

JIMMA UNIVERSITY
COLLEGE OF PUBLIC HEALTH AND MEDICAL SCIENCE
DEPARTMENT OF ENVIRONMENTAL HEALTH SCIENCE AND TECHNOLOGY



IMPLEMENTATION OF COMMUNITY-LED TOTAL SANITATION AND HYGIENE
APPROACH ON THE PREVENTION OF DIARRHEAL DISEASES IN KERSA DISTRICT,
JIMMA ZONE

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**Implementation of Community-led Total Sanitation and Hygiene Approach
on the Prevention of Diarrheal Diseases in Kersa District, Jimma zone**

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Jimma, Ethiopia**

Declaration

Hereby declare that this submission is my own work towards the MSc. and that, to the best of my knowledge, it contains neither material previously published by another person nor material which has been accepted for the award of any other degree of the University, except where due acknowledgement has been made in the text.

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Abstract

Background: Diarrheal diseases are considered as major causes of morbidity and mortality in Ethiopia. Lack of access to safe water and inadequate sanitation, unsafe hygiene practices and poor hand washing with soap, can cause diarrheal diseases. It is believed that implementation of Community-led Total Sanitation and Hygiene (CLTSH) has significantly reduced the risk of diarrheal diseases and currently it is a nationwide strategy to promote sanitation and hygiene.

Objective: To assess the CLTSH implementation approach on the prevention of diarrheal disease in Kersa District of Jimma Zone, Southwest Ethiopia.

Methods: A cross-sectional study was conducted in Kersa District of Jimma Zone, Southwest Ethiopia from December 2012 to January 2013. The study subjects were randomly selected 423 households from CLTSH implemented and 423 households where CLTSH none implemented kebeles. Two health centers and one District Health Office were included to compile secondary data on the prevalence of diarrheal diseases. Primary data were collected through interview and observation and secondary was collected from log books and reports. Then the data were analyzed using SPSS version 16.0 software package.

Result and discussion: From the total 72.81% households in CLTSH implemented and 54.10% in the CLTSH non-implemented kebeles used protected water as the main source of supply. The study revealed that the average water consumption of the CLTSH approach implemented kebeles (8.05 L/C/ day) was greater than the non-implemented (7.27 L/C/ day). This study showed that the extent of latrine coverage in CLTSH implemented (91.49%) was greater than that of CLTSH non-implemented kebeles (87.90%) and about 98.71% households in CLTSH implemented & 85.75% in non-implemented kebeles use latrine always. But the occurrence of diarrhea was statistically associated with the extent of latrine utilization in the bivariate analysis in the CLTSH non-implemented kebeles [OR: 9.64, 95%CI: (5.11-18.19)]. The study showed that hand-washing facility near the latrine in CLTSH implemented (73.06%) was greater than that of CLTSH non-implemented kebeles (72.58%). The study also indicated that from those households with latrine the habit of hand-washing after defecation in CLTSH implemented and none implemented kebeles were 99.48% and 95.97% respectively. In the study, the prevalence of diarrhea in the CLTSH non-implemented kebeles (22.22%) is high when compared with the figure in the CLTSH implemented (18.91%). This might be due to mass sensitization and awareness creation during trigger.

Conclusion: The implementation of CLTSH approach improves the sanitation and hygiene of the community with a reduction of diarrheal disease prevalence by 0.84 odd ratios as well as with high influence to its nearby neighbors.

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Table of content

Content	page
Abstract.....	ii
Acknowledgement.....	iii
Table of content.....	iv
List of Tables.....	v
List of Figures.....	vi
Abbreviations and acronyms.....	vii
1. Introduction.....	1
1.1. Background of the study.....	1
1.2. Statement of the problem.....	2
1.3. Significance of the study.....	3
2. Literature Review.....	4
2.1. Magnitude of diarrheal diseases.....	4
2.2. Water, Sanitation and hygiene.....	4
2.3. Determinants of diarrheal diseases.....	5
3. Objective and Hypothesis.....	8
3.1. Objective.....	8
3.2. Hypothesis.....	8
4. Methods and Materials.....	9
4.1. Study Area.....	9
4.2. Study Design and Period.....	9
4.3. Source Population.....	10
4.4. Sample population.....	10
4.5. Eligibility criteria.....	10
4.6. Sample size estimation.....	10
4.7. Study variables.....	11
4.8. Sampling procedure.....	11
4.9. Data collection.....	12
4.10. Data quality assurance.....	13
4.11. Data Processing and Data Analysis.....	13
4.12. Ethical Consideration.....	13
4.13. Operational definitions.....	14
4.14. Dissemination of findings.....	14
5. Result.....	15
6. Discussion.....	30
7. Conclusion.....	33
8. Recommendations.....	33
References.....	34
Annexes.....	37

List of Tables

Contents	Page
Table 1: Socioeconomic characteristics of the study households of the study site, Kersa District, January 2013	15
Table 2: Environmental conditions of the study households of the study site, Kersa District, January, 2013	17
Table 3: Behavioral conditions of the study households of the study site, Kersa District, January 2013	19
Table 4: Health characteristics of the households of the study site, Kersa District, January 2013	21
Table 5: Numbers of patients who come to health posts and health centers of the study area, Kersa District, Jimma Zone, January 2013	22
Table 6: Selected socio-economic factors in relation to diarrheal morbidity of the households of the study site, Kersa District, January 2013	24
Table 7: Selected environmental factors in relation to diarrheal morbidity of the households of the study site, Kersa District, January 2013	25
Table 8: Selected behavioral factors in relation to diarrheal morbidity of the households of the study site, Kersa District, January 2013.....	27
Table 9: Odd ratio of the compared kebeles of the study site, Kersa District, January 2013	28
Table 10: Multivariate regression of the relative effect of variables on the occurrence of diarrhea morbidity, Kersa District, January 2013.....	29

List of Figures

Contents	Page
Figure 1: Conceptual framework of determinants of diarrheal disease	7
Figure 2: Map of the study site.....	9
Figure 3: Schematic presentation of sampling procedure for the selection of study units, Kersa District, Jimma Zone, January 2013	12
Figure 4: Solid waste disposal methods of households of the study area, Kersa District, January 2013.....	18
Figure 5: Reasons for latrine construction of the study area, Kersa District, January 2013.....	20
Figure 6: Adult trends of diarrhea prevalence of the study area, Kersa District, January 2013	23
Figure 7: Under five trends of diarrhea prevalence of the study area, Kersa District, January 2013	23

Abbreviations and acronyms

CLTSH = community-led total sanitation and hygiene

EDHS= Ethiopian Demographic and health survey

JMP = the WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation

NGO = nongovernmental organization

ODF = open defecation free

OD = open defecation

POU = point of use

RiPPLE' = Research-inspired Policy and Practice Learning in Ethiopia and the Nile Region

SNV= Netherlands Development Organization

WASH = water, sanitation and hygiene

WHO = World Health Organization

1. Introduction

1.1. Background of the study

Inadequate and unsafe water, poor sanitation, and unsafe hygiene practices are the main causes of diarrhea. Diarrheal diseases constitute a major burden of disease in the world, especially in low- and middle-income countries (Jill *et al*, 2010). In 2004, the disease was the third leading cause of death in low-income countries, causing 6.9% of deaths overall. In children under five years old, diarrheal disease is the second leading cause of death – second only to pneumonia. Out of the 1.5 million children killed by diarrheal disease in 2004, 80% were under two years old (WHO, 2004).

Diarrhea can last several days, and can leave the body without water and salts that are necessary for survival. Most people who die from diarrhea actually die from severe dehydration and fluid loss. Children who are malnourished or have impaired immunity are most at risk of life-threatening diarrhea (WHO Factsheets, 2012). Dehydration resulting from diarrhea causes approximately 1.8 million deaths every year (Kume & Ali, 2005).

In African countries including Ethiopia, each child on average suffers from five episodes of diarrhea per year while the two-week prevalence ranges from 10 to 40% in different parts of Ethiopia. Diarrheal diseases have persistently been the first or the second causes of visits to health units in the country (Belachew *et al.*, 2001)

Many of the risk factors for contracting diarrheal illnesses are associated with poor socioeconomic conditions, such as lacking access to safe water and sanitation, poor hygiene practices and unsafe human waste disposal. Low socioeconomic status can limit access to health care and education, and can affect diet, housing conditions and other factors that increase likelihood of exposure to infectious organisms or reduce resistance to infectious diseases. Children in households with lower socioeconomic status receive oral rehydration therapy (fluids taken by mouth to prevent or treat dehydration) less often than children in households with higher socioeconomic status (Forsberg *et al.*, 2009).

1.2. Statement of the problem

Diarrhea is the passage of loose or liquid stools more frequently than is normal for the individual. It is caused by ingestion of pathogens found in the feces of human beings and certain animals and birds. When excreta are disposed of improperly, agricultural fields, water, food, people's hands and household objects can be contaminated (EHP, 2004)

Diarrhea kills about 1.8 million people each year, with about 90% of them being children under five years of age. The disease is responsible for over a quarter of the deaths of children in the world. Most of these deaths occur in developing countries where an estimated 25% of under-five mortality is directly attributed to diarrhea disease (Cesar *et al.*, 2000).

Lack of access to clean water, and poor hygiene practices such as open defecation and lack of hand-washing afterwards, are leading causes of diarrhea (Kenya Breaking Toilet Taboos, 2012).

According to 2013 the WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation report, the drinking-water coverage remains at 89% and about 64% of the world population relied on improved sanitation facilities, while 15% still practice open defecation in 2011 (JMP, 2013). Report of Ethiopia Demographic and Health Survey of 2011 also showed that about 46 % of households in the Ethiopia have access to non-improved source of drinking water and 82% of households use non-improved toilet facilities; of these, 38 % of households have no toilet facility (CSA & ORC Marco, 2011).

The Government of Ethiopia and partners like UNICEF, Plan International Ethiopia, WSP-AF, and USAID's Hygiene Improvement Project (HIP) are applying tireless efforts to reverse the situation of health risks associated with the current state of hygiene and sanitation in the country. One of the effective and efficient approaches to upscale sanitation and hygiene is Community-Led Total Sanitation (CLTS); now called community-led total sanitation and hygiene (CLTSH). It was introduced in Ethiopia after a hands-on workshop organized by Vita, an Irish international development agency working in the Horn of Africa, and facilitated by Dr. Kamal Kar, in October 2006. The heart of the approach is about "triggering" or "igniting" communities to change their hygiene and sanitation habits, by constructing and using latrines instead of defecating in the open (Lyla & Petra, 2009).

Even though the implementation started in different parts of Ethiopia; the assessment of CLTSH approach on the control of diarrheal disease was not assessed, particularly in the study area. So, this study is designed to fill the gap and tried to assess the important of CLTSH approach implementation on the prevention of diarrheal disease.

1.3. Significance of the study

Community-led total sanitation and hygiene approach started in different parts of Ethiopia in 2006 by the Ministry of Health and its stake holders (NGOs) in order to eliminate the practice of open defecation in rural and peri-urban areas (Lyla& Petra, 2009). However, the Assessment of Community-led Total Sanitation and Hygiene approach on the prevention of diarrheal disease was not assessed in ways that help to improve the health of the community.

This study will, therefore, help to show impacts of CLTSH implementation on the prevention of diarrheal disease. The result may also uses for fund raising and gives insight for the policy makers and concerned bodies to take appropriate measures based on findings as well as it may uses as baseline data for other researchers.

2. Literature Review

2.1. Magnitude of diarrheal diseases

Diarrhea remains a leading cause of child mortality and morbidity worldwide, with 90 % of all deaths caused by diarrheal diseases occurring among children under age five (Fewtrell *et al.*, 2005). Studies conducted in different parts of Ethiopia at different times indicate the following two-week prevalence of diarrhea: Manna district of Jimma zone 33.7% (Kaba. & Ayele, 2000), in Jimma town 39.3% (Biruk, 2002) , Gondar 59.3% (Yohannes *et al.*, 1993) and keffa-sheka zone 15% (Olango, 1989). Another study conducted at Gilgel Gibe Field Research Center showed that the prevalence of diarrheal diseases was 30 % (SNV, 2010).

