HARAMAYA UNIVERSITY

COLLEGE OF HEALTH AND MEDICAL SCIENCE

SCHOOL OF GRADUATE STUDIES

HOUSEHOLD SANITATION PRACTICE AND ASSOCIATED FACTORS IN GOLA ODA WOREDA, EAST HARARGHE ZONE, EASTERN ETHIOPIA

MSc THESIS

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Household Sanitation Practice and Associated Factors in Gola Oda Woreda, East Hararghe Zone, Eastern Ethiopia

A Thesis Submitted to the Department of Environmental Health, School of Graduate Studies

In Partial Fulfilment of the Requirements for the Degree of Master in Water Supply, Sanitation and Hygiene Management

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APPROVAL SHEET

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We hereby certify that we have read and evaluated this thesis entitled "Household sanitation practice and associated factors in Gola Oda Woreda, East Harerghe zone, Eastern Ethiopia" prepared under our guidance by Alemayehu Tsegaye. We recommend that it will be submitted as fulfilling the thesis requirement.

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BIOGRAPHICAL SKETCH OF THE AUTHOR

I was born in 1986 GC in Resa Jeneta Kebele, Bedeno district, East Hararghe Zone. I completed my elementary education at Kara Hormat and Furda schools, and my secondary and preparatory education in Bedeno. After completing secondary and preparatory school, I joined the University of Gondar in 2006 GC, where I earned a BSc degree in Applied Chemistry in 2008. Subsequently, I served as a teacher for three years and as an expert for four years at the Gola Oda Woreda Educational Office. Later, I worked as a labor inspector at the East Hararghe Zone Labour and Social Affairs Office. In October 2019, I enrolled in an MSc program in Water Supply, Sanitation, and Hygiene Management.

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ABBREVIATIONS AND ACRONYMS

AOR	Adjusted Odds Ratio
ETB	Ethiopia Birr
CI	Confidence Interval
CLTSH	Community-Led Total Sanitation and Hygiene
CSA	Central Statistical Agency
EDHS	Ethiopia Demographic Health Survey
FTI	Faecally Transmitted Infection
HEP	Health Extension Package
HEWs	Healthy Extension Workers
HSTP	Health Sector Transformation Plan
HWT	Household Water Treatment
IHRERC	Institutional Health Research Ethics Review Committee
KAP	Knowledge, Attitude and Practice
MDG	Millennium Development Goal
NHEHS	National Hygiene and Sanitation Strategy
NNP	National Nutrition Program
OD	Open Defecation
OR	Odds Ratio
SDG	Sustainable Development Goal
SNNPR	Southern Nations and Nationalities People's Regional State
SPSS	Statistical Packages for Social Science
UN	United Nation
UNICEF	United Nations Children's Fund
WASH	Water Supply, Sanitation and Hygiene
WHO	World Health Organization

ABSTRACT

Background: Sanitation practices are essential for maintaining health, preventing diseases and contributing to long-term development. Poor sanitation conditions contribute significantly to the spread of infectious diseases, making it a critical public health issue in most low- and middle-income countries, including Ethiopia. There is evidence paucity on level of household sanitation practices and related factors in the study area.

Objective: This study aimed to assess household sanitation practice and identify the associated factors in Gola Oda woreda, East Harerghe Zone, Eastern Ethiopia.

Methods: A community-based cross-sectional study was conducted among 498 households from September 19- October 6, 2024. Six out of 18 kebeles were selected using a simple random sampling method. Within each selected kebele, a systematic random sampling technique was used to select the study participants. Data collection involved a pre-test structured questionnaire and an observational checklist. Analysis was performed by using SPSS version 25, with bivariate and multivariate logistic regressions used to identify the associated factors, considering a significance level of p-value < 0.05.

Results: The study found that 53.5% (95 CI: 49.2%, 58.2%) of households exhibited good sanitation practice. Factors significantly associated with sanitation practice included a diploma or higher education (AOR = 14.389, 95% CI: 1.74-118.80), grades 9 to 12 education (AOR = 4.034, 95% CI: 1.13-14.40), grades 1 to 4 education (AOR = 2.361, 95% CI: 1.33-4.19), the presence of a latrine superstructure (AOR = 4.133, 95% CI: 1.24-13.80), regular follow-up visits from health extension workers (AOR = 13.452, 95% CI: 2.36-76.75), good knowledge of sanitation (AOR = 4.218, 95% CI: 2.00-8.89), and positive attitudes towards sanitation (AOR = 3.927, 95% CI: 1.89-8.15).

Conclusion: - This study revealed that just over half of the households in the study area practice good sanitation. However, a significant portion still faces challenges. The study underscores the critical need for targeted educational and awareness programs to improve sanitation practices in the area. By bridging knowledge gaps, fostering positive attitudes towards sanitation, enhancing sanitation infrastructure, and ensuring ongoing support from health extension workers, significant advancements in public health can be realized

Key Words: Household Sanitation Practice, Knowledge, Attitudes, Latrine, Gola Oda Woreda, Eastern Ethiopia

1. INTRODUCTION

1.1. Background

Sanitation plays a crucial role in the overall wellbeing of a community, safeguarding human health, increasing life expectancy, and yielding economic advantages (Taing and Dang, 2020). Ensuring sanitation services are safely managed is critical to a healthy life, well-being, and achieving health related Sustainable Development Goals (SDG). Access to safely managed sanitation is at the top of the sanitation ladder, which divides sanitation access into four categories: safely managed sanitation, basic, limited, and open defecation. A safe sanitation service involves the use of improved sanitation facilities that are not shared with other households and excreta are treated in-situ or offsite. Basic access refers to the use of improved facilities that are not shared with other households, whereas limited access refers to the use of improved facilities that are shared among households. Unimproved sanitation facilities, on the other hand, include the use of pit latrines without a slab or platform, hanging latrines, or bucket latrines. The practice of disposing of human feces in fields, forests, bushes, open bodies of water, beaches, and other open spaces, or with solid waste, is known as open field defecation (WHO and UNICEF, 2017).

3.5 billion individuals worldwide lack access to safely managed sanitation. This includes 1.9 billion with basic services, 570 million with limited services, 545 million using unimproved services, and 419 million who engage in open defecation. Consequently, two out of five people are without safely managed sanitation (WHO, 2023).

According to a report from WHO and UNICEF JMP (2022), over 987 million people across Africa lack access to safely managed sanitation services. Of these, 780 million do not have even basic sanitation facilities, and 193 million still practice open defecation. Additionally, 1 billion people are without basic hygiene services. Achieving universal sanitation coverage (>99%) by 2030 will require significant improvements, including a 23-fold increase in progress for safely managed sanitation, a 13-fold increase for basic sanitation, and a 3-fold acceleration to eliminate open defecation. In Sub-Saharan Africa specifically, around 276 million people (24% of the population) had access to safely managed sanitation services in 2022, while 115 million (10%) used basic sanitation facilities. Meanwhile, 207 million (18%) relied on limited sanitation services, and 357 million (31%) had unimproved sanitation options. Alarmingly, 195 million people (17%) in the region still practiced open defecation. These statistics underscore the urgent need for enhanced sanitation and hygiene infrastructure across Africa (WHO and UNICEF, 2023).

Between 2000 and 2017, Ethiopia made significant progress in reducing open defecation, with rates dropping from 79% to 22%. However, despite this achievement, the country was unable to meet its ambitious target of ensuring that all households used proper latrine facilities by 2020, as outlined in the Health Transformation Plan I for 2015/16 to 2019/20 (HSTP I, 2015). This discrepancy is particularly apparent in persistent disparities in coverage across different urban and rural areas, regions, and household socioeconomic status (WHO, 2019a).

The Health Sector Transformation Plan II (HSTP II, 2020) has revised its goal, targeting 60% of households to have access to basic sanitation services by 2025 (HSTP, 2021).

The effectiveness of sanitation practice is not solely determined by the availability of sanitation facilities but also by individuals' willingness to comply with proper sanitation practices. Addressing health issues related to inadequate sanitation requires both access to facilities and public knowledge and attitudes towards sanitation (Barnard et al., 2013).

1.2. Statement of the problem

Sanitation plays a vital role in maintaining health, preventing diseases, and fostering sustainable development (WHO, 2023). Without adequate and operational sanitation facilities and appropriate hygiene practices, communities remain at risk of frequent out breaks of diseases associated with water and sanitation (Chariar and Sakthivel, 2011). Research has shown that the safe disposal of human waste can lead to a 30% decrease in the incidence of waterborne disease (UNICEF, 2016).

Globally, over 2 billion people drink water from sources contaminated with faecal matter. Nearly 50% of global population lacks access to adequately managed sanitation services and 29% lack a hand washing facility equipped with soap and water in their homes. If the current pace of advancement continues, it is projected that only 67% of the global population will have access to safe sanitation services by the year 2030, leaving 2.8 billion people without such services (WHO, 2023)

In 2015, about 70% of the population in sub-Saharan Africa still used unimproved health facilities. Now, progress in WASH is driven by the Sustainable Development Goals (SDG) targets 6.1 and 6.2, which aim to achieve, universal and equitable access to safely managed drinking water, sanitation and hygiene, and to put an end open defecation by 2030 (Angoua et al., 2018).

In Ethiopia, 11.4% of the households admit to open field defecation.15.6% of the households engage in unsafe disposal of child faeces(Abera et al., 2018). Despite the Ethiopia government's effort to improve WASH services and track progress towards the 2030 Sustainable Development Goal targets 6.1, 6.2, and 6.3, the population with access to improved sanitation has only increased from 28% to 31% (EMRO, 2017).

Inadequate sanitation practices significantly contribute to the spread of infectious diseases (Dreibelbis et al., 2013). Public knowledge and attitudes significantly influence the degree of safe sanitation practice (Ozdemir et al., 2011)

The understanding of sanitation practices at household level and the factors influencing them in Ethiopia remains in adequate (Kabito G et al., 2021). Following the introduction of health extension program and the subsequent implementation of community-led total sanitation and hygiene initiatives aimed at eradicating open defecation, there has been notable progress in the number of households gaining access to latrine facilities in Ethiopia (Girmay et al., 2023). However, to enhance the sustainability and advancement of sanitation in Ethiopia, particularly in this study area, the proportion of household sanitation practices and their determinant factors have never been reported. Understanding the state of sanitation practices in this area

would aid in achieving the SDGs, particularly Goal 6, which aims for universal access to basic sanitation, by directing the development of specific intervention initiatives to enhance family latrine usage. This study will fill the gap in information and provide a basis for proper intervention measures to improve sanitary conditions and subsequently community health in the study area.

Therefore, this study aims to assess household sanitation practices and the associated factors in Gola Oda Woreda, East Harerghe Zone, Eastern Ethiopia.

1.3. Significance of the study

This study provides essential baseline information on the household sanitation practices and related factors for Gola Oda Woreda Health office, East Hararghe Zonal Health office, Oromia regional health bureau and other governmental and nongovernmental organizations that working on sanitation program. The study findings aid healthy institutions and other organizations in pinpointing intervention area. The findings obtained from results will majorly benefit community; district and zone planning, implementation, monitoring, and evaluation of sanitation strategies and intervention.

1.4. Objectives

1.4.1. General Objective

The overall objective of the study was to assess the proportion of sanitation practice among households and identify associated factors in Gola Oda woreda, East Hararghe Zone, Eastern Ethiopia from September 19- October 6, 2024.

1.4.2. Specific Objectives

1. To determine the proportion of sanitation practice among households in Gola Oda woreda.
2. To identify factors associated with sanitation practice at household in Gola Oda Woreda.

2. LITERATURE REVIEW

2.1 Household Sanitation practice Conditions

In 2020, access to basic sanitation services remained a significant challenge, particularly in rural areas across the world. The data highlighted those two thirds of the world population without even basic service were living in rural areas. A substantial proportion of this population, nearly half, was located in countries within Sub-Saharan Africa. Moreover, the practice of open defecation was predominantly rural, with 92% of individuals engaging in this practice residing in rural areas (WHO and UNICEF, 2021).

The global community aims to eliminate open defecation by 2028 and achieve universal access to basic sanitation by 2030. However, as of 2020, 1.7 billion individuals still lacked even basic sanitation services, with 70% living in rural areas and 40% residing in the least developed countries (UN-Water, 2021).

