ARSI UNIVERSITY

COLLEGE OF HEALTH SCIENCE

DEPARTMENT OF PUBLIC HEALTH

Latrine Utilization and Associated Factors among Households in Honkolo Wabe District, Arsi Zone, Oromia, Ethiopia

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ACRONOMY AND ABBREVIATION

BCD	Behavior Centered-Design
BSc	Bachelor of Science
CLTSH	Community Led Total Sanitation & Hygiene
DALYs	Disability Adjusted Life Year
ETB	Ethiopian Birr
EDHS	Ethiopian Demographic Health Survey
ESI Economics of Sanitation	
FDG	Focus Group Discussion
HCW	Health Care Workers
HEP	Health Extension Package
HEWs	Health Extension Workers
HHs	Households
HSTP II	Health Sector Transformation Plan II
JMP	Joint Monitoring Program WHO/UNICEF
Km	Kilometers
NGO	Non-Governmental Organization
OD	Open Defecation
ODF	Open Defecation Free
PPS	Population Proportional to Size
RERC	Research Ethics Review Committee
SDG	Sustainable Development Goal
SNNPR	South Nation Nationality Peoples Region
SPSS	Statistical Package for Social Sciences
SRS	Simple Random Sampling
TV	Television
UNICEF	United Nations International Children's Emergency Fund
USD	United States Dollar
WASH	Water, Sanitation, and Hygiene
WHO	World Health Organization

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Abstract

Background: Access to proper sanitation is crucial for public health, but over 3.5 billion people globally lack it, exposing communities to preventable diseases such as diarrhea, which causes significant morbidity and mortality, especially among young children. Although some households have latrines, open defecation remains a challenge due to socio-cultural beliefs, economic limitations, and poor infrastructure.

Objectives: This study assessed latrine utilization and associated factors in Honkolo Wabe District, Oromia Region, Ethiopia.

Methods: A mixed study design was conducted among 502 households in Honkolo Wabe district from August 25, to September 25, 2025. A multi-stage sampling method was used to recruit study participants. Semi-structured questionnaires were used to collect data. Data were entered into the Kobo Toolbox software and analyzed by SPSS version 25. Variables with p-value ≤ 0.25 were entered into a multivariable logistic regression model. A p-value < 0.05 and adjusted odds ratio (AOR) with 95% confidence interval (CI) were considered significant. For qualitative data, four focus group discussions (FGDs) were held with eight purposively chosen participants from kebeles. Data were transcribed, translated into English, and thematically analyzed by using open code software 4.03.

Results: Latrine utilization in this study was 31.4% (95%CI: 27.3%-35.7%). Significant factors associated with increased latrine use included being female (AOR = 2.03, 95%CI: 1.28–3.21), having at least secondary education (AOR = 4.42, 95%CI: 1.91–10.23), absence of children under five years (AOR = 1.87, 95%CI: 1.16–3.01), smaller family size (AOR = 2.44, 95%CI: 1.41–4.21), safe latrine access at night (AOR = 5.95, 95%CI: 3.48–10.16), and presence of a privacy wall or door (AOR = 1.63, 95%CI: 1.02–2.61). FGDs confirmed barriers: child fall fears prompting open defecation, unsafe bush-covered paths, and privacy deficits due to costs.

Conclusion: Latrine utilization in Honkolo Wabe District households was low (31.4%) compared to other studies and SDG targets. Significant factors included female sex, maternal secondary education, family size <5, absence of under-5 children, safe nighttime access, and privacy walls/doors, with FGDs confirming child fall fears, unsafe paths, and privacy/cost barriers. Therefore, health education should be given on associated findings to get full coverage latrine utilization in this District.

1 INTRODUCTION

1.1 Background

Access to adequate sanitation is a fundamental public health need and basic human right [1]. Globally, over 2.5 billion people lack improved sanitation, and about 494 million still practice open defecation, mostly in sub-Saharan Africa and South Asia [2], [3]. Inadequate sanitation accounts for 4% of all deaths and 5.7% of the global disease burden (DALYs), mainly via diarrheal diseases, helminthic infections, trachoma, and other fecal-oral illnesses [4]. Diarrhea is the second leading cause of death in children under five, with 88% of cases linked to poor water, sanitation, and hygiene [5]. Poor sanitation also harms child growth and cognition and disproportionately affects women and girls, compromising privacy, dignity, and safety in rural areas [6].