1.2. Water, Sanitation and hygiene

In 2000, 2.4 billion people lacked access to improved sanitation. 81% of these were in rural areas (WHO, 2004). As WHO and UNICEF JMP progress report of 2012, over 2 billion people gained access to improved water sources and 1.8 billion people gained access to improved sanitation facilities between 1990 and 2010 (JMP, 2012).

Report of 2011 EDHS showed that about 54 % of households in the country have access to an improved source of drinking water and only 8% households used improved toilet facilities that are not shared with other households (CSA & ORC Marco, 2011).

In communities where the usage of latrine is low the prevalence of water borne diseases especially diarrhea, is found to be very high (Wang, 2008). Study conducted in Ethiopia showed that 60% of the population use pit latrine, 81.1 % exercise indiscriminate waste disposal, 32.6% get piped water, 16.7% use protected spring/well and 25.8% use dual water source i.e. protected and unprotected source of water. The average use volume of water was 15.4 L/C/ day (Mekasha & Tesfahun, 2003).

Study done in Jimma Zone showed that only 10.2% of households dispose excreta on the open field and only 13.2% and 10.4% of the households their members do not practice hand washing with soap after using the latrine and before main meals, respectively (Disease Control Priorities Project, 2007)

1.3. Determinants of diarrheal diseases

Family income/wealth is an important determinant of diarrhea through which factors like parental education and occupation exert their major effect. A study revealed that the probability of having diarrhea was 33-38% lower for children from the medium- and high-socioeconomic groups than the children from the low-socioeconomic group (Woldemichael, 2001)

Most of the morbidity and mortality among children can be prevented through the use of straightforward hygiene improvement actions. A 30-50% reduction in the burden of diarrheal diseases can be achieved through improvements of water supply, sanitation, and hygiene (Manisha & Ashok, 2008). Studies done showed that improved sanitation reduces diarrhea morbidity by 36 % of which 30% or more reduction is accounted for proper disposal of human feces (Fewtrell *et al.*, 2005).

In Ethiopia over 60% of the communicable diseases are due to poor environmental health conditions arising from unsafe and inadequate water supply and poor hygienic and sanitation practices (Abebe, 1986).

WASH practices, such as hand washing, sanitation, and water treatment and safe storage have each been proven to reduce diarrhea rates by 30–40% (Clasen *et al.*, 2007). However, globally, the rates at which hands are washed with soap range from only 0-34% of the time (Global Public-Private Partnership, 2009). For instance, study including several sub-Saharan African countries (i.e. Kenya, Senegal, Tanzania, and Uganda) reported that 17% of participants washed their hands with soap after using the toilet (Curtis *et al.*, 2009).

When implemented correctly, sanitation can reduce diarrheal disease by 36 %. Sanitation together with increased hygiene can reduce incidences of diarrhea by 65 %. Since hand-washing requires a behavior change; it works best as part of a broader package of comprehensive intervention methods. Optimal hand-washing with soap can reduce diarrhea by 45 % (WHO Factsheets, 2012).

According to WHO (2004) reports, the three most effective interventions to reduce diarrhea morbidity in children under 5 are hand washing with soap (37%), improved sanitation (34%) and point of use (POU) water treatment (29%). A reason for the relatively low effectiveness of source water treatment interventions (21%) is the risk of microbiological contamination of drinking water during collection and storage in the home.

Study conducted in Ghana showed that children living in households with some kind of latrine facility are less likely to be sick than children in households that do not have latrine facilities. Lack of access to a latrine facility is associated with a high incidence of diarrhea (Boadi & Kuitunen, 2005). Study conducted at Gilgel Gibe Field Research Center also revealed that diarrhea prevalence was slightly higher among infants without a latrine facility (32%) compared to households with latrine facility (24%) (Deribew *et al.*, 2007). The greatest reductions in diarrhea are associated with flush toilets compared with pit latrines (Levine, OS. & Levine, MM., 1991).

Availability of improved water sources or latrine alone will not reduce diarrhea morbidity, without a change in behavior that affects hygiene practice (Faris & Kaba, 1999). Even though the source is protected, water may be contaminated during transport and/or storage. Water stored in an uncovered container may be contaminated easily by pets, dirt, or other debris (Asnake, 1991). Dirty utensils used to draw water from a storage container may also contaminate the water obtained from protected sources. A study revealed that the prevalence of diarrhea was significantly higher in children from households where water is obtained from storage container by dipping than in those where water is obtained by pouring (Mintz *et al.*, 1995). Similarly, study showed that obtaining water from storage containers by dipping was a risk factor for diarrhea, and suggested that hands and objects introduced in to stored water were sources of contamination (Teklemariam *et al.*, 2000).

The study from Hulet Ejju Enessie District, Amhara region, showed about 61% households with traditional pit latrines had latrine utilization and 38.9% households disposed their children's feces improperly by throwing out of houses somewhere either in the garden or in the bush (Anteneh & Kumie, 2010). Another study from Nekemte town, Western Ethiopia indicated that the presence of feces around the pit-hole and presence or absence of pit-hole cover and feces seen in the compound appeared to be significantly associated with diarrheal morbidity. Children from those households in which feces were observed around the pit-hole on the slab had about three times more likely to have diarrhea compared to those children from houses in which had not observed around the pit-hole (Girma *et al.*, 2008)

Community led total sanitation and hygiene (CLTSH)

CLTSH is a concept that revisits all the past approaches, particularly the promotion of household sanitation within the context of basic human dignity. It is participatory in nature and facilitates communities to take a decisive role in ensuring that each and every member

internalizes the implication of poor sanitation and hygiene (e.g. open defecation). The CLTSH methodology unites the community to commit to using sanitary latrines and hygienic behavior and the community understands that the process is a shift towards a zero subsidy approach rather than providing them with money to construct latrines.

Process of CLTSH

The following steps have been identified in the CLTSH process (Kar and Pasteur, 2005):

- 1. Pre-triggering:** Includes selecting a community and building rapport with community members and opinion leaders.
- 2. Triggering:** This entails building a sanitation profile of the community utilizing participatory approaches and the moment of ‘ignition’ when the community members internalize a need for behavior change. It is this moment of collective realization and emerging of natural leaders that due to open defecation all are ingesting each others’ feces and as the result their children are dying of diarrhea and related diseases.
- 3. Post-triggering:** This step involves action planning by the community, design and construction of latrines and follow up.
- 4. Scaling up and going beyond CLTSH for sanitation ladder:** CLTSH efforts can be scaled up through building a resource base of trainers, campaigns, advocating for policy changes, etc.

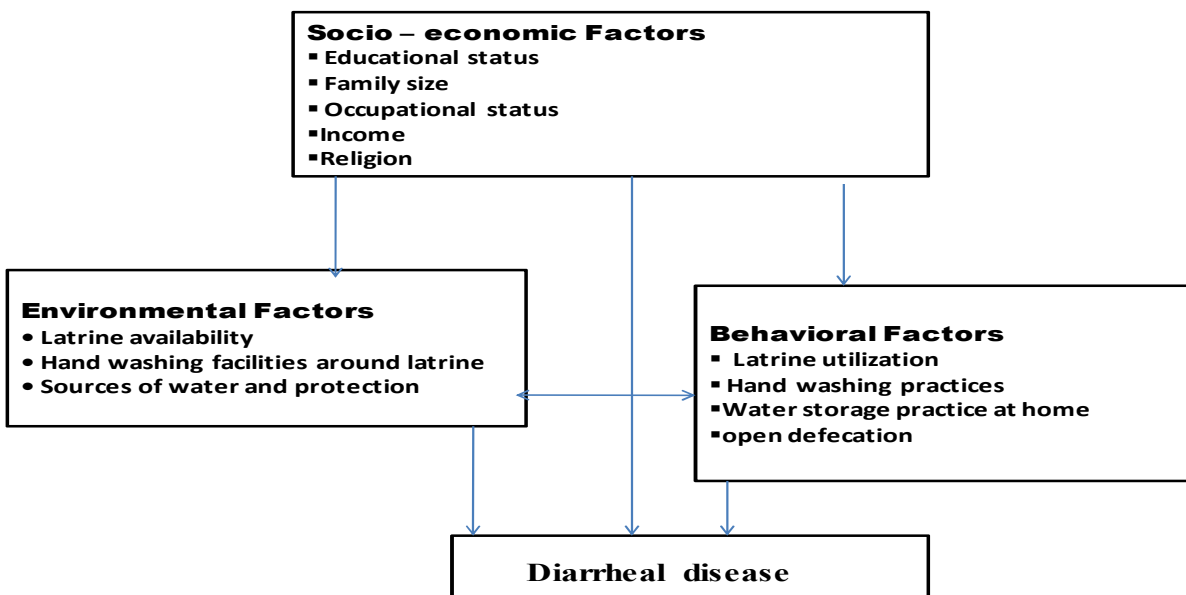


Figure 1: Conceptual framework of determinants of diarrheal disease

3. Objective and Hypothesis

3.1. Objective

3.1.1. General Objective

The general objective of this study was to assess the CLTSH implementation approach on the prevention of diarrheal disease in Kersa District, Jimma zone

3.1.2. Specific Objectives

- ❖ To evaluate effectiveness of CLTSH implementation approach on the prevention of diarrheal disease in CLTSH implemented kebeles.
- ❖ To compare the prevalence of diarrhea in CLTSH implemented versus non-implemented Kebeles in the district
- ❖ To investigate the knowledge and Practice of community towards hand washing after defecation in CLTSH implemented versus non-implemented kebeles in the district
- ❖ To determine the extent of latrine coverage and utilization in CLTSH implemented versus non-implemented Kebeles in the district.
- ❖ To assess average water consumption rate in CLTSH implemented versus non-implemented Kebeles in the district.

3.2. Hypothesis

The implementation of Community-led Total Sanitation and Hygiene approach (CLTSH) has significantly reduced the risk of diarrheal diseases in Kersa District, Jimma zone

4. Methods and Materials

4.1. Study Area

The study was conducted in Kersa District of Jimma Zone, Southwest Ethiopia. The District is one of the 17 districts that are found in Jimma Zone. It has a total population of 188266 and 39222 households and bounded by Limmu Kossa, Tiro Afeta, Omo Nadda, Manna and Dado to the North, East, West and South respectively.

The district has 31 Kebeles and Serbo, capital of the District, is situated 18 km away to the north east of Jimma town and 325 km away from Addis Ababa to the south of Ethiopia. It is found on 1600-2400m above sea level; 85% of the populations economically depend on the agriculture. The district has 4health center and 30 health posts, 6 private clinics. 3 private drug venders, 1 private drug store and all Kebeles have covered by health extension program (Kersa woreda, 2004). In July 2008, Plan Ethiopia Jimma Programme Unit planned to trigger and follow up implementation of CLTSH activities in Merewa and Tikur Balto kebele of Kersa District. All the households in those kebele constructed simple pit latrines of their own, some with slabs and covers, superstructures, and hand-washing facilities (Plan Ethiopia, 2008).

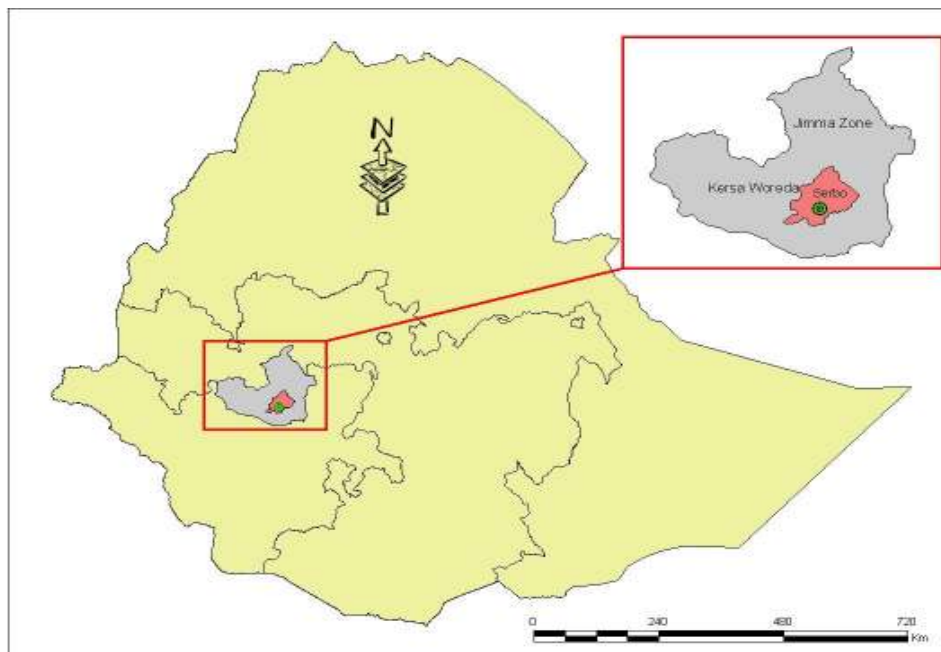


Figure 2: **Map of the study site.** (SOURCE: Ketema *et al.*, 2009)

4.2. Study Design and Period

A cross-sectional study design was conducted from December 2012-January 2013 in Kersa District, Jimma zone

4.3. Source Population

All households live in the rural community of Kersa District.