In Ethiopia, the latest Joint Monitoring Program (JMP) by UNICEF and WHO reports that basic household sanitation coverage is estimated at 63%. Despite this progress, around 37% of the population, over 35 million people, still engage in open defecation, which has significant socio-economic impacts on communities (WHO and UNICEF, 2021).

By 2015, while 181 countries had at least 75% basic water supply coverage, only 154 countries had achieved the same level for basic sanitation. This discrepancy highlights a substantial sanitation gap, with 2.3 billion people lacking basic sanitation services compared to 844 million without basic water supply (FDRE, 2019).

A study conducted in Southern Ethiopia among households revealed that out of 630 surveyed households only 27.3% of them had improved sanitation facilities and only 64.5 % of household with improved sanitation facilities being used properly (Afework et al., 2022).

In Bugina Woreda, Amhara Region, a community-based cross-sectional study highlighted significant sanitation challenges. Only 23.6% of households had access to improved sanitation facilities, while 18.9% relied on unimproved latrines, and a notable 54.8% practiced open defecation. Handwashing facilities were inadequate, with less than half (41.2%) of the latrines having handwashing stations, and of those, 58.8% lacked water and soap. Only 62% of households washed their hands after using the latrine. Among households with children under five, 52.8% disposed of children's faeces unsafely, and 88.2% of households used latrines improperly (Amare, 2019).

A study conducted among rural households in Southern Ethiopia revealed that 67.1% of households utilized latrines (95% CI: 63.71, 70.49). The majority of these latrines (93.1%) were basic pits covered with wood logs and mud. In contrast, 5.3% were pits with cemented

slabs, and 1.6% were composting latrines. Notably, 63.35% of the latrines lacked slabs, and 88.1% were privately owned. Regarding hygiene, 56.2% of the latrines were adequately clean, but only 3.9% had handwashing facilities (Eyasu et al., 2022).

A study conducted in West Gojjam Zone, Amhara Region, Ethiopia, revealed that latrine utilization was at 48.9% (95% CI: 44, 54). More than two-thirds (70.9%) of the latrines did not have a squat hole cover, while only 29.1% had squat holes covered. Additionally, about two-thirds (61.4%) of the latrines had a door, but more than half (55.1%) lacked walls and roofs. In terms of hygiene, 42.9% of the latrines were considered hygienic, but 78.1% were not frequently cleaned (Abrham et al., 2021).

Research done in Rural Communities of Farta Woreda, Northwest Ethiopia, revealed that only 28.1 % of the household use sanitation facilities properly (Kassie and Hayelom, 2017).

A cross-sectional study in the Tigray region of Northern Ethiopia found that 89.2% of respondents recognized the importance of toilets in their households, with 42.2% revealed that good sanitation practices (Berhe et al., 2020).

2.2 Factors Associated with Sanitation Practice

2.2.1. Socio-demographic factors

A study conducted in Geshiyaro project study sites in Ethiopia., found that older household heads are more likely to have access to sanitation services, with an Adjusted Odds Ratio (AOR) of 1.8 (95% CI: 1.1, 2.5). Additionally, occupation of household heads impacted access to sanitation services, with those in formal sectors having better access (AOR: 2.0, 95% CI: 1.4, 2.8). And also larger family sizes were associated with higher access to sanitation services (AOR: 1.2, 95% CI: 1.1, 2.0) (Alemu et al., 2024). Furthermore, a systematic review analysis revealed that male-headed households had better access to sanitation compared to female-headed households (AOR: 1.4, 95% CI: 1.2, 1.9). Households with better-educated members were more likely to have access to proper sanitation (AOR: 1.7, 95% CI: 1.3, 2.2) (AOR: 1.7, 95% CI: 1.3, 2.2) (Novotny and Mamo, 2022).

Religious practices and beliefs also influenced the adoption of sanitation facilities in Bugina Woreda, Amhara Region, Northeast Ethiopia (AOR: 1.3, 95% CI: 1.0, 1.6) (Amare, 2019)

2.2.2. Knowledge on sanitation

A systematic review analysis done on household level sanitation and its associated factors in Ethiopia showed that households with good knowledge of sanitation practices were more likely to adopt proper facilities (AOR: 1.8, 95% CI: 1.4, 2.4) (Novotny and Mamo, 2022).

2.2.3. Attitudes towards sanitation

A study conducted in Southern Ethiopia among households identified that respondents with positive attitudes towards improved sanitation facilities were 6.71 more likely to use their facility appropriately than those who did not (Afework et al., 2022).

2.2.4. Environmental and latrine related factors

A study done in rural areas of Kenya, showed that the proximity of the latrine to the household affects its usage. Latrines that are too far from the home are less likely to be used regularly (AOR: 1.5, 95% CI: 1.0-2.3) (Eliud et al., 2023).

A research done in Gedeo Zone, South Ethiopia revealed that the quality of the latrine superstructure, such as having proper roofs and walls, ensures privacy and encourages usage (AOR: 3.1, 95% CI: 2.0-4.7) (Soboksa and Yimam, 2017).

A study conducted in Geshiyaro project study sites in Ethiopia, identified that owning a latrine was significantly increased the likelihood of proper sanitation practices, with an AOR of 2.2 (95% CI: 1.6, 3.0) Additionally, the study showed that the quality of the latrine's structure, including the roof and walls, impacted sanitation practices, with an AOR of 1.8 (95% CI: 1.3, 2.5). And also households that had latrines with proper doors for privacy were more likely to use them, with an AOR of 1.5 (95% CI: 1.1, 2.1) and the proximity of latrines to the household also played a role in their usage, with an AOR of 1.4 (95% CI: 1.0, 1.9) (Alemu et al., 2024).

2.2.5. Institutional support factors

A systematic review done on household level sanitation and associated factors revealed that professional support from health offices, including guidance and resources, contributes to improved sanitation practices (AOR: 2.8, 95% CI: 1.9-4.2)(Novotny and Mamo, 2022).

A study conducted in rural areas of Ethiopia identified that households visited by Health Extension Workers (HEWs) were 2.45 times more likely to implement better water treatment practices and have latrines compared to those who weren't visited. Additionally, households that received training under the Health Extension Program (HEP) were 3.12 times more likely to have proper hand-washing facilities and latrines. And also, the involvement of health office professionals increased the likelihood of proper water treatment and latrine availability by 1.88 times. This indicates that households supported by these professionals had better WASH practices than those without such support.(Alemu et al., 2023).

A study conducted in Geshiyaro project study sites in Ethiopia, indicated that regular follow-up by Health Extension Workers (HEWs) was associated with better sanitation practices (AOR: 2.0, 95% CI: 1.5, 2.7). Additionally, the results from this study showed that training

provided through the Health Extension Program (HEP) positively influenced sanitation practices (AOR: 1.8, 95% CI: 1.3, 2.4). And also support from health office professionals was crucial for maintaining sanitation services, with an AOR of 1.9 (95% CI: 1.4, 2.5) (Alemu et al., 2024).

2.3. Conceptual framework

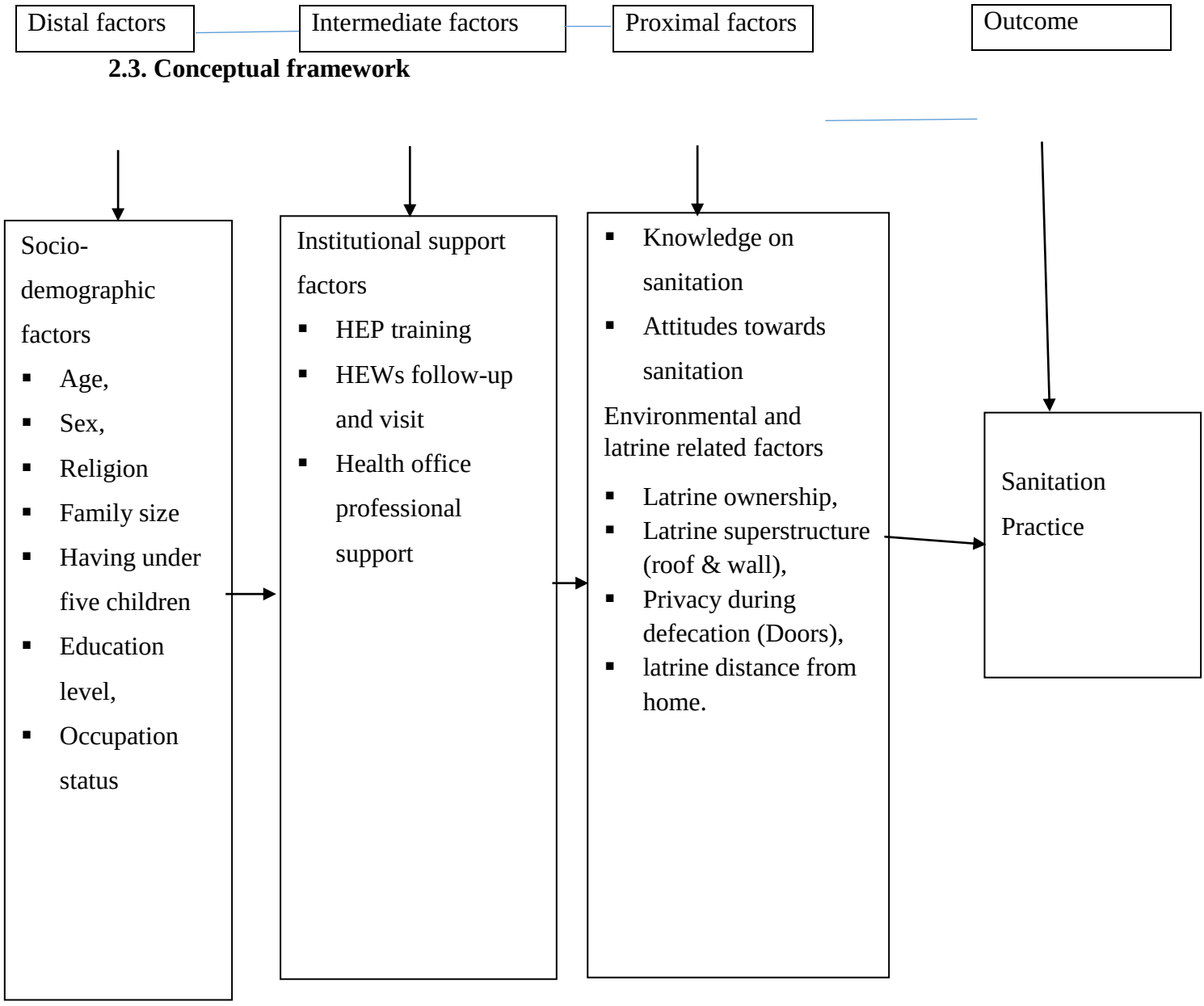

Figure 1 Conceptual framework that show factors associated with household sanitation practices in Gola Oda Woreda, Eastern Harerghe zone, Eastern Ethiopia (Constructed by principal investigator)

3. MATERILALS AND METHODS

3.1. Study Area and Study Period

The study was conducted at the Gola Oda woreda which is found in East Hararghe Zone, Oromia Regional State, Ethiopia. It is located at 660 km from Addis Ababa to the East part of Ethiopia. Gola Oda woreda bounded by Meyu woreda on the East, Melka Mebo and Oda Bultum woreda on the west, Kumbi woreda on the south and Bedeno woreda on the north. According to data obtained from the district health Office the projected population size of the woreda in 2023 is 128,149 and 26,655 households. The woreda has 18 kebeles. The total number of households with any type of toilet is 8,876(33.3% of the total households). 5 public health centers and 18 Health Posts are found in the woreda. The study was conducted from September 19- October 6, 2024.