Economically, the World Bank estimates global losses of $260 billion annually from poor sanitation due to lost productivity, healthcare costs, and reduced education [7]. In sub-Saharan Africa, nearly 60% lack basic sanitation, driving disease, poverty, and environmental pollution. Latrine use—regular and proper disposal of human waste—is essential for disease prevention [8].

In Ethiopia, Mini EDHS 2019 reported, more than one in four households (27%) in Ethiopia has no toilet facility (35% in rural areas and 10% in urban areas) [9]. Poor sanitation contributes to 60% of communicable diseases, with diarrheal disease causing 15% of under-five deaths [10]. Annual economic losses exceed 13.5 billion Ethiopian Birr [11]. Proper latrine utilization is key to controlling diseases of poverty such as diarrhea, trachoma, and intestinal parasites [12]. This study aims to establish baseline data on latrine utilization and its determinants in Honkolo Wabe district.

1.2 Statement of the Problem

Adequate sanitation represents the most fundamental public health measure available to communities around the world [13]. Large numbers of people lack safely managed sanitation, and in 2022 billion people still did not have access to safely-managed services, leaving major gaps that sustain disease transmission and environmental contamination [14]. Large gaps remain in quality sanitation: in 2022, an estimated 3.5 billion people lacked "safely managed" sanitation services, meaning many use unimproved facilities, share toilets, or have no facility[3]. Open defecation has fallen sharply since 2000, but remained large in 2022 — about 419 million people still practiced open defecation (major driver of faecal contamination and disease) [15].

Inadequate sanitation drives faecal–oral disease transmission (diarrhoeal disease, soil-transmitted helminths, schistosomiasis, and trachoma) and contributes to under-nutrition and impaired child growth through repeated enteric infections[16]. In other words, poor sanitation raises healthcare costs, reduces school attendance (especially for girls during menstruation), undermines dignity and safety for women and girls, and constrains economic productivity at household and national levels[17].

Africa lags other regions in safely managed sanitation and still contains many of the countries with the highest open-defecation rates. UNICEF/JMP regional summaries note that progress in Africa is uneven and that hundreds of millions remain without basic services [15].

In sub-Saharan Africa, similar patterns persist. In Tanzania and Nigeria, latrine use is hindered by poor maintenance, lack of privacy, cultural taboos, and seasonal inaccessibility [18], [19]. Even well-constructed latrines are underutilized when users perceive them to be unsafe, unclean, or culturally inappropriate. Moreover, behavior-change programs like Community-Led Total Sanitation (CLTS), while effective in some settings, have not universally translated into sustained use without follow-up reinforcement[20]**.**

In Ethiopia, sanitation has been a national development priority, especially through strategies such as the Health Extension Program (HEP) and the One WASH National Programme [21]. According to the Ethiopian Demographic and Health Survey (EDHS) 2019, 61% of households have access to a latrine, but only 7% use improved sanitation with a hand washing facility, and 29% of the population still practices open defecation, primarily in rural regions [9].

Open defecation in Ethiopia has declined over time, but remains substantial in some areas, according to World Bank / JMP data report roughly 17–18% of the population practicing open defecation in 2022[22].

Despite increases in latrine coverage, latrine utilization remains critically low in many rural areas. Studies from across the country report that between 30% and 60% of households that own latrines do not use them regularly [23], [24], [25]. Reasons for this include poor construction (e.g., no slab, roof, or door), lack of water for cleaning, negative attitudes, poor risk perception, large family size, and cultural beliefs.

According study done in the Southern Nations, Nationalities, and Peoples' Region (SNNPR), lack of health education and poor supervision were associated with non-use of latrines [26], and study done in Bahir Dar Zuria, found that latrine utilization was as low as 51.9%, mostly due to poor environmental conditions and poor attitude toward latrine use [27].