4.4. Sample population

Randomly selected households living in Bala Wanjo', 'Merawa', 'Tikur Balto', 'Gora Sariti', 'Gungu', and 'Shewa Totobi' kebeles of Kersa District were included in the study.

4.5. Eligibility criteria

The representative person of the family (household heads or spouses) and live for more than 6 months in the study area and greater than 18 years of age was included.

4.6. Sample size estimation

The sample size was calculated using two population proportion formula. By using proportion of households exposed to diarrheal disease 50% for two study groups (there is no similar study), 95% confidence level, 5% tolerable margin of error and possible non-response rate of 10%, the final sample size was **846**.

$$n = z \frac{\alpha^2 [p_1(1 - p_1) + p_2(1 - p_2)]}{d^2}$$
$$n = (1.96)^2 \frac{[0.5(1 - 0.5) + 0.5(1 - 0.5)]}{(0.05)^2}$$
$$n = 3.8416 \frac{[(0.25) + (0.25)]}{0.0025}$$
$$= 768$$
$$10\% \text{ for non-response} = 768 * 10\% + 768$$
$$= \underline{846 \text{ households}}$$

Where, n= sample size

Z $\alpha/2$ = standardized normal distribution value for the 95% confidence interval (1.96)

P1 & P2 = proportion of households exposed to diarrheal disease (50%)

d = the margin of error taken as 5%

4.7. Study variables

4.7.1. Dependent Variables

- ✓ Diarrheal disease prevalence

4.7.2. Independent Variables

- ✓ Socio-economic factor(age, sex, income, occupation, educational status & religion)
- ✓ Environmental factors (water source, water source protection, availability of latrine, latrine lid, hand washing near latrine & way of waste disposal)
- ✓ Behavioral factors (Water storage , time of hand washing , Way of drinking water drawing from storage, latrine utility, open defecation , hand washing after defecation)

4.8. Sampling procedure

Multi stage sampling procedure was employed, where first the kebeles divided in to CLTSH implemented & none-implemented kebeles then 3 kebeles were selected from each total kebeles by simple random sampling technique using lottery method. Accordingly, ‘Bala Wanjo’, ‘Merawa’, and ‘Tikur Balto’ for CLTSH implemented and ‘Gora Sariti’, ‘Gungu’, and ‘Shewa Totobi’ for CLTSH none-implemented kebeles were selected. Then, to draw a sampling frame the total numbers of households in the selected kebeles were obtained from local authority of that kebele. Accordingly, a total of 6526 households of which, 541, 1219, 1736, 1156, 1019 and 855 households were for B/Wanjo, Merawa, T/Balto, G/Sariti, Gungu and Sh/Totobi were obtained respectively. The study households were distributed proportionally to population size (number of households) in the kebeles. Systematic random sampling (every 8th and 7th households for CLTSH implemented and non- implemented) from the selected households in the kebeles was included for the study. The first household was selected by random from 1-8 or 1-7 households selected in the middle of the kebeles.

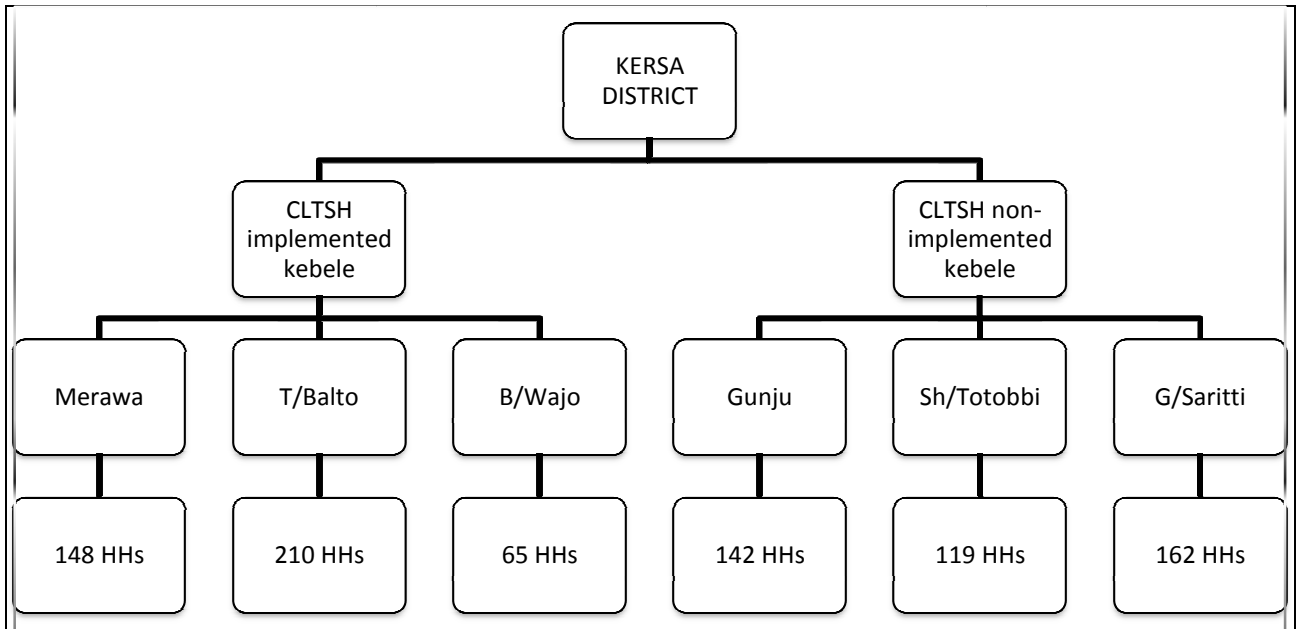


Figure 3: Schematic presentation of sampling procedure for the selection of study units, Kersa District, Jimma Zone, January 2013

4.9. Data collection

Data was collected using a structured questionnaire prepared by reviewing previously done studies and other materials related to the topic (see annex). Questionnaire was first prepared in English and then it was translated in to Afan Oromo and then back to English to check for consistency. Twelve data collectors who have completed high school and above were involved in the primary data collection. Two supervisors from Kersa Health Office were selected and trained for supervision.

Data collectors were trained for three days on questions included in the questionnaire, on interviewing techniques, purpose of the study, and importance of privacy, discipline and approach to the interviewees and confidentiality of the respondents.

4.10. Data quality assurance

Before conducting the main study, pretest was carried out on 18 households in CLTSH implemented and 18 households in CLTSH non-implemented kebeles, which was not included in the main study. Based on the result, data collectors were reoriented and the questionnaire was modified as necessary. From the very beginning, through training of data collectors and supervisors were undertaken. The principal investigator and supervisor made a day to day on site supervision during the whole period of data collection.

At the end of each day, the questionnaires were reviewed and checked for completeness, accuracy and consistency by the supervisor and investigator and corrective discussion was undertaken. Explanations were given during morning times on how to minimize errors and take corrective actions timely.

4.11. Data Processing and Data Analysis

The collected data were coded and entered into a computer by using SPSS version 16.00 and Microsoft excel 2007 and analyzed. Frequency distribution, percentages, and odds ratio with 95% confidence interval were calculated to ascertain the association between dependent and independent variables as appropriate and displayed using tables and figures

Bivariate analysis was also used to see the association between the explanatory and outcome variables. Logistic regression model was used to determine Odds ratio and 95% confidence interval for the different risk factors of diarrhea and describe the strength of association between the selected study variables by controlling for the effect of possible confounders and prediction of population parameters. The multivariate analysis model was run by selecting only variables with p-value less than 0.30 ($P < 0.30$) in the bivariate analysis and reported as the result of this study (Victoria *et al.*, 1997).

4.12. Ethical Consideration

Ethical approval was obtained from Jimma University College of Public Health and Medical Science, Department of Environmental Health Sciences & Technology; informed permission was also obtained from Kersa District & each study subject prior to the interview after the purpose of the study was explained to respondent. Interview was carried out only with full consent of the person being interviewed. Before each interview, clear explanation was given about the aim of the study. Each respondent was assured that the information provided by him/her would be confidential and used only for the purpose of research.

4.13. Operational definitions

Community-led Total Sanitation and Hygiene (CLTSH) Approach is an integrated newly introduced community based approach to achieving and sustaining open defecation free status.

Open Defecation Free is state in which all community members practice use of latrine at all times and a situation wherein no open defecation is practiced at all.

Diarrhea is defined as having three or more loose or watery stools in a twenty-four hours period, as reported by the caretaker of the patient.

Hygiene is a practice where a given community exercise safe human excreta disposal (ODF), hand washing with detergents (soap or substitute) and safe water management cycles.

Safe water is water which is free from disease-causing agents and does not have any significant risk to health over a lifetime of consumption.

Sanitation is the prevention of human contact with human waste for hygienic purposes.

Total sanitation is a situation wherein no open defecation is practiced and in which the cycle of fecal contamination has been broken.

Triggering is the process where in an outside facilitator mobilizes communities to take action to change their hygiene and sanitation behavior.

4.14. Dissemination of findings

The result of the study will be disseminated to Jimma University College of Public Health and Medical Science, Department of Environmental Health Sciences & Technology, Jimma Zonal Health Office, Kersa District and NGOs working on this area (Plan Ethiopia). Further attempt will be made to publish it on national and international public health journal

5. Result

5.1. Social Demographic Characteristics

A total of eight hundred forty six households were included in this study. Out of these households, four hundred twenty three (50%) from CLTSH implemented kebeles while the remaining were from CLTSH none implemented kebeles. There was no non-response found during the data collection. One hundred eighty four (43.50%) and one hundred thirty four (31.68%) of the respondents were wives in CLTSH implemented and non-implemented kebeles respectively (Table 1).

Table 1: Socioeconomic characteristics of the study households of the study site, Kersa District, January 2013

<i>Variable</i>	Community-led	Total	Sanitation and	Hygiene
	approach		and	approach
	<i>Implemented</i>		<i>Non-Implemented</i>	<i>kebeles</i>
	<i>kebeles</i>	<i>No (%)</i>	<i>No (%)</i>	
<i>Status of the respondent</i>	<i>Husband</i>	143(33.81)		185(43.74)
	<i>Wife</i>	184(43.50)		134(31.68)
	<i>Others</i>	96(22.70)		104(24.59)
<i>Age of respondent</i>	<i>18-25</i>	154 (36.41)		168(39.72)
	<i>25-40</i>	235(55.56)		186(43.97)
	<i>>40</i>	34(8.04)		69(16.31)
<i>Religion</i>	<i>Orthodox</i>	2(0.47)		93(21.99)
	<i>Protestant</i>	0		8(1.89)
	<i>Muslim</i>	421(99.53)		322(76.12)
<i>Ethnicity</i>	<i>Oromo</i>	421(99.53)		415(98.11)
	<i>Amhara</i>	0		4(0.95)
	<i>Kefa</i>	0		4(0.95)
	<i>Others</i>	2(0.47)		0
<i>Family size</i>	<i>1-3</i>	94(22.22)		97(22.93)
	<i>4-6</i>	231(54.61)		177(41.84)
	<i>>7</i>	98(23.17)		149(35.22)
<i>No of children aged under 5</i>	<i>1</i>	171(40.43)		202(47.75)
	<i>2 and above</i>	166(39.24)		86(20.33)
	<i>None</i>	86(20.33)		135(31.91)
<i>Education status of the respondent</i>	<i>Illiterate</i>	261(61.70)		244(57.68)
	<i>Literate</i>	162(38.30)		179(42.32)
<i>Occupation of the Household</i>	<i>Governmental employee</i>	10(2.36)		15(3.55)
	<i>Merchant</i>	38(8.98)		66(15.60)
	<i>Farmer</i>	373(88.18)		340(80.38)
	<i>Daily laborer</i>	2(0.47)		2(0.47)
<i>Monthly income</i>	<i><350</i>	10(2.36)		193 (45.63)
	<i>350-550</i>	38(8.98)		82(19.39)
	<i>551-750</i>	373(88.18)		21(4.96)
	<i>>750</i>	2(0.47)		127(30.02)

5.2. Environmental Characteristics

One hundred ninety three (45.63%) households in CLTSH implemented kebeles & three hundred seventy three (88.20%) households in CLTSH non-implemented kebeles used spring as the main source of drinking water. Three hundred eight (72.81%) & two hundred twenty nine (54.10%) of households in CLTSH implemented and non-implemented kebeles used protected source as the main source of water respectively. Regardless of the distance of water source, three hundred thirtyone (78.25%) households in CLTSH implemented kebeles and three hundred forty eight (82.30%) households in CLTSH none implemented kebeles got water in a less than one kilometer walking distance from their home.

