or is not kept hygienically (18). Global sanitation fund program outcome evaluation concludes that the CLTSH program improve all hygiene and sanitation situation of implementation area. As the outcome of 40 Woredas in the country after CLTSH implementation indicated an coverage improved in all Hygiene and sanitation program i.e. Household latrine coverage from 12% to 81.6%, access to improved water source 41.7% to 73.3%, safe water storage 8% to 93.5%, access to hand washing facility near latrine from 7% to 30.7% Utilization(19)

After 10 literatures were reviewed, different factors directly or indirectly affecting latrine utilization were identified and their relationship was indicated on the following conceptual framework. Demographic factors like (mother education, presence of <5 year children, student and level their educations). Among social factors (house hold graduated as model households, being participated in CLTSH triggering process and existence community rule) were identified. Environmental factors (climate condition, distance from health facility, latrine affected by disaster and ODF status of Kebele) and status of latrines (type of latrine, kind of arrangement of latrine, physical structure of latrine, clean ability) were those factors affect satisfactory latrine utilization directly and indirectly. These factors were considered as essential factor for satisfactory latrine utilization and open defecation free status of kebeles were used as comparative indicator of latrine utilization.

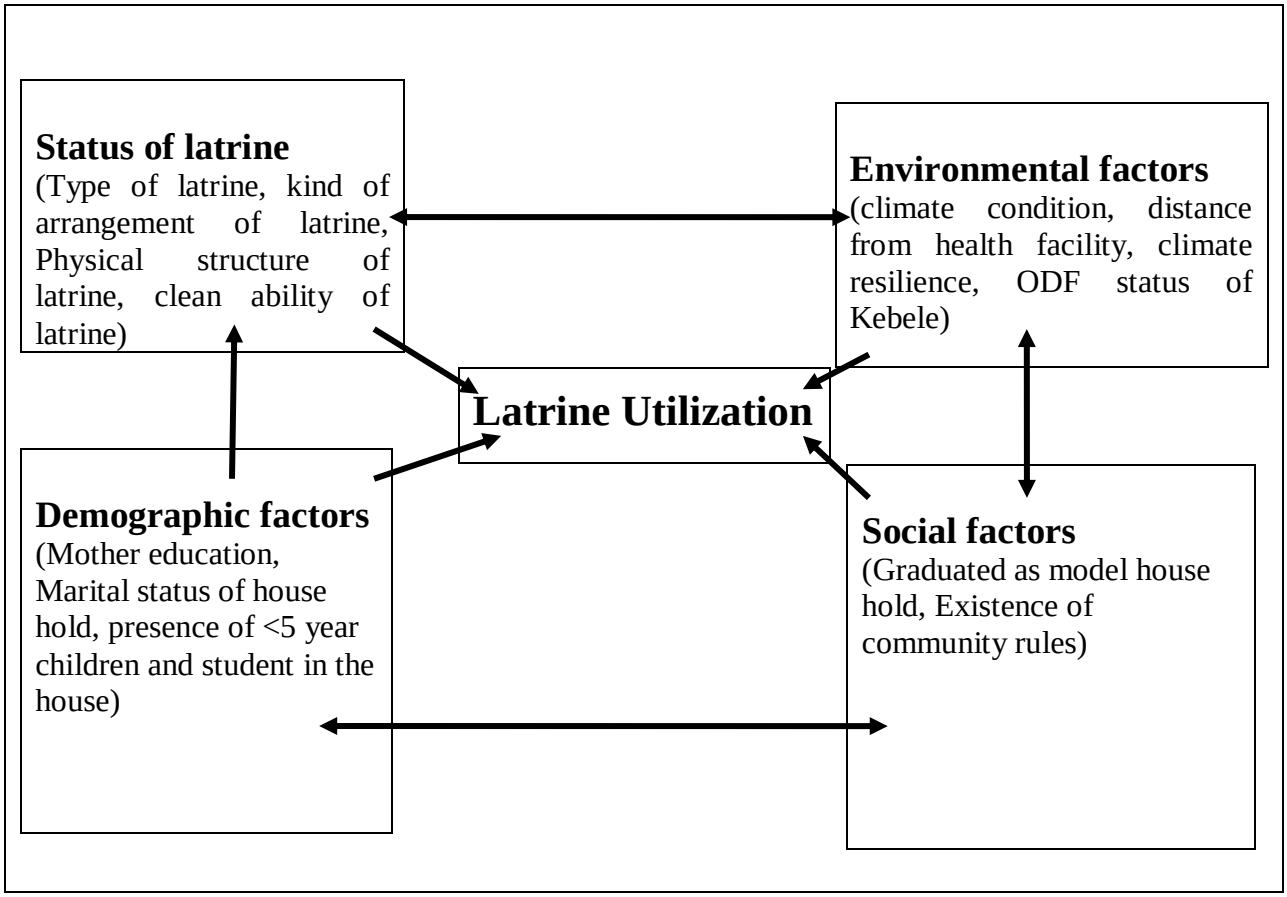

Figure 1: Conceptual framework latrine utilization and factor affecting developed after reviewed different relative literature, 2017.

3. OBJECTIVES

3.1. General Objective

Assessment of magnitude of latrine utilization and associated factors in rural setting of Hetosa Woreda, Arsi, Oromia, Ethiopia:- A comparative study.

3.2. Specific Objective:

- To assess magnitude of latrine utilization among open defecation free and non-open defecation free kebeles,
- To identify factors associated with latrine utilization in both open defecation free and non-open defecation free kebeles.

4. METHOD AND MATERIALS

4.1. Study area

The study conducted in Hetosa Woreda, which found in Arsi Zone, Oromia regional state. Hetosa Woreda found at a distance of 150 K.M from the capital of Ethiopia, Addis Ababa. It has all the topographic feature of Dega/High land, Woyinadega/Middle Land and Kola/ Aired climate condition. In percentage, Dega/High land 18.1 %, Woyinadega/Middle Land 21.7 % and Arid/Lowland 60.2 % of the Woreda area (history of Hetosa Woreda, 2007).

Hetosa Woreda has a total population of 160,219 of which 80961 male and female 79675. Populations living in urban area were 25065 (9,048 male and 9,433 female). The rural population is 135,571 from this population, male accounts 67,786 and female account 73,555 respectively. The Woreda has 26 kebeles (23 rural and 3 urban). According to 2016 woreda report indicate, among 23 rural kebeles, 8 (35%) declared open defecation free status.

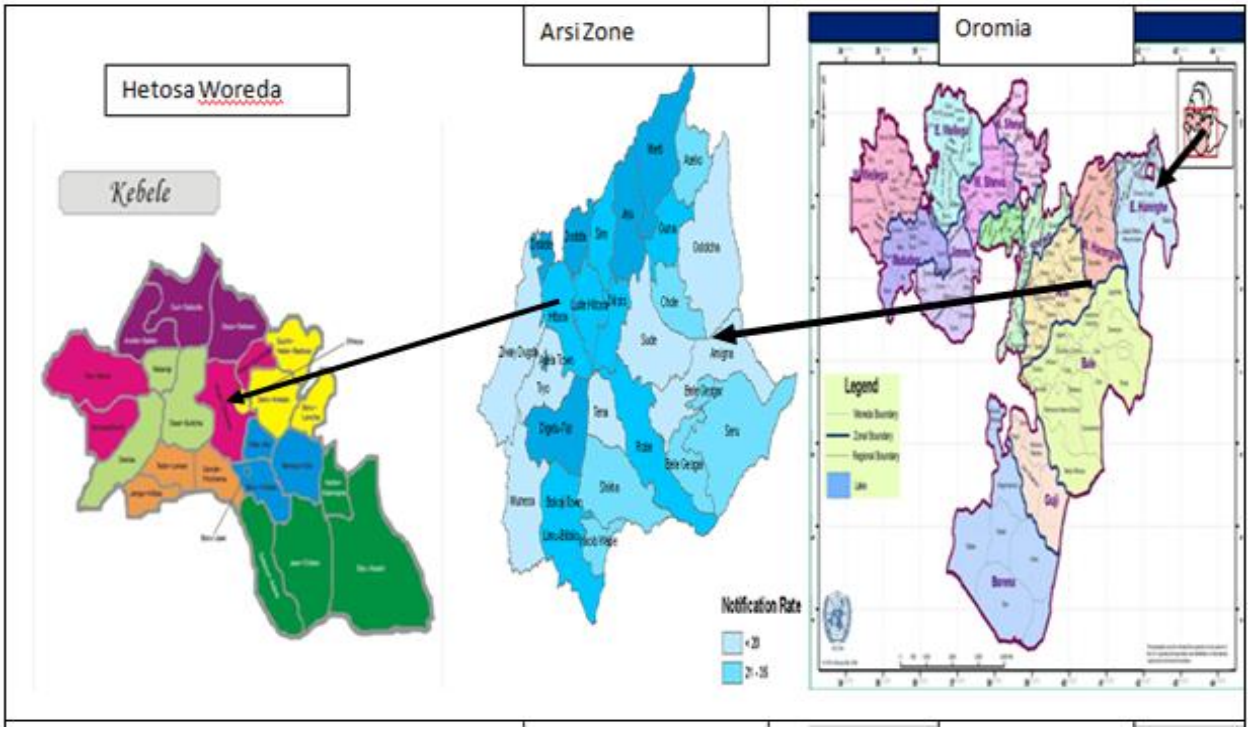

Figure 2: Map of Hetosa Woreda, Arsi, Oromia, Ethiopia, 2017

4.2. Study period

Study period was from July 2016 to June 2017.

4.3. Study design

A community based comparative cross-sectional study design was employed.

4.4. Source population

All households who had latrine in rural setting of Hetosa Woreda were considered as source of population.

4.5. Study population

All randomly selected households who had latrine in rural setting of Hetosa Woreda were the study population.

4.6. Inclusion criteria

All households who had of latrine in rural setting of Hetosa Woreda was inclusion criteria.

4.7. Sample size

The sample size was calculated to each specific objectives and the highest sample size was used for the study.

Objective One; - To assess the magnitude of latrine utilization in open defecation free and non-open defecation free communities. For compression study, it obvious that double population proportion formula have to be used for sample size calculation. However, due to high variation of proportion of latrine utilization between open defecation free and non-open defecation free kebele sample size found was very low. So that, sample size was computed separately for ODF and NODF communities as shown below and finally added up.

Assumptions.

n1= sample size for ODF community n2= sample size for NODF community

$Z \alpha /2$=1.96 level of significant for both ODF and NODF

P1=prevalence of latrine utilization in ODF (74.5%) P2=prevalence of latrine utilization In NODF, (55 %)

d= degree of precision 0.05 for both communities

Design effect both =1.5

Then sample size was calculated using single population proportion sample size estimation formula.

$$n1\ (ODF) = \frac{(Z\alpha/2)^2\ p\ (1-p)}{d^2}$$

$$= (1.96)^2 \times 74.5\% \times 25.5\% / (0.05$$

$$n2\ (NonODF) = \frac{(Z\alpha/2)^2\ p\ (1-p)}{d^2}$$

$$= (1.96)^2 \times 55\% \times 45\% / (0.05)^2$$

Multiplying both out by design effect (1.5)

n1= 312*1.5 = 468 n2= 408*1.5= 612, Total sample size = 468+612 =1080, and then adding 10% non-respondents **N=1080+108= 1188**

Objective two: - To identify factors associated with latrine utilization in both open defecation free and non-open defecation free communities Epi-info 7 was used by double population proportion formula with the following assumptions.

Assumption

- Latrine utilization population proportions NODF community (p1=55%), since Research undertaken in relative Southern Ethiopia indicate (20)
- Odd ratio of 2 latrine utilization in ODF community.
- 95% confidence interval
- 80% Power of test
- r: Ratio between ODF and non ODF kebeles =1
- Zα is the standard normal deviate for an α type I error corresponding 1.96 and
- Z1-β (power) is the standard normal deviate for type II error corresponding, the Power of study to detect 80%,
- *Deff* = is the design effect to compensate the variation affected by the multi stage nature of sampling = 2

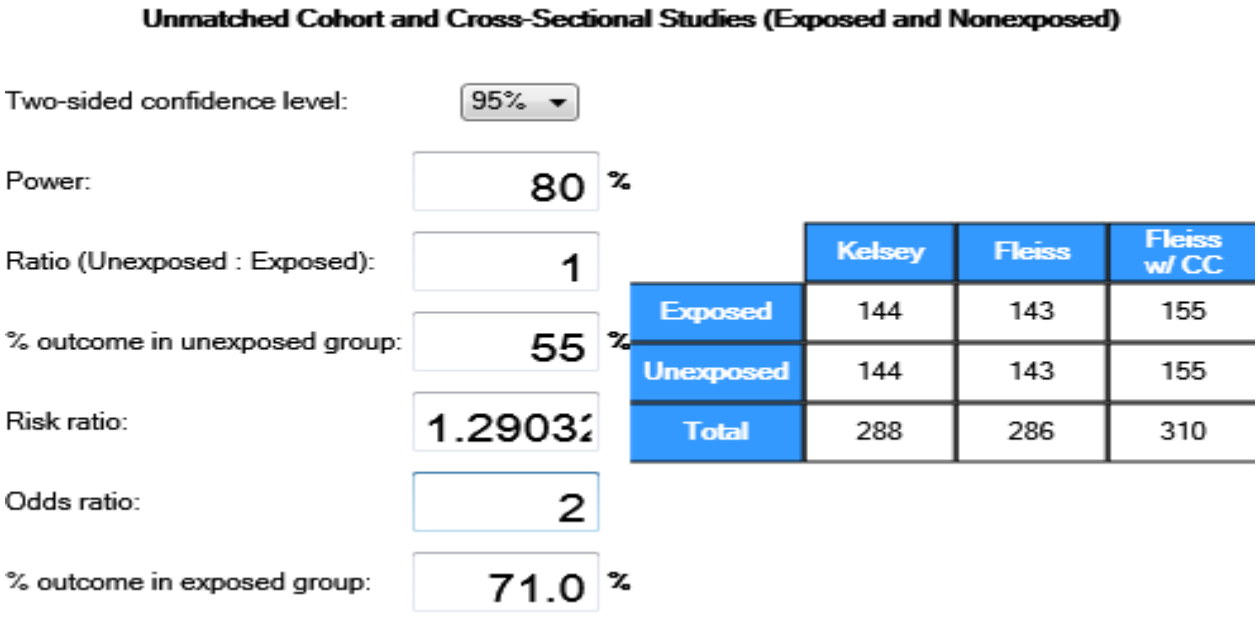

Figure 3. Epi Info 7 sample calculation methods, 2017

By using those assumptions and using EPI info7 the sample size was 310 and after that we multiply by 2 for design effect sample size becomes 620, Then with 10% non-respondent rate, total sample size was **682.**

Finally, to take maximum sample size, the first sample size calculation was considered as study sample size, that is total sample size of the study was 1188. Of these 522 households from ODF and 666 house hold for N-ODF community will be allocated.