In Ethiopia, Diarrhea remains a significant public health challenge, particularly among children under five. According to the Global Burden of Disease Study 2019, diarrheal diseases were the second leading cause of death among Ethiopian children under five, accounting for approximately 13.2% of under-five deaths in that year [28].

This gap between latrine access and usage undermines the effectiveness of public health interventions aimed at reducing diarrheal diseases, helminth infections, and environmental contamination.

Large numbers of latrine-use studies are cross-sectional, household surveys that report ownership/use prevalence and associations (wealth, education, latrine type). But deeper causal pathways, decision processes, intra-household negotiations, and seasonal/temporal variation in use, which demand longitudinal and qualitative methods (ethnography, in-depth interviews, participatory observation are unknown[29].

In another way, research finds associations between open defecation or poor sanitation and higher odds of harassment/sexual violence for women in several countries. But, longitudinal evidence establishing causality and quantifying how much violence is preventable by specific sanitation improvements (lighting, lockable doors, location near house), rigorous impact

evaluations that include GBV outcomes are sparse[30]. Furthermore, the district lacks reliable, research-based data on the magnitude of the problem and the factors influencing latrine utilization.

Therefore, this study Assessed the magnitude of latrine utilization among households in Honkolo Wabe District; Identify the individual, environmental, behavioral, and socio-demographic factors associated with utilization; Provide evidence-based recommendations to improve sanitation behavior and reduce preventable diseases; Contribute to the goals of Ethiopia's Health Sector Transformation Plan II (HSTP II) and Sustainable Development Goal 6 (Ensure access to water and sanitation for all by 2030) [31].

1.3 Significance of the Study

Open defecation is a big problem in the developing world. Ethiopia is one of the most open defecating 10 countries in the world, 5 of Africa (Nigeria, Ethiopia, Sudan, Niger, and Mozambique). Low access and utilization of sanitation is baseline cause of hygiene-related diseases like diarrheal disease, which seriously causes morbidity and mortality rates among children. Low latrine utilization exists in rural communities.

This study will be vital to identify the level of latrine utilization and associated factors in the study area. It will provide baseline information to programmers, HCWs, and HEWs to intervene for the health of the community. Thus, the findings of this study will give insight for the District Health Office and local NGOs working on sanitation activities by providing evidence in reducing open defecation through different strategies. The households in the communities of the district will ultimately benefit from this study. The local planners will use it for planning purposes in protecting the community's health, and it will also provide baseline information to other researchers.

2 LITERATURE REVIEW

2.1 Magnitude of Latrine Utilization

Lack of access to improved sanitation remains a global public health challenge. According to the Joint Monitoring Programme (JMP) by WHO and UNICEF, around 3.6 billion people globally lacked safely managed sanitation services as of 2020, and 494 million people still do not use a latrine and 90% of whom live in rural areas [2]. This translates to more than one in four people globally without access to hygienic sanitation. Open defecation leads to widespread diarrheal diseases, responsible for over 360,000 deaths annually among children under five, mostly in low- and middle-income countries [32]. In developed countries, access to hygienic sanitation is near universal (99%), while in developing countries the rate is only about 53%, with wide disparities between urban (71%) and rural (39%) populations [23]. In addition, the World Bank and WHO estimate that inadequate sanitation causes economic losses of up to $260 billion annually, due to impacts on health, education, and productivity [22].

In Sub-Saharan Africa, only about 28% of the population uses improved sanitation. The prevalence of open defecation is estimated at 18%, with many countries falling short of the SDG target 6.2, which aims for universal access to sanitation by 2030 [24]. Poor sanitation contributes to 30% of diarrheal deaths in these countries, with a heavy burden on children under five. Water-borne diseases, helminthic infections, and trachoma are widely prevalent due to open defecation and poor hygiene practices [33]. According to the Mini Demographic and Health Survey 2019, Ethiopia faces significant challenges in sanitation access, with only 20% of households utilizing improved toilet facilities. This disparity is more pronounced between urban and rural areas; 42% of urban households have access to improved sanitation, compared to just 10% in rural regions. Consequently, over half (56%) of rural households rely on unimproved toilet facilities, and approximately 27% of households nationwide lack any toilet facility altogether, including 35% in rural areas and 10% in urban settings [9].