Three hundred eighty seven (91.49%) households in CLTSH implemented kebeles and three hundred seventy two (87.90%) households in CLTSH none implemented kebeles had latrine facility. All (100%) types of available latrines were traditional pit latrines. One hundred four (23.87%) of latrine in CLTSH approach implemented kebeles and two hundred ten (56.42%) of latrine in CLTSH approach none implemented kebeles didn't have cover for latrine drop-hole. About two hundred thirty four (60.47%) of latrines in CLTSH implemented kebeles and one hundred ninety two (51.45%) of latrines in CLTSH none implemented kebeles were less than six meter far away from kitchen. One hundred four (26.94%) households CLTSH implemented kebeles & one hundred two (27.42%) households in CLTSH none implemented kebeles with latrine had no any kind of hand washing facilities (Table 2).

Table 2: Environmental conditions of the study households of the study site, Kersa District, January, 2013

<i>Variables</i>		Community-led Total Sanitation and Hygiene approach	
		Implemented kebeles	Non-implemented kebeles
		No (%)	No (%)
Water source	Spring	193(45.63)	373(88.2)
	Well	230(54.37)	50(11.80)
Water source protection	Protected	308(72.81)	229(54.10)
	Unprotected	115(27.19)	194(45.90)
Time taken in minute	<15	277(65.48)	238(56.30)
	15-30	126(29.79)	157(37.10)
	30 and above	20(4.73)	28(6.60)
living with cattle	No	407(96.22)	270(63.83)
	Yes	16(3.78)	153(36.17)
Latrine availability	Available	387(91.49)	372(87.90)
	Not available	36(8.51)	51(12.10)
Latrine seat hole cover	Available	283(73.13)	162(43.55)
	Not available	104(26.87)	210(56.45)
Distance of latrine from kitchen in meter	<6	234(60.47)	192(51.61)
	>6	153(39.53)	180(48.39)
Hand washing facility near latrine	Present	282(73.06)	270(72.58)
	Not present	104(26.94)	102(27.42)
Reason for absence of hand washing near latrine	Don't use	6(5.88)	8(7.84)
	lack of water	26(25.49)	26(25.49)
	Don't know it's important	70(68.63)	68(66.67)

Two hundred sixty one (61.70%) of the households in CLTSH implemented kebeles and two hundred twenty two (52.50%) of the households in CLTSH non-implemented kebeles explained that they disposed wastes in pit (see figure 3).

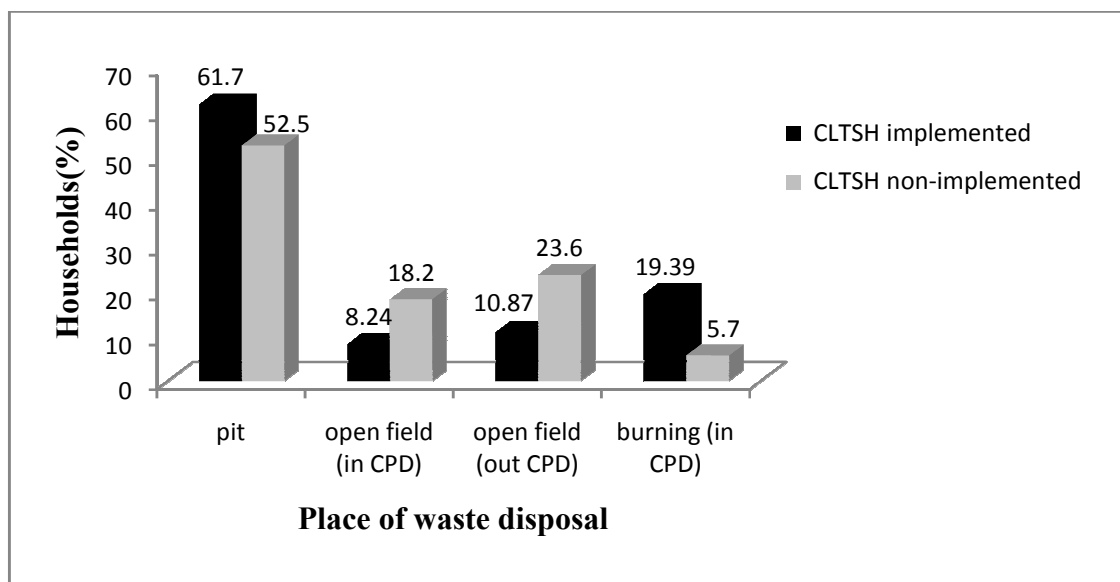


Figure 4: Solid waste disposal methods of households of the study area, Kersa District, January 2013.

5.3. Behavioral Factors

Two hundred forty three (57.45%) respondents of CLTSH implemented kebeles and two hundred sixteen (51.10%) respondents of CLTSH non-implemented kebeles treated their drinking water if the source is other than protected source by boiling, filtering and adding water guard. Three hundred seventy nine (89.60%) of households of CLTSH implemented kebeles and three hundred twenty two (76.10%) of respondents of CLTSH non-implemented kebeles stored their water in jerry can. Four hundred eleven (97.60%) of the CLTSH implemented and four hundred seventeen (98.60%) respondents CLTSH non-implemented kebeles use cover material during survey at home. Forty four (10.40%) of the CLTSH implemented and one hundred one (21.90%) of CLTSH none-implemented kebeles households practiced dipping method to draw water from the container. Three hundred twenty seven (77.30%) in CLTSH implemented kebeles and two hundred ninety four (69.50%) of CLTSH none implemented kebeles households got less than 10L/C/ day average water consumption. The average water consumption of the approach implemented and none implemented kebeles were 8.05 L/C/ day & 7.27 L/C/ day respectively.

Out of the total respondents who indicated the availability of latrine; three hundred eighty five (99.48%) households of the CLTSH implemented kebeles and three hundred fifty seven (95.97%)

households of the CLTSH non-implemented kebeles were washing their hands after defecation. From these, two hundred sixteen (51.06%) of households in the CLTSH implemented kebeles and sixty one (17.04%) of households in the CLTSH non-implemented kebeles expressed to use soap/ash and water to wash their hands. Four hundred thirteen (97.64%) households in the CLTSH implemented kebeles and three hundred sixty nine (87.20%) households in the CLTSH non-implemented kebeles were wash their hands at all critical time (after defecation, after cleaning a baby's bottom, before preparing food/cooking and before eating respectively). There were observable feces in the compound of one hundred twenty (28.37%) household of CLTSH implemented kebeles and eight six (20.30%) households of CLTSH none implemented kebeles.

Table 3: Behavioral conditions of the study households of the study site, Kersa District, January 2013

<i>Variables</i>		Community-led Total Sanitation and Hygiene approach	
		<i>Implemented kebeles</i> No (%)	<i>Non-implemented kebeles</i> No (%)
<i>Water treatment</i>	Yes	243(57.45)	216(51.1)
	No	180(42.55)	207(48.9)
<i>method of treatment</i>	Boiling	181(74.49)	32(14.55)
	Filtering	24(9.88)	162(73.64)
	Others	38(15.64)	26(11.82)
<i>Material used for water storage</i>	jerry can	379(89.60)	322(76.1)
	Pot	32(7.57)	79(18.7)
	Pail	12(2.84)	22(5.2)
<i>washing storage equipment before collection</i>	Yes	407(96.22)	421(99.5)
	No	16(3.78)	2(0.5)
<i>Method of drawing water from storage</i>	Pouring	379(89.60)	322(76.1)
	Dipping	44(10.40)	101(23.9)
<i>Presence of water storage covers during survey</i>	Yes	411(97.16)	417(98.6)
	No	12(2.84)	6(1.4)
Average water consumption in L/per/day	<10	327(77.30)	294(69.5)
	10– 20	96(22.70)	129(30.5)
Who construct latrine?	by self	381(98.45)	366(98.39)
	kebele leaders	4(1.03)	2(0.54)
	primary health workers	2(0.52)	2(0.54)
	Others	0	2(0.54)
<i>Latrine utility</i>	Rarely	0	31(8.33)
	Mostly	5(1.29)	22(5.91)
	Always	382(98.71)	319(85.75)

<i>If no latrine why not</i>	too expensive	16(44.44)	34(66.67)
	nearest toilet here	14(38.89)	13(25.49)
	No land to build one	4(11.11)	4(7.84)
	Do not want to use	2(5.56)	0
<i>If no latrine place of defecation</i>	open field	15(41.67)	28(54.9)
	community latrine	21(58.33)	17(33.3)
	Others	0	6(11.8)
<i>Hand washing after defecation</i>	Yes	385(99.48)	357(95.97)
	No	2(0.52)	15(4.03)
<i>Detergent used for hand washing</i>	only water	171(40.43)	296(82.68)
	soap/ash	216(51.06)	61(17.04)
<i>Knowledge of importance of hand washing</i>	Yes	421(99.53)	414(97.9)
	No	2(0.47)	9(2.1)
<i>Time of hand washing</i>	Mixed practices	10(2.36)	54(12.8)
	At all critical time	413(97.64)	369(87.2)
Presence of feces in the latrine	Yes	104(26.87)	71(19.09)
	No	283(73.13)	301(80.91)
Place of children feces disposal	in the latrine	347(82.03)	286(67.6)
	in the open field	70(16.55)	123(29.1)
	Others	6(1.42)	14(3.3)
Presence of feces in the compound/around home	Yes	120(28.37)	86(20.3)
	No	303(71.63)	337(79.7)

One hundred thirty one (33.85%) households in the CLTSH implemented and one hundred eighty six (50%) households in the CLTSH non-implemented kebeles were explained that they constructed latrine by self-initiation (see figure 4).

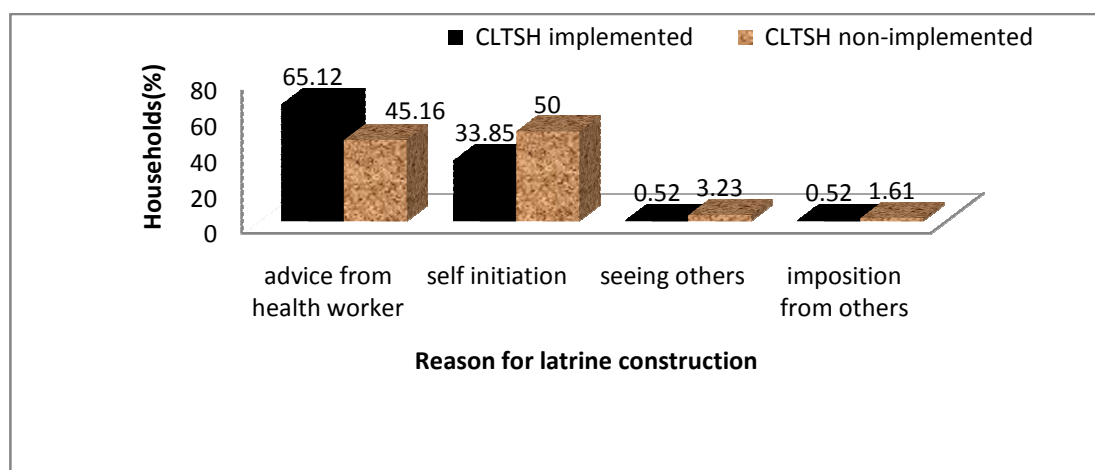


Figure 5: Reasons for latrine construction of the study area, Kersa District, January 2013

In these households the information on diarrheal morbidity was obtained by asking the households/caretaker whether there was diarrheic person in the two-week period. If the members had had diarrhea, the caretaker was asked about action taken during the diarrheal episode. Accordingly, the overall two weeks period prevalence of diarrhea in the CLTSH implemented and CLTSH none implemented kebeles were found to be 18.91% and 22.22% respectively.