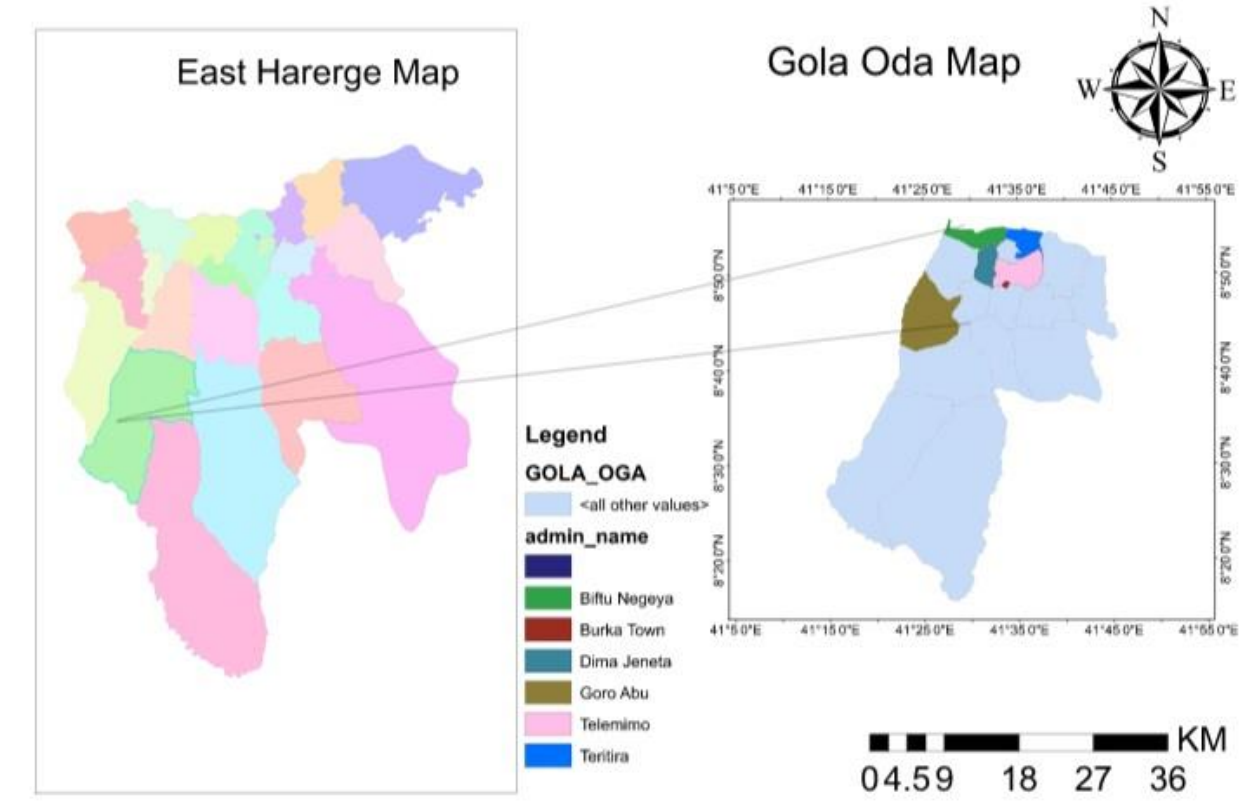

Figure 2 Map of Study Area, Gola Oda Woreda, East Harerghe Zone

3.2. Study design

A community based cross-sectional study

3.3. Population

3.3.1. Source Population

All households that had latrine in 18 kebeles of Gola Oda Woreda were a source population.

3.3.2. Study population

All selected households that had latrine in selected kebeles of Gola Oda woreda were the study population.

3.4. Inclusion criteria and exclusion Criteria

3.4.1. Inclusion Criteria

All selected household head or representatives with more than 18 years who had presented during data collection were included in the study.

3.4.2. Exclusion Criteria

Household heads or representatives who unable to communicate due to mental health issues or other illnesses and refused to participate were excluded from the study.

3.5. Sample size determination

For objective1: - The proportion of practices on sanitation at household.

The sample size for the first objective was determined using the formula for a single population proportion with the assumptions that 49.2% proportion (P) of good sanitation practice(Berhe et al., 2020),5% margin of error (d), 95% CI (Z = 1.96), design effect (D) of 1.2 and 10 non response rate. Thus, the sample size is determined by using single population proportion formula.

$$n = \frac{Z^2\alpha/2 \times P(1-P)}{(d)^2}$$

n is the sample size, $Z^2\alpha/2$ is the standard normal value at 95% confidence interval (CI) which is equal to 1.96 and d is margin of error 5%

By replacing the above formula $n = \frac{(1.96)^2 \times 0.492(1-0.492)}{(0.05)^2}$

Gives us a sample size ≈384

Then multiplying by a design effect of 1.2 and adding a 10% non-response rate, the final sample size was calculated to be:

n= (384X1.2+38) ≈498

Therefore, total sample size is ≈498

For objective 2: - Sample size for the second objective was calculated for some of the factors significantly associated with latrine utilization obtained from different kinds of literature by using the Statistical calculation of Epi info statistical software version 7 with the following assumption. By taking assumption of power 80%, 95% confidence interval, 10% for non-response, the design effect of 1.2 and the ratio of unexposed to exposed 1:1

Table 1 Sample size determination of the second objective for factors associated with sanitation practices

Variables	Proportion of exposure		Final sample size (including 10 % of non-response and DE 1.2)	Reference
	Not expose	Exposed		
Knowledge on latrine utilization	Utilized (15.9%)	Not utilized (28.9 %)	457	(Abrham et al., 2021)
Cleanliness of latrine	Yes (18.3%)	No (47.1 %)	125	(Woyessa et al., 2022)
Received information about constructing latrine	Yes (64.3%)	No (35.7 %)	141	(Asnake and Adane, 2020)

Therefore, sample size estimation for the first objective i.e., 498 is used because it provides larger sample size when compared to the second.

3.6. Sampling procedure and technique

A multistage sampling technique was used in the study. Six kebeles from 18 kebeles were randomly selected. The calculated sample size was allocated proportionally based on the total households that have toilet in each kebele. A systematic random sampling technique was used to select the sample number of households in each selected kebele to determine the proportion of the number of households. For systematic random sampling technique each kebele's community health information household list from health extension workers was used as a sampling frame and the sampling interval of households in each kebele is determined by dividing the total number of households to the allocated sample size. The subsequent households to be included in the study were identified systematically through house-to-house visit (since Kth = 8 (4102/498)), then randomly select the first sample between 1 and 8 and then select every 8 after the first sample was done. Then, data collectors were going to the selected household's resident to collect the required information from the head of the household or representative of the household.

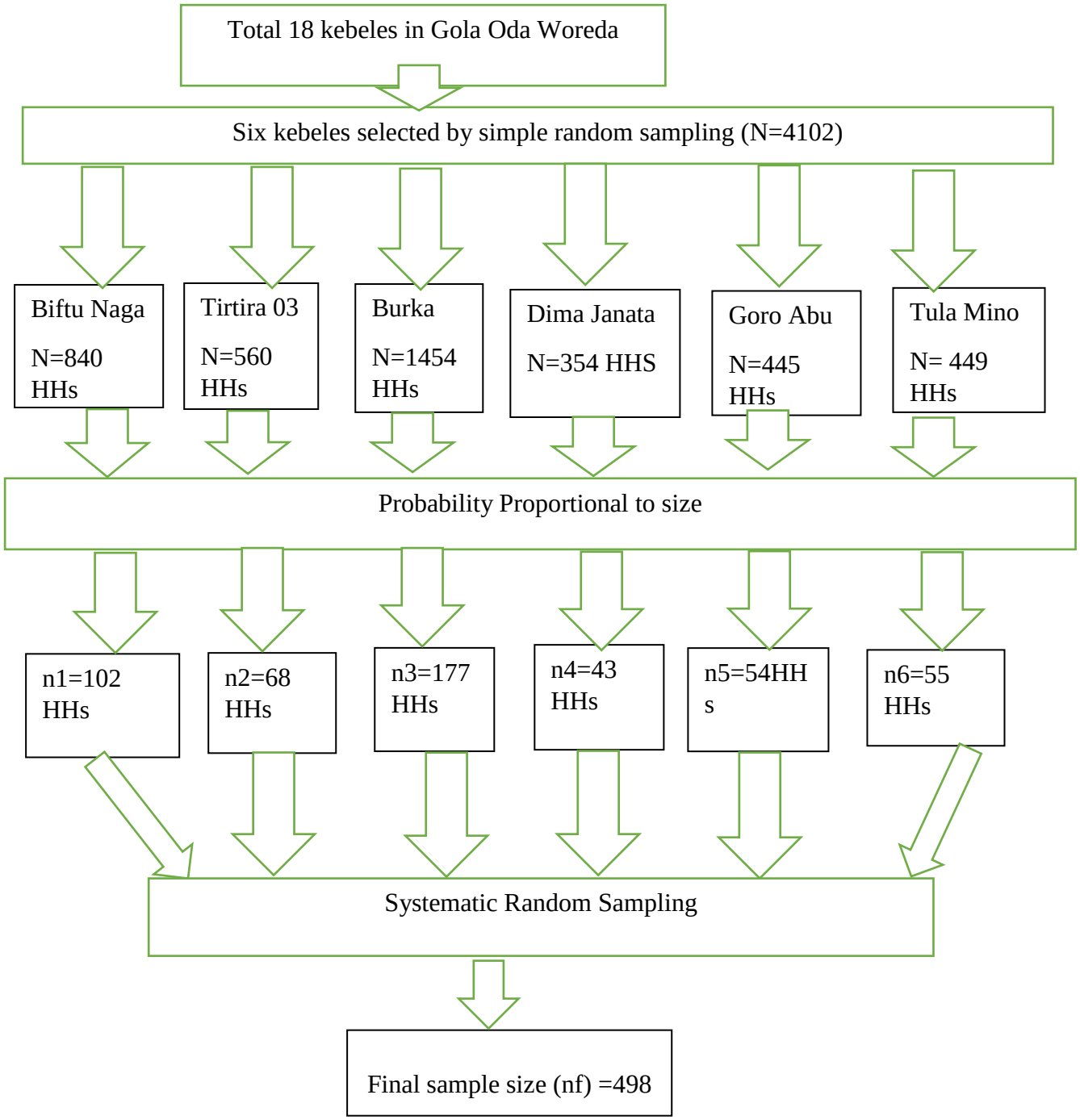

Figure 3: Schematic presentation of sampling technique for household sanitation practice and associated factors in Gola Ode Woreda, East Hararghe Zone, Eastern Ethiopia.

3.7. Data Collection Methods

3.7.1. Data collection instruments

The data was collected by using structured and pre-tested closed ended questionnaire and checklist through face-to-face interview and observation. The questionnaire was adopted and modified based on the available literature reviewed to elicit proportion and associated factors

of sanitation practice with the question designed to assess the household sanitation practices. Then, were contextually modified based on the concepts of WHO and UNICEF Core questions on drinking water and sanitation for household surveys (WHO and UNICEF, 2006)

The questionnaire was prepared in English and then translated to local language (Afan Oromo) and again translated to English for consistency.

3.7.2. Data collectors

To conduct the study, a team of four data collectors was deployed, comprising two experts from the Gola Oda Water and Energy Office with Level IV qualifications in Water Supply, and two environmental experts holding BSc degrees in Environmental Health. Two supervisors, one with a BSc in Public Health and the other with a BSc in Environmental Health, oversaw the data collection process. The principal investigator assumed overall responsibility for managing the data collection process, ensuring daily oversight of activities alongside the supervisors to guarantee the completeness and accuracy of the questionnaires.

A one-day training session was conducted by the principal investigator for both the data collectors and supervisors. This training covered the use of data collection tools and outlined the procedures to be followed during the study.

3.7.3. Procedure of data collection

The data was collected by using structured questionnaire through face-to-face interview and observation and the data collectors was randomly select the household from 1 to 8 households, the rests every respected 8^{th} until the final sample size is achieved and a written informed consent were obtained from each participant before the interview.

3.8. Variables

3.8.1. Dependent Variable:

Sanitation practice

3.8.2. Independent Variables:

1. Socio-demographic factors: - age, sex, religion, family size, having school aged children education level, occupation status
2. Institutional support factors: - HEWs follow-up, HEP training, Health office professional support.
3. Environmental and latrine relatedl factors: - Latrine ownership, Latrine superstructure (roof & wall), Privacy during defecation (Doors), latrine distance from home

4. Knowledge on sanitation
5. Attitudes towards sanitation

3.9. Operational Definitions

Sanitation Practice: Refers to the activities and behaviors adopted by households to maintain cleanliness and prevent the spread of diseases. This includes latrine use, availability of handwashing facility with water and soap and use it , safe disposal of child feces, maintaining cleanliness of the latrine and maintaining hygiene around the home(WHO, 2019b). These practices are evaluated through 11 specific questions, with each correct answer earning 1 point and each incorrect answer scoring 0 points. Households that achieve a score of 8 or higher out of 11 are classified as having good sanitation practices, while those scoring below 8 are considered to have poor sanitation practices (Kabito et al., 2021).