2.2 Factors Associated with Latrine Utilization

Latrine utilization is influenced by a complex interplay of factors like socio-demographic and economic factors, Individual factors, Environmental factors, and Latrine condition factors. Understanding these factors is crucial for designing effective sanitation interventions.

Socio-Demographic Factors

Latrine utilization is not solely a function of infrastructure availability. It is deeply influenced by the socio-demographic characteristics of households and communities. Studies across different contexts have shown that demographic and socioeconomic variables such as education, income, household size, age, sex, occupation, cultural norms, and presence of children significantly affect whether and how latrines are used. Globally, the WHO/UNICEF Joint Monitoring Programme (2020) reports that individuals from lower socio-economic backgrounds, particularly those with limited education and larger households, are less likely to use improved sanitation facilities[3]. According to UNICEF Ethiopia Annual reports, Education is pivotal, as households with heads having at least primary education are more aware of the health risks of open defecation and more likely to use latrines consistently[32]. In South Asia, countries like India and Bangladesh demonstrate that wealthier and educated families not only have better access to improved latrines but also maintain and use them more consistently. School-based sanitation improvements also influence latrine use positively among children, impacting hygiene practices beyond schools[18][34].

Sub-Saharan Africa research shows that latrine utilization is significantly associated with the educational level of household heads. For example, in Uganda, households headed by older, educated males showed higher latrine use, attributed to their valuation of cleanliness and investment in sanitation[35]. Similarly, in Kenya and Tanzania, households with more educated members and those exposed to sanitation promotion through radio or TV reported increased latrine use, underscoring education and information access as key factors[36][19].

Within Ethiopia, multiple studies reinforce education's significance. The 2019 Ethiopian Demographic and Health Survey (EDHS) indicates rural households with low education levels are less likely to use improved sanitation facilities[9]. Research in Diksis Woreda, Arsi Zone,

found households with no formal education were 70% less likely to use latrines than those with secondary or higher education[23]. Likewise, in Bahir Dar Zuria, literacy level alongside family income predicted latrine utilization, with low-literacy households more prone to open defecation[25]. Moreover, in Southwest Ethiopia and the Tigray Region, the presence of school-aged children and radio ownership (proxy for exposure to information and hygiene promotion) correlated positively with latrine use, likely reflecting school-based hygiene education's impact[24][37].

Globally, a WHO/UNICEF report highlights that households headed by older individuals tend to have differing sanitation behaviors, with sub-Saharan African studies illustrating that older, educated male heads are more likely to value cleanliness and invest in sanitation, thereby increasing latrine use[15]. Research from Uganda supports this, showing higher latrine utilization among households led by older, educated males[38]. In Kenya and Tanzania, while education and income are prominent, age intersects with these factors within household dynamics, affecting usage patterns[39][19]. Locally in Ethiopia, the Ethiopian Demographic and Health Survey (EDHS 2019) shows age-related trends, with latrine utilization varying across age groups of household heads. For example, households headed by individuals aged 15–30 showed a slightly higher improvement in latrine usage (29.5%) compared to those aged 31–40 and older groups, with utilization declining somewhat among older heads[9].

Globally, the WHO/UNICEF Joint Monitoring Programme (2020) highlights that individuals from lower socio-economic backgrounds, including those with lower income, are less likely to use improved sanitation facilities[40]. This suggests that wealthier households can afford better sanitation options, facilitating higher latrine utilization. In South Asia, countries like India and Bangladesh show that wealthier families, often with higher income, have better access to improved latrines and practice better maintenance and consistent use, reinforcing the link between income and latrine utilization[41][42]. In sub-Saharan Africa, studies demonstrate that higher income levels correlate strongly with improved sanitation use. For instance, households in Kenya and Tanzania with higher income showed greater latrine utilization, underscoring the role of economic capacity in sanitation behavior[43][44]. In Ethiopia, numerous local studies confirm the pivotal role of income in latrine use. The Ethiopian Demographic and Health Survey (EDHS) 2019 reported that rural households with low income were less likely to have improved

sanitation facilities[9]. A study in Bahir Dar Zuria found that family income, along with literacy and number of children, predicted latrine utilization, with the lowest wealth quintile being 2.5 times more likely to practice open defecation[27]. Furthermore, research based on the mini-EDHS 2019 data showed households with richer wealth indices were approximately 3.7 times more likely to utilize improved latrines compared to poorer households[9]. Similarly, household income influenced sanitation outcomes in studies in Southwest Ethiopia and urban slums of Gondar City[24][45].