Table4: Health characteristics of the households of the study site, Kersa District, January 2013

Variables		Community-led Total Sanitation and Hygiene approach	
		Implemented kebeles No (%)	Non-implemented kebeles No (%)
<i>Two weeks period prevalence</i>	Yes	80(18.91)	94(22.22)
	No	343(81.09)	339(77.78)
<i>Age of diarrhea patient in the two weeks</i>	< 5	54(67.50)	69(73.40)
	≥ 5	26(32.50)	25(26.60)
<i>Action taken</i>	No action taken	4(6.90)	6(7.69)
	Take to health institution	50(86.21)	72(92.31)
	Take to traditional healer	4(6.90)	0

Trends of diarrheal disease in CLTSH implemented and non-implemented kebeles

During data collection there were 16772 cases seen in the CLTSH implemented, of which 1271 presented with diarrhea in five year and half. By using the findings, the prevalence of the diarrheal diseases were calculated and presented in figure 5 and 6

Table 5: Numbers of patients who come to health posts and health centers of the study area, Kersa District, Jimma Zone, January 2013

Year in E.C.	CLTSH implemented					CLTSH non-implemented				
	Total population	Total cases by age		Diarrheal cases by age		Total population	Total cases by age		Diarrheal cases by age	
		<5	≥5	<5	≥5		<5	≥5	<5	≥5
2000	13765	2174	1351	110	190	14637	1729	1236	194	178
2001	14100	1593	1226	89	81	15063	1931	1397	138	119
2002	14115	1938	1422	129	106	15085	1648	1114	264	147
2003	14133	2235	789	101	56	15094	1105	709	242	365
2004	14543	1792	863	184	174	16780	1337	793	156	99
2005	15041	674	715	35	16	17344	536	651	88	48

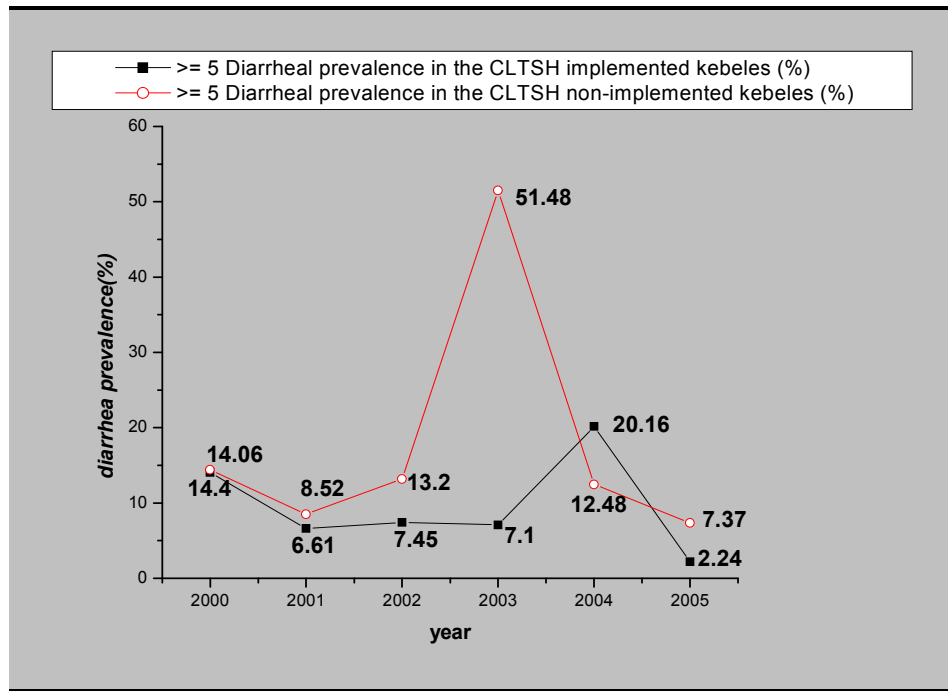


Figure 6: Adult trends of diarrhea prevalence of the study area, Kersa District, January 2013

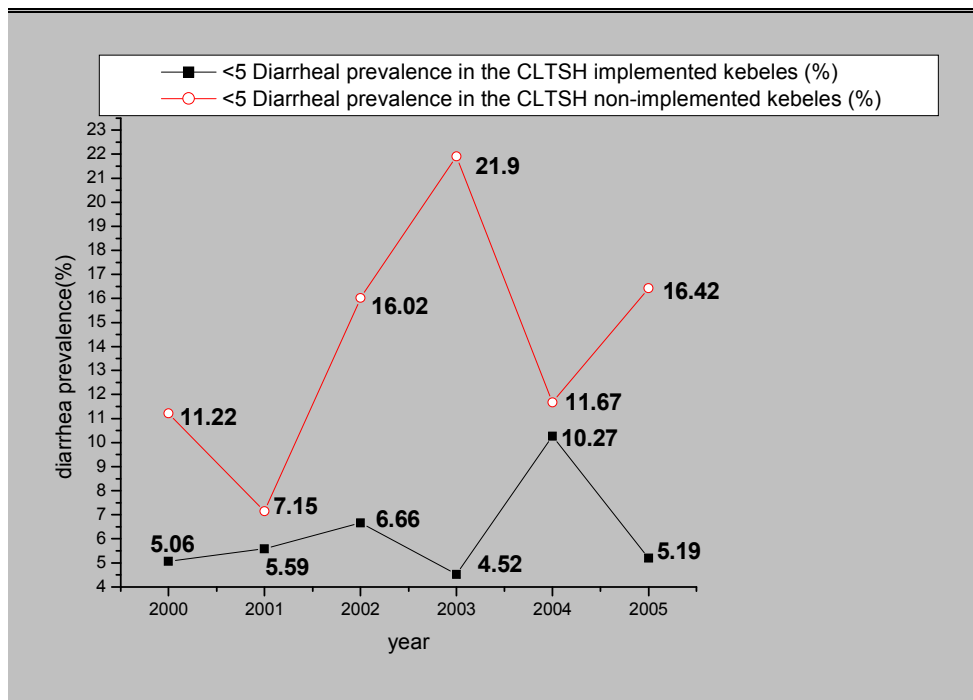


Figure 7: Under five trends of diarrhea prevalence of the study area, Kersa District, January 2013

Bivariate Analysis

Socio-Economic Factors

The occurrence of diarrhea had no statistically significant association with religion in both sites. However, the educational status of respondent, family size, number of under five children and monthly income were found to be significantly associated with the occurrence of diarrhea in CLTSH non-implemented and only family size was significantly associated in the CLTSH implemented kebeles. The occurrence of diarrhea in the households with 4-6 families was 2 times [OR: 2.14, 95% CI: (1.09-4.19)] higher than the households with 7 families but had no significant association with in the households with less than 3 families in CLTSH implemented kebeles. But, occurrence of diarrhea in the households with less than 3 families was 2 times [OR: 2.08, 95% CI: (1.10-3.95)] higher than the households with 7 families and had no significant association with in the households with 4-6 families in CLTSH non-implemented kebeles (Table 6).

Table 6: Selected socio-economic factors in relation to diarrheal morbidity of the households of the study site, Kersa District, January 2013

Variable		CLTSH implemented kebeles(n=423)			CLTSH none implemented kebeles(n=423)		
		Diarrhoea		Crude OR(95% CI)	Diarrhoea		Crude OR(95% CI)
		YES No (%)	NO No (%)		YES No (%)	NO No (%)	
Religion	Orthodox	0	2(100)	1.00	14(15.05)	79(84.95)	1.00
	Protestant	0	0	-	0	8(100)	1.40(0.75-2.63)
	Muslim	60(14.25)	361(85.75)	-	64(19.88)	258(80.12)	-
Family size	1-3	18(19.15)	76(80.85)	2.25(1.14-4.42)*	23(23.71)	74(76.29)	2.08(1.10-3.95)*
	4-6	22(9.52)	209(90.48)	1.05(0.51-2.17)	23(12.99)	154(87.01)	1.14(0.62-2.09)
	>7	20(20.41)	78(79.59)	1.00	32(21.48)	117(78.52)	1.00
Number of under five children	no child	16(18.60)	70(81.40)	1.19(0.63-2.25)	36(26.67)	99(73.33)	0.73(0.37-1.45)
	1	24(14.04)	147(85.96)	0.71(0.35-1.43)	27(13.37)	175(86.63)	0.42(0.24-0.74)*
	2 and above	20(12.05)	146(87.95)	1.00	15(17.44)	71(82.56)	1.00
Educational status	Illiterate	42(16.09)	219(83.91)	1.00	36(14.75)	208(85.25)	1.0
	Literate	18(11.11)	144(88.89)	0.63(0.34-1.15)	42(23.46)	137(76.54)	1.77(1.08-2.91)*
Monthly income	<350	36(18.09)	163(81.91)	1.00	30(15.54)	163(84.46)	1.00
	350-550	18(12.5)	126(87.5)	0.25(0.06-1.09)	25(30.49)	57(69.51)	1.20(0.66-2.18)
	551 – 750	4(9.52)	38(90.48)	0.39(0.09-1.76)	0	21(100)	0.50(0.26-0.97)*
	>750	2(5.26)	36(94.74)	0.53(0.09-3.06)	23(18.11)	104(81.89)	-

Note: * =significantly associated $p < 0.05$

Environmental Factors

The households' selected environmental variables and their relation to diarrhea is presented in Table 7. As shown in the table, in the crude analysis, place of waste disposal site was significantly associated with diarrheal morbidity at 95% confident interval in both. But water Source protection, distance of latrine from kitchen, Average water consumption and Cover for latrine drop-hole was not significantly associated with diarrheal morbidity in both CLTSH implemented and non-implemented kebeles. Statistically significant association was found between the latrine availability and the occurrence of diarrhea and the risk was 10 [OR: 9.64, 95% CI: (5.11-18.19)] higher in households that didn't own latrines in CLTSH non implemented kebeles. But significant association was not shown in CLTSH implemented kebeles.

Table 7: Selected environmental factors in relation to diarrheal morbidity of the households of the study site, Kersa District, January 2013

Variable		CLTSH implemented kebeles (n=423)			CLTSH none implemented kebeles (n=423)		
		No (%)		Crude OR(95% CI)	No (%)		Crude OR(95% CI)
		Diarrhoea (%)			Diarrhoea (%)		
YES	NO	YES	NO	YES	NO		
No (%)	No (%)	No (%)	No (%)	No (%)	No (%)		
Source of drinking water	Spring	36(18.65)	157(81.35)	1.00	67(17.96)	306(82.04)	1.00
	Well	24(10.43)	206(89.57)	0.46(0.26 - 0.81)*	11(22)	39(78)	1.29(0.63-2.65)
Water source protection	Protected	44(14.29)	264(85.71)	1.03(0.56-1.91)	31(13.54)	198(86.46)	0.49(0.29-0.81)*
	Unprotected	16(13.91)	99(86.09)	1.00	47(24.23)	147(75.77)	1.00
Average water consumption	<10		279(85.30)	1.48(0.78-3.05)	55(18.7)	239(81.3)	1.06(0.62-1.82)
	≥10	48(14.70)		1.00	23(17.8)	106(82.2)	1.00
Latrine	Available	54(13.95)	333(86.05)	1.00	48(12.90)	324(87.10)	1.00
	Not available	6(16.67)	30(83.33)	1.23(0.49-3.10)	30(58.82)	21(41.18)	9.64(5.11-18.19)*
Distance of latrine from kitchen (M)	<6	36(15.38)	198(84.62)	1.36(0.74-2.50)	26(13.54)	166(86.46)	1.13(0.61-2.07)
	>6	18(11.76)	135(88.24)	1.00	22(12.22)	158(87.78)	1.00
Latrine seat hole cover	Present	36(12.72)	247(87.28)	1.00	16(9.88)	146(90.12)	1.00
	Not present	18(17.31)	86(82.69)	1.44(0.78-2.66)	32(15.24)	178(84.76)	1.64(0.87-3.11)
Hand washing near the latrine	Present	34(12.1)	248(87.9)	1.00	28(10.4)	242(89.6)	1.00
	Not present	20(19.2)	84(80.8)	1.74(0.95-3.18)	20(19.6)	82(80.4)	2.11(1.13-3.94)*
Place of refuse/waste dispose	In the pit	36(13.79)	225(86.21)	0.38(0.17-0.87)*	27(12.16)	195(87.84)	1.19(0.52-2.75)
	Open field (in the compound)	10(29.41)	24(70.59)	0.58(0.26-1.26)	8(10.39)	69(89.61)	0.22(0.12-0.38)*
	Open field (out of the compound)	10(21.74)	36(78.26)	3.12(1.08-9.05)*	39(39)	61(61)	0.69(0.22-2.18)
	Burning in the compound	4(4.88)	78(95.12)	1.00	4(16.67)	20(83.33)	1.00

Note: * =significantly associated $p < 0.05$

Behavioral factors

Table 8 present analyses that has been undertaken to compare the occurrence of diarrhea with selected behavioral factors. In this table variables like method of water treatment, latrine utility, presence of feces in the compound/around home of the households and time of hand washing were significantly associated with diarrheal morbidity in both CLTSH implemented and non-implemented kebeles. But water storage, way of drawing water from storage, place of defecation if no latrine, hand washing habit after defecation & feces in the latrine floor were significantly associated with diarrheal morbidity in only CLTSH implemented kebeles.