Improved Latrine: A sanitation facility that effectively separates human excreta from human contact. This includes pit latrines with a slab, ventilated improved pit latrines (VIP latrines), and other latrines with proper sanitation measures(WHO/UNICEF, 2018).

Unimproved Latrine: A sanitation facility that does not effectively separate human excreta from human contact. This includes pit latrines without a slab, open pits, and any facility that does not meet the criteria for an improved latrine(WHO/UNICEF, 2018).

Latrine Utilization: The consistent and appropriate use of latrines by all household members for defecation and disposal of human waste(WHO/UNICEF, 2018).

Handwashing Facility: A dedicated station equipped with water and soap for washing hands at critical times, after using the latrine, before eating or handling food and after cleaning a child who has defecated (WHO/UNICEF, 2018).

Safe Disposal of Child Feces: The practice of disposing of child feces in a manner that prevents contamination and spread of diseases. This includes disposing of feces in a latrine or burying them away from water sources and play areas(WHO/UNICEF, 2018).

Attitudes Towards Sanitation: The perceptions and feelings of household members regarding the importance of maintaining good sanitation practices. Positive attitudes are indicated by correctly answering 8 or more out of 11 related questions(Kabito et al., 2021).

Knowledge on Sanitation: The understanding and awareness of household members about sanitation practices and their importance. Good knowledge is indicated by correctly answering 7 or more out of 10 related questions(Kabito et al., 2021).

3.10. Data Quality Control

The questionnaire was originally prepared in English language and then translated to the local language (Afaan Oromoo) and again translated to English for consistency. The questionnaire was pre-tested on 5% of sample size (25 participants) before the actual data collection on respondents that were not included in the main study having similar characteristics with the study participants in Gola Oda woreda. The data collectors and supervisors were trained for one days particularly in the proper filling of a questionnaire, method of data collection, how to took observational measurements, ethical issues, and the purpose of the study. The selection of the right kind of data collectors and supervisors were done on their good work experiences, dedication, and previously involved in the study. Every day the collected data was reviewed and checked for completeness and consistency by supervisors and principal investigator. The principal investigator was guided the data collectors and supervisors through-out the process, make ongoing supervision of the data collection process. A discussion was made with the data collectors and supervisors every other day morning to minimize errors committed during the interview and to take corrective actions timely. All incomplete data were identified and a correction is made. Data entry format template was produced and programmed. To ensure accuracy and minimize errors, double data entry was carried out by two separate data clerks using Epi-Data version 3.1. Subsequently, the consistency of the entered data was rigorously verified by cross-checking the two independently entered datasets using SPSS version 25.

3.11. Methods of Data Analysis

The collected data were meticulously checked, coded, and entered into Epi-Data version 3.1 for initial processing. Subsequent data analysis was performed using SPSS version 25. Descriptive statistics were computed to determine the frequencies and percentages of sanitation practices, and the results were presented through figures and tables. Sanitation practices and related questions were illustrated using frequencies and percentages in tables.

To estimate confidence intervals (CI) for good sanitation practices, confidence intervals were calculated. The associations between dependent and independent variables were examined using both bivariate and multivariate logistic regression analyses. Bivariate and multivariate logistic regression models were computed to identify independent and dependent variables significantly associated with household sanitation practices. In the binary logistic regression analysis, variables with a P value ≤ 0.25 were included in the multivariable logistic regression model. In the multivariable logistic regression model, variables with a P value <0.05 were considered associated factors for household sanitation practices.

Both crude and adjusted odds ratios with a 95% confidence interval were calculated to assess the level of significance. Multi collinearity was checked, with the Variance Inflation Factor (VIF) and tolerance values for all independent variables found to be below 10, indicating acceptable levels of multi collinearity. The data were described using text and tables.

3.12. Ethical Consideration

The study protocol was reviewed and approved by the Institutional Health Research Ethics Review Committee (IHRERC) of Haramaya University, College of Health and Medical Sciences. Then, the college write an official letter to be presented to East Hararghe zone Health office for its awareness and official permission to undertake the study and again circular letter was written from zone to woreda. All the study participants were provided with information about the objective of the study. Finally, informed voluntary written and signed consent were obtained from the study participants before the interview on the title of the study, purpose of study, procedure and duration, risks and benefits of participating in the study, confidentiality and rights. The information obtained from clients was kept confidential. The study participants had the full right to refuse or terminate the interview at any time.

3.13. Information Dissemination

The results of the study will be presented both in hard and soft copies to Haramaya University, College of Health and Medical sciences and to school of Graduate studies as part of master of Water supply, Sanitation and hygiene management thesis, on top of that, the report will be shared to Gola Oda woreda Health office where they can use it as an input during planning for improvement of household sanitation practice and associated factors through intervention.

4. RESULTS

4.1. Socio-demographic Characteristics of respondents

A total of 484 participants were involved in the study, achieving a response rate of 97.2%. The majority of respondents were males (66.5%). The mean age (±SD) of the participants were 39.55±9.75 year. The predominant religion in the area was Islam, with a striking 99.2% of the population identified as Muslim. In terms of education, 76.7% of the population was literate. The primary occupation among respondents was farming, engaging 63.0% of the population. Most households had five and fewer than five members (67.8%) and 50.6% of households had children under the age of five (Table 2).

Table 2 Socio-demographic characteristics of household at Gola Oda woreda, East Harerghe zone, Oromia region, Eastern Ethiopia,2024.

Characteristics(n=484)	Category	Frequency	Percentage
Sex	Male	322	66.5
	Female	162	33.5
Age	≤ 34 years	184	38.0
	35-49 years	225	46.5
	≥50 years	75	15.5
Religion	Muslim	480	99.2
	Orthodox	3	0.6
	Protestant	1	0.2
	Other	0	0
Education status	Diploma and above	8	1.7
	Grade 9-12	24	5.0
	Grade 5-8	88	18.2
	Grade 1-4	251	51.9
	Illiterate	113	23.3
Occupation status	Housewife	101	20.9
	Farmer	305	63.0
	Daily labourer	22	4.5
	Merchant	47	9.7
	Other	9	1.9
Having under age of five children	Yes	245	50.6
	No	239	49.4

Household size	<5	328	67.8
	=>5	156	32.2

4.2. Institutional support factors

The results revealed that a majority of households, 64.7%, did not participate in HEP (Health Extension Program) training. Moreover, 66.3% did not receive follow-up visits from health extension workers related to sanitation. An overwhelming 98.6% of households did not receive any support from health offices or health professionals regarding sanitation. Additionally, 61.6% reported there was no enforcement to use latrines properly. On a more positive note, 95.7% of households were exposed to sanitation information through social media such as TV and radio (Table 7).

Table 3 Institutional support factors of household at Gola Oda woreda, East Harerghe zone, Eastern Ethiopia, 2024.

Variable(n=484)	Category	Frequency	Percentage
Participate in HEP training	Yes	171	35.3
	No	313	64.7
HEWs follow up and visit related to sanitation practice	Yes	163	33.7
	No	321	66.3
Receiving any sanitation practice support from woreda health professional	Yes	7	1.4
	No	477	98.6
Any enforcement to use latrine propely	Yes	186	38.4
	No	298	61.6
Exposure to media (Tv or radio)	Yes	463	95.7
	No	21	4.3

4.3. Knowledge on sanitation practice

A significant 60.5% knew that latrines are essential and obligatory for every household, and an overwhelming 94.0% understood the importance of latrine utilization. Similarly, 60.7% recognized the benefit of latrine use in reducing the population of flies, and 85.7% were aware of the health impacts of open defecation. An impressive 94.2% acknowledged the role of latrines in preventing diseases.

Further, 58.1% believed that open defecation attracts rodents and flies, while 63.2% understood that child feces contain disease-causing germs. Additionally, 89.1% knew that latrine utilization helps prevent environmental pollution. In terms of water contamination, 53.7% believed that open defecation contaminates water sources. Most notably, 95.5% of households recognized that improper disposal of liquid and solid waste can transmit diseases.

Overall, 56.6% of the households had good knowledge on sanitation and 43.4% of them had poor knowledge on sanitation (Table 4).

Table 4 knowledge of households on sanitation at Gola Oda woreda, Eastern Ethiopia, 2024

Variable (n=484)	Category	Frequency	Percentage
Knows latrine is essential for every household	Yes	293	60.5
	No	186	38.4
	Don't know	5	1.0
Knows the importance of latrine utilization	Yes	455	94.0
	No	26	5.4
	Don't know	3	0.6
Knows the benefit of latrine use to reduce flies' population	Yes	294	60.7
	No	185	38.2
	Don't know	5	1.0
Knows the health impact of open defecation	Yes	415	85.7
	No	64	13.2
	Don't know	5	1.0
Knows the benefit of latrine utilization to prevent disease	Yes	456	94.2
	No	26	5.4
	Don't know	2	0.4
Knows open defecation attracts rodents and flies	Yes	281	58.1
	No	200	41.3
	Don't know	3	068
Knows child faeces contain disease-causing germs	Yes	306	63.2
	No	173	35.7
	Don't know	5	1.0
Knows that latrine utilization prevents environmental pollution	Yes	431	89.1
	No	49	10.1
	Don't know	4	0.8
Believes that open defecation contaminates water sources	Yes	260	53.7
	No	218	45.0
	Don't know	6	1.2
Believes that improper disposal of liquid and	Yes	462	95.5

solid waste can transmit disease	No	17	3.5
	Don’t know	5	1.0
Knowledge on sanitation	Good	274	56.6
	Poor	210	43.4

4.4. Attitudes towards sanitation

The results indicate that a significant majority, 86.2%, strongly agreed that using a latrine is essential and obligatory for every household. Additionally, 83.9% strongly agreed that using latrines prevents diarrhea diseases. Conversely, 75.8% strongly disagreed with the notion that latrines are only important for rich people, and 63.4% strongly disagreed that latrines are only important for urban people.

Furthermore, 71.5% strongly disagreed that latrines are important for night use only. In terms of children's feces, 54.1% strongly disagreed that they are free from disease-causing germs. Regarding open defecation, 57.0% agreed that it attracts flies, and 71.7% agreed that it can pollute the environment.

Most respondents, 82%, disagreed that defecation in the bush or open space is more comfortable than using a toilet. Additionally, 42.4% agreed that defecation in the garden increases soil fertility and has no health impact. Lastly, 81.4% agreed that open defecation causes diarrheal disease. Overall, 54.5% of respondents had a positive attitude towards sanitation, while 45.5% had a negative attitude (Table 5).

Table 5 Attitudes of households towards sanitation in Gola Oda Woreda, East Harerghe zone, Eastern Ethiopia, 2024

Characteristics (n=484)	Strongly disagree		disagree, N (%)		Neutral, N (%)		Agree, N (%)		Strongly agree, N (%)	
	N	%	N	%	N	%	N	%	N	%
Using latrine is essential and obligatory for every HH.	3	0.6	31	6.4	1	0.2	35	7.2	414	85.5
Using latrine prevent diarrhea diseases.	4	0.8	12	2.5	4	0.8	58	12	406	83.9
Latrine is only important for rich people.	367	75.8	39	8.1	0	0	70	14.5	8	1.7
Latrines are only important for urban	307	63.4	16	3.3	2	0.4	157	32.4	2	0.4

people.										
Latrine is important for night use only	346	71.5	123	25.4	8	1.7	7	1.4	0	0
Children's feces are free from disease causing germs.	262	54.1	32	6.6	0	0	171	35.3	19	3.9
Open defecation attracts flies.	21	4.3	126	26.0	4	0.8	276	57.0	57	11.8
Open defecation can pollute the environment.	8	1.7	54	11.2	10	2.1	347	71.7	65	13.4
Defecation in the bush or open space is comfortable than toilet	14	2.9	10	2.1	3	0.6	397	82	60	12.4
Defecation in the garden increase soil fertility and has no health impact	193	39.9	75	15.5	0	0	205	42.4	11	2.3
Open defecation causes diarrheal disease	3	0.6	3	0.6	3	0.6	394	81.4	81	16.7
Over all attitudes towards sanitation										
Positive	264(54.5%)									
Negative	220(45.5%)									

4.5. Environmental and latrine related factors

The data revealed that a significant majority of households (93.0%) owned private latrines, and 92.4% had latrines with superstructures like roofs and walls. However, only 36.4% of households had privacy during defecation. Most latrines were located within 10 meters from the home for 8.7% of households. In terms of water supply, 92.8% of households used household tap water, but only 30.4% had a water source less than 1000 meters away. Additionally, a vast majority (90.7%) took more than 30 minutes to fetch water, and 53.5% reported having a water source available throughout the year. There was a strong social bias against open defecation, with 94.4% of households opposing it (Table 6).