In sub-Saharan Africa, specifically in Kenya and Tanzania, large households with many dependents frequently face latrine congestion, which discourages consistent use, especially among children and the elderly[46][44]. This is a common challenge where limited sanitation infrastructure must be shared by many members, reducing cleanliness and usability. In Ethiopia, multiple studies provide strong evidence on how household size affects latrine use. The Ethiopian Demographic and Health Survey (EDHS 2019) reports that rural households with large family sizes are less likely to utilize improved sanitation[9]. Research in semi-urban northeastern Ethiopia found that households with smaller family sizes (one to three persons) were nearly four times more likely to use latrines than those with six or more members[47]. Another study in the East Meskan district of Ethiopia demonstrated that households with fewer than five members were 24 times more likely to use latrines compared to those with five or more members[48]. The challenges in larger households include higher demand on a single latrine, leading to frequent use and rapid deterioration, thereby discouraging consistent utilization.

Latrine Condition

Cleanliness is one of the strongest predictors of consistent latrine use. A study from a rural village in Eastern Nepal demonstrated that households that always clean their latrines were approximately 3.66 times more likely to use them than those who rarely cleaned. Similarly, cleaned latrines had a 3.45 times higher utilization rate[49]. In Ethiopia, research in Awabel District showed households with latrines not requiring maintenance were about four times more likely to use them than those with maintenance-needing facilities. This underscores that well-maintained, clean latrines significantly enhance user acceptance and routine utilization[12].

The type and physical characteristics of latrines impact utilization. Households owning pit latrines with pit covers in the Gulukomeda District, Tigray Region (Ethiopia) were 7.86 times more likely to use latrines compared to those without structural features that provide privacy, such as privacy closures, increased use almost 22-fold, and latrines taller than 1.5 meters were associated with nearly 13 times higher use[23]. Additionally, a large proportion of pit latrines were constructed with wood and mud, and several required maintenance or reconstruction, as found in Southern and Northwest Ethiopia districts, indicating the importance of functional, durable structures for sustained utilization[48][50].

Latrines that have been in use longer tend to have higher utilization rates. For instance, households with latrines older than three years in Gulukomeda District were 3.19 times more likely to use them compared to newly constructed ones[23]. Paradoxically, the Nepal study found that households with latrines constructed within the past two years were 82% less likely to use them, possibly due to a lack of behavioral adaptation or incomplete settling-in periods[51].

The physical distance of latrines from the household is an important determinant. In Laelai Maichew District, North Ethiopia, latrines located less than ten meters from the household were 8.5 times more likely to be used than those farther away. Closer proximity facilitates frequent use, easier maintenance, and increases the likelihood of consistent hygiene behavior[52]. Occupation status, a proxy for socio-economic and educational status, influences latrine utilization. In Lemo Woreda, Southern Ethiopia, households headed by government employees or students had 6.5 times higher odds of having improved sanitation compared to households headed by farmers[53].

Environmental Factors

According to WHO Reports, latrines that are poorly constructed, emit foul odors, attract flies, or lack privacy and security tend to deter users, especially vulnerable groups like women, children, and the elderly[16]. UNICEF-WHO Joint Monitoring Programme (2020) similarly highlights that unhygienic sanitation environments, broken slabs, unclean floors, or overflowing pits discourage usage even when latrines are technically present[3]. In rural Nepal, households that consistently clean their latrines were over three times more likely to use them than those who seldom cleaned, and latrines with privacy closures increased use nearly 22-fold[51].