Households those drawing water from storage by dipping material in water storage had more than 2times [OR: 1.94, 95%CI: (0.90-4.16)] risks of having diarrhea than in households who were drawn by pouring material in water storage in CLTSH implemented kebeles. The risk of the occurrence of diarrhea was 0.91 times [OR: 0.91, 95%CI: (0.49-1.68)] higher in the households with no observable feces in their compound/around home of the household than households with observable feces in their compound/around home of the household in the CLTSH implemented kebeles.

The occurrence of diarrhea in the households those wash their hands at mixed time was about 4times higher [OR: 4.25, 95% CI: (1.16-15.53)] than those wash their hands at all critical times in CLTSH implemented kebeles & 7times higher [OR: 6.87, 95% CI: (0.04 - 0.64) (3.73-12.66)] than those wash their hands at all critical times in CLTSH none implemented kebeles and also had significant association with mixed washing practice in both.

Table 8: Selected behavioral factors in relation to diarrheal morbidity of the households of the study site, Kersa District, January 2013

Variables		CLTSH implemented kebeles(n=423)			CLTSH none implemented kebeles(n=423)		
		Diarrhoea (%)		Crude OR(95% CI)	Diarrhoea (%)		Crude OR(95% CI)
		YES No (%)	NO No (%)		YES No (%)	NO No (%)	
Treatment	Yes	34(13.99)	209(86.01)	1.00	34(15.74)	182(84.26)	1.00
	No	26(14.44)	154(85.56)	1.04(0.59-1.80)	44(21.26)	163(78.74)	1.45(0.88-2.37)
treatment	Boiling	34(18.78)	147(81.22)	1.00	4(12.5)	28(87.5)	1.00
	Filtering	0	24(100)	-	26(16.05)	136(83.95)	1.27(0.29-5.67)
method of treatments	Others	0	38(100)	-	4(15.38)	22(84.62)	0.95(0.30-2.99)
wash the container before collecting the water	Yes	54(13.27)	353(86.73)	1.00	78(18.53)	343(81.47)	1.00
	No	6(37.5)	10(62.5)	3.92(1.37-11.23)*	0	2(100)	-
Material of water storage	jerry can	48(12.70)	331(87.30)	1.00	57(17.70)	265(82.30)	1.00
	Pot	6(18.75)	26(81.25)	3.45(1.00-11.33)	17(21.52)	62(78.48)	1.03(0.34-3.17)
	Pail	4(33.33)	8(66.67)	2.17(0.49-9.64)	4(18.18)	18(81.82)	0.81(0.24-2.72)
way of take water from the storage container	Pouring	50(13.19)	329(86.81)	1.00	57(17.70)	265(82.30)	1.00
	Dipping	10(22.73)	34(77.27)	1.94(0.90-4.16)	21(20.79)	80(79.21)	1.22(0.69-2.14)
Presence of water storage covers	Yes	56(13.63)	355(86.37)	1.00	76(18.23)	341(81.77)	1.00
	No	4(33.33)	8(66.67)	3.17(0.92-10.88)	2(33.33)	4(66.67)	2.24(0.40-12.47)
Place of defecation if no latrine	open field	4(26.67)	11(73.33)	1.00	9(32.14)	19(67.86)	1.00
	public latrine	2(9.52)	19(90.48)	0.29(0.05-1.85)	17(100)	0	4.22(0.65-27.49)
	Others	0	0	-	4(66.67)	2(33.33)	-
Utilization of latrine	Rarely	0	0	-	2(6.45)	29(93.55)	-
	Mostly	2(40)	3(60)	4.23(0.69-25.93)	0	22(100)	0.41(0.09-1.77)
	Always	52(13.61)	330(86.39)	1.00	46(14.42)	273(85.58)	1.00
hand washing after defecation	Yes	54(14.03)	331(85.97)	-	46(12.89)	311(87.11)	0.96(0.21-4.39)
	No	0	2(100)	1.00	2(13.33)	13(86.67)	1.00
Detergent used for hand washing	only water	36(21.05)	135(78.95)	2.93(1.60-5.38)*	42(14.19)	254(85.81)	2.36(0.81-6.84)
	soap/ash	18(8.33)	198(91.67)	1.00	4(6.56)	57(93.44)	1.00
Knowledge of the importance of hand washing	Yes	60(14.25)	361(85.75)	-	76(18.36)	338(81.64)	1.27(0.26-6.24)
	No	0	2(100)	1.00	2(22.22)	7(77.78)	1.00
time of hand washing	Mixed practices	4(40)	6(60)	4.25(1.16-15.53)*	28(51.85)	26(48.15)	6.87(3.73-12.66)*
	At all critical time	56(13.56)	357(86.44)	1.00	50(13.55)	319(86.45)	1.00
Presence of faeces around the pit-hole (or on the floor)	Yes	16(15.38)	88(84.62)	1.17(0.62-2.21)	12(16.90)	59(83.10)	1.50(0.74-3.05)
	No	38(13.43)	245(86.57)	1.00	36(11.96)	265(88.04)	1.00
place of dispose children feces	in the latrine	50(14.41)	297(85.59)	1.00	32(11.19)	254(88.81)	1.00
	in the field	10(14.29)	60(85.71)	-	42(34.15)	81(65.85)	3.18(0.94-10.72)
	Others	0	6(100)	-	4(28.57)	10(71.430)	0.77(0.23-2.61)
Faeces seen around the house (or in the compound)?	Yes	16(13.33)	104(86.67)	1.00	19(22.09)	67(77.91)	1.00
	No	44(14.52)	259(85.48)	0.91(0.49-1.68)	59(17.51)	278(82.49)	0.75(0.42-1.34)

Note: * =significantly associated $p < 0.05$

The odd ratio of CLTSH implemented to non-implemented kebeles was 0.84 at 95% CI and it indicated that implementation reduced the risk of diarrhea.

Table 9: Odd ratio of the compared kebeles of the study site, Kersa District, January 2013

Community-Led Total Sanitation and Hygiene	Diarrheal disease		OR (95% CI)
	present NO (%)	not present NO (%)	
Implemented	80(18.91)	94(22.22)	0.84(0.60-1.74)
non-implemented	343(81.09)	339(77.78)	1.00

*Note: * =significantly associated p<0.05*

Multivariate analysis

The multivariate analysis was meant to explore the effect of CLTSH implementation on diarrhea by considering the hierarchical conceptual framework. In the model, only variables with p-value <0.30 in the bivariate analysis were re-evaluated independently controlling for other potential confounders (Victoria *et al.*, 1997). Hence, most of the variables disappeared and number of under 5 children in house, source of water supply and detergent used for hand washing after latrine visit in the CLTSH implemented & family size and presence of hand washing facility near the latrine in the CLTSH non-implemented kebeles remained to be independent risk factors/predictors of diarrheal morbidity.

Even though some variables were significantly associated in the bivariate analysis, their significance disappeared in the multivariate analysis. Time of hand washing which was significantly associated in both CLTSH implemented [OR: 4.25, 95% CI: (1.16-15.53)] and non-implemented [OR: 6.87, 95% CI: (3.73-12.66)] kebeles disappeared in multivariate analysis. Availability of latrine which showed significant association in the bivariate analysis [OR: 9.64, 95%CI :(5.11-18.19)] also disappeared in the multivariate analysis in CLTSH non-implemented kebeles.

The odds of having diarrhea in households where waste/refuse was disposed in the Open field (out of the compound) was 3 times higher than the odds in those households that burned in the compound [OR: 3.12, 95% CI: (1.08-9.05)] in CLTSH implemented kebeles but had no significant association in the multivariate analysis in both CLTSH implemented and non-implemented kebeles in multivariate analysis (see table 9).

Table 10: Multivariate regression of the relative effect of variables on the occurrence of diarrhea morbidity, Kersa District, January 2013

Variable		CLTSH implemented kebeles (n=423)		CLTSH none implemented kebeles (n=423)	
		Crude OR(95% CI)	Adjusted OR(95% CI)	Crude OR(95% CI)	Adjusted OR(95% CI)
Family size	1-3	2.25(1.14-4.42)*	1.98(0.85-4.57)	2.08(1.10-3.95)*	0.24(0.05-1.12)
	4-6	1.05(0.51-2.17)	0.75(0.28-2.05)	1.14(0.62-2.09)	0.20(0.04-0.96)*
	>7	1.00	1.00	1.00	1.00
Number of under five children	no child	1.19(0.63-2.25)	0.95(0.39-2.34)	0.73(0.37-1.45)	0.75(0.32-1.74)
	1	0.71(0.35-1.43)	0.36(0.14-0.90)*	0.42(0.24-0.74)*	1.63(0.67-3.97)
	2 and above	1.00	1.00	1.00	1.00
Educational status	Illiterate	1.00	1.00	1.00	1.00
	Literate	0.63(0.34-1.15)	0.67(0.31-1.46)	1.77(1.08-2.91)*	0.40(0.12-1.38)
Monthly income	<350	1.00	1.00	1.00	1.00
	350-550	0.25(0.06-1.09)	0.12(0.01-1.03)	1.20(0.66-2.18)	3.32(0.80-13.85)
	551 – 750	0.39(0.09-1.76)	0.18(0.02-1.56)	0.50(0.26-0.97)*	1.76(0.34-9.05)
	>750	0.53(0.09-3.06)	0.21(0.02-2.86)	-	-
Source of drinking water	Spring	1.00	1.00		
	Well	0.46(0.26 - 0.81)*	0.37(0.14-0.94)*		
Water source protection	Protected			0.49(0.29-0.81)*	1.07(0.49-2.36)
	Unprotected			1.00	1.00
Average water consumption	<10	1.48(0.78-3.05)	0.67(0.27-1.68)		
	≥10	1.00	1.00		
Latrine	Available			1.00	1.00
	Not available			9.64(5.11-18.19)*	-
Latrine seat hole cover	Present	1.00	1.00	1.00	1.00
	Not present	1.44(0.78-2.66)	0.79(0.33-1.90)	1.64(0.87-3.11)	1.19(0.58-2.46)
Hand washing near the latrine	Present	1.00	1.00	1.00	1.00
	Not present	1.74(0.95-3.18)	1.84(0.72-4.70)	2.11(1.13-3.94)*	2.17(1.03-4.56)*
Place of refuse/waste dispose	In the pit	0.38(0.17-0.87)*	0.42(0.12-1.47)	1.19(0.52-2.75)	1.56(0.54-4.46)
	Open field (in the compound)	0.58(0.26-1.26)	1.33(0.31-5.80)	0.22(0.12-0.38)*	0.65(0.28-1.52)
	Open field (out of the Cpd)	3.12(1.08-9.05)*	1.35(0.33-5.57)	0.69(0.22-2.18)	1.52(0.27-8.55)
	Burning in the compound	1.00	1.00	1.00	1.00
Treatment	Yes			1.00	1.00
	No			1.45(0.88-2.37)	0.59(0.23-1.57)
wash the container before collecting the water	Yes	1.00	1.00		
	No	3.92(1.37-11.23)*	4.59(0.73-28.91)		
Material of water storage	jerry can	1.00	1.00		
	Pot	3.45(1.00-11.33)	1.69(0.34-8.49)		
	Pail	2.17(0.49-9.64)	2.24(0.30-16.67)		
Presence of water storage covers	Yes	1.00	1.00		
	No	3.17(0.92-10.88)	-		
Detergent used for hand washing	only water	2.93(1.60-5.38)*	2.43(1.18-5.02)*	2.36(0.81-6.84)	1.85(0.58-5.89)
	soap/ash	1.00	1.00	1.00	1.00
time of hand washing	Mixed practices	4.25(1.16-15.53)*	0.16(0.01-1.87)	6.87(3.73-12.66)*	1.15(0.32-4.19)
	At all critical time	1.00	1.00	1.00	1.00
Presence of feces around the pit-hole (or on the floor)	Yes			1.50(0.74-3.05)	1.56(0.55-4.43)
	No			1.00	1.00

*Note: * =significantly associated p<0.05*

6. Discussion

Diarrheal diseases remain a major cause of morbidity and mortality in low-income countries like Ethiopia societies, and the aim of the present study was to assess the important CLTSH approach implementation on the prevention of diarrheal disease by comparing kebeles where the approach implemented and non-implemented.