Table 6 Environmental and latrine related factors of household at Gola Oda woreda, East Harerghe zone, Eastern Ethiopia, 2024.

Variables(n=484)	Category	Frequency	Percentage
Latrine ownership	Private	450	93.0
	Shared	34	7.0
Latrine superstructure (roof & wall)?	Yes	447	92.4
	No	37	7.6
Privacy during defecation (Doors)	Yes	176	36.4
	No	308	63.6
Latrine distance from home	≤10 meters	42	8.7
	>10 meter	19	3.9
Main source domestic water supply	Public tap water	449	92.8
	Household tap water	35	7.2
Distance to water source from home	≤1000 meters	147	30.4
	>1000 meters	337	30.2
Time taken to fetch water	≤30 minutes	45	9.3
	> 30 minutes	439	90.7
Availability of water source throughout the year	Yes	259	53.5
	No	225	46.5
Open defecation is culturally forbidden	Yes	457	94.4
	No	27	5.6

4.6 Household sanitation practice

The majority of households (57%) had improved latrines, with 72.7% reporting consistent use by all members. Nearly all households (99.4%) show signs of recent latrine usage and 72.2% safe disposal of child faeces. Additionally, 72.9% of households-maintained compounds free from visible faeces and urine. Over half of the households practiced hand washing after toilet use and maintained clean latrines, although only 3.1 had hand washing facilities with water hand soap. General cleanliness was observed in 69.2% of households, with proper waste disposal practices. Overall, 53.5% of households demonstrated good sanitation practices (Table 3).

Table 7 Sanitation practices of households at Gola Oda Woreda, East Harerghe Zone, Eastern Ethiopia, 2024.

Variables(n=484)	Category	Frequency	Percentage
Types of latrines	Improved latrine	276	57.0
	Unimproved latrine	208	43.0
Latrine utilization by all household members	Yes	352	72.7
	No	132	27.3
Fresh foot path to the latrine or fresh excreta inside the pit	Yes	481	99.4
	No	3	0.6
Safe disposal of child feces	Yes	177	72.2
	No	68	27.8
Feces and urine present around the house compound	Yes	131	27.1
	No	353	72.9
Hand washing after visiting toilet	Yes	263	54.3
	No	221	45.7
Cleanness of latrine	Clean	263	54.3
	Not clean	221	45.7
Hand washing facility with water and soap present	Yes	15	3.1
	No	469	96.9
Cleaning of house compound appropriately	Yes	335	69.2
	No	149	30.8
Dispose waste water properly	Yes	222	45.9
	No	262	54.1
Dispose solid wastes properly	Yes	335	69.2
	No	149	30.8
Overall sanitation practice	Good	259	53.5
	Poor	225	46.5

4.7. Factors associated with sanitation practice

The bivariate analysis revealed several factors significantly associated with sanitation practices at the household level, with a significance level of $p \leq 0.25$. These factors included household education status, household size, the presence of under-five aged children, latrine ownership, the presence of a latrine superstructure, latrine doors, and latrine squat hole, as well as the distance of the latrine from the home. Additionally, participation in the Health Extension Package training, follow-up visits by health extension workers, enforcement of sanitation practices, knowledge on sanitation, and attitudes towards sanitation were also identified as significant. These variables were identified as candidates for further examination in a multivariate logistic regression analysis (Table 8).

Table 8 Bivariate analysis of factors associated with sanitation practice at Gola Oda Woreda, East Harerghe Zone, Eastern Ethiopia,2024.

Variables (n=484)	Category	Sanitation Practices		COR	P-value
		Good: n (%)	Poor: n (%)		
Age	34 and under	109(59.2)	75(40.8)	1.574(0.92,2.70)	0.100
	35-49	114(50.7)	111(49.3)	1.113(0.66,1.88)	0.689
	50 and above	36(48.0)	39(52.0)	1	
Sex	Male	174(54.0)	148(46.0)	1.065(0.73,1.56)	0.744
	Female	85(52.5)	77(47.5)	1	
Education status	Diploma and above	6(75.0)	2(25.0)	6.417(1.23,33.36)	0.027*
	Grade 9-12	13(54.2)	11(45.8)	2.528(1.03,6.19)	0.042*
	Grade 5-8	39(44.3)	49(55.7)	1.702(0.96,3.03)	0.071
	Grade 1-4	165(65.7)	86(34.3)	4.104(2.55,6.59)	0.000*
	Illiterate	36(31.9)	77(68.1)	1	
Occupation status	Housewife	52(51.5)	49(48.5)	0.315(0.06,1.54)	0.154
	Farmer	160(52.5)	145(47.5)	0.971(0.15,6.24)	0.976
	Daily Laborer	17(77.3)	5(22.2)	0.274(0.05,1.46)	0.129
	Merchant	23(62.2)	24(37.8)	0.303(0.06,1.53)	0.149
	Other	7(77.8)	2(22.2)	1	
Household size	<=5	204(62.2)	124(37.8)	3.021(2.03,4.49)	0.000*
	>5	55(35.3)	101(64.7)	1	
Having under aged five children	Yes	109(44.5)	136(55.5)	0.476(0.33,0.68)	0.000*
	No	150(62.8)	89(37.2)	1	
Latrine ownership	Private	242(55.4)	195(44.6)	2.190(1.17,4.09)	0.014*
	Shared	17(36.2)	30(63.8)	1	
Presence of latrine	Yes	253(56.6)	194(43.4)	6.738(2.76,16.47)	0.000*
	No	6(16.2)	31(83.8)	1	

superstructure					
Presence of latrine doors	Yes	125(70.6)	52(29.4)	3.103(2.09,4.60)	0.000*
	No	134(43.6)	173(56.4)	1	
Presence of latrine squat hole	Yes	159(70.4)	67(29.6)	3.750(2.56,5.48)	0.000*
	No	100(38.8)	158(61.2)	1	
Latrine distance from home	<=10 meters	252(55.0)	206(45.0)	3.320(1.37,8.05)	0.008*
	>10 meters	7(26.9)	19(73.1)	1	
Major water source	Household tap water	17(48.6)	18(51.4)	0.808(0.41,1.61)	0.543
	Publik tap water	242(53.9)	207(46.1)	1	
Time to fetch water	<=30 minutes	19(42.2)	26(57.8)	0.606(0.33,1.13)	0.114
	>30 minutes	240(54.7)	199(45.3)	1	
Participate in HEP training	Yes	143(80.3)	35(19.7)	6.692(4.33,10.35)	0.000*
	No	116(37.9)	190(62.1)	1	
HEWs visit and follow-up	Yes	166(84.3)	31(15.7)	11.170(7.08,17.63)	0.000*
	No	93(32.4)	194(67.6)	1	
Enforcement to practice sanitation	Yes	159(78.7)	43(21.3)	6.730(4.4,10.20	0.000*
	No	100(35.5)	182(64.5)	1	
Open defecation is culturally forbidden	Yes	250(54.7)	207(45.3)	2.415(1.06,5.49)	0.035*
	No	9(33.3)	18(66.7)	1	
Knowledge on sanitation	Good	224(81.8)	50(18.2)	22.400(13.93,36.02)	0.000*
	Poor	35(16.7)	175(83.3)	1	
Attitudes towards sanitation	Positive	217(82.2)	47(17.8)	19.567(12.34,31.03)	0.000*
	Negative	42(19.1)	178(80.9)	1	

In multivariate logistic regression, household education status, presence of a latrine superstructure, follow-up visits by health extension workers (HEWs), knowledge on sanitation, and attitudes towards sanitation remained significantly associated with sanitation practices, with a significance level of $P < 0.05$. Education status emerged as a crucial determinant, with household heads possessing a diploma or higher education being 14.389 times more likely to practice good sanitation compared to illiterate household heads (AOR =

14.389, 95% CI: 1.74,118.80). Those who completed grades 9 to 12 were 4.034 times more likely to engage in good sanitation practices (AOR = 4.034, 95% CI: 1.13,14.40), and those with education levels between grade 1 to 4 were 2.361 times more likely (AOR = 2.361, 95% CI: 1.33,4.19). The presence of a latrine superstructure significantly increased the likelihood of good sanitation practices, making households 4.133 times more likely to have good practices (AOR = 4.133, 95% CI: 1.24-13.80). Regular follow-up visits from health extension workers were highly influential, with households receiving these visits being 13.452 times more likely to practice good sanitation (AOR = 13.452, 95% CI: 2.36-76.75). Knowledge of sanitation played a critical role, with households having good knowledge being 4.218 times more likely to practice good sanitation compared to those with poor knowledge (AOR = 4.218, 95% CI: 2.00-8.89). Additionally, households with positive attitudes towards sanitation were 3.927 times more likely to practice good sanitation compared to those with negative attitudes (AOR = 3.927, 95% CI: 1.89-8.15) (Table 9).

Table 9 Multivariate logistic regression of associated factors with sanitation practices at Gola Oda Woreda, East Harerghe zone, Eastern Ethiopia (n=484)

Variables	Category	Sanitation Practices		AOR (95%, CI)	P-Value
		Good: n (%)	Poor: n (%)		
Education status	Diploma and above	6(75.0)	2(25)	14.389(1.74,118.80)	0.013**
	Grade 9-12	13(54.2)	11(45.8)	4.034(1.13,14.40)	0.032**
	Grade 1-4	165(65.3)	86(34.7)	2.361(1.33,4.19)	0.030**
	Illiterate	36(31.9)	77(68.1)	1	
Household size	<5	204(62.2)	124(37.8)	1.721 (0.95,3.13)	0.075
	>=5	55(35.3)	101(64.7)	1	
Having under aged five children	Yes	109(44.5)	136(55.5)	0.594(0.34,1.04)	0.070
	No	146(61.1)	93(38.9)	1	
Latrine ownership	Private	242(55.4)	195(44.6)	1.465(0.57.3.80)	0.432
	Shared	17(36.2)	30(63.8)	1	
Presence of latrine superstructure	Yes	253(56.6)	194(43.4)	4.133(1.24,13.80)	0.021**
	No	6(16.2)	31(83.8)	1	
Latrine door	Yes	125(70.6)	52(29.4)	1.364(0.74,2.53)	0.324
	No	134(43.6)	173(56.4)	1	
Latrine squat hole	Yes	159(70.4)	67(29.6)	1.658(0.93,2.95)	0.084
	No	100(38.8)	158(61.2)	1	
Latrine distance from home	<=10 meters	252(55.0)	206(45.0)	1.645(0.37,7.31)	0.513
	>10 meters	7(26.9)	19(73.1)	1	
Participate in HEP training	Yes	143(80.3)	35(19.7)	0.628(0.21,1.86)	0.567
	No	116(37.9)	190(62.1)	1	
HEWs visit and follow-up	Yes	166(84.3)	31(15.7)	13.452(2.36,76.75)	0.003**
	No	93(32.4)	194(67.6)	1	
Enforcement	Yes	159(78.7)	43(21.3)	0.460(0.13,1.61)	0.224

to practice sanitation	No	100(35.5)	182(64.5)	1	
Open defecation is culturally forbidden	Yes	250(54.7)	207(45.3)	0.628(0.21,1.86)	0.402
	No	9(33.3)	18(66.7)	1	
Knowledge on sanitation	Good	224(81.8)	50(18.2)	4.218(2.00,8.89)	0.000**
	Poor	35(16.7)	175(83.3)	1	
Attitudes towards sanitation	Positive	217(82.2)	47(17.8)	3.927(1.89,8.15)	0.000**
	Negative	42(19.1)	178(80.9)	1	

Significant at, P<0.05=**

5. DISCUSSION

The study revealed that 53.5% (95% CI: 49.2%, 58.2%) of households exhibited good sanitation practices, demonstrating significant progress when compared to findings from other regions in Ethiopia. In the Tigray region of Northern Ethiopia, 42.2% of households demonstrated good sanitation practices (Berhe et al., 2020), while in Bugina Woreda, Amhara Region, only 11.8% of households utilized latrines properly (Amare, 2019). Similarly, in Southern Ethiopia, although 27.3% of households had improved sanitation facilities, only 64.5% of these households utilized the facilities properly (Afework et al., 2022). This suggests an improvement in sanitation practices in the study area compared to previous findings from similar rural settings, indicating that targeted interventions and education efforts may have been effective. Such improvement demonstrates the potential benefits of continued investment in sanitation programs for enhancing public health.