4.8. Sampling techniques

A multi-stage sampling procedure was applied to select households of the study. After screening was performed to identify the eligible households using inclusion criteria, a total of 8 ODF kebeles and 15 NODF kebeles included in the study. Both ODF and NODF kebeles further clustered based on their climate conditions of Dega, Woynadega and Kola for both ODF and NODF cluster groups. From each clusters of climate condition, one kebele was selected using random sampling which gives a total of three kebeles for each ODF and NODF group. In case of one kebele only exist in cluster of climate condition, it directly included in the study. Within each kebele the name of all villages/gares were taken for sampling frame and using lottery method the eligible 60 villages/gares were selected in both ODF and NODF cluster groups. The sample size allocated based on the proportional size of households available with latrine at each village. Having the number of households to be taken from each villages/gares, to select the household that could be participated in study, list of all households with latrine in the village take as a frame and lottery method employed to select household.

Table 1: Proportionally distributed samples to selected kebeles by their house hold access to latrine, Hetosa Woreda, 2017

Climate condition	Name of ODF Kebeles	House Hold access latrine	Sample	Code of kebele	Name of NODF Kebeles	House Hold access latrine	Sample	Code of kebele
Dega	Harbe Ademonye	5567	167	HA	Jawwi Chilalo	10095	302	JC
Woynadega	Boneya Edo	10106	303	BE	Boru Lencha	6595	198	BL
Kola	Wolargi	1747	52	WA	Teddo Leman	5536	166	TL
	Total	**17420**	**522**			**22226**	**666**	

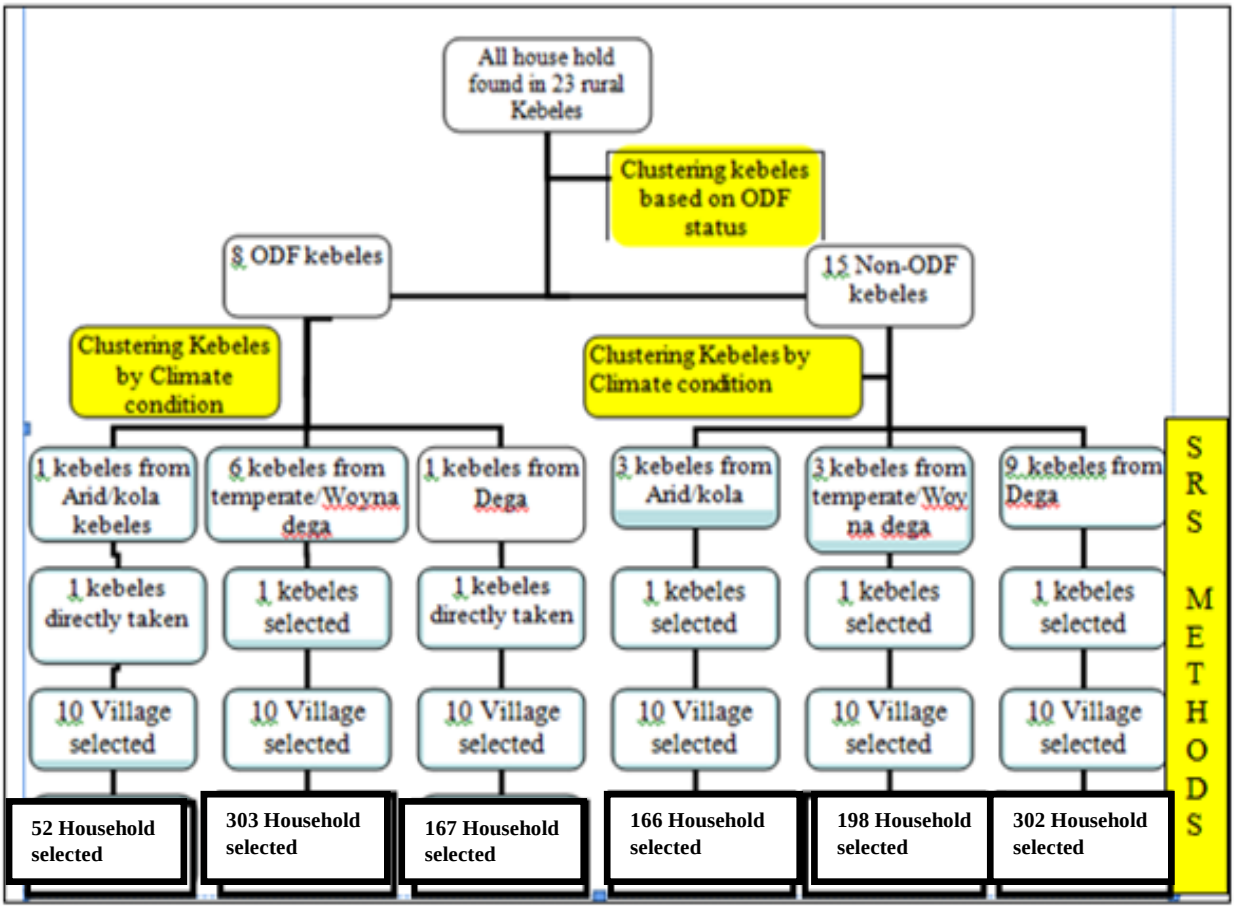

Figure 4. Sampling procedure of the assessment, Hetosa Woreda 2017

4.9. Data collection procedures

Standard questionnaires and observation checklists were adapted from different literature and WHO/UNICEF. Ten diploma certified data collectors were collect the data using interview and

observational checklist. Three-degree holder supervisors were involved to oversee the data collector during data collection. To gain exact information, household head, father, mother, or representative of household was interviewed. During screening of households with latrine, health extension workers were involved.

4.10. Variables

4.10.1. Dependent variable: - Magnitude of latrine utilization in open defecation free and Non-Open defecation free kebeles.

4.10.2. Independent variables:

- Demographic characteristics (age, marital status, head of the house hold, family size, education status, presence of <5 year children and Student etc);
- Social factors:- Graduated as model HH, existence community rule
- Environmental factors:- Climate condition, distance from health facility, latrine affected by disaster & ODF status of Kebeles
- Characteristic of latrine:- Type of latrine, kind of arrangement of latrine, physical structure of latrine clean ability

4.11. Operational and definition of terms

Community-Led Total Sanitation and Hygiene (CLTSH): A community mobilization methods to change behavior by using triggering tool that is administered by trained and skilled facilitators to mobilize communities through self-realization resulting from fear, disgust and shame which emphasizes changing behavior of communities towards open defecation free environment.

Functional latrine: Is a latrine that provide services (using) at the time of data collection.

Satisfactory latrine utilization:- A household with functional latrine and no feces observable in the compound and showed at least two sign of latrine use. Observation checklist used to assessed sign of latrine utilization consist of visible footpath to the latrine, observation splash water or urine on the latrine floor, absence of fresh feces observed on the latrine floor and observations of at least one fly in the latrine.

Unsatisfactory latrine utilization: - A household with latrine not fulfill the criteria of satisfactory latrine utilization.

Open defecation free (ODF):- It describes a state in which all community members practice use of latrine at all times and a situation where in no open defecation is practiced at all .

Model family:- Household head that had taken basic training on health extension programs and recognized by local administrative as model family and informed at community gathering or provided certificate.

Sanitation;- Redefers to the provision of facilities and services for the safe handling and disposal of human fecesand urine. It refers accessing and using latrines in this survey. Observation checklist used to identify type of latrine observed at household level.

Household (HH):- Single person or a group of related or unrelated persons who live together in the same dwelling unit(s) and who acknowledge one adult member as head of the household.

Access to hand washing facilities: Is availability of hand washing facilities at the entry or adjacent to the latrine.

Community rule and regulation: - A rule and regulation sated by community collectively, monitored and regulated by community leaders assigned by community itself.

4.12. Data quality management

To maintain the data quality:

- Adapted questionnaire and checklist was prepared first in English then translated to local language (Afaan Oromoo) and then back to English in order to ensure correct translation.
- The questioner and checklist was tested in 5% of the sample size similar to the study population but different from the selected sample in the Woreda prior to the data collection.
- Training for data collectors and supervisors provided for two days, including one-day practical work. Feedback from the interviewers incorporated to enrich the questionnaire and make more applicable to the local situations.
- The data collection process checked on daily base by three BSc holder supervisors. Principal investigator corrected anything unclear, missing and ambiguous on the next day.
- Weather the data collectors collect data or not, supervisors did recheck 5% of the sample or households by randomly taking filled questionnaire and travelling to household based on codes given and leveled at household.

4.13. Analysis procedures

The data was entered in to Epi Info7, then after data clearing and coding undertaken, double data entry verification was employed. Data exported to SPSS Version 21 and stratified analysis

conducted to check for missing values and variables having missing values and no patterns observed not considered for further analysis.

Data initially computed for summary descriptive statistics such as percentage, mean and standard deviation applied for general characteristics, proportion of satisfactory latrine utilization. Frequency tables for the dependent and independent variables generated before cross-tabulations made. Cross tab computed to determine the association between categorical variables by using Chi-squared tests.

Logistic regression applied to find the relationship between outcome variable and independent variable. Crude logistic regression was used to see relationship between one independent variable with outcome at time and adjust logistic regression was used to see relationship between many independent variables with outcome variable after controlling confounding factors. Variables in binary screening found at p-value ≤ 0.25 further considered into multiple logistic regressions to avoid unstable estimate and to describe the independent predictor factor of satisfactory latrine utilization.

Finally, adjusted Odds ratio (AOR) was used for checking the association factors of latrine utilization while controlling other variables. The significance level was defined (cut-off point) as a p-value of less than 0.05. The result presented in tables and charts.

Summary statistics such as frequencies, proportions, mean with standard deviation, proportions with SD used to present quantitative data using Tables and Figures used to describe level of latrine utilization in both ODF and NODF community.

Odds ratio with 95% confidence interval and X^2 was used computed assess the strength of the association and statistical significance between independent and dependent variable in both ODF and NODF. Calculating odd ratio, confidence interval, and p-values for statistical significance and the degree of association with the determinant factors assessed. For all statistical significant tests p-value < 0.05 used as a cut-off point.

4.14. Ethical consideration

The study carried out after obtained ethical clearance from institutional review board of Addis Ababa University, approval from research and ethics committee of the school of public health. Data collected after getting permission letter from oromiya regional health bureau and Woreda health office. A verbal consent administered to each study respondent for the willingness to participate in

the interview. The right of respondent to withdraw the interview partially or completely respected without any persuasion.

The privacy of respondent maintained using a neutral place free from any visual and speech disturbance for interviewing. Interconnection and complementarily was considered during data collection, entry and analysis. Study subjects had unique IDs to present them in a questioner, data management and analysis.

4.15. Dissemination of Research Finding

Findings of the study submitted to School of Public Health, Health Science College, and University. It also communicated to the regional health bureau, woreda health office to take action. I will also communicate ministry of health and other organizations concerned with promotion of hygiene and sanitation program. Peer reviewed publication was also considered

5. RESULTS

Totally, 1170 households (522 in ODF and 648 in NODF kebeles) were involved in the study with response rate of 98.5%.

5.1. Socio-Demographic and Economic Characteristics

The participants age range from 18 to 98 years, with the mean of 39.5 years and standard deviation ±14.6. Majority (306(43.4%) at ODF and 356(56.6%) at NODF kebeles) of participants included in the study were male *(Table1)*. The greater part of participants 424(84.1%) and 545(84.1%) from ODF and NODF kebeles respectively were married.

The households' family size ranged from 1 to 15 people with mean family size of 5.7. Among households involved on the interview, 349(75%) of husbands in ODF and 435 (74%) in NODF kebeles were literate, whereas 234(49.6% of wives in ODF and 373(60.6%) in NODF kebeles were literate.