In the study, the overall two weeks period prevalence of diarrhea in the CLTSH implemented and non-implemented kebeles were 18.91% and 22.22% respectively. The figure in the CLTSH non-implemented is high when compared with the figure in the CLTSH implemented kebeles. But the study showed that even if the risk of diarrheal was reduced by 0.84 odd ratios it was not significant.

Study showed that family size had impacts on the occurrence of diarrhea in the adjusted in both non-implemented kebeles. As the family size becomes increase, they might be decreasing of socio-economic, which lead the family members to poor hygienic practices.

Study showed that obtaining water from storage containers by dipping was a risk factor for diarrhea (Teklemariam *et al.*, 2000). But in this study occurrence of diarrhea was not statistically significant with way of drawing water from storage in both bivariate and multivariate analysis; however the risk of the occurrence of diarrhea was 1.94 and 1.22 times higher in households where water is obtained from storage container by dipping than in those where water is obtained by pouring in the approach implemented and non-implemented kebeles respectively. This might be introducing hands and objects in to stored water were sources of contamination.

The finding of this study shows that 91.49% households of the CLTSH implemented and 87.90% households of the non-implemented kebeles had pit latrines. This result is less when comparing with the findings of RIPPLE in Mirab Abaya Woreda, the SNNPR, which shows the latrine coverage was 94% coverage (Tefera, 2008). But greater when comparing with the findings of the Ethiopia Demographic and Health Survey in 2011, which indicated that about 55% households of the rural areas had latrine facilities. It was also better when comparing with study conducted in district of Bahir Dar Zuria (58.4%) (Awoke & Muche, 2013) and Kewotth woreda, Amhara Region (67.7%) (Rachael, 2011). The findings of this study also shows that of the households lacked latrines, about 54.9 % in CLTSH non-implemented and 41.67% in CLTSH implemented kebeles were practice open defecation during survey.

This study revealed that from households who had latrines, about 50% of the respondents in CLTSH non-implemented and 33.85% in the implemented kebeles explained that they were construct latrines by self-initiation. As we know the aim of CLTSH is igniting communities to change their hygiene and sanitation habits by constructing and using latrines instead of defecating in the open. So the above figures contradict each other's. This might be due to the respondents in the CLTSH non-implemented kebeles miss the body initiate them and those respondents from CLTSH implemented kebeles may not considered the triggering of CLTSH approach as self-initiation.

In this study the occurrence of diarrhea was statistically associated with the extent of latrine availability in the bivariate analysis in the CLTSH non-implemented kebeles [OR: 9.64, 95%CI: (5.11-18.19)] but the significant was disappeared in the multivariate analysis. This might be even though the latrines present they defecate in open field.

This study showed that hand-washing facilities near the latrines in CLTSH implemented (73.06%) was almost equal to that of CLTSH non-implemented kebeles (72.58%). The study also indicated that from those households that had latrine the habit of hand-washing after defecation in CLTSH implemented and none implemented kebeles were 99.48% and 95.97%, respectively. This study was better when comparing with study conducted in East Hararghe, Kersa District, only about 5.1% of the households having latrines washed their hands after defecation (Mengistie & Baraki, 2010). These large differences might be promotion of hand washing along with latrine construction by governments and NGOs time to time. The implementation of CLTSH approach improves the sanitation and hygiene of the community as well as with higher influence to its nearby neighbors.

The presence of hand washing facilities near the latrines encourages the users to wash their hands after latrine use. This study also revealed that, in multivariate analysis, latrine provided with hand washing facility was related to the risk of diarrhea in CLTSH non-implemented kebeles. But the significance was not related to the risk of diarrhea in both bivariate and multivariate analysis in the approach implemented kebeles.

Optimal hand washing with soap reduces the risk of diarrhea by 45% (WHO Factsheets, 2012). Study including different African countries showed that about 17% of the respondents washed their hands by soap after using latrine (Curtis *et al.*, 2009). In this study also about 17.04% respondents in the approach non-implemented washed their hands by soap/ash after using

latrine. But in the CLTSH implemented more than half of the respondents (51.06%) wash their hands by soap/ash after using latrine. This might be due to mass sanitization and awareness creation during the program implementation.

The results revealed that 61.70% of the households in CLTSH implemented and 52.50% of the households in CLTSH non-implemented kebeles explained that they disposed solid wastes in open pit. However, the present finding is relatively higher when compared with study conducted in Kersa woreda, Eastern Hararghe, which shows 26.5% disposed wastes in open pits (Mengistie & Baraki, 2010).

The study showed that the average water consumption of CLTSH approach implemented and non-implemented kebeles were 8.05 L/C/ day and 7.27 L/C/ day respectively. However, this study finding was almost similar when compared with study conducted in Mecha District of West Gojjam which showed that the average water consumption was 7.7 L/C/ day (Dessalegn, 2009). But the results were below the figures of south western Ethiopia which was 15.4 L/C/day (Wondimagegn, 1994)and the minimum recommendation of WHOfor developing countries,(20L/C/D) (JMP, 2000).

7. Conclusion

In this study, the prevalence of diarrhea in the CLTSH non-implemented is high when compared with the figure in the CLTSH implemented kebeles and the risk of diarrhea also reduced due to the implementation of CLTSH, this is due to the mass sensitization and awareness creation in the CLTSH implemented kebeles.

The findings of this research also revealed that large number of households in CLTSH implemented used protected spring and well water as the main source of drinking water when compared with households in the CLTSH non-implemented kebeles and also average water consumption of the approach implemented kebeles was greater than the non-implemented.

The study showed that the extent of latrine coverage and utilization in CLTSH implemented was greater than that of CLTSH non-implemented kebeles. The study indicated that both compared kebeles were not open defecation free even the approach implemented in three kebeles. In this study hand-washing facility near the latrines in CLTSH implemented kebeles (73.06%) was greater than that of CLTSH non-implemented kebeles (72.58%). The study also indicated that from those households with latrine the habit of hand-washing after defecation in CLTSH implemented was greater than the non-implemented kebeles. Thus, it can be concluded that it is possible to reduce diarrheal disease through implementation of CLTSH approach.

8. Recommendations

Based on the results of this study, the following recommendations are suggested:-

1. Health-workers and local authorities must give health education and sensitization for the community to stop open defecation using CLTSH approach.
2. CLTSH approach should be advocated and implemented in all kebeles of the region
3. Further in-depth studies should also be conducted at different season.

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Annexes

Annex I: Questionnaire

JIMMA UNIVERSITY

COLLEGE OF PUBLIC HEALTH AND MEDICAL SCIENCES

DEPARTMENT OF ENVIRONMENTAL HEALTH SCIENCES

Questionnaire prepared to assess Community-led Total Sanitation and Hygiene approach on the control of diarrheal disease in Kersa District

Consent form

A Questionnaire prepared to collect data *on the assessment of Community-led Total Sanitation and Hygiene approach on the prevention of diarrheal disease in Kersa district.*

Hallo! Good morning?

My name is -----I am here today to collect data on the *assessment of Community Led Total Sanitation and Hygiene Approach on the prevention of diarrheal disease in Kersa district.* The objective of this questionnaire is to assess *Community-led Total Sanitation and Hygiene approach on the prevention of diarrheal disease.* Your correct and genuine answer to the questions can make the study achieve its goals. Therefore, you are kindly requested to respond voluntarily with patience. The interview may take 15-20 min. we assure you that this study is surely confidential, thus writing your name is not needed.

Are you willing to participate in the interview?

Yes! Go to the next page.

No! Thank them and interrupt the interview.

Sign of the consenting interviewer -----

Result of the interview 1. Completed

2. Partially completed

3. The interviewee refused

4. Others-----

Name of interviewer----- sign-----

Kebele Name -----Questionnaire Number -----

Date -----

Time started: ----- Time ended: -----

Part –I- Socio-demographic characteristics

1. Status of the respondent
 - 1) Husband
 - 2) Wife
 - 3) Others-----
2. Age of respondent
 - 1) 18-25
 - 2) 25-40
 - 3) >40
3. Religion
 - 1) Orthodox
 - 2) Protestant
 - 3) Muslim
 - 4) Others
4. Ethnicity
 - 1) Oromo
 - 2) Amhara
 - 3) Kefa
 - 4) Others-----
5. Number of family
 - 1) 1-3
 - 2) 4 - 6
 - 3) ≥ 7
6. No of children aged under 5
 - 1) 1
 - 2) 2 and above
 - 3) no child
7. Education status of the respondent
 - 1) Illiterate
 - 2) literate
8. Occupation of the Household
 - 1) Government employee
 - 2) Merchant
 - 3) Farmer
 - 4) Daily laborer
 - 5) Jobless
 - 6) Other
9. How much does your spend monthly in birr?
 - 1) < 350
 - 2) 350-550
 - 3) 551-750
 - 4) >750

Part II—water supply, sanitation and hygiene

10. What is the main source of water for the household?
 1. Spring,
 2. Bono
 3. Well
 4. River
 5. other specify-----
11. Is the source protected?
 1. Yes
 2. No
12. Distance from the house to the water source (kilometer)?
 1. <1
 2. 1-2
13. Time taken from the house to the water source (Minutes)
 - 1.<15
 - 2.15-30
 - 3.30 and above

14. Do you wash the container before collecting the water?
 1) Yes 2) No
15. If your water source is other than bono source do you treat it?
 1. Yes 2. No
16. . If you treat it what method(s) do you use?
 1. Boiling 2. Filtering 3. Other, specify _____
17. How do you store your water?
 1. Jerry can 2. pot 3. Pail 4. Other specify _____
18. How do you take water from the drinking water storage container?
 1. Pouring 2. Dipping
19. Does the drinking-water storage container have a cover? *Ask the respondent to show you the storage container.*
 1. Yes 2. No
20. How much water is consumed per day on average for one person in the family?
 1. <10 2. ≥ 10
21. Do you have latrine facility?
 1. Yes 2. No
22. If Q21 is yes, when started to use the latrine? ----- Before construction place of defecation? -----
23. If Q21 no, where do you use?
 1. Open field 2. Communal 3. Other specify _____
24. If Q21 is yes, how frequently is the toilet used If yes?
 1. Rarely 2. Mostly 3. Always
25. If Q21 is yes, does the latrine have a lid?
 1. Yes 2. No
26. How far is the latrine from home /Kitchen?(meter)
 1. <6 2. ≥6
27. What are your reasons to construct latrine?
 1. Advice from health workers 3. Seeing others
 2. Self initiation 4. Imposition from others
 5. Others/specify__