Household heads with education were significantly more likely to practice good sanitation compared to those without. Specifically, household heads with a diploma or higher education were 14.39 times more likely, those with grades 9-12 education were 4.03 times more likely (AOR = 4.03), and those with grades 1-4 education were 2.36 times more likely to practice good sanitation compared to illiterate household heads. This finding aligns with the literature indicating that households with better-educated members were more likely to have access to proper sanitation (Novotny and Mamo, 2022) The implication is that improving educational opportunities and literacy rates can significantly impact public health by promoting better sanitation behaviors.

The presence of a latrine superstructure significantly increased the likelihood of good sanitation practices, making households 4.133 times more likely to have good practices. This finding aligns with research conducted in the Gedeo Zone, South Ethiopia, which revealed that the quality of the latrine superstructure, such as having proper roofs and walls, ensures privacy and encourages usage(Soboksa and Yimam, 2017). The implication of these findings is clear: investing in the quality of latrine infrastructure is crucial for promoting good sanitation practices. Proper roofs, walls, and privacy features significantly enhance the likelihood that households will use and maintain latrines effectively. By improving the physical infrastructure of latrines, public health initiatives can reduce the incidence of sanitation-related diseases and enhance overall hygiene in communities. Therefore, continued investment in the construction and maintenance of high-quality latrines is essential for achieving better sanitation outcomes and improving public health.

Regular follow-up visits by health extension workers (HEWs) were strongly associated with better sanitation practices, making households 13.45 times more likely to have good practices This finding aligns with a study in rural areas of Ethiopia found that households visited by HEWs were 2.45 times more likely to implement better water treatment practices and have latrines compared to those who weren't visited (Alemu et al., 2023). Another study in the Geshiyaro project sites in Ethiopia revealed that regular follow-up by HEWs was associated with better sanitation (Alemu et al., 2024). The implication is that regular and effective follow-up by HEWs can significantly improve sanitation practices, indicating that strengthening HEW programs and increasing the frequency of follow-ups can greatly enhance public health outcomes.

Households with good knowledge of sanitation were more likely to practice good sanitation (AOR = 4.22). This finding aligns with a systematic review analysis which showed that households with good knowledge of sanitation practices were more likely to adopt proper facilities (Novotny and Mamo, 2022). Additionally, a study conducted in West Gojjam Zone found that less than half of the respondents had good knowledge of toilet use, and those with better knowledge were more likely to practice good sanitation (Abraham, 2021). Similarly, in the Tigray Region, a significant proportion of respondents recognized the importance of toilets and demonstrated sufficient knowledge of sanitation practices (Berhe et al., 2020).The implication is that increasing knowledge about sanitation practices can significantly improve sanitation behaviors. Educational campaigns and information dissemination are essential strategies for enhancing public health, as they equip households with the necessary knowledge to adopt and maintain good sanitation practices.

Positive attitudes towards sanitation were significantly associated with good practices (AOR = 3.93). This finding aligns with a systematic review analysis done on household level sanitation and its associated factors in Ethiopia, which identified that households with positive attitudes towards sanitation were more likely to use sanitation facilities (Novotny and Mamo, 2022) These studies indicate that fostering positive attitudes through community programs can motivate households to maintain high sanitation standards. The implication of this is that community-based programs that aim to shift attitudes and norms around sanitation can be effective in improving sanitation behaviors. By fostering positive attitudes, communities can work collectively towards better sanitation outcomes

5.1. Limitation of the study

Since it is cross sectional study, it is difficult to establish cause and effect relationship between dependent and independent variables. Recall bias is another limitation, since some of the question asked about the event in the past.

6. CONCLUSION AND RECOMMENDATIONS

6.1. Conclusion

This study revealed that just over half of the households in the study area practice good sanitation. However, a significant portion still faces challenges. Critical factors influencing sanitation behaviors include education, knowledge, attitudes, presence of latrine superstructure, and regular follow-up visits by health extension workers. Households with higher education levels, better sanitation knowledge, positive attitudes towards sanitation, well-constructed latrines, and regular engagement with health extension workers were more likely to maintain good sanitation standards. These factors highlight the importance of addressing educational gaps, improving infrastructure, and fostering positive attitudes to achieve better sanitation practices. The findings suggest that targeted efforts in these areas can lead to significant improvements in public health and reduce the risk of sanitation-related health problems. Addressing these key factors comprehensively is crucial for creating a healthier and more hygienic environment for the community.

6.2. Recommendations

For local authorities

1. Organize community meetings and workshops to raise awareness about good sanitation practices.

For Health Centers and Health Posts:

1. Implement targeted health education programs on proper sanitation and hygiene.
2. Provide training to health extension workers
3. Establish regular monitoring and evaluation of sanitation interventions.
4. Encouraging home to home visit by HEWs.

For Woreda Health Office:

1. Coordinate with local authorities, health centers, and stakeholders for a unified approach to sanitation.
2. Allocate resource efficiently for sanitation projects.
3. Support and monitor the implementation of the Health Extension Program (HEP).

For researcher

1. Conduct further studies on the factors influencing sanitation practices, incorporating larger sample sizes and diverse study designs to gain deeper insights.

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8. ANNEXES

8.1 Consent form

A. Participant Information sheet and informed voluntary consent form for head of household aged 18 years or older

My name is _____. I am working as a data collector for the study being conducted in this community by **Alemayehu Tsegaye** who is studying for his Master's degree at Haramaya University, College of Health and medical Sciences. I kindly request you to lend me your attention to explain you about the study and being selected as the study participant.

1. **The study title:** Household sanitation practice and associated factors in Gola Oda Woreda, East Hararghe Zone, Eastern Ethiopia
2. **Purpose of the study:** The findings of this study can be of a paramount importance for Oromia region, East Hararghe zone, and Gola Oda Woreda to plan intervention programs to improve the sanitation among households in the woreda and possible factors will be found in this study. Moreover, the aim of this study is to write a thesis as a partial requirement for the fulfilment of a Master's program in Water Supply Sanitation and hygiene Management for the principal investigator.
3. **Procedure and duration:** I will be interviewing you using a questionnaire to provide me with pertinent data that is helpful for the study. There are 60 questions to answer where I will fill the questionnaire by interviewing you. The interview will take about 35-50 minutes, so I kindly request you to spare me this time for the review.
4. **Risks and benefits:** The risk of being participated in this study is very minimal but only taking few minutes from your time. There would not be any direct payment for participating in this study. But the findings from this research may reveal important information for the local health planners.
5. **Confidentiality:** The information you will provide us will be confidential. There will be no information that will identify you in particular. The findings of the study will be general for the study community and will not reflect anything particular of individual person or housing. The questionnaire will be coded to exclude showing names. No reference will be made in oral or written reports that could link participants to the research.
6. **Rights:** Participation for this study is fully voluntary. You have the right to declare to participate or not in this study. If you decide to participate, you have the right to withdraw from the study at any time and this will not label you for any loss of benefits which you

otherwise are entitled. You do not have to answer any question that you do not want to answer.

7. Contact address: If there are any questions or enquires any time about the study or the procedures, please contact:

Alemayehu Tsegaye: Mobile number (+251)-935-97-22-49

Email Address alemtsaga455@gmail.com

8. Declaration of informed voluntary consent:

I have read/ was read to me the participant information sheet. I have clearly understood the purpose of the research, the procedure, the risks and benefits, issues of confidentiality, the rights of participating and contact address for any queries. I have been given the opportunity to ask questions for things that may have been unclear. I was informed that participants have the right to withdraw from the study at any time or not to answer any question that they do not want. I am also informed that the institution has the right to stop this study from being conducted in the institution if any misdeeds and unethical procedures are observed during the data collection process in the institution promises. Therefore, I declare my voluntary consent to on behalf of town for this study to be conducted with my initials (signature) as indicated below.

Name and signature of participant: _____ Date _____

Name and signature of Data Collector: _____ _____ Date _____

B. Participant Information sheet and informed voluntary consent form for head of household under 18 years of age

My name is _____. I am working as a data collector for the study being conducted in this community by **Alemayehu Tsegaye** who is studying for his Master's degree at Haramaya University, College of Health and medical Sciences. The head of household of this family is randomly selected to be a participant in this study. I kindly request you to lend me your attention to explain you about the study and head of household participation.

1. **The study title:** Household sanitation practice and associated factors in Gola Oda Woreda, East Hararghe Zone, Eastern Ethiopia
2. **Purpose of the study:** The findings of this study can be of a paramount importance for Oromia region, East Hararghe zone, and Gola Oda Woreda to plan intervention programs to improve the sanitation among households in the woreda and possible factors will be found in this study. Moreover, the aim of this study is to write a thesis as a partial requirement for the fulfilment of a Master's program in Water Supply Sanitation and hygiene Management for the principal investigator.
3. **Procedure and duration:** I will be interviewing he/she using a questionnaire to provide me with pertinent data that is helpful for the study. There are 60 questions to answer where I will fill the questionnaire by interviewing him/her. The interview will take about 35-50 minutes, so I kindly request you to spare me this time and allow me for interviewing him/her.
4. **Risks and benefits:** The risk of being participated in this study is very minimal but only taking few minutes from his/her time. There would not be any direct payment for participating in this study. But the findings from this research may reveal important information for the local health planners.
5. **Confidentiality:** The information he/she shall provide us will be confidential. There will be no information that will identify he/she in particular. The findings of the study will be general for the study community and will not reflect anything particular of individual person or housing. The questionnaire will be coded to exclude showing names. No reference will be made in oral or written reports that could link participants to the research.
6. **Rights:** Participation for this study is fully voluntary. He/she has the right to declare to participate or not in this study. If he/she decides to participate, he/she has the right to

withdraw from the study at any time and this will not label he/she for any loss of benefits which he/she otherwise are entitled. He/she does not have to answer any question that you do not want to answer.

7. Contact address: If there are any questions or enquires any time about the study or the procedures, please contact:

Alemayehu Tsegaye: Mobile number (+251)-935-97-22-49

Email Address alemtsaga455@gmail.com

8. Declaration of informed voluntary consent:

I have read/ was read to me the participant information sheet. I have clearly understood the purpose of the research, the procedures, the risks and benefits, issues of confidentiality, the rights of participating and the contact address for any queries. The opportunity has been given to him/her to ask questions for things that may have been unclear. I was informed that he/she has the right to withdraw from the study at any time or not to answer any question that he/she does not want. Therefore, I declare my voluntary consent to allow a head household of this family to participate (be involved) in this study with my signature.