Most husbands' of the households participated in the study 480(96.8%) in ODF and 579(89.4%) in NODF kebeles) were farmer. Of households participated on study 180(34.5%) in ODF and 314(48.5%) NODF kebeles had at least one under five-year children. On the other hand, 393(72.3%) of households in ODF and 520(80.2%) in NODF kebeles had at least one child, who attended formal education. In addition to this 278(70.2%) of households from ODF and 222(42.6%) from NODF had two or more children attended formal education (Table1).

Table 1: Socio-demographic characteristics of the participants in selected kebeles in both ODF and NODF kebeles in Hetosa woreda, Arsi, Oromia region ,Ethiopia, 2017

Variables		Kebele status			
		ODF		NODF	
		Number	%	Number	%
Number of respondents		522	44%	648	55.4%
Climate condition of the Kebele	Highland/Dega	46	8.8%	277	42.9%
	Tamprate/Woyinadega	424	81.2%	207	31.9%
	Low land/Kola	52	10.0%	164	25.2%
Sex OF Respondent	Male	306	58.6%	356	54.9%
	Female	216	45.1%	292	45.1%
Sex of Family head	Male	476	85.4%	529	85.9%
	Female	76	14.6%	89	14.1%
Age of the respondent	15-24	67	12.8%	84	13%
	25-34	128	24.5%	184	28.4%
	>35	327	62.6%	380	58.6%
Marital status of head HH	Never married	26	5%	31	5%
	Married	424	84.1%	545	84.1%
	Divorced/separated/Widowed	72	13.8%	72	11.1%
Education of husband	Illiterate	118	25.3%	152	16%
	Literate	349	75%	435	74%
Education status Wife	Illiterate	208	42.3%	245	39.8%
	Literate	245	39.8%	370	60.2%
Occupation of Husbands	Farmer	480	96.8%	579	92.6%
	Other(Gov't+ merchant)	16	3.2%	69	7.4%
Occupation of wife	Farmer	480	96.8%	579	89.4%
	Other(Gov't+ Merchant)	16	3.2%	69	10.6%
Family size	Family size ≤5	264	50.6%	318	49.1%
	Family Size >5	258	49.4%	330	50.9%
<5 Yr child in the HH	Yes	180	34.5%	314	48.5%
	No	342	65.5%	334	51.5%
Availability of Children attending formal education	Yes	393	75.3%	520	80.2%
	No	129	24.7%	128	19.8%
Number of children attending school per household	≤2	118	29.8%	299	57.4%
	>2	278	70.2%	222	42.6%
Level of education of student per household	≤8	207	52.4%	345	66.3%
	>8	188	47.6%	175	33.7%
Religious of respondents	Orthodox	417	79.9%	270	41.7%
	Muslim	105	20.1%	378	58.3%
Ethnicity	Oromo	465	89.1%	583	90%
	Amera	57	10.9%	5	10%

5.2. Characteristics of available latrine

The characteristics of latrines were identified by observation checklist at each household level. Type of latrines mostly available per household found were traditional pit latrine with slab made of wood and earth 498(95.4%) in ODF and 569(88.1%) in NODF kebeles (Figure 4).

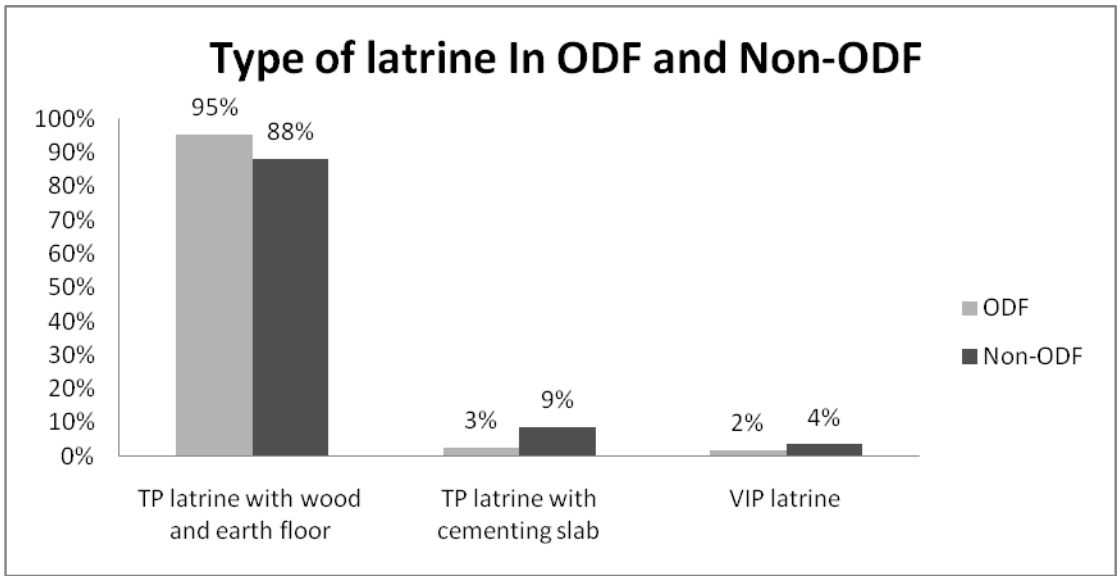

Figure 4: Type of latrine In ODF and NODF selected study Kebele of Hetosa Woreda, Arsi,Oromia region ,Ethiopia, 2017.

Of the available latrines, 503(96.4%) in ODF and 584(90.1%) in NODF were privately owned. Among the latrines observed, 370(72%) in ODF and 402(64.2%) in NODF were constructed within last three years and mean duration latrine 2.75 (±1.026) years.

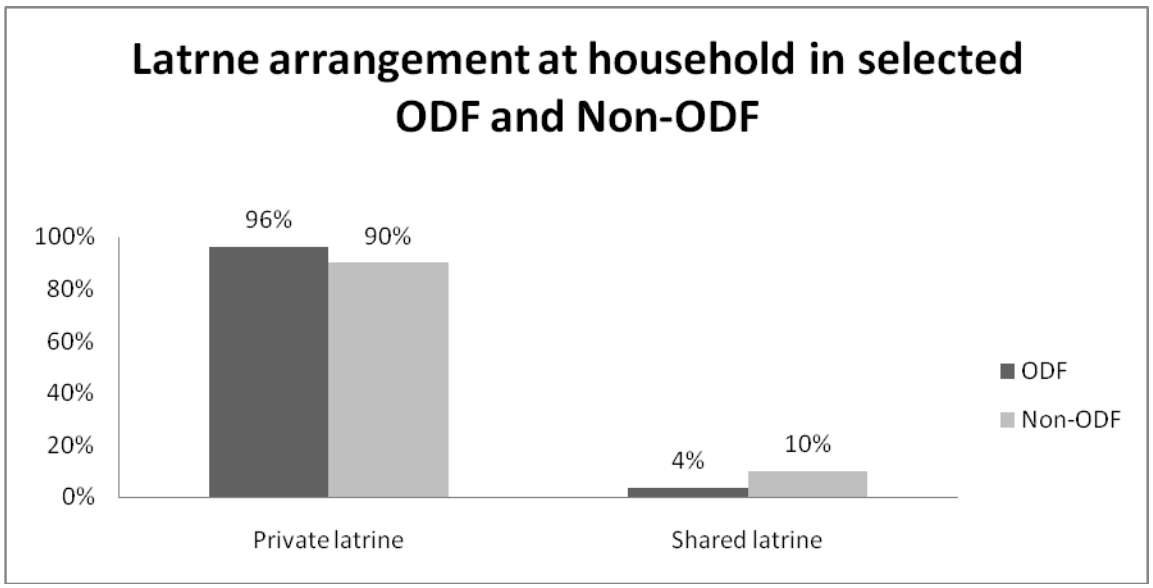

Figure 5: Latrine arrangement at household in selected ODF and NODF kebeles of Hetosa woreda, Arsi,Oromia region ,Ethiopia, 2017

Of the total households latrine, 470(90%) at ODF and 525(79%) at NODF kebeles were found accessible to all family members belongs that household *(Table 2).* Among total of observed latrines, 470(90%) in ODF and 525(81%) NODF kebeles had good wall for privacy, 269(51.5%)

in ODF and 389(60.3%) NODF kebeles had roof that prevent rain and sun light and only 10(1.9%) in ODF and 23(3.5%) in NODF kebeles' had vent pipes for ventilation.

Among all functional latrines observed in this study 16(3.1%) in ODF and 106(16.4%) in NODF kebeles had well constructed slab. On the other hand, among observed latrines 41(9.8%) at ODF and 92(14.4%) at NODF kebeles had washable slab. Most of observed latrines during data collection, 377 (72.4%) in ODF and 342(52.8%) in NODF kebeles had floor which was easily cleanable but only 329(63%) in ODF and 365(56.3%) in NODF kebeles household latrines' floor were found clean (hygienic). Also, 368(70.5%) in ODF and 495(76.4%) in NODF kebeles had only one squat hole. Of this, 81(15.5%) in ODF and 102(9.3%) in NODF latrines had squat hole covers.

Among observed functional latrines, 72(13.6%) in ODF and 92(14.2%) in NODF kebeles had hand washing facility near to latrine and among latrine with hand washing facility 13(18.3%) in ODF and 20(19.8%) in NODF had soap or substitute near the hand washing facility. On the other hand among available hand washing facility near to latrines 30(42.3%) in ODF and 50(48%) in NODF kebeles' provided service/functional (Table 2).

Table 2: characteristics of latrines in selected kebeles at both ODF and NODF kebeles in Hetosa woreda, Arsi,Oromia region ,Ethiopia, 2017 must

Variables		Kebele status			
		ODF		NODF	
		Number	%	Number	%
Latrine with wall for privacy	Yes	407	78.0%	512	79.0%
	No	115	22.0%	136	21.0%
Latrine with roof	Yes	269	51.5%	389	60.3%
	No	253	48.5%	257	39.7
Latrine with slab	Yes	16	3.1%	106	16.4%
	No	506	96.9%	541	83.6%
Latrine with washable floor	Yes	41	7.9%	92	14.2%
	No	481	92.1%	556	85.8
Latrine with easily cleanable floor	Yes	377	72.4%	342	52.8%
	No	144	27.6%	306	47.2%
Latrine with vent pipe	Yes	10	1.9%	23	3.5%
	No	512	98.1%	625	96.5%
Latrine with only one squat hole per latrine room	Yes	368	70.5%	495	76.4%
	No	154	29.5%	153	23.6%
Latrine with squat hole cover	Yes	81	15.5%	102	15.7%
	No	441	84.5%	546	84.3%
Latrine with hand washing facility	Yes	71	13.6%	92	14.2%
	No	451	86.4%	556	85.8%
Hand washing with water	Yes	35	49.3%	61	59.8%
	No	36	50.7%	41	40.2%
Soap/substitute available with hand washing facility	Yes	13	18.3 %	20	19.8%
	No	58	81.7%	81	80.2%
Hand washing give service	Yes	30	42.3%	50	48%
	No	41	57.7%	52	52%

5.3. Magnitude of latrine utilization

Among observed latrines, 88% in ODF and 75% in NODF kebeles were identified as fully utilized at time of data collection. The latrine utilization was measured using availability of five sign of latrine utilization at time observation. The functional latrines that showed at least two sign of latrine utilizations during observation were considered as satisfactory latrine utilization and used as cut of point *(Table3).*

Table 3. Magnitude of latrine utilization based on observational check list in selected kebeles in both ODF and NODF kebeles of Hetosa woreda, Oromia, Ethiopia, 2017

Variables		Kebele status			
		ODF		NODF	
		Number	%	Number	%
Is there fresh foot path leading to the latrine	Yes	498	95%	572	88.50%
	No	26	5%	74	11.50%
Is there splash water/ Urine on latrine floor	Yes	448	85.50%	571	88.40%
	No	76	14.50%	75	11.60%
Is there feces observed in side latrine	Yes	366	69.70%	486	75.20%
	No	158	30.30%	160	24.80%
Is there fly observed in the latrine	Yes	389	74.20%	542	79.60%
	No	135	25.80%	104	20.40%
Observe a human feces in the compound	Yes	43	8.20%	118	18.30%
	No	481	91.80%	528	81.70%
Latrine utilization by five sign use	Yes	280	47.40%	357	55.30%
	No	244	46.60%	289	44.70%
Satisfactory latrine use/two sign use	Satisfactory	**460**	**88%**	**487**	**75%**
	Unsatisfactory	64	12.20%	159	24.60%

5.4. Reason for not utilizing latrine

Among households observed for latrine utilization, 497(96.1%) in ODF and 553(88.5%) in NODF kebeles were responded as all household members utilized latrine. Among the respondent who stated as they were not utilized latrine were reason out that, Due to the latrine pit full and slab is not safe to use. Among households that latrines not utilized by all family members mostly utilize latrine were identified as adult men and adult women in both ODF and NODF kebeles. Whereas, children and disabled people were reported as not mostly utilize latrine in ODF and NODF kebeles (table 5).

Among total households latrines 172(33%) in ODF and 260(37%) in NODF stated identified as affected by environmental flood at least one times and households 122(78.9%) in ODF and 234(90%) in NODF kebeles reported as they were defecate on open field at that time (Table4 and Table5).