28. Who constructed your household latrine?
1. by your self
 2. kebele leaders
 3. primary health workers
 4. Other, specify-----
29. Type of latrine facility (observation)
1. Traditional pit latrine
 2. VIP latrine
 3. Others (specify)....
30. Is the toilet provided with hand washing facility? 1. Yes 2. No
31. If Q30 No, why? 1) Don't use 2) lack of water 3) don't know its important
32. Are you washing your hand after defecation?
1. Yes
 2. No
33. By what you wash your hands after defecation?
1. Only water
 2. Water and Soap/ash
34. Do you know the importance of hand washing?
1. Yes
 2. No
35. At what time you wash your hands?
1. After defecation only
 2. Mixed practices
 3. At all critical time
36. Is faeces seen around the pit-hole (or on the floor)? (OBSERVATION)
1. Yes
 2. No
37. Where do you dispose children feces?
- 1) in the latrine
 - 2) in open field
 - 3) others-----
38. Is faeces seen around the house (or in the compound)? (OBSERVATION)
1. Yes
 2. No
39. What will you do if your toilet is full?
1. Emptying
 2. Preparing new by covering the old with soil or other material.
 3. Other, specify-----
40. If no private toilet now, why not?
1. Toilet is too expensive
 2. nearest toilet here
 3. No land to build one
 4. Do not want to use toilet

5. Other, specify-----

41. Where do you dispose refuse/waste?

- 1) In the pit 2) Open field (in the compound) 3) Open field (out of the compound?) 4) Burning in the compound

42. Does your family have a history of diarrhoea within the past two weeks?

- 1) Yes 2. No

42.1 If `Q 42 yes, which age group?

1. ≤ 5 2. >5

43. What actions do you take to treat/stop the diarrhoea?

- 1) No action taken 2) take to health institution
3) Take to traditional healer 4) increase feeding 5) others-----

Observational checklist

No.	Variables	Answers	Remarks
1.	What is the main source of water for the household?(if observable)	a. Spring b. bono c. well d. river e. others -----	
2.	Is the water source protected?	a. Yes b. No	
3.	How do you store your water?	a. Jerry can b. Pot c. Pail d. Others _____	
4.	Does the drinking-water storage container have a cover?	a. Yes b. No	
5.	Do you have latrine facility?	a. Yes b. No	
6.	If no latrine, where do you use?	a. Open field b. Public latrine c. Others _____	
7.	Does the latrine have a lid?	a. Yes b. No	
8.	How far is the latrine from home /Kitchen? (meter)	a. <6 b. ≥6	
9.	Type of latrine facility	a. Tradition pit latrine b. VIP latrine c. Others	
10.	Is the toilet provided with hand washing facility?	a. Yes b. No	
11.	Is faeces seen around the pit-hole (or on the floor)?	a. Yes b. No	
12.	Is faeces seen around the house (or in the compound)?	a. Yes b. No	
13.	Where do you dispose refuse/waste?	a. In the pit b. Open field (in the compound)\ c. Open field (out of the compound?) d. Burning in the compound	

Annex II: Afan Oromo version questionnaire

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Kolleejjii Saayinsii Fayyaa Hawaasaa Fi Meedikaalaa

Gaaffii qorannoo malli sanitashinii fi hayiginiin wali gala uummataan durfame ittisa garaa kaasaa irratti qabu daataa ittiin guuruuf qophaaye. Maqaa kee fi waan hojjattu erga himtee booda ,yoo siif eeyyaman itti fufi .

Maqaa gandaa: ----- Lakk. Gaaffii-----Guyyaa -----

Sa'aatii itti eegalte : ----- sa'aatii ittixumuurte: -----

Part –I- hawaas-dinagdee

- Gahee nama deebii kennee
 1. Abbaawarraa
 2. Haadhaa warraa
 - 3 ijoollee
- Umurii nama gaaficha deebisee
 1. 18-25
 2. 25-40
 - 3 > 40
- Amantaa
 - 1) Ortodoksii
 - 2) Protestaantii
 - 3) musillma
 - 4) kanbiroo
- Sabummaa
 - 1) Oromoo
 - 2) Amahaara
 - 3) Kafaa
 - 4) Kan biro _____
- Baayinamatii
 - 1) 1-3
 - 2) 4 - 6
 - 3) >7
- Baayina ijoolle waggaa shanii gadii meeqa?
 - 1) 1
 - 2) fi isaa oli
 - 3) Ijoolleen hin jirtu
- Sadarkaa barnootaa nama gaafficha deebisee
 1. Hin baratne
 2. Kan barate
- Hojii abbaa warraa maali?
 1. Hojjataa mootummaa
 2. daldaala
 3. qonnaan bulaa
 4. hojjataa guyyaa
 5. hoji dhabeessa
 6. kan biro-----
- Ji'aan qarshii meeqa argattu ?
 1. 350 gadi
 2. 350-550
 3. 551-750
 4. 750 oli

Part II—dhiyeesa bishaanii, sanitaashinii fi hayjiini

- Iddoo guddaan bishaan irraa waraabbatan eessa?
 1. burqaa,
 2. boonoo
 3. boolla
 4. Laga
 5. Kanbiroo-----
- Maddiichi haguugamaadhaa?
 1. eeyyen
 2. lakki
- Fageenya bakki bishaan waraaban mana isaaniirraa qabu(KM)
 1. <1
 2. 1-2

13. Sa'aatii itti fudhatu maddicha hanga manaatti (daqqaan) 1) <15 2) 15-30 3) 30 fi isaaoli
14. Bishaan waraabuun dura meeshaa itti waraabdan ni dhiqxuu? A) eeyyee B) lakkii
15. Maddi bishaan keessanii yoo boonbaa hin taane ni walaantu?
1 eeyyen 2.lakki
16. Yoo ni wal'aatu ta'e mala kam itti fayyadamtu?
1. Danfisuu 2.calaluu 3. Kan biro , _____
17. Bishaan mana keessaatti maaliin tursiistu?
1. Jerkana 2. Ubboo 3. Baldii 4. Tankarii 5. Kanbiroo_____
18. Akkam itti bishaan bakka kuusaa keessaa buufattuu?
1) Meesha kuusaa jallisuu 2)Meeshaa keessa kaayuun
19. Meeshaan bishaan dhugaatii keessatti kuufame sun qadaada qabaa? Akka sitti argisiisan gaaffadhu
1 eeyyen 2.lakki
20. Guyyaatti giddu-galleessan maatii keessan keessaa namni tokko bishaan ammam itti fayyadamtu ?
(liitiriin) 1. <10 2. 10-20 3. >20
21. Mana fincaanii qabduu?
1. eeyyen 2 .lakki
22. Yoomii kaaftanii fayyadamuu eegaltani?-----sanadura eessatti fayyadamtu-----

23. Yoo gaaffii 21 lakki ta'e eessatti fayyadamtuu?
1. goodaarratti 2. Mana fincaanii hawasaa 3.Kan biroo_____
24. Yoo gaaffiin 21 eeyyee ta'e yeroo kam mana fincaanii fayyadamtu?
1. Darbee darbee 2. Harka jireessa 3. Yeroo hunda
25. Yoo gaaffiin 21 eeyyee ta'e, manni fincaanichaa qadaada qabaa?
1. eeyyen 2. lakki
26. Manni fincaanichaa mana nyaatni itti qophaa'u irraa hangam fagaata?(meetiraan)
1. <6 2. ≥6
27. Mana fincaanii akka qopheeffataniif maaltu ka'umsa siniif ta'e?
1) Gorsa hojjatoota fayyaa 4) Dhiibbaa nama biroon
2) Of kakaasuun 5) Kan biroo__
3) Nam biro ilaaluun
28. Mana fincaanichaa eenyutu sinii ijaare?
1. ofumaan 3. hojjatota fayyaa hawaasaa
2. dursitoota gandaa 4. Nama biroon-----
29. Gosa mana fincaanichaa (ilaaluun)
1. Boolla fincaanii aadaa 3. Kan biraa...
2. Mana fincaani sadarkaa
isaa eege (VIP)
30. Mana fincaanichaa bira harka dhiqannaan jiraa?
1. eeyyeen 2. lakki
31. Hin jiru yoo ta'e maaliif? 1. Hin fayyadu 2. Bishaan dhabne 3. Fayyida isaa hin beeknu
32. Oggaa bobbaa baatanii booda harka ni dhiqattuu?
1 eeyyee 2.Lakki

33. Oggaa bobbaa baatanii booda harka maaliin dhiqattuu?
 1. Bishaan qofaan 2. Saamunaan/ daaraan 3 kan biroo-----
34. Fayidaa harka dhiqannaa beektuunii?
 1 eeyyee 2. lakki
35. Yeroo kam faa harka dhiqattuu?
 1. Boola'uun booda qofa 2. Yeroo tokko tokko 3. Yeroo barbaachisu hunda
36. Boobbaan mana fincaanichaa keessaa jiraa? (**ilaali**) 1) eeyyee 2) lakki
37. Bobbaan daa'ima eessaatti gattuu? 1) mana fincaanii 2) dirreetti 3) kan biro-----
38. Boobbaan mooraa keessaa jiraa? (**ilaali**)
 1. eeyyee 2. lakki
39. Yoo mannii fincaanii keessan guute maal gootu?
 1. Duwwaa taasisuu/xuuchisuu 3. Mala biraa, -----
 2. Isa biyyoon duuchuun kan biro qotuu.
40. Mana fincaanii dhuunfaa hin qabdu yoota'ee maaliif?
 1. Qopheessuun ni ulfaata 4. Fayyadamuu hin barbaadu
 2. Kan biroo dhihootti waan jiruuf 5. Kan biro -----
 3. Lafa itti qopheessu waan hin jirreef
41. Balfaa ykn kosii eessatti gattuu?
 1. Boollaatti 2. Dirree irrattii (mooraa keessatti) 3. Dirree irrattii (mooraa alatti) 4. Gubuun
42. Maatii keessan keesaa torbee lamaa as kan garaa kaasaan qabame jiraa?
 1. Eeyyee 2. Lakki
 42. 1 yoo eeyyee ta'e, umrii 1. ≤ 5 2. >5
43. Gara kaasicha dhaabuuf tarkaanfii maal fudhatte?
 1. Tarkaanfii hin fudhanne
 2. Gara dhabbata fayyaa geessu
 3. Gara mana wal'aansa aadaa geessu
 4. Nyaachisuun dabale
 5. Kan biroo-----

Chekliistii qorannoo malli sanitashinii fi hayiginiin waligalaa uummataan durfame ittisa garaa kaasaa irratti qabu daataa ittiin to'achuuf qophaaye.

Lakk.	Wantoota ilaalaman	Deebii	Yaada
1.	Iddoo guddaan bishaanii irraa waraabatan eessa?	a. burqaa, b. boonoo c. boolla d. Laga e. Kanbiroo-----	
2.	Maddiichi haguugamaadhaa?	a. Eeyyee b. lakki	
3.	Bishaan mana keessaatti maaliin tursiistu?	a. Jerkana b. ubboo c. Baldii d. Kanbiroo_____	
4.	Meeshaan bishaan dhugaatii keessatti kuufame sun qadaada qabaa?	a. Eeyyee b. Lakki	
5.	Mana fincaanii qabduu?	a. Eeyyee b. Lakki	
6.	Yoo manni fincaanii hin jiru ta'e eessatti fayyadamtuu?	a. Goodaarratti b. Manafincaaniihawasaa c. Kanbiroo_____	
7.	Manni fincaanichaa qadaada qabaa?	a. Eeyyee b. Lakki	
8.	Manni fincaanichaa mana nyaatni itti qophaa'u irraa hangam fagaata?(metiraan)	a. <6 b. ≥6	
9.	Gosa mana fincaanichaa	a. Boollafincaaniiadaa b. Manafincaanisadarkaaisaaeege (VIP) c. Kanbiraa....	
10.	Mana fincaanichaa bira harka dhiqannaan jiraa?	a. Eeyyee b. lakki	
11.	Boobbaa mana fincaanichaa keessaa jiraa?	a. Eeyyee b. lakki	
12.	Boobbaan mooraa keessaa jiraa?	a) Eeyyee b) Lakki	
13.	Balfaa ykn kosii eessatti gattu?	a. Boollaatti b. Dirreeirrattii(mooraakeessatti) c. Dirreeirrattii(mooraaalatti) d. Mooraakeessattigubuun	