Ethiopian studies in Tigray and other regions find that pit latrines with covers, superstructures, and slabs are associated with significantly higher use[54]. Maintenance status is critical, with households owning latrines that do not require repair being up to four times more likely to use them[48]. Conversely, non-functional and poorly maintained latrines discourage use, and Proximity of the latrine to the household is a strong determinant[48]. Latrines located closer (less than 10 meters) to homes in Ethiopian districts were over eight times more likely to be used, as a short distance reduces physical effort and increases convenience, safety, and maintenance regularity[25]. In Kenya, latrines located far from homes were avoided at night due to fears of sexual violence or wildlife, particularly among women, and inaccessible latrines during rainy seasons or flooding further limit use in rural areas[55].

Availability of water for flushing and hand washing is vital for hygiene and encourages latrine use. A Nigerian study found that households with well-maintained latrines that had cleaning tools, ash, and soap showed three times higher utilization rates. Absence of water and hygiene supplies not only discourages use but also increases the risk of contamination and disease transmission[18]. Seasonal changes impact latrine access and use in rural areas. During rainy seasons, flooding and muddy conditions may block access to latrines or degrade structural integrity. Vegetation growth around homes during some seasons creates open spaces considered convenient for open defecation, reducing latrine use. This seasonal accessibility challenge is documented in Ethiopia and elsewhere[56]. Discomfort from poor latrine conditions is a frequently cited deterrent. In Yaya Gulale, Ethiopia, more than two-thirds of respondents mentioned latrine-related discomfort as a key reason for non-use. Inadequate superstructures, broken doors or a lack of privacy discourage use. Safety concerns, especially for women at night, restrict access to distant or poorly constructed latrines[57].

Individual and Behavioral Factors

Latrine utilization is influenced not only by physical access or infrastructure but critically by individual and behavioral factors that shape consistent use. Globally, the World Health Organization (WHO) underscores that constructing latrines alone is insufficient without motivation and habituation to use them regularly[16]. Behavioral components such as awareness of disease transmission, belief in sanitation benefits, and emotional drivers like

shame, dignity, and disgust are central to sanitation behavior[58]. The Behavior Centered Design (BCD) model highlights psychological drivers, including nurture (care for children), disgust, pride, and social norms as powerful motivators for sanitation behavior change[59]. Community-Led Total Sanitation (CLTS) leverages social emotions such as shame and community pride to catalyze changes in open defecation practices[60]. For example, a study in India found that cultural preferences for open defecation, traditional habits, and beliefs about purity were more influential than poverty or access, leading people to prefer open defecation despite latrine availability[61].

Regionally, studies from Tanzania demonstrate that access to mass media like radio and television enhances exposure to sanitation campaigns, which correlates with increased latrine use, particularly when people comprehend the connection between fecal contamination and disease[62]. In Kenya, households exposed to health extension messaging or participating in CLTS programs showed more consistent latrine use, with gender roles also affecting sanitation behaviors as women were generally more consistent users and maintainers of latrines, whereas men often influenced decisions around construction and design[39]. In Ethiopia, research in Hulet Ejju Enessie Woreda revealed that frequent visits by health extension workers significantly increased both awareness and latrine use[56]. Another study in southwest Ethiopia identified positive attitudes, perceived disease risk, and social norms, especially injunctive norms (belief that significant others expect latrine use), as stronger predictors of use than knowledge alone[24]. Hand washing, an important complementary behavior, was reported in approximately 44.8% of heads of Ethiopian households after latrine use, although critical hand washing practices remain relatively low[63].

A recent comprehensive study in rural communities of Lomabosa district, Ethiopia, quantitatively confirmed that educational status, wealth index, perceived susceptibility to disease, injunctive norms, and perceived ability significantly influence latrine utilization[64]. Those who perceived themselves at risk of diarrheal diseases were 3.2 times more likely to use latrines, while social pressures via injunctive norms doubled the likelihood