Name and signature of parental/guardian: _____ Date _____

Name and signature of Data Collector: _____ _____ Date _____

8.2 English version questionnaire

Title: - Household sanitation practice and associated factors in Gola Oda Woreda, East Hararghe Zone, Eastern Ethiopia

Name of kebele _____

Code of participant_____ date_____

Name of data collector _____Signature _____

Name of supervisor_____ Signature _____

Part I: Socio-demographic characteristics of respondents

No	Variable	Response	skip
101	What is the age of the respondent?	_____years	
102	what is the sex of the respondent?	1-Male 2-Female	
103	what is religion of the head of the household?	1-Muslim 2-Orthodox 3-Protestant 3-Other(specify)-----	
104	What is the educational status of the respondent?	1. Illiterate (can't read & write) 2. Grade 1-4 3. Grade 5-8 4. Grade 9-12 5. Diploma and above	
105	What is the occupational status of the respondent?	1. Housewife 2. Farmer 3. Daily labourer 4. Merchant 5. Other, (specify) _____	
106	Household size	_____	
107	Do you have under five-year aged children?	1. Yes 2. No	

Part II Household sanitation practice

Ser No	Statement	Response	Skip
201	Latrine availability	1. Yes 2. No	
202	Types of latrine	1. Pit latrine with slab 2. Ventilated pit latrine 3. Pit latrine without slab 4. Other(specify)_____	
203	Do all the household members utilize latrine?	1. Yes 2. No 3. I don't know	
204	Is there fresh foot path to the latrine or fresh excreta inside the pit (observe)?	1. Yes 2. No	
205	Child feces disposed into the toilet or buried appropriately (Observe)	1. Yes 2. No 3. I don't know	
206	Feces and urine present around the house compound (Observation)	1. Yes 2. No	
207	Do you wash your hand with soap after visiting toilet?	1. Yes 2. No	
208	What is/are the anal cleansing material do you use?	1. solid (soft, paper, plant leaf) 2. water 3. other (specify)_____	If your answer is No, skip to Q.211
209	If your answer to Q.209 is 1, do you manage separately or properly that solid anal cleaning materials?	1. Yes 2. No	

210	Frequency of cleaning latrine	1. Daily 2. Twice per week 3. Never 4. Other (specify) _____	
211	Cleanliness of latrine(observation)	1. Clean 2. not lean	
212	Does a toilet have a hand washing facility with water and soap? (observation)	1. Yes 2. No	
213	Do you clean your compound appropriately or periodically? (Observation)	1. Yes 2. No 3. I don't know	
214	Do you dispose the waste water generated from house properly? (Observation)	1. Yes 2. No 3. I don't know	
215	Do you dispose solid wastes properly?	1. Yes 2. No 3. I don't know	

Part III: knowledge on sanitation practice

Please note that: Yes=1 No=2, I don't know=3

Ser No	Statements	1	2	3
301	Do you know that latrine is essential and obligatory to every household?			
302	Do you know the importance of latrine utilization?			
303	Do you know benefit of latrine use to reduce flies Population?			
304	Do you know the health impact of open defecation?			
305	Do you know the benefit of latrine utilization to prevent disease?			
306	Do you think that open defecation can attracts rodents and fly?			
307	Do you think that child faeces contain disease causing germs?			
308	Do you know think latrine utilization prevents environmental pollution?			
309	Do you think open defecation contaminate water source?			
310	Do you think that improper disposal of liquid and solid waste can transmit disease?			

Part IV: Attitudes towards sanitation practice

I would like to ask about your personal attitude towards sanitation practice. What is your level of agreement with the following statements?

Please note that for strongly agree=5, agree=4, undecided=3, disagree=2, strongly disagree=1

Ser No	Statement	1	2	3	4	5
401	Using latrine is essential and obligatory for every HH.					
402	Using latrine prevent diarrhea diseases.					
403	Latrine is only important for rich people.					
404	Latrines are only important for urban people.					
405	Latrine is important for night use only					
406	Children's feces are free from disease causing germs.					
407	Open defecation attracts flies.					
408	Open defecation can pollute the environment.					
409	Open defecation causes diarrheal disease.					
410	Defecation in the bush or open space is comfortable than in toilet					
411	Defecation in the garden increase soil fertility and have no any health impact					

Part V: Environmental and latrine related factors

Ser No	Statement	Response	Skip
501	Latrine ownership	1. Private 2. Shared	
502	Does the latrine have superstructure (roof & wall)? (observation)	1. Yes 2. No	
503	Does the latrine have doors that can provide privacy during defecation? (observation)	1. Yes 2. No	
504	Does the latrine have squat hole suitable to sit during defecation? (observation)	1. Yes 2. No	
505	Latrine distance from the home	_____ meter	
506	What is the major source of your domestic water supply?	1. Hand-dug well 2. Borehole 3. Public tap water 4. Household tap water 5. River 6. Other (specify) _____	
507	How far is the water source from your home?	2. <500m 3. 500m-1000m 4. >1000m	
508	How much is time taken for round trip including queuing time to fetch the water?	1. <30min 2. 30min-1hr 3. >1hr	

509	Do water present throughout the year?	1. Yes 2. No	
510	Is open defecation culturally forbidden?	1. Yes 2. No 3. I don't know	

PART VI: Institutional support factors

Ser No	Statements	Response	Skip
601	Have you participated in HEP training?	1. Yes 2. No 3. I don't know	
602	Is health extension worker follow up and visit related to sanitation?	1. Yes 2. No 3. I don't know	
603	Have you received any support from health office or health professional related to sanitation?	1. Yes 2. No 3. I don't know	
604	If you answer to Q.503 is yes, what types of support? (Specify)		
605	Is there any enforcement/advice to use latrine?	1. Yes 2. No 3. I don't know	

C. Participant Information sheet and informed voluntary consent form for head of household aged 18 years or older (Afan Oromo version)

Maqaan kiyya _____jedhama. Barataa Mastarii Yunivarsitii Haramaayaa damee Fayyaa kan ta'e Obbo Alamaayyoo Tsaggaayee qorannoo hawasaa kana kessatii godhuuf isin birati ergamera.Anis odeffannoo qorannoo isaanii kanaaf ragaa barbachisuu funanaa jira.kanafiis qorannoo kana irratti akkaa hirmataan waan filatamtaniif waa'ee qorannoo kanaa akkaa isinitti himuuf xiyyeefannoon akkaa na dhageefatanin isin gafadhaa**.**

1. Maqaa qorannoo: Itti fayyadama mana fincaani fi wantoota dhibbaa uuman irratti abbaa warraa aanaa Gola Oda irratti qorannoo gaggeessuuf kan qopha'ee dha.

2. Kaayyoo qorannoo kanaa: Ragaan qorannoo kana irra argamu biiroo eegumsa fayyaa fi qaamoollee dhimmi Kun ilaalatu hundaaf, kana irratti hundaa'anii sagantaa qulqullina naannoo itti makfamuu dandahu, akkasumas sagantaa ittiin haala gochaa hubannoo qulqullina fayyaa fi dhiyeesssiilee kanaaf barbaachisan foyyeesuuf akkasumas dhukkuba sababa qulqullina tajaajila hawaasaa irraa nama qaban ittisuuf rakkoowan jiran foyyeesuuf gargaaruu danda'a.

3. Akkaata qorannoon Kun itti gaggeefamuu fi dheerina yeroo inni fudhatuu: Gaaffiin isin gaafadhu gaaffiilee 60 yoo ta'an odeeffannoo gahaa akkan ani qorannoo kanaaf argadhuf kan na gargaaru dha. Walumaagalatti af-gaaffiin kun yoo baay'ate daqiiqaa 35-50 fudhata. Kanafuu,af-gaaffii isin waliin tasiisuu kanaf yeroo keessan irraa aarsa gotanii akka naaf kennitanii kabajaan isin gaafadha.

4. Midhaa fi faayida: Qorannoo kana irratti hirmaachuun keessaniin rakkoo isin qunnamu hin jiru. Garuu, yeroo xiqqoo isin irraa fudhachuun isaa hin oolu. Qorannoo kan irratti hirmaachuudhaf qarshiin/kafaltiin kennamu hin jiru. Haa ta'u malee bu'aan qorannoo kana irraa argamu qaama karoora baasuu fi dhimmichi ilaalatuu hundaaf fayidaa kennuu danda'a.

5. Iccittii qorannoon kun itti eegamu: Ragaan nuti qorannoo kanaaf funnaannu icitiin isaa ni eegama.Ragaan kammiyuu maqaa keessaniinis ta'ee maqaa mana keessaniin walitti hin qabamu.Ragaan qorannoo kanaas faayidaa qorannoo kana qofaf oola. Akkasumas gaaffillee

kana hundaaf lakkoofsa addaa iccitii kan kennamu yoo ta'uu ragaa argame irratti hirmaatan akka wabiitti hin eeramu.

6. Mirga: Qorannoo Kan irratti hirmaachuunis hirmaachuu dhabuunis fedhii keessan irratti hunda'a. Hirmaachuuf yoo murteesitanis yeroo barbaadan adda kutuu ni dandeessuu.

7. Teessoo qorataa: Qorannoo kanaan wal qabatee yoo gaafii qabattan gaggeessaa qorannoo kanaa kan ta'an **Alamaayyoo Tsaggaayee** bilbila 0935972249 fi email alemtsaga455@gmail.com irrattti argachuu ni dandeessuu. Akkasumas Yuuniveersiitii Haramayaa garee dhaabbata qorannoo fayyaa biratti bilbila 0256661899 bilbiluudhan qunnamu ni dandeessuu. Akkasumas Postaa 235 Harar, jettani erguu ni dandeessuu.

8. Qorannoo kana irratti fedhiin hirmaachuu: Barreefama kana dubbiseen/naaf dubbifamee jira.Waan barreeffame hundi sirriti naaf galee jira. Kaayyoon qorannoo kanaa, akkaataa ragaan itti funaanamu, bu'aa fi miidhaa qorannoo, ragaan kun iccitii/dhoksaan qabamuu isaas, mirgi kiyyaas akkasumas yoon gaaffii qabadhe naman gaafadhu/qunnamu naaf dubbifame/dubbisee naaf galee jira. Kana hunda hubachuudhan fedhii kiyyaan qorannoo kana irratti hirmachuu akka danada'u mallattoo kiyyaanin ibsa.

Maqaa hirmaata/Abba ykn Haadha warra_____Mallattoo _____Guyyaa _____

Maqaa yaada funaanaa (tuu): _____ Mallattoo: _____ Guyyaa_____

D. Participant Information sheet and informed voluntary consent form for head of household under 18 years of age (Afan Oromo version)

Maqaan kiyya _____jedhama. Barataa Mastarii Yunivarsitii Haramaayaa damee Fayyaa kan ta'e Obbo Alamaayyoo Tsaggaayee qorannoo hawasaa kana kessatii godhuuf isin birati ergamera.Anis odeffannoo qorannoo isaanii kanaaf ragaa barbachisuu funanaa jira.kanafiis qorannoo kana irratti akka hirmataan abba warraa/haadha warra maatii kana waan filatamaniif waa'ee qorannoo kanaa akkaa isinitti himuuf xiyyeefannoon akkaa na dhageefatanin isin gafadhaa**.**

1. Maqaa qorannoo: Itti fayyadama mana fincaani fi wantoota dhibbaa uuman irratti abbaa warraa aanaa Gola Oda irratti qorannoo gaggeessuuf kan qopha'ee dha.

2. Kaayyoo qorannoo kanaa: Ragaan qorannoo kana irra argamu biiroo eegumsa fayyaa fi qaamoollee dhimmi kun ilaalatu hundaaf, kana irratti hundaa'anii sagantaa qulqullina naannoo itti makfamuu dandahu, akkasumas sagantaa ittiin haala gochaa hubannoo qulqullina fayyaa fi dhiyeesssiilee kanaaf barbaachisan foyyeesuuf akkasumas dhukkuba sababa qulqullina tajaajila hawaasaa irraa nama qaban ittisuuf rakkoowan jiran foyyeesuuf gargaaruu danda'a.

3. Akkaata qorannoon Kun itti gaggeefamuu fi dheerina yeroo inni fudhatuu: Gaaffiin isaa/ishee gaafadhu gaaffiilee 60 yoo ta'an odeeffannoo gahaa akkan ani qorannoo kanaaf argadhuf kan na gargaaru dha. Walumaagalatti af-gaaffiin kun yoo baay'ate daqiiqaa 35-50 fudhata. Kanafuu,af-gaaffii isaa/ishee waliin tasiisuu kanaf yeroo isaa/ishee irraa aarsa gote akka naaf kennuu/kennituun kabajaan gaafadha.

4. Midhaa fi faayida: Qorannoo kana irratti hirmaachuun rakkoo isaa/ishee qunnamu hin jiru. Garuu, yeroo xiqqoo isaa/ishee irraa fudhachuun isaa hin oolu. Qorannoo kan irratti hirmaachuudhaaf qarshiin/kafaltiin kennamu hin jiru. Haa ta'u malee bu'aan qorannoo kana irraa argamu qaama karoora baasuu fi dhimmichi ilaalatuu hundaaf fayidaa kennuu danda'a.

5. Iccittii qorannoon kun itti eegamu: Ragaan nuti qorannoo kanaaf funnaannu icitiin isaa ni eegama.Ragaan kammiyuu maqaa isaa/isheetinis ta'ee maqaa mana isaa/isheen walitti hin

qabamu.Ragaan qorannoo kanaas faayidaa qorannoo kana qofaf oola. Akkasumas gaaffillee kana hundaaf lakkoofsa addaa iccitii kan kennamu yoo ta'uu ragaa argame irratti hirmaatan akka wabiitti hin eeramu.