Table 4. Interview result of latrine utilization from respondent in selected kebeles in both ODF and NODF kebeles of Hetosa woreda, central Ethiopia, 2017

Variables		Kebele status			
		ODF		NODF	
		Number	%	Number	%
Functionality of available latrine	Non-Func.	7	1.3%	24	3.70%
	Functional	517	98.7%	622	97.40%
Do you wash your hand after latrine use	No	41	56.90%	52	51.50%
	Yes	31	43.10%	49	48.50%
Do you use soap or substitute during hand Washing .	No	55	12.5%	34	5.2%
	Yes	457	87.5%	614	94.8%

Table 5. Reason for not utilizing latrine in selected kebeles in both ODF and NODF kebeles of Hetosa woreda, Arsi,Oromia region, Ethiopia, 2017

Variables		Kebele status			
		ODF		NODF	
		Number	%	**umber**	%
Does All HH member Utilize latrine	Yes	497	96.1%	553	88.5%
	No	20	3.9%	72	11.5%
Among HH member Who usually utilize latrine	Adult Men	22	53.6%	33	50.00%
	Adult women	19	46.4%	33	50.00%
Among HH Who didn't usually utilize latrine	Children	29	39.1%	70	35.00%
	Disabled people	15	20.2%	62	31.0%
	Aged people	30	40.2%	68	34.9%
Does the latrine affected by disaster before	Yes	172	33.00%	260	36.90%
	No	352	67.00%	387	63.10%
During latrine damaged where do you defecate	Open field	122	79.90%	234	90.00%
	Construct new latrine	50	29.10%	26	10.00%

5.5. Factor affecting latrine utilization

As result from cross tabulation shown on (Table 6) below being house hold headed by female contribute to satisfactory latrine 88.2% in ODF and 91 % in Non-ODF kebeles and being headed by male were only contribute 76.2% in ODF and 85.2% in Non-ODF kebeles with (X^2 3.13 and p-value 0.08,) latrine utilization. Presence of literate mothers/wife within household were contribute to latrine utilization 84% in ODF with (X^2 13.75 and p-value <0.001) and 90%in Non-

ODF with (X^2 11.45 and p-value <0.001). Availability of under five children in the household were affect latrine utilization negatively by 23% in ODF with (X^2 0.089 and p-value <0.765) and 18% in Non-ODF with (X^2 9.261and p-value <0.002). Alternatively, presence of school age children attending formal education only were not show statistically significance. However, the number and level of students per house matter, so that, existence of three and more student in the house hold 89% with (X^2 7.64 and P-value 0.004) in ODF and 91% with (X^2 7.01 and p-value <0.004) in Non-ODF kebeles make possible latrine utilization. Furthermore, family with children attend more than grade eight were score utilize latrine 89% at ODF (X^2 26.11 and P-value 0.001) and 90% at Non-ODF Kebeles (X^2 14.1 and P-value 0.001).

Being household graduated as model, maintain latrine utilization by 78% with (X^2 26.11 and P-value 0.001) in ODF and 71% with (X^2 19.61 and P-value 0.001) in Non-ODF kebeles. Household found near to health facility were utilize latrine 82% at ODF (X^2 38.39 and P-value 0.001) and 93% at-Non-ODF (X^2 20.197 and P-value 0.001) in Non-ODF kebeles. The other cross tabulation result show that, house hold access to private latrine in compound and not shared 79% with (X^2 7.37 and P-value 0.007) in ODF and 93% with (X^2 5.4 and P-value 0.002) in Non-ODF were utilize latrine. Latrine with good wall for privacy utilized 83% at ODF (X^2 22.617 and P-value 0.001) and 85% in Non-ODF (X^2 20.197 and P-value 0.001) kebeles. Latrine with easily cleanable latrine floor utilized latrine satisfactorily 82% (X^2 17.055 and P-value <0.001) at ODF and 91% with (X^2 36.77 and P-value <0.001) at Non-ODF kebeles. In addition being found in semi aired/woynadega favor satisfactory latrine utilization by 80% with (X^2 39.053 and P-value <0.001) at ODF and 99% with (X^2 35.57.77 and P-value <0.001) at Non-ODF kebeles.

Table 6: Cross tabulation of Reason for not utilizing latrine in selected kebeles in both ODF and Non-ODF kebeles of Hetosa woreda, central Ethiopia, 2017

Variable		Latrine Utilization ODF				Latrine Utilization Non-ODF			
		Unsatisfied Utilization	Satisfactory Utilization	X^2	P-Value	unsatisfied Utilization	Satisfy Utilization	X2	P-Value
Sex of HH Head	Male	106 (23%)	340 (76.2%)	5.4	0.02	83(14.8%)	476(85%)	3.13	0.08
	Female	9 (11.8%)	67 (88.2%)			7(7.9%)	82(91.1%)		
Marital status of HH head	Unmarried	14 (54%)	12 (46%)			13(41.9%)	18(58.1%)		
	Married	91 (21%)	334 (79%)	17.4	<0.001	74(13.6%)	471(86.4%	20.19	<0.001
	Divorced	11 (16%)	60 (84%)			4(5.8%)	68(94.2%)		
Education of Wife	Illiterate	62 (30%)	146 70%)	13.8	<0.001	49(20%)	196(80%)	11.45	<0.001
	Literate	45(16%)	239 (84%)			38(10%)	332(90%)		
Presence of < 5 children	Yes	41 (23%)	139 (77%)			57(18%)	257(82%)		
	No	74 (22%)	268 (78%)	0.09	0.765	33(10%)	301(90%)	9.261	0.002
Number of student in HH	≤2	36 (31%)	82 (69%)	7.6	0.006	51(17%)	248(83%)	7.01	0.008
	>2	50(18%)	228 (82%)			20(9%)	202(91%)		
Education Level student	1-8	66 (34%)	241(66%)			61(18%)	284(82%)	14.10	0.001
	> 8	20 (11%)	168(89%)	26.1	0.001	10(10%)	165(90%)		
Climate condition of Kebele	Dega	26 (57%)	20 (43%)			59 (21%)	218(79%)		
	W/dega	85 (20%)	339 (80%)	39.1	<0.001	2(1%)	205(99%)	35.57	<0.001
	Kola	4 (7.7%)	48 (92.3%)			38(23%)	126(77%)		
Arrangement of latrine HH	Private	106(21%)	397(79%)	7.4	0.007	75(7%)	509(93%)	5.4	0.002
	Shared	9(47%)	10(53%)			15(34%)	49(66%)		
HH Graduated as model	Yes	25(22%)	147(78%)	8.4	0.004	26(29%)	304(71%)	19.60	0.001
	No	90(26%)	260(74%)			63(20%)	254(80%)		
Distance HH Health Facility	Near	79(18%)	368(82%)	34.4	<0.001	18(7%)	229(93%)	14.09	0.001
	Far	36(48%)	39(52%)			71(18%)	329 (82%)		
Presence of latrine wall	Yes	71(17%)	336(83%)			55(15%)	451(85%)		
	No	44(38%)	71(62%)	22.6	0.001	35(26%)	101(73%)	20.19	0.001
Latrine with one squat	Yes	49(13%)	319(88%)			58(12%)	437(88%)		
	No	66(43%)	88(57%)	55.2	0.001	32(21%)	121(79%)	8.267	0.004
Is latrine floor cleanable	Yes	74(18%)	335(82%)			48(9%)	457(91%)		
	No	41(36%)	72(67%)	17.1	<0.001	42(30%)	101(70%)	36.7	<0.001

5.6. Bivariate regression analysis results of factor affecting satisfactory latrine Utilization

Bivariate logistic regression analysis was undertaken for each variable in relation to latrine utilization from all study population. The result of variables those made statistically significant association reviewed according to factors indicated on the conceptual framework.

Socio demographic factors and latrine utilization association at ODF and NODF kebeles assessed. Factors like age, sex, educational status of husband and wife, ethnicity, religion, occupation of husband and wife ,family size , presence of <5 children, presence, number and educational level of children attended formal education assessed. According, to the biavirate result of this study the socio demographic variable such as sex of head of household, Education of husband, Education of wife, Number student per household, Level of education of student in household, Presence of <5 year children in the household showed statistically significant association to latrine utilization (table 6). Some of the results, household married were spastically significant association with latrine utilization (COR: 4.12, 95%CI (2.38-7.12), literate mother/wife was statistically predictor of latrine utilization (COR: 2.22, 95%CI (1.63-3.06)) and student greater than grade eight found within the household (COR: 3.32, 95%CI ((2.17-5.06)) were among socio-demographic factors showed statistically significant association with latrine utilization *(Table7).*

Environmental factors such as ODF status of Kebele, climate condition, household distance from the health facility, and ever latrine affected by disaster assessed for the association with latrine utilization. As a result, household found in temperate/Woynadega region showed significant association with latrine utilization (COR: 1.83, 95%CI (1.3-2.58)), Household found in ODF kebeles (COR: 1.75, 95%CI (1.29-2.37)), household found near to heath facility (COR: 1.79, 95%CI (1.32-2.4)) showed statistically significant association with latrine utilization.

Social factors such as household graduated as model, participated in community led total sanitation and hygiene program, accessing information about latrine utilization and existence of rules, reward and punishment toward latrine utilization. Of the social factors, being household graduated as model household showed significant association [(COR: 2.35, 95%CI (1.38-4.01)].

Factors related to characteristic of latrine such as type of latrine, kind of latrine arrangement to household, accessibility to households, how far since constructed, presence of wall, roof, slab, washable and cleanable floor, vent pipe, number of squat hole per floor and availability of hand washing facility with soap or substitute and its functionality assessed. Among those factors

household those privately owned latrine (COR: 2.04, 95%CI (1.24-3.35)), Presence of well-constructed latrine wall for privacy (COR: 2.89, 95%CI (2.09-4.01)), latrine floor with only one squat hole (COR: 3.12, 95%CI (2.23-4.31)) and latrine with easily cleanable floor (COR: 3.31, (95%CI (2.42-4.54)) were showed statistically significant association with latrine utilization*(Table7).*

Table 7. Bivariate logistic regression analysis results of utilizing latrine in both ODF and NODF kebeles of Hetosa woreda, central Ethiopia, 2017

Variable		Satisfactory latrine Utilization		COR (95%CL)
		Yes	No	
ODF status of Kebele	ODF	458	63	2.38(1.74-3.3)
	NODF	488	160	1.0
Sex of head of HH	Female	149	16	2.2(1.26-3.69)
	Male	816	189	1.0
Education of Husband	Literate	651	134	1.44(1.08-2.0)
	Illiterate	209	62	1.0
Education of wife	Literate	571	83	2.22(1.63-3.06)
	Illiterate	342	111	1.0
Level of Education of Student in HH	>Grade 8	333	30	3.32(2.17-5.06)
	≤grade 8	425	127	1.0
Number Student per HH	>2	430	70	1.62(1.15-2.29)
	≤2	330	87	1.0
Presence of <5 Year children	Yes	396	98	1.0
	No	569	107	0.76(0.56-1.03)
HH graduated as Model Family	Yes	451	51	1.0
	No	514	153	2.63(1.87-3.7)
Does latrine accessible to all	Yes	809	186	0.53(0.32-0.8)
	No	156	19	1.0
Kind of Latrine arrangement	Private	906	181	2.04(1.24-3.35)
	Shared	59	24	1.0
Presence of latrine wall	Yes	793	126	2.89(2.09-4.01)
	No	172	79	1.0
Latrine only one squat hole on floor	Yes	756	107	3.31(2.42-4.54)
	No	209	98	1.0
Does latrine Floor easily cleanable	Yes	792	122	3.12(2.23-4.31)
	No	173	83	1.0
Climate condition	Arid/Kola	174	41	1.28(0.83-1.96)
	Woynadega	289	54	1.83(1.3-2.58)
	Dega	249	75	1.0
Distance HH from Health facility	Near (<30 Minute walk)	597	97	1.79(1.32-2.4)
	Far (<30 Minute walk)	368	107	1.0

5.7. Multiple logistic regression analysis results of factor affecting latrine Utilization

Some selected variables those significantly associated with dependent variable at bivariate analysis and with P-value <0.25 were further analyzed in the multivariate analysis to identify their related effects with latrine utilization (Table 8).

From socio demographic factors only educational status wife and marital status of household head showed statistically significant association with satisfactory latrine utilization. This study showed that, Literate house hold specially mothers/wife [AOR: 2.23, 95%CI (1.33-3.75)] and level of education student [AOR: 2.22, 95%CI, (1.26-3.91)] were found statistically predictor of latrine utilization. That is household with literate mother/wife 2.23 times more likely to utilize latrine than household with illiterate mother/wife is. Like wise household with student attending higher than grade eight, 2.22 times more likely to utilized latrine when compared to households that did not have student attending higher than grade 8 (eight).

Environmental factors that showed significant association with satisfaction of latrine utilization on bivairate analysis, ODF status of Kebele (being house hold found in ODF kebeles) [AOR: 2.33, 95%CI(1.19-4.6)] showed significant association with satisfactory latrine utilization. Means household found in ODF kebeles were 2.3 times more likely satisfactorily utilize latrine than those found in NODF kebeles. In addition to this, Climate condition (Household found intemperate/Woynadega) [AOR: 2.2, 95%CI (1.1-4.4)]. Households at woyinadega climate condition were 2.2 times more likely satisfactorily utilize latrine not at woyinadega climate region do. Distance of household from the health facility (household found near to heath facility) [AOR: 5.01, 95%CI (2.8-8.9)] also showed significant association with latrine utilization. Households that found near to health facility (<30 minute walking distance) were 5 times more likely to satisfied latrine utilization than households far more than 30 minute walking distance.