2.3 Conceptual Framework

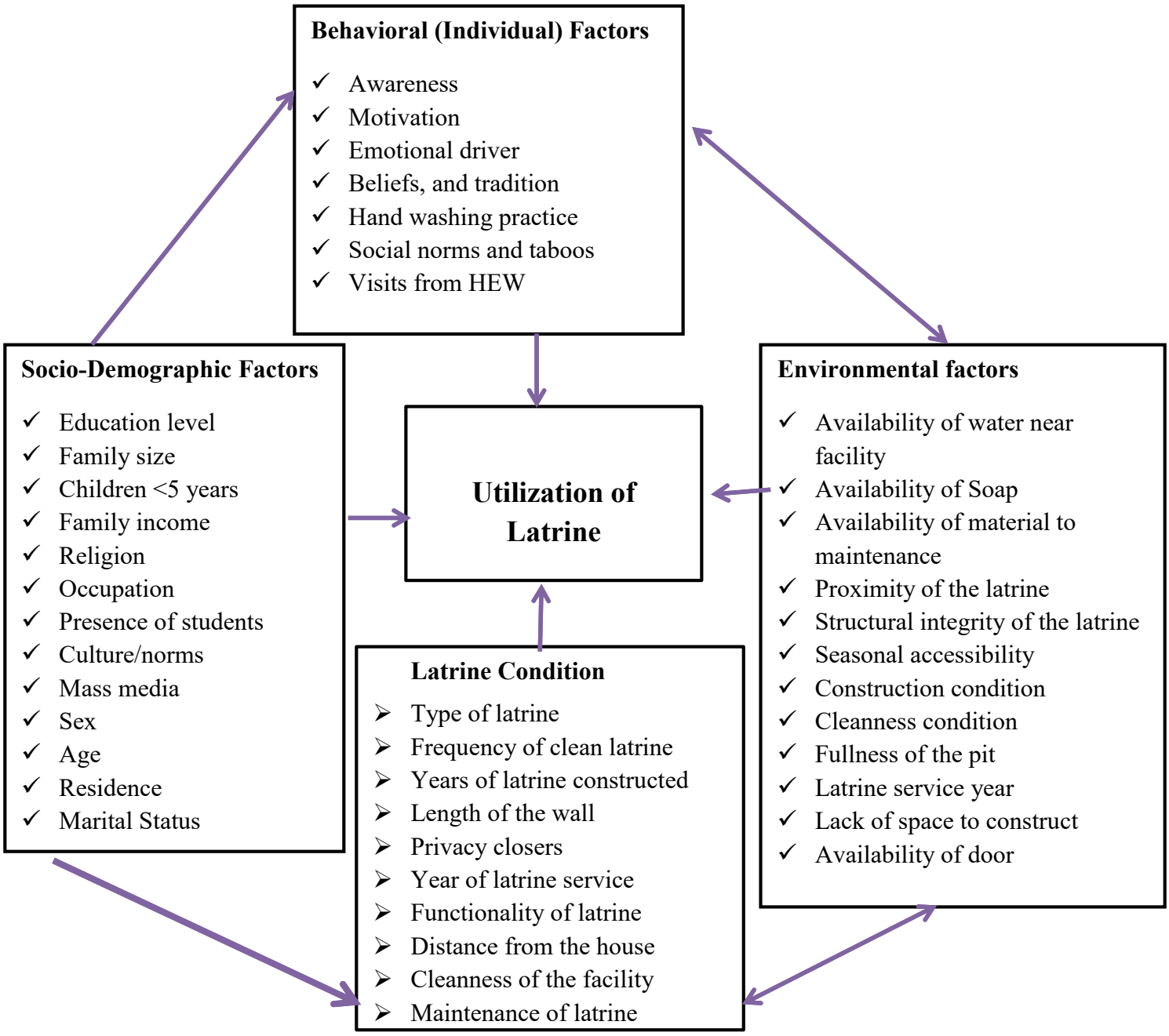

Figure 1: Conceptual framework for latrine utilization and associated factors among Households of Honkolo Wabe District, Oromia Region, Ethiopia, 2025.