6. Mirga: Qorannoo Kan irratti hirmaachuunis hirmaachuu dhabuunis fedhii isaa/ishee irratti hunda'a. Hirmaachuuf yoo murteessaniis yeroo barbaadan adda kutuu ni danda'u.

7. Teessoo qorataa: Qorannoo kanaan wal qabatee yoo gaafii qabattan gaggeessaa qorannoo kanaa kan ta'an **Alamaayyoo Tsaggaayee** bilbila 0935972249 fi email alemtsaga455@gmail.com irrattti argachuu ni dandeessuu. Akkasumas Yuuniveersiitii Haramayaa garee dhaabbata qorannoo fayyaa biratti bilbila 0256661899 bilbiluudhan qunnamu ni dandeessuu. Akkasumas Postaa 235 Harar, jettani erguu ni dandeessuu.

8. Qorannoo kana irratti fedhiin hirmaachuu: Barreefama kana dubbiseen/naaf dubbifamee jira.Waan barreeffame hundi sirriti naaf galee jira. Kaayyoon qorannoo kanaa, akkaataa ragaan itti funaanamu, bu'aa fi miidhaa qorannoo, ragaan kun iccitii/dhoksaan qabamuu isaas, mirgi kiyyaas akkasumas yoon gaaffii qabadhe naman gaafadhu/qunnamu naaf dubbifame/dubbisee naaf galee jira. Kana hunda hubachuudhan abba warra/ haadha warra maatii kana ta'e qorannoo kana irratti hirmachuu akka danada'u fedhii kiyyan hayyama koo mallattoo kiyyaanin ibsa.

Maqaa maatii/guddiftuu_____Mallattoo _____Guyyaa _____

Maqaa yaada funaanaa (tuu): _____ Mallattoo: _____ Guyyaa_____

8.3. Afan Oromo version questionnaire

Abba warra aanaa Gola Odaa biratti itti fayyadama mana fincaanii fi wantoota dhibbaa uuman

Maqaa Araddaa_____

Koodii Hirmaataa _____ Guyyaa_____

Maqaa nama ragaa funanee _____Mallattoo _____

Maqaa suppervaayizaraa _____ Mallattoo_____

Kutaa I: Odeeffannoo waa'ee hawaasummaa fi dhuunfaa

Lakk	Safartuulee	Deebii	Isa itti aanutti darbi
101	Umrii kee waggaa meeqa?	_____ waggaan	
102	Koorniyaa	1-dhiira 2-dubara	
103	Amantii kee maali?	1-muslima 2-orthodoksii 3-Protentantii 3-kan biraa(ibsi)_____	
104	Sadarkaa barumsa kee hangami?	1. kan hin baranne 2. barnoota idilee alaa 3. Kutaa 1-8 4 .Kutaa 9-12 5 Dippilooma fi isaa ol	
105	Maatii keessatti gaheen keessan maali?	1. haadha manaa 2. Qote bula 3. hojjataa guyyaa	

		4. daldalaa/ttuu 5. Kan biroo _____	
106	Matii meeqatu mana kana keessa jirata?	_____	
107	Da'imma umrii waggaa 5 gadii ni qabdu?	1. Eeyyee 2. Lakkii	
108	Madda galii keessanii ji'an meeqa?	Qarshii _____	

KUTAA II: **Itti fayyadama mana fincaani irratti abbaa warraa maal fakkaatu?**

Lakk	Safartuulee	Deebii	Kan itti aanu darbi
201	Manni fincaani qabataman ni jira?	1. Eeyyee 2. Lakkii	
202	Gosa mana fincaani	1.Mana fincaanii boollaa slab qabu 2.Mana fincaanii boollaa qilleensa qabu 3.Mana fincaanii boollaa slab hin qabne 4.Kan biroo(ibsi)_____	
203	Miseensotni maatii hundi mana fincaani ni fayyadamu?	1. Eeyyee 2. Lakkii 3 Hin beekuu	
204	Karaan haarayni fincaanitti geessu yookiin boolla mana fincaanii keessa udaan haarayni ni jira?(Daawwii)	1. Eeyyee 2. Lakkii	
205	Udaan da'immaa mana fincaanitti ni gatama yookiin sirriitti ni awwalama?	1. Eeyyee 2. Lakkii 3 Hin beekuu	
206	Naannawa mana jireenyatti fincaani fi udaan ni	1. Eeyyee 2. Lakkii	

	mul'ata(Dawwii)		
207	Erga mana fincaanii fayyadamtan booda harka keessan saamunan ni dhiqaatu?	1. Eeyyee 2. Lakkii	
208	Erga mana fincaani fayyadamtan bood udduu keessan keessan maalin qulqulleeffatu?	1 Jajjaboo 2 Bishaan 3 Kan biro(ibsi)_____	
209	Gaaffii 209'f deebii keessan 1, yoo ta'ee balfaa isaa sirriitti ni dhabbamsiiftuu?	1. Eeyyee 2. Lakkii	
210	Mani fincaani yeroo hangam hangamiin qulqulla'a?	1.Guyyaa guyyaan 2.Torbeen 3 Darbee darbee 4 Gonkummaa 5 kan biro(ibsi)_____	
211	Qulqullina mana fincaanii	1 Qulqullu 2 Qulqullu miti	
212	Iddoon haka dhiqaana bishaani fi saamuna qabu ni jira?(Dawwii)	1. Eeyyee 2. Lakkii	
213	Naannoon mana jireenya yeroo yeroon ni qulqulleeffama (Dawwii)	1. Eeyyee 2. Lakkii 3 Hin beekuu	
214	Balfii dhaangala'an haala gaariin ni gatama(Daawwii)	1. Eeyyee 2. Lakkii 3 Hin beekuu	
215	Balfaa gogaa haala gaariin ni dhabbamsiifama(daawwii)	1. Eeyyee 2. Lakkii 3 Hin beekuu	

KUTAA III: Beekumsa abbaan warraa mana fincaani irratti qaban

Deebii keessan “Eeyyeef 1” “Lakkiif 2””Hin beekuuf 3” jechuun deebisaa.

Lakk	Safartuulee	1	2	3
301	Abbaa warraa hundaaf mani fincaanii barbaachisaa fi dirqama ta'uu ni beektaa?			
302	Barbaachisummaa itti fayyadama mana fincaanii ni beektaa?			
303	Faayidaa itti fayyadamni mana fincaanii wal hormaata titisa hir'isuuf qabu ni beektaa?			
304	Dhibbaa udaan dirree irratti ta’un fayyaa irratti qabu ni beektuu?			
305	Faayidaa itti fayyadamni mana fincaanii dhukkuba ittisuuf qabu ni beektaa?			
306	Udaan diree irratti ba’un tittisi akka haala mijjawa uumu ni beektaa?			
307	Udaan da’imma jarmoota dhukkuba fidan of keessa akka qabu ni beekta?			
308	Itti fayyadamni mana fincaanii faalama naannoo akka ittisuu ni beekta?			
309	Udaan diree irratti ta’uun madda bishaanii akka faalu ni beekta?			
310	Balfaa jiidha fi gogaa haala sirrii tanen qabun dhukkuba ni daddabarsaa jettanii yaadu?			

KUTAA IV: **Ilaalcha Abbaan warraa mana fincaani irratti qaban**

Gaaffilee kanaaf deebii yeroo kennitan baay'ee waliigala, waliigaleera, murteessuu hin danda'u, waliif hin galuu fi tasummaa waliif hin galuu jechuun deebisa.

5=baay'ee waliigala 4=waliigaleera 3=murteessuu hin danda'u 2=waliif hin galuu 1=tasummaa waliif hin galuu

Lakk	Safartuulee	1	2	3	4	5
401	Mana fincaanitti fayyadamun abbaa warra hundaaf barbaachisa fi dirqama dha.					
402	Mana fincaanitti fayyadamun dhukkuba garaa kaasaa ni ittisa.					
403	Mani fincaani abbaa qabeenya qofaf barbaachisa.					
404	Mani fincaani jirattoota magaala qofaf barbaachisa.					
405	Mani fincaani halkaan halkaan qofaf barbaachisa					
406	Udaan da'imma jarmoota dhukkuba fidaan irraa bilisaa dha.					
407	Udaan diree irratti ta'un wal hormaata tittisaaf haala mijaawa uuma.					
408	Udaan diree irratti ta'un naannoo ni fala.					
409	Udaan diree irratti ta'uun dhukkuba gara kaasaa nama qabsiisa.					
410	Mana fincaani keessatti udaanu caala diree irratti udaanatu namatti tola.					
411	Udaan ooyruu keessatti udaanun gabbina biyyeef kan oolu fi fayyaa irrattis dhibbaa kan hin qabne dha.					

Kutaa V: Sababoota Naannoo fi haala mana fincaanin walqabatan

Lakk	Safartuulee	Deebii	Kan itti aanu darbi
501	Abbummaa mana fincaani	1 Kan dhunfaa 2 kan waliini	
502	Mani fincaani dhaabbaa fi qorqorroo gubbaa ni qaba?	1 Eeyyee 2 Lakkii	
503	Mani fincaani hula ni qaba?	1 Eeyyee 2 Lakkii	
504	Booli mana fincaani iddoo irraa ta'umsa mijaawa qaba?	1 Eeyyee 2 Lakkii	
505	Fageenya mana fincaani mana jireenya irra qabu(Meetiran)	_____	
506	Maddi guddaan dhiheessi bishaani mana keessanii maali?	1. Boolla harka 2 Maddaa 3. Bobbaa dhunfaa 4. Boobba ummata 5. Kan biro(ibsi)_____	
507	Maddii bishaanii mana jireenya irraa hangam fagaata?	1. < 500m 2. 500m-1000m 3. >1000m	
508	Bishaan dhaqanii warabanii galuuf yeroo hangam fudhata?	1. Daqiiaqa 30 gad 2. Daqiiqa 30- Sa'a 1 3 Sa'a 1 ol	
509	Maddi bishaani waggaa guutuu ni jiraata?	1. Eeyyee 2. Lakkii	
510	Diree irratti udaanan aadaa naannoottin dhorkaa dha?	1Eeyyee 2 Lakkii 3 Hin beekuu	

KUTAA VI: Sababoota deeggarsa Dhaabbilee

Lakk	Safartuulee	Deebii	Fuula itti anutti darbi
601	Leenjii paakeejii ekisteeshinii fayyaa keessatti hirmaatanii beektuu?	1Eeyyee 2 Lakkii 3 Hin beekuu	
602	Manni keessan hojjettoota ekisteeshinii fayyaan daawwatame beekaa?	1Eeyyee 2 Lakkii 3 Hin beekuu	
603	Ogeessoota fayyaa ykn waajjira fayyaatiin deeggarsi ykn gorsii ni kennama?	1Eeyyee 2 Lakkii 3 Hin beekuu	
604	Gaaffii lakk. 503'f deebii keessan eeyyee yoo ta'e,deeggasa ykn gorsa isiniif kenname ibsaa?		
605	Mana fincaanii akka fayyadamtaniif raawwachiisni/gorsi ni jira?	1. Eeyyee 2. Lakkii	

8.4 Curriculum Vitae of Principal Investigator

1. Personal Details

Full Name: -Alemayehu Tsegaye Shelemew

Sex: -Male

Date of birth: -August 21/1986 G.C

Place of birth: - Bedeno

Marital status: - Married

Nationality: -Ethiopian

Address: -Mobile; +251935972249/+251777972249 , E-mail: - alemtsaga455@gmail.com

3. Educational Backgrounds

Level of education	Name of school
Primary school	Furda primary school
Secondary school	Bedeno Secondary School
Higher education	University of Gondar

3. Qualification

BCS Degree in applied chemistry in Gondar University

Work experience 8 years at Government organization at Gola Oda Educationa office and 8 years work experience at East Hararghe zone Labor and Social Affairs office.

4. Academic Achievements

BSc degree in applied chemistry.

5. Language proficiency

Language	Listening skill	Speaking skill	Reading skill	Writing skill
Afan Oromo	Excellent	Excellent	Excellent	Excellent
Amharic	Excellent	Excellent	Excellent	Excellent
English	Excellent	Good	Excellent	Excellent

6. Hobbies

- Reading books
- Helping people
- Participating in social issues

7. Reference

Gola Oda Woreda Education office +2511180006

East Hararghe zone Labor and Social Affairs office +251256660077