Factors related to latrines' condition and showed association on bivariate analysis such as kind of latrine arrangement at house hold level, presence of latrine wall for privacy, easily cleanable latrine floor, latrine have floor have only one squat hole, accessibility of latrine to all household members, were assessed for the association with the satisfactory latrine utilization multivariate analysis. Among those factors, privately owned latrine arrangement [AOR: 2.4, 95%CI (1.06-5.44)], presence of latrine wall for privacy [AOR: 3.48, 95%CI (1.96-6.16)], easily cleanable latrine floor [AOR: 2.64, 95%CI (1.53-4.56)], latrine have floor have only one squat hole [AOR: 3.0, 95%CI(1.53-4.56)] showed

significant association to satisfactory latrine utilization. This showed that household privately owned latrine were 2.4 times more likely to satisfy latrine utilization than households share latrine with other household. In addition to this, households' latrines with wall for privacy were 3.48 times more likely to satisfy latrine utilization than latrines with no wall for privacy. Latrine with easily cleanable latrine floor were also 2.64 times more probable satisfy latrine utilization than latrines with difficult to clean its' floor and latrine have floor have only one squat hole were 3 times likely to satisfy latrine utilization than latrines with more than one squat hole per floor (table 8).

Table 8. Multivariate regression analysis results of satisfactory utilizing latrine in both ODF and NODF kebeles of Hetosa woreda, central Ethiopia, 2017

Variable		Satisfactory latrine Utilization		COR (95%CL)	AOR(95%CI)
		Yes	No		
ODF status of Kebele	ODF	458	63	2.38(1.74-3.3)	2.33 (1.19-4.6)
	NODF	488	160	1.0	1.0
Sex of head of HH	Female	149	16	2.2(1.26-3.69)	-
	Male	816	189	1.0	
Education of Husband	Literate	651	134	1.44(1.08-2.0)	-
	Illiterate	209	62	1.0	-
Education of wife	Literate	571	83	2.22(1.63-3.06)	2.23(1.33-3.75)
	Illiterate	342	111	1.0	1.0
Level of Education of Student in HH	>Grade 8	333	30	3.32(2.17-5.06)	2.22(1.26-3.91)
	≤grade 8	425	127	1.0	1.0
Number Student per HH	>2	430	70	1.62(1.15-2.29)	-
	≤2	330	87	1.0	-
Presence of <5 Year children	Yes	396	98	1.0	-
	No	569	107	0.76(0.56-1.03)	-
HH graduated as Model Family	Yes	451	51	1.0	1.0
	No	514	153	2.63(1.87-3.7)	2.35(1.38-4.01)
Does latrine accessible to all	Yes	809	186	0.53(0.32-0.8)	-
	No	156	19	1.0	-
Kind of Latrine arrangement	Private	906	181	2.04(1.24-3.35)	2.4(1.06-5.44)
	Shared	59	24	1.0	1.0
Presence of latrine wall	Yes	793	126	2.89(2.09-4.01)	3.48(1.96-6.16)
	No	172	79	1.0	1.0
Latrine only one squat hole on floor	Yes	756	107	3.31(2.42-4.54)	3.0(1.53-4.56)
	No	209	98	1.0	1.0
Does latrine Floor easily cleanable	Yes	792	122	3.12(2.23-4.31)	2.64(1.53-4.56)
	No	173	83	1.0	1.0
Climate condition	Arid/Kola	174	41	1.28(0.83-1.96)	1.9(0.6-1.96)
	Woynadega	289	54	1.83(1.3-2.58)	2.2(1.1-4.4)
	Dega	249	75	1.0	
Distance HH from Health facility	Near (<30 Minute walk)	597	97	1.79(1.32-2.4)	5.01(2.8-8.9)
	Far (<30 Minute walk)	368	107	1.0	1.0

6. DISCCUSSION

This study undertaken with the intension to answer level of latrine utilization and factor related in both ODF and NODF kebeles. Totally, 1170 respondents were participated in the study with 98.1% response rate.

Based on observational checklist, 459 (88%) in ODF and 488(75%) in NODF kebele's of latrine were identified as satisfactory latrine utilization functional latrine. This finding was show latrine utilization in ODF higher than NODF kebeles; this may be due to the quality of ODF verification, declaration, certification and follow-up after ODF declaration by Woreda and Kebeles ODF certification teams. Correspondingly, comparative study undertaken between CLTSH implementer and Non-implementer urban kebeles at Hawasa town where showed that majority of the respondents, 90.3% of UCLTSH implementers and 85.4% non-UCLTSH implementers utilize latrine(21). Magnitude of latrine utilization of this study beat lower than, study at Hawasa of CLTSH Implementer community, this may be due to study population were town which latrine coverage was high when compared to this study population (4). Study done at Denbia Woreda, Northwest Ethiopia, which based on observation 609 (76.0%) households were observed with the presence of at least one sign of use as an indication of utilization(5), which was almost the same with NODF kebeles latrine utilization of this study, but in this study, two sign of latrine utilization used as cut of point. Study done based on self report at Awabal Woreda 52% and in Hulet Ejju Enessie Woreda (86.7%) showed majority of latrines was reported as used by the respondents(22, 23). Lower than the finding of this study in both ODF and NODF kebeles. This variation could be due to differences in socioeconomic status, the study period difference, differences in study designs and operational definitions latrine utilization.

In this study area among accessed household latrines, 470(90%) at ODF and 525(79%) at NODF kebeles identified as accessible to all family members belongs that household. The finding of this study showed that, presence of at least one person defecate at open field among house hold member last 24 hour were taken as open defecation provenance which was 4% in ODF and 12% NODF in NODF Kebeles respectively. Study at Denbia Woreda (13.2%) latrines were never used by house hold at all.(5), which is higher than this study area. On the other hand among house hold members those didn't usually utilize latrines were identified that due to, old age, children and disability at both ODF 30(40.2%), 29(39.1%) and 15(20.3%) and 68(34.9%), 70(35%), 62(31%) in NODF kebeles respectively. Study at Hawasa show that, majority of children (96.2%) and 3.8 adult in UCLTSH implementing kebeles(21). Ethiopia is among 16 (sixteen) countries reduced open

defecation by more than 25 percentage points during the MDG period the largest decrease (64%) in the proportion of the population practicing open defecation (from 92 % in 1990 to 29 % in 2015)(1). Open defecation was practiced by 44.3 million Ethiopians in 1990 and 28.3 million in 2015 an average reduction of over 4 Percentage points per year over 25 years(1).

This study showed that, Literate house hold specially mothers/wife [AOR: 2.23, 95%CI (1.33-3.75)] found statistically predictor of latrine utilization. That is household with literate mother/wife 2.23 times more likely to satisfactory utilize latrine than household with illiterate mother/wife isStudy in Denbia also showed that, extent of latrine utilization were 2.437 times more likely for mothers who can read and write than those unable to read and write [AOR: 2.437, 95%CI(1.032,5.756)](22). Study in Gulomekada Woreda, Tigray Region were also approved this, that households with mother educational status of primary and above were 3.71 times [AOR=3.71, 95%CI: 1.52-9.09] more likely to utilize latrine than households with illiterate husbands(4). Study in Thailand also show that, respondents who had high education were more high percentage 59.1% of use latrines than those who had low education (24). The possible elaboration for this is that education helps the literate household head to access the information from different sources than illiterate household head about the advantage of latrine utilization

Likewise household with student attending higher than grade eight found statistically predictor of satisfactory latrine utilization [AOR: 2.22, 95%CI, (1.26-3.91)]. Which mean household with student attending higher than grade eight were 2.22 times more likely to satisfactorily utilized latrine when compared to household did not had student attending higher than grade. Study in Denbia Woreda showed that, Households with secondary school children were 3.739 times more likely to utilize latrine compared to households without secondary school children [AOR: 3.739, 95% CI (1.884,7.419)](21). Study in Alaba Woreda show that, At all things held constant, the odds ratio is in favor of interest to increase the utilization of sanitation and hygiene information by the factor of 5.484(25). One of the possible reasons for this relation is that as the individual education levels increase, the ability to obtain information, process, understanding and the consequent utilization of sanitation and hygiene information increases.

Marital status of household found statistically predictor of latrine utilization [AOR: 8.55, 95%CL (1.93-37.9)], Married household head satisfactorily utilize latrine 8.6 times more likely than households with other marital status do. This may be due to married household responsible to their children

ODF status of Kebele (being household found in ODF kebeles) showed significant association with satisfactory latrine utilization [AOR: 2.3, 95%CI (3.19-12.59)]. Means household found in ODF kebeles were 2.3 times more likely satisfactorily utilize latrine than those found in NODF kebeles. Study at Southern Ethiopia showed that latrine utilization lower than the this study finding, which data were collected at a time of visit indicate 74.5% in the ODF and 55% in the NODF villages respectively with (X^2=70.325, P=.001)(20). Correspondingly, comparative study undertaken in Hawas Town showed, UCLTSH implementers significant association with latrine utilization [COR: 1.59, 95% CI(1.00, 2.53), this indicates that the odd of latrine utilization among UCLTSH implementer's households is 1.59 times that among non UCLTSH implementers. (21). Which is higher latrine utilization than this study funding; this difference may be due to differences in socioeconomic status, the study period difference, differences in study designs and operational definitions latrine utilization.

In addition to this, Climate condition (Household found intemperate/Woynadega) [AOR: 2.2, 95%CI (1.1-4.4)]. Households at woyinadega climate condition were 2.2 times more likely satisfactorily utilize latrine not at woyinadega climate region do. This could be due to in Temprate/woyinadega climate condition the probability to gain material for constriction were advanced and it was durable for long time and not usually affected by natural disaster. Contrarily households found at Highland/Dega most of the time the soil condition highly affected by natural disaster and material for construction were easily decomposable and in Arid/Lowland areas peoples interested to defecate outside and they belief that feces was easily decomposed and dried. Residents in "Kola" were less likely to use latrines than in other climate zones. Study in Hulet Ejju Enessie Woreda, East Gojjam Zone, indicate that, wide spread open defecation practice in Kola were common due to fear of smell and flies from traditional pit latrines and misunderstanding of that fecal matter under sunlight dries quickly and becomes harmless in the open space in such hot climate as "Kola"(8). This finding also indicates lower latrine utilization at kola climate condition, so that those reasons may also work to this study area.

Distance of household from the health facility [AOR: 5.01, 95%CI (2.8-8.9)] also showed significant association with satisfactory latrine utilization. Households that found near to health facility (<30 minute walking distance) were 5 times more likely to satisfied latrine utilization than households far more than 30 minute walking distance. Study in Beharder Zuria Woreda also identify that household found at near health facility was 2 times more to be expected utilize latrine than

households far more than 30 minute walking distance [AOD:1.57, CI(1.11-2.22)] (26). This may be due to health professional and health extension worker could frequently visited nearby household to local health facility. Indicate that households found at short walking distance from the local health facility better informed about the importance of building latrine facilities and its utilization through health-promotion programs and community mobilization.

Household privately owned latrine were 2.4 times more likely to satisfy latrine utilization than households share latrine with other household [AOR: 2.4, 95%CI (1.06-5.44)]. About 503(96.4%) in ODF and 584(90.1%) in NODF latrines were privately owned and the remained were shared (X^2=17.062 p=<0.001). This finding almost equal with study done in Dangila Woreda 89.7% at ODF and 92.8% at NODF kebeles have private latrine(27). Higher than study done in Sidama zone 79.4% in ODF and 59.1% in NODF of the households have latrine(20). this difference may come because of the differences on the CLTSH implementation, commitment at both communities and officials and socio-economic and demographic characteristics differences.

In this study area, common type latrines of available were 498(95.4%) in ODF and 569(88.1%) from NODF kebeles were traditional pit latrine with slab made of wood and earth. It is slightly higher than study done in Dangla Woreda (87.4%) among ODF and (87.8%) among NODF) pit latrine(27, 28) and relatively equal with study done in Kersa Woreda which is 91.7% of the total households have traditional pit latrine(29). Similarity and disparity of the result was may be due to how strong and restrict to gaud line of CLTSH and the strength of monitoring and evaluation system difference from area to area and because CLTSH recommends first simple pit latrine to be constructed as part of behavioral change component.

This study result showed that, household latrines with wall for privacy were 3.48 times more likely to satisfy latrine utilization than latrines with no wall for privacy [AOR: 3.48, 95%CI (1.96-6.16)]. Study in Denbis indicate that, households with latrines which had door were 3.201 times more likely to utilize latrine compared with latrines which have no door (AOR: 3.201, 95% CI: (1.437,7.130))(5). Study in Aneded Woreda also indicate that, latrine with well-constructed superstructure were about three times higher satisfactory latrine utilization (AOR: 3.194, 95%CI: 1.364 - 6.631) than had no superstructure(30). The results of both studies result in relation to latrine wall and this study indicate that, latrine with well-constructed wall satisfactorily utilized three times more probable than latrines without or not well-constructed latrine wall.