3 OBJECTIVES

3.1 General Objective

To assess latrine utilization and associated factors in the Households among Honkolo Wabe District, Oromia Region, Ethiopia, 2025

3.2. Specific Objectives

To assess latrine utilization among Households in Honkolo Wabe District, Oromia Region, Ethiopia, 2025

To identify factors associated with latrine utilization among Households in Honkolo Wabe District, Oromia Region, Ethiopia, 2025

To explore households perceptions and attitudes toward latrine utilization in Honkolo Wabe District, Oromia Region, Ethiopia, 2025

3 METHODS

3.1 Study Area

The study was conducted in Honkolo Wabe District, Oromia Region, Ethiopia. The district is located at 94km from Asella, the Zonal town of Arsi Zone, and 254 km from Addis Ababa, the capital city of Ethiopia. According to 2024/25 population projection growth rate, Honkolo Wabe district population is estimated to be 97,124, with 48,368 are males and 48,756 are females[65]. Administratively, the district has 2 urban kebeles and 9 rural kebeles. Most of the infrastructure serves both the urban and rural populations. Regarding health service distribution, there are 3 health centers, 9 health posts, 11 Private clinics, and 2 rural drug vendors in the district. According to Honkolo Wabe district Health office report, the coverage of water supply and latrine was 61% and 81% in 2024/2025 respectively[66].

3.2 Study Design and Period

A community-based mixed study design was conducted from August 25 to September 25, 2025.

3.3 Source and Study Population

Source Population

All households that have a latrine facility in Honkolo Wabe district were the source population.

Study Population

All households who have latrine facility in selected kebele of Honkolo Wabe district were study population.

3.4 Inclusion and Exclusion Criteria

Inclusion Criteria

Households that have latrine facility, aged above 18 years old, and have stayed in the areas for at least 6 months before data collection time.

Exclusion Criteria

Household who were unable to respond due to critical illnesses were excluded from the study.

3.5 Sample size determination and sampling procedure

Sample size determination

The sample size was calculated for each specific objective, and the highest sample size was used for the study. The sample size for the first objective was determined using the single population proportion formula, with the assumption of 95% of confidence interval, 5% margin of error, a proportion of households utilizing latrine(p=30.7%)[23], a 10% non-response rate, and a design effect of 1.5. $n = \frac{z\alpha 2p(1-p)}{d2}$ $n = \frac{(1.96)2*0.307*0.693}{0.05*0.05}$ n=327

Then, multiplying by the design effect of 1.5, the sample size was 491. However, the population correction formula was used since the total households were less than 10,000.

$n = \frac{n}{1+n/N}$ $n = \frac{491}{1+491/6357}$ n=456, where N is the total households from selected kebeles. Adding10% non-response, the computed sample size for the study was 502. The sample size for the second objective was computed using variables such as the presence of a latrine wall for privacy, need for latrine maintenance, and positive attitude. The sample size was calculated using Epi-Info 7.2.6.0, with the assumptions of a power of 80%, 95% confidence interval, 10% for non-response, adjusted odds Ratio, the design effect of 1.5, and the ratio of unexposed to expose. The highest sample size computed using associated factors was 402, which is smaller than the sample size of the first objective. Therefore, the final sample size for this study was 502.

Table 1: Sample size determination for the second objective for latrine utilization among Households in Honkolo Wabe District, Oromia Region, Ethiopia, 2025.

Variable	% of non-exposed	% of exposed	CI %	AOR	Power	Allocation ratio	Sample size calculated with 10% of non-responses, 1.5 DE	
presence of a latrine wall for privacy	81	93.7	95	3.48	80	1	402	[67]
Latrine maintenance need	52.7	87.8	95	6.449	80	1	102	[68]
positive attitude	67.1	86.7	95	3.2	80	1	270	[24]

Focus group discussants were Community leaders, mothers who have under-five children, elementary students, and Residents who >18 years old. A total of 3 FGDs were conducted in the study, and each of them contained 12 participants in each selected kebele of the district.

Sampling procedures

A multistage sampling technique was employed to recruit the study participants. In the first stage, 11(eleven) kebeles were randomly selected using a lottery method. The sample size was proportionally allocated to each kebele based on the number of households. For each selected kebele, a list of households with a latrine facility was developed as a sampling frame using health extension workers. Then, the sampling interval of households in each kebele was determined by dividing the total number of households by the allocated sample size (K=N/n). Finally, the first household was selected randomly from households, and the households were visited at every Kth interval using a systematic random sampling method. For the Qualitative study, the study participants were selected for focus group discussions (FDGs) using a purposive sampling technique.