This finding also indicate, Latrine with easily cleanable latrine floor were 2.64 times more expected contribute to satisfactorily latrine utilization than latrines with floor difficult to clean [AOR: 2.64, 95%CI (1.53-4.56)]. Study in Aneded Woreda also indicates that, households with clean latrine facilities were four times (AOR: 4.1, 95%CI [1.7, 10.0]) more likely to utilize than those with unclean ones(30). Similarly, study in Tanzania indicate that hygienic latrines were 4.327 times more likely to utilize latrine compared with latrines not hygienic (AOR: 4.327, 95% CI: (2.05, 9.134))(31). Both studies finding higher than the study area result, it may be due to study design and geographical setting difference. This indicate that cleanness of the latrine attract people to use latrine, prevention of various diseases which initiate them to utilize latrine satisfactorily. The reason attributed to the fact that participant's behavior will be motivated through attractive environment and could attributed to fear of contamination, odour and flies that are major problems of unhygienic latrines.

Latrine floor only one squat hole was 3 times more possible to satisfactorily utilization latrine than latrines with more than one squat hole per floor [AOR: 3.0, 95%CI(1.53-4.56)].

Majority of the latrines 152(28%) in ODF and 246(35.8%) in NODF were constructed before three year ago of the study time. Mean age of having a latrine was 2.75 (±1.026) and It is lower than study done in Tigray region which 54% of the latrines constructed before 3 years and higher than in which study done in Dangla Woreda which is 18% in NODF and 17.4% in ODF latrine constructed 3 year ago(28). This may come because of the differences in the materials the two communities used that sustained longer which means those households who are in Tigray region uses stone for construction of latrine which used longer as compared with the materials used in Dangla and Hetosa Woredas since they used wood and mud for construction of latrine.

The majority of respondents in both ODF (79%) and NODF (73.8%) kebeles uses soap/ash at hand washing time in 24 hour recall which is much higher in both settings as compared with the study done in sidama zone that showed 57.3% from ODF and 57.7% from NODF use soap/ash at hand washing time in 24 hour recall(32).

Among observed functional latrines, only 72(13.6%) in ODF and 92(14.2%) in NODF kebeles had hand washing facility. Which is more than two times higher than the study done in Baher Dar Zuria (6.2%)(23), (2)Kersa(33), (8.3%) Behar der zuria(26). However, this study result was lower than Hulet Ejju Enessie (30.8%) (8) , (26.9%) Denbia (22) and study in Dangila Woreda 45.8% in

ODF and 33.8% from NODF kebeles households latrines had hand washing facility(28). This difference may be because recently there has been high mobilization of the community on hygiene and sanitation may be increases hand washing facility coverage of the study area. The difference might be due to effort difference on mobilizing the community to use hand washing facilities and strategy used for promotion of hand washing, full implementation of CLTSH packages, and follow-up of CLTSH implementation differences.

On the other hand, Only 30(5.7%) in ODF and 50(7.7%) in NODF kebeles of latrines hand washing facility is contain water. Similarly, study in Awabel Woreda also indicates only 7% of households had hand washing facility were using either soap or ash and as (75%) of the contain water during observation. (23). It indicates that many latrines had access to hand washing with water than the study area. This difference may be due to that problem of water supply accessibility difference and promotion of hand washing after latrine was high in Awabel and Kersa Jimma Woreda. Only 13(2.4%) in ODF and 20(3.1%) of latrines had soap or substitute near the hand washing facility.

In this study area Only 30(5.7%) in ODF and 50(7.7%) in NODF kebeles were give service. This result was relatively the same with study in Denbia Woreda which indicate among all functional latrines only 65 (10.7%) of households with access to a place to wash hands that has all essential supplies and give service(5). Study in Kersa east Hararge show that, only about 5.1% of the households having latrines were washed their hands after defecation (29, 33). But other comparative study in Kersa Woreda Jimma zone indicated hand-washing after defecation in CLTSH implemented and none implemented kebeles were 99.48% and 95.9% respectively(29) These could be partly attributed to scarcity of water, and soap in concert with lack of awareness about the importance of hand washing after visiting toilet in preventing feco-oral transmission of diseases.

7. Limitation

- These study designs (cross-sectional) which measure the exposure and out come at the same time, which cannot measure the cause and effect relationship were used.
- Quantitative research could have been more accurate if qualitative approach employed to involve health extension workers and other key informants to realize quantitative data.

8. Strength of the study

- Simple random methods used to select study population within the study area.
- Observation checklist was used to identify proper utilization of latrine by sign of latrine use.

9. Conclusion

Magnitude of satisfactory latrine utilization highly related to ODF status of Kebeles, those household found ODF Kebeles found higher satisfactory latrine utilization at non-OD Kebeles. Whereas hand-washing facility near the latrine with access to all essential supplies and functional were very low in both ODF and NODF Kebeles.

This study indentified that, presence of ≤ 5 years children, being mother to be illiterate and unclean ability of latrine floor, absence of latrine wall were factors negatively associated with latrine utilization. Household found in ODF Kebele, presence of latrine wall for privacy, latrine with only one squat hole, latrine with easily cleanable floor, household found near to health facility, household found in temperate/Woynadega region, literate mother/wife found with household, presence of student greater than grade eight, married household head were factors those positively associated with satisfactory latrine utilization.

10. Recommendation

Depending on the results of this study, the following recommendations forwarded:

To Health extension Worker and Kebele administrative

- Health extension worker and local authorities must provide health education and sensitization for the community to end open defecation and all kebele declare ODF status.
- Kebele certification should have to be according to criteria of verification and certification and every local administrative have to undertake post-triggering follow to sustainability of the approach even after one year.
- Health extension worker should have to provide technical support during latrine construction at household level to have durable and easily cleanable latrine.

To Regional health bureau, Zonal health office and Woreda heath office

- Regional health bureau and Zonal health offices better to undertake verification of kebeles according to the criteria sited on the manual and frequent follow of the program to assess its implementation and provide feedback timely.

To Health Worker

- Health professional at health center level have to undertake proper community triggering about open defecation and initiate selection of natural leader and link with health extension worker for proper follow up of post-triggering and technical support on latrine construction and utilization at household level.

Reference

1. WHO and UNICEF Joint Monitoring Programme for Water Supply and Sanitation :2015 2015.
2. MIni EDHS 2014 CSA. Ethiopia mini Demographic and Health Survey (DHS) 2014. July 2014 Addis Ababa, 2014; :13-4
3. Agency CS. ETHIOPIA Demographic and Health Survey 2016. Addis Ababa, Ethiopia2016.
4. Debesay N IL, Gebresilassie A, Assefa H, Yemane D (2015) Sanitation Utilization and Associated Factors in the Rural Communities of Gulomekada District, Tigray Region, North Ethiopia, A Community Based Cross-Sectional Study,. J Community Med Health Educ 2013;5:338.
5. Tadesse Yimam1 KG, Daniel Haile Chercos1 Sanitation utilization and associated factors among people living in rural areas of Denbia district, Northwest Ethiopia, 2013, a cross-sectional study,. Pan African Medical Journal (2014) 2014; ;18::334
6. Ethiopia. FMoH. Implementation Guideline for CLTSH Program and verification guideline Addis Ababa, Ethiopia,: Federal Ministry of Health Ethiopia; 2012 2012.
7. 2010. EMoHHI. Health Sector Development Programme IV,. Addis Ababa: Federal Democratic Republic of Ethiopia Ministry of Health, ; 2010.
8. Andualem A AK. Assessment of the impact of latrine utilization on diarrhoeal diseases in the rural community of Hulet Ejju Enessie District, East Gojjam Zone, Amhara Region Ethiopian. J Health Dev 2010 2010;24(2)::110-8.
9. UNICEF Sanitation Priority Country Factsheet Ethiopia. Sanitation Priority Country Factsheet UNICEF, 2014 2014. Report No.
10. Health FMo. health sector transformation plan of Ethiopia, 2015. Addis Ababa 2015. Ababa.
11. Mohoeea. CLTSH Verification and certification protocoL. In: health Hae, editor. Hygiene, ed2012.
12. UNICEF JWa. Joint Monitoring Programme for Water Supply and Sanitation : . Jenave: WHO and UNICEF, 2014 2014. Report No.
13. Kumie A AAals. An overview of environmental health status in Ethiopia with particular emphasis to its organization, drinking water and sanitation, Ethiop J Health Dev 2005;19:89-103.
14. Central Statistical Agency Addis Ababa. Ethiopia mini Demographic and Health Survey,. Addis Ababa Ethiopia. July 2014. 2014.
15. Anteneh A KA. Assessment of the impact of sanitation utilization on diarrheal diseases in the rural community of HuletEjjuEnessie Woreda, Amhara Region. . Ethiop Journal Health Dev 2010,. 2010;24(2):114.
16. Kar KaP, K. Subsidy or self-respect? Community led total sanitation.An update on recent developments. Working Paper. 2005;257,Brighton: IDS.
17. Federal Democratic Republic of Ethiopia Ministry of Health. Health sector transformation plan. Addis Ababa2015.
18. Kebede F JR. Water and sanitation program: Addis Ababa 2011. [cited 2015], learning note [Internet]. 2015.
19. Health FDRoEMo. Outcome evaluation Global sanitation Fund Ethiopia 2016.
20. Hunachew B WD, Abera K, Delia G. Effect of Community Led Total Sanitation interventions on Diarrheal diseases and other hygienic behaviors and Sanitation infrastructure sustainability challenges, Southern Ethiopia. 2015. 2015
21. Lemma T, Abera K, Sintayehu BH, Hailu FD, Mesfin TS. Latrine utilization and associated factors among kebeles implementing and non implementing Urban Community Led Total

Sanitation and Hygiene in Hawassa town, Ethiopia. African Journal of Environmental Science and Technology. 2017;11(3):151-62.
22. Yimam Tadesse Yimam1 KAG, Daniel Haile Chercos1,. <Latrine utilization and associated factors among people living in rural areas of Denbia. Pan Afr Med J. 2014.
23. Gedefaw M, Amsalu, Y., Tarekegn, M. and Awoke, W. Opportunities, and Challenges of Latrine Utilization among Rural Communities of Awabel District. Open Journal of Epidemiology, . 2014 2015,;5,:98-106.
24. Guterres ICL YK, Xenos P. . Factors influencing households to use latrines after the open defecation free declaration in Ermera district, Timor-Leste. J Health Res ;. 2014;28(3):191-8.
25. Nigatu Regassa1 DSRaKK. Access to, and Utilization of Information on Sanitation and Hygiene by Rural Households in Alaba Special District, Southern Ethiopia. J Hum Ecol, . 2011;33(2):: 101-12.
26. Muche Aa. <A cross sectional studylatrine coverage and associated factors among rural communities in the District of Bahir Dar Zuria, Ethiopia. 2013 >. BMC Public Health. 2013 13:99.
27. Misganew A. Assessment of diarrhea in under-five children: a comparative cross-sectional study 2016.
28. (BSc.) AM. Assessment of Diarrhea In Under-Five Children: A Comparative Cross-Sectional Study In Open Defecation and Open Defecation Free Rural Settings In Dangla District, North West Ethiopia. 2016.
29. Negasa Eshete1 AB, Gudina Terefe2. Implementation of Community-led Total Sanitation and Hygiene Approach on the Prevention of Diarrheal Disease in Kersa District, Jimma Zone Ethiopia. Science Journal of Public Health. 2015;3(5):: 669-76.
30. Chanie T* GMaKK. <latrine-utilization-and-associated-factors-in-rural-community-of-Aneded District, North West Ethiopia, 2014-2161-0711-1000478.pdf>. Community Med Health Educ. 2014;6(5).
31. Maggie A Montgomery MMDB, Elimelech M. . Assessment of latrine use and quality and association with risk of trachoma in rural Tanzania. 2010. PubMed | Google Scholar. 2010; 104(4).
32. Chomsky N. What is Special About Language?: University of Arizona; 2012.
33. Mengistie B BN. Community based assessment on household management of waste and hygiene practices in Kersa Woreda, Eastern Ethiopia. Ethiop J Heal Dev. 2010;. PubMed | Google Scholar. 2010;24(2)::103-9.

Annex I. Curriculum Vitae

Date: 09/06/2017

1. Personal Data

Name: **Damtew Arado Bedada**

Sex : Male

Marital status Married

Profession: Environmental Health Officer,

Birth: 21 November 1983

Nationality: Ethiopian

Languages	Listening	Speaking	Reading	Writing
Afan Oromo (Oromo Language)	Excellent	Excellent	Excellent	Excellent
Amharic	Excellent	Excellent	Excellent	Excellent
English	Excellent	Very Good	Excellent	Excellent

Address: +251 912057887

E-mail: damtewaredo@gmail.com

P. O. Box 24341

Addis Ababa, Ethiopia

2. Academic and Professional Education:

Tertiary: BSc Degree in Environmental Health Officer from Gonder University in July 2005, GMPH follower at Addis Ababa University

Secondary: Asella Comprehensive 2nd School (9-12), Asella (1999-2002): Asella

Primary: Sibu Abadir Primary School, (1-7) Sibu (1990- 1997) and grade 8 at Boru Jawwi 2nd school 1998.

3. Key Qualifications:

- Coordinate and Facilitate the process of Health Extension Programs
- Translation Woreda transformation guide lines from English and Amaric to Afan Oromo Language. .
- Evaluating capacity of Health service provision at regional, zonal and woreda level and acts as monitoring and evolution team member for more than seven years.
- Translation of Rural and Urban Health Extension program implementation guide line to afan Oromo.

- Coordination and facilitation capacity of pre service and on service training for urban and rural health extension program (HCT, PMTCT, TB-HIV,
- Community Home Based Care and sanitation and hygiene specifically community lead total sanitation and hygiene (CLTSH).
- Environmental and Hygiene Promotion /WASH (water supply, sanitation and hygiene) program coordination capacity,.
- Coordinate and Facilitate the process of identification and inclusion of WaSH partner Organizations and other relevant sector regional health bureaus
- Manage capacity of overall Health Activities at regional, zonal, Woreda and town Level

4. In Service Short term Trainings:

- TOT on project planning, implementation, monitoring and evaluation of health program from Public Service College of oromia, Certificate awarded.
- MTOT on Integrated Refresher training for Health Services Extension Program on Components (RH, TB-HIV, IMNCI, ENA, Malaria, Hygiene and Sanitation, IEC, Monitoring and Evaluation) organized by Federal ministry of Health, UNICEF and Other Partners in Bahir Dar, Ethiopia, Stay for 12 days, June 13-23/2011, Certificate awarded.
- MTOT on Integrated Refresher training for Health Services Extension Program on TB/HIV organized MSH at Adama town, Certificate awarded.
- MTOT on preserves training for Urban and rural health extension program that given to college teachers, those give training for health extension program
- MTOT on Integrated Refresher training for Health Services Extension on EPI, Certificate awarded.
- MTOT on Integrated Refresher training for Health Services Extension on TB-HIV, Certificate awarded
- TOT for training Supervisors on accelerated Implementation of HSEP
- Emergency need WASH assessment: Organized by FMOH in Collaboration with WHO, UNICEF, WFP and other Partners but no certificate award.
- Full basic computer skill training, certificate awarded
- SPSS computer skill training , certificate awarded

5. Work experience

1. From October 1, 2013 G.C up to now, working in Oromia Regional Health Bureau under Health Delivery Core Process, as **Urban and Rural health extension and Water, Sanitation and hygiene sub-process coordinator.**.
2. From September 1, 2008 G.C -2012, I am working in ORHB under Health Delivery Core Process, as **Urban, Rural and Pastoralist community health extension program and environmental sanitation and hygiene officer** work position PS-4/1.
   And, in this capacity I have actively worked in the areas of

3. From February 1, 2006 up to August 30, 2008 study Master Program on Urban Management in Ethiopian Civil Service University .
4. From April 1, 2005. to January 30, 2006 as Becho Woreda Health office head, Becho Woredas of Ilu Aba Bora Zone Oromia Region
   Shouldering this duties and responsibility I had actively worked and delivered valuable contributions
   - In planning,
5. From October 1, 2005 up to March 30, 2005, Becho Woredas of Ilu Aba Bora Zone Oromia Regional Health office with title acting Environmental, Extension and IEC Department and Malaria Prevention and Control Department expert at Work position PS 1/1,

6. Research Studies:

1. Assessment of accessibility and affordability of communal water distribution center to community in Gonder town of Amhera regional state, Ethiopia. May 2006, Research for fulfillment of Degree program.

7. Other skills

- Basic computer skills
- Good skills in communication and social interaction

8. **Hobbies:**

- Helping low income community with different health programs.
- Listening/watching spiritual songs and reading different literatures.

9. References

a. Dr. Dereje Duguma; (MD, MPH) Head of oromia health bureau Cell Phone: 0912670560
   E-mail: dere2010@gmail.com

   Addis Ababa, Ethiopia

b. Mr. Feyisa Safeho (BSC, MPH) Deputy Head of Oromia regional Health Bureau Cell Phone; 0944731449
   E-mail; fsafawo@yahoo com

c. Mokonnin Ayale : Health Extension program, sanitation and hygiene program seiner expert of Oromia Regional Health Bureau,
   Cell Phone: 0910197715

   Email: jimamok@gmail.com

   Addis Ababa, Ethiopia

I certify that the statements made by me to the foregoing curriculum vitae are true, complete and correct to the best of my knowledge and belief.

Name: Damtew Arado **Signature:** Date 09/06/2017

Annex II. Questioners (English) *Questionnaire Designed to assess Magnitude of Latrine Utilization and Assiciated factors in Open Defication Free and Open Defication Rural areas of Hetosa, Woreda, Oromia, 2016*

Identification ***Date of the interview D/M/Y__/__/___***

Q101.Name of Kebele _____

Q102. ODF status of Kebele 1. ODF 2. NODF

Q103. Name of Village/Gare_____

Q104. Climate condition of of the Kebele 1. Highland/Dega 2. Semi-Aired 3. Desert/Kola

Q105. Code of the respondent_____

Part 1. Socio-Demography Charactestics				
Sr.No	**Variables**	**Possible answer**	Skip	Code
Q101.	Name of Kebele			
Q102.	ODF status of Kebele	1. ODF 2. NODF	→ Q103	
Q103	How far since kebele declared ODF	***1. <1*** ***2. 1-2*** ***3. 2-3*** ***4. >3***		
Q104.	Climate condition of of the Kebele	1. Highland/Dega 2. Temperate 3.Desert/Kola		
Q105.	Name of Village/Gare	_____		
Q106.	Code of the respondent	_____		
Q107.	Sex of the respondents	***1. Male____*** ***2. Female_____***		
Q108.	Age of the respondent	_____year		
	Part I. Socio Demographic Characteristics			
109.	Sex of the Head of the household	1. Male **2.** *Female*		
Q110.	Marital status of the head of household? 1**.**	*1. Never married* *2. Currently married* *3. Divorced/separated* *4. Widowed* *99. Other*	→ Skip Q112, Q114	
Q111.	What is Educational status of husband?	0. Illiterate 1. *Grade 1-8* 2. *Grade 9-12* **3.** *>12grade*		
Q112.	What is Educational status of wife?	0. Illiterate 1. *Grade 1-8* 2. *Grade 9-12* **3.** *>12grade*		
Q113.	What is the occupation of husband?	1. Farmer 2. Gov't employee 3. Private 99. Other		

Q114.	What is the occupation of wife?	1. Farmer 2. Gov't employee 3. Private 99. Other		
Q115.	Total number of family member (those living in one house)?	_____		
Q116	Is there <5 Year child among house hold member?	1. Yes 2. No		
Q117.	Are the school age children of any age attending formal education?	1. Yes 2. No →	**Skip to Q120**	
Q118	If answer for Q117 is yes how money?	_____		
Q119.	If answer for Q117 yes what is the level of their education	1. Primary 2. Secondary 3. Higher education (>12)		
Q120.	What is the Religious of the respondent?	1. Orthodox 2. Protestant 3. Muslim 4. Wakefeta. 5. Catholic 6. Others (specify)__		
Q121.	Ethnicity	1. Oromo 2. Amhara 3. Tigre 4. Gurage 99. Others (specify)__		
Part II. Practice of sanitation				
Q201.	Is the latrine available latrine being functional now?	1. Yes ***2.*** No →	**Skip to Q203**	
Q202.	How far since you own your latrine?	1. <1year 2. 1-2 years 3. 2-3 4. >3years		
Q203.	If answer for Q201 yes, Do all household members always use latrine?	1. Yes all are Always use latrine 2. No all are not Always use latrine ↘	**Skip to Q208,**	
Q204.	If answer to Q201 is No, what are the possible reasons? ***[Do not Read all options, check all that apply]***	1. Difficult to them to use latrine 2. Due to others use it, latrine is busy 3. No material to construct 4. Latrine pit is full 5. The slab is not safe to use		

Q205.	*What* are the possible reasons for non-functionality of the latrine? ***(Do not read options, Circle all that applies)***	1. I have no money to maintain 2. A lot of people use the latrine, so i am not concerned to maintain 3. No material to construct used to maintain 4. Latrine pit is full 5. The slab is not safe to use 99. Others		
Q206.	If answer for **Q203 is NO all** member, among your house hold, who uses the latrine always? ***(Do not read options to the respondent, Circle all that applies)***	***1.*** Adults- men ***2.*** Adults-women ***3.*** Anybody in the household ***4.*** School age student ***5.*** Elderly people ***6.*** Under five children ***7.*** Disabled people		
Q207.	If answer for **Q203 is NO all** member, among your house hold, who are not uses the latrine always? ***(Do not read options to the respondent, Circle all that applies)***	***1.*** Adults- men ***2.*** Adults-women ***3.*** Anybody in the household ***4.*** School age student ***5.*** Elderly people ***6.*** Under five children ***7.*** Disabled people		
Q208.	Is there any house hold members ***those have problem*** to properly utilizing the latrine due to individual problem	1. Yes 2. No →	**Skip to Q211**	
Q209.	If answer for Q208 is yes, what is the reason?	1. Being patient 2. Old age 3. Injury 4. Disability 5. Pregnancy 6. During a pried 7. Being child		
Q210.	If there is person those don't utilize latrine among member, what are the possible reason?	1. Offensive odor 2. Squatting hall is big 3. Not comfortable to use 4. The slab is not safe to use 5. Write other reason		

Q211.	What kind of arrangement is the latrine? ***(Observe and indicate the arrangement, multiple response is not allowed)***	1. Private latrine/inside the living house 2. Private latrine/outside the living house 3. Shared with other households /communal 4. Shared with the public 5. Other		
Q212.	Does your latrine affected by natural disaster like wind and flood?	1. Yes 2. No		
Q213.	During your latrine not give service, where does you defecate?	1. Neighborhoods 2. Open field 99. Other place		
Q214.	Do you wash your hand after you use latrine?	1. Yes 2. No →	**Skip to Q215B**	
Q215A.	If answer for Q214 is yes, do you use soap or substitute?	1. Yes 2. No		
Q215B.	If answer for Q214 is No, what are possible reason?	1. No hand washing facility 2. Due to shortage of water 3. Do not know the importance of hand washing 99. Other specify		
Q216.	How are baby's feces usually disposed of? ***(Do not read options, Circle only one which is very often)***	1. Put into latrine using Popo 2. Put into drain/ditch 3. Thrown in garbage Buried. 4. Left open 5. Other (specify) _____		
Q217.	past six month, have you ever seen a person defecating outside/ on the field	1. Yes 2. No		
Q218.	During journey on the road, when you want to defecate what action do you take?	1. I will use public latrine beside the road 2. Defecate on the field 3. Use latrines of house hold found on the road side. 99. Other action ------		

Q219.	Is there a reward or punishment system regarding latrine utilization in your community?	1. Yes ***2.*** No		
Q220.	Have you ever this house hold was graduated as model House hold	1. Yes 2. No		
Q221.	Have you ever participated in community led total sanitation and hygiene program?	1. Yes 2. No		
Q222.	This house hold is found from health facility including health post at___?	1. Far (>30 minute walking time) 2. Near (<30 minute walking time		
Q223.	you seen / heard any promotion on latrine utilization in the last six months?	1. Yes ***2.*** No →	**Skip to 225**	
Q224.	If Q223 is yes, through which source or media have you heard? Workshop /training? ***(DO NOT read options, circle all that apply).***	1. Radio 2. Television 3. Newspaper 4. Health worker 5. Health extension workers 6. Health development army member 7. Family member 8. Brochure ***99.*** Others specify _____		
Q225.	Does health extension worker house hold visit have contribution to latrine utilization	1. Yes 2. No		
Q226.	Do you belief that reward or punishment system in the community regarding latrine utilization helps at all house level for latrine utilization?	1. Yes ***2.*** No		
Q301.	What type of latrine available for your house hold? ***(observe the storage, tick only one)***	1. Flush/pour flush to septic tank/ sewer line 2. Ventilated improved pit latrine 3. Traditional pit latrine with cemented slab or stone slab 4. Traditional pit latrine with wood log and earth cover 5. Composting 6. Bucket latrine ***99. Others (specify)____***		

Q302.	Is the latrine accessible to all?	1. Yes 2. No		
Q303.	Does the latrine have wall for privacy?	1. Yes 2. 2. No		
Q304.	Does the latrine have roof?	1. Yes 2. No		
Q305.	Does the latrine have slab?	1. Yes 2. No		
Q306.	Does the latrine have only one squat hole?	1. Yes 2. No		
Q307.	Does the latrine squat hole have cover?	1. Yes 2. No		
Q308.	Is the toilet slab washable?	1. Yes 2. No		
Q309.	Is the toilet slab easily cleanable?	1. Yes 2. No		
Q310.	Is the available latrine being hygienic?	1. Yes 2. No		
Q311.	Does latrine have hand washing facility (within 3 meters)?	1. Yes 2. No		
Q312.	Is hand washing facility is have water within it?	1. Yes 2. No		
Q313.	Near the hand washing facility, is there soap/substitute now?	1. Yes 2. No		
Q314.	during this visit, does the hand washing facility give service	1. Yes 2. No		
Q315.	Is there a vent pipe for the latrine?	1. Yes 2. No		
Q316.	**Fresh foot path** leading to the latrine?	1. Yes 2. No		
Q317.	**Splash of urine or water** on the latrine slab/floor?	1. Yes 2. No		
Q318.	Are there **fecesaround the household**/latrine?	1. Yes 2. No		

Q319.	Are there fly (even a single fly) in the latrine?	1. Yes 2. No		
Q320.	Around the latrine or in the compound of the house hold, do you observe a human feces?	1. Yes 2. No		

Annex II. Bargaafii afaan Oromoo

YUUNIVARSTII FINFINNEETTI

KOLLEEJJII SAAYINSII FAAYYAATI

KUTAA BARUMSAA FAYYAA HAWAASAA

Qo'annoo adeemsifamu ilaalichisee fuula hirmaatonnii odeeffanoon irra itti kennamuu fi feedhiin isaanii itti gaafatamuu..

Seensaa: Akkaam jirtu ani maqaan koo_____jedham, sababnin asitti argameef odeeffaannoowwaan barbaachisoo qo'annoo degirii lammaaffaa univeristii finfinneetti barachaa jiru xumuruu guutachuuf. Qo'annicha ilaalchisee yaada hubannoo gabaabaa akka argatuuf odeeffaan siifan keennaa, irrraatti hirmaachuus ta'ee hirmaachuu baachuu mirga qabda.

Mata duree qu'annichaa:- Sadarkaa ittifayyadama mana fincaanii fi dhimmoota danqaa ta'anii fi haala haala mijaata jiru gandoota ODF fi ODF hin tane keessaa jiruu addaa baasuuf.

Fayidaan isaa mali;- namoon gaafii fi deebii qo'annoo kanaa irraatti hirmaatan kallaatiin wanti fayyaadam hin jiru. Garuu odeeffaannoo hirmaatota irraa argamu sadarkaa ittifayyaadama mana fincaanii jiruu dhimmoota rakkoo ta'an adda baasuuf kan gargaarudha. Odeeffaannoon isiii fi namoota biro hirmaatan irraa argamu dhimmaa kana waliin walqabatee haalaa ganda fi aanaa keessaan keessaa jiruu ibsuuf gargaara. Kanaafuu qaamonni biro foyyaa'insaa iittiffaayadama mana fincaanii irraatti hojjetan itti fayyaadamuu danda'u.

Midhaan nama hirmaatu irraa gahuu ilaalchisee;- Qu'annichi namoota yaada kennuu irraatti hirmaatan waan miidhu hin qabu. Sa'aa muraasa qofa waan fudhatuuf sa'atii muraasaa jalaa qisaasuu danda'a.

Mirga hirmaatotaa ilaalchisee;- gaafii deebii kana irraatti akka hirmaattu kan ta'uu fedhii keetin. Gaafilee isiniif dhihaatan keessaa deebii itti kennuu kan hin barbaadne irra darbuu ni dandeessu yookin yeroo barbaade addaan kuttee deemuu ni dandeeessaa.

Icciti eeguu ilaalchisee:- Unki gaaffii fi deebiin irraatti taasifame kun nama qu'annoo adeemsisuu fi isa hordofuuf malee qaama kamiifuu dabarfamee hin keennaamu. Deebiin ati naaf kennitu kamiyyuu maqaa keessaan waliin tokkoyyuu walitti dhufeenyaa hin qabu, kanaafuu iccitiin isaa akka sirritti egaamu abdii guddaa qabaadhaa.

Qo'annoo adeemsfamu ilaalchisee gaafii ifa hin tanee osoo qo'anniichi hin adeemsifamin, osoo adeemsifamaa jiruu fi erga adeemsifamee booda yoo qabataan, mirga gafaachuu guutuu qabdu . kanaafuu Univarsitii Finfinnee, biiroo Dame barumsaa/ mana barumsaa fayyaa hawaasaa;- kutaa haala mijeessituu Bilbila 0115157701

Qo'annno nama Adeemsisaa jiru;- Daamxoo Araddoo 0912057887 (muba'elii)

Gorsaa ; Dr. Abarraa Kumee Mobalii 0911882912, mana barumsaa fayyaa Hawaasaa , Finfiunnee

Ani_____qo'annoo adeemsifamu kana irraatti hirmachuuf feedhinii qabu ibseen jira. Odeeffaannon qo'annoo adeemsifamu ilaalchisee ani barbaadu afaan ani danda'uun naaf

kennaamee jira, osoo gaafii fi deebiin taasifamaa jiruu osoo adabbiin takkoo narraa gahinii fi faayidaan argachuu qabu hin dhabin addaan kuutee deemuu mirga akkan qabu hubadhee jira.

1. Yoo sirri ta'e gara fuula itti aanutti itti fufi. 2. Miti yoo ta'e, nama itti aanee gaafatamutti cehi.
   - Maqaa nama raga walitti qabuu_____Mallaatoo_____
   - Maqaa nama hordoffii taasisuu_____Mallaattoo_____
   - Guyyaa gaafi fi deebiin itti taasifame _____

LakkoofsaAddaa Waraqaa Gaafii fi deebii_____ guyyaa gaafi fi deebii_____

Q101. Maqaa gandichaa_____

Q102. Odeeffaan ODF ilaalchisee 1. ODF 2. Miti ODF

Q103. Maqaa Garee_____

Q104. Halaa qIllensaa gandichi keessaatti argamuu 1 Baddaa 2. Badda Daree 3. Gammoojjii

Q105. Lakkoofsa Addaa Hirmaataa_____

Q106. Saala 1. Dhiiraa 2. Dhalaaa

Q107. Umrii waggaan _____

Kutaa 1ffaa. Haala hawwaasummaa fi rawaanni mala jireenyaa ilaalchisee

Q108. Ittigafatamaan/wamamaan abbaa waarraa eenyu? 1. Abbaa warraa 2. Hadha Warraa 3 Kan birooti

Q 109. Haala uudhaf heerumaa ittigaafatamaa abbaa waarraa 1. Gonkumaa hin heerumne/fuune 2. Yeroo ammaa fudee/heerumeeti kan jiru. 3. Kan hike ykn addaan bahan 4. Kan jala du'e'duute

Q110. Sadarkaa barumsaa abbaa waarraa/yoo hin heerumne abban mana gaggeessu meeqa

1. Gonkumaa hin barannee 2. 1-8 keessaatti 3. 9-10 4 10-12 5. >12

Q111. Sadarkaa barumsaa haadha warraa

1. Gonkumaa hin barannee 2. 1-8 keessaatti 3. 9-10 4 10-12 5. >12

Q112. Akaakuu hojii haadha warraa 1. Q/Bulaa 2. Dhunfaaa. 3. Kan biroo

Q113. Akaakuu hojii abbaa warraa 1. Q/Bulaa 2. Dhunfaaa. 3. Kan biro

Q114. Waggaatti galii hanga meeqaa argatu? 1. Xiqqaa <3600 2. G/Galeessi 3600-7200

3. Guddaa 7200-10800 4 baay'ee gudaa >10800

Q115. Baay'inaa maatii waliigalatti _____

Q117. Daa'imtti umriin ishii waggaa 5 gadii ni jirtii ? 1. Eyyee 2. Miti

Q118. Daa'immaan umrii mana barumsaa (6-12) barumsa idilee hordofaa jirtu ni jirtii?

1. Ijoolleen umrii mana barumsaa keessaa jiran hin jiran, 2. Ni jiran, garuu barumsa idilee hordofaa hin jiran. 3. Ni jiran Muraasa qofatu mana barumsa idilee hordofaa jira.

Q119. Amantaan ati ittin waaqeffaattu maali? 1. Ortodosii 2. Protestaantii 3. Musiliim 4. Waaqeffannaa 5. Kaatolikii 6. Kan biro

Q120. Sabni kee malii ? 1. Oromoo 2. Amahaaraa 3. Guraagee 4. Sidaamaa 5. Tigree 6. Kan biro

Kutaa lama. Waa'ee qulqulliin ilaalchisee gaaffiiwwaan dhihaatan.

G201. Abbaan warraa/Maatiin kun mana fincaanii ni qabaa? 1.Eeyyee 2.Miti

G202. Deebiin gaafii 121ffaa Miti yoo ta'e Atii fi maatiin keessan eessatti bobbaatu? 1.Mana fincaanii ummataa 2. Mana fincaanii olla 3. Mana fincaanii fira 4. Dirreetti /Bosona/Dhagaa jala 5. Kan biro yoo jiraate haa ibsamu_____

G203. Deebiin gaafii 121ffaa miti yoo ta'e dhimmoni sababa ta'u danda'an maali fa'a?

1.I tti fayyadama mana fincaanii irratti hubannoo dhabu.

2. Hojetachuuf qarshii hin qabu.

3. Meeshaan/qodaan ittin ijaaran hin jiru.

G204. Deebiin G201 Mana fincaanii yeroo ammaa tajaajjila ni kenna?

1.Eeyyen 2. Miti

G205. Deebiin G201 eeyyen yoo ta'e,Mana fincaanii gosa akkamittu jira?

1. Flush/pour flush to septic tank/pit latrine/sewer line
2. Ventilated improved pit latrine
3. Traditional pit latrine with cemented slab
4. Traditional pit latrine with wood log and earth cover
5. Traditional pit latrine with stone slab
6. Pit latrine with wood log having one or multiple holes
7. Pit with NO slab of any type
8. Composting latrine
9. Bucket latrine
10. Bed pan (Popo)
11. Open space
12. Others (specify) _____

G206. Deebiin G201 eeyyen yoo ta'e , waggaa meqaaf itti fayyadamte?

1.<1 2.1-2 3.2-3 4.>3

G207. Deebiin G201 eeyyen yoo ta'e ,Miseensi maatii hundi itti fuffinsaan mana fincaanii ni fayyadamu?

1. Maatii hundi itti fuffinsaan ni fayyadamu.
2. Darbee darbee maatii hundi ni fayyadamu.
3. Maatii hundi itti fuffinsaan hin fayyadaman.

G208. Deebiin G204 eeyyen yoo ta'e, miseensa maatii keessa kan yeroo hundaa fayyadamu eenyu?

1. Dhiira ga'eessa
2. Dubartii ga'eetti
3. Waggaa shanii gadi
4. Namoota naannoo san jiran hunda
5. Miseensa maatii hunda
6. Qaama midhamtoota
7. Mangodoota

G209. Mana fincaanii tajaajjila kan hin kennine yoo ta'e maaliif?

1. Suphuuf qabeenya hin qabu
2. Namooni biraa itti waan fayyadamaniif,maaltuu na dhibe.
3. Meeshaan ittin suphuu hin jiru
4. Bolloon mana fincaanii guutuudha
5. Islaabiin ammansiisaa miti.
6. Kan biraa yoo jiraate ibsaa….

G210. Hallii mannii fincaanii ijaarramee jiruu akkaami (ilaaluudhaan kan guutamu qabu, tokkoo qofatu guutamuu qab. 1. Mna fincaanii dhuunfaa /mana keessaatti

2. Mana fincaanii dhuunfaa/ mana jireenyaatiin alatti.
3. Mana fincaanii maatii biraa waliin walitti ijaaramee jiru
4. Mana fincaanii hawaasaa fayyadamu
5. Kan biro yoo jiraate haa baraa'u

G211. Miseensa maatii keessanni keessaa mana fincaanii haalan kan hin fayyadamne jira?

1. Eeyyen 2.Miti

G212. Deebiin G211 eeyyen yoo ta'e, sababni isaa maalinni?

1.Foolii qaba

2. Qaawwii mana fincaanii bal'aadha.

3. Mani fincaanii fayyadamuuf mijataa miti.

4. Islaabiin/irri lafa isaa mijataa miti

5.Kan biro yoo jiraate yaa bareeffamu

G213. Udaan daa'ima yeroo baay'ee akkamin maqsituu?

1.Poppo fayyadamuun mana fincaanitti gatama

2. Bishaan/lolaa yaa'uutti gatama

3.Ni awaalama

4.Gubuu

5. Dirree irraati gatama

G214. Ji'ootan darban jahan keessatti namni dirree irratti bobba'u argitee hi beektuunii beektuu?

1.Eeyyen 2. Miti

G215. Karoora fi gamaagama raawwii hojii eegumsa fayyaa naannoo irraattii hirmaatanii beektuu?

1. Eeyyee 2. Miti

G 216. Hojii eegumsa fayyaa naannoo ilaalchsee sirni baadhaasaa ykn Addabii akka ganda keessaanitti ni Jira?

1. EEyyee 2. Miti.

G217. Mannii fincaani ni jira yoo iddoo harka dhiqannaa dhiheenyatti ni qaba?

1. EEyyee 2. Miti.

G218. Gaaffiin lakk. 217 eeyyee yoo ta'e, meeshaan harka dhiqannaa qophaahe bishaan qaba?

1. Eeyyee 2. Miti.

G219. Saamunaa ykn Daaraan iddoo harka dhiqannaa qophaa'e bira ni jiraa?

1. EEyyee 2. Miti.

G220. Meeshani harka dhiqannaa qophaahee tajaajila kennaa jiraa/ tajaajila kennaa jiraachuu isaa mallatoolee ittin mirkaneeffatan ilaalluyun haa mirkanahuu?

1. EEyyee 2. Miti.

Declaration

I, the under signed, declared that this is my original work, has never been presented in this or any other University, and all the resources and material used for the thesis, have been fully acknowledged.

Name of the student: Damtew Arado

Signature _____

Date, **June 18, 2017**

Place_____

Date of submission _____

Approval of the primary Advisor

This thesis has been submitted for examination with my approval as university **Supervisor**.

Name of the primary advisor: Abera Kumie

Signature _____

Date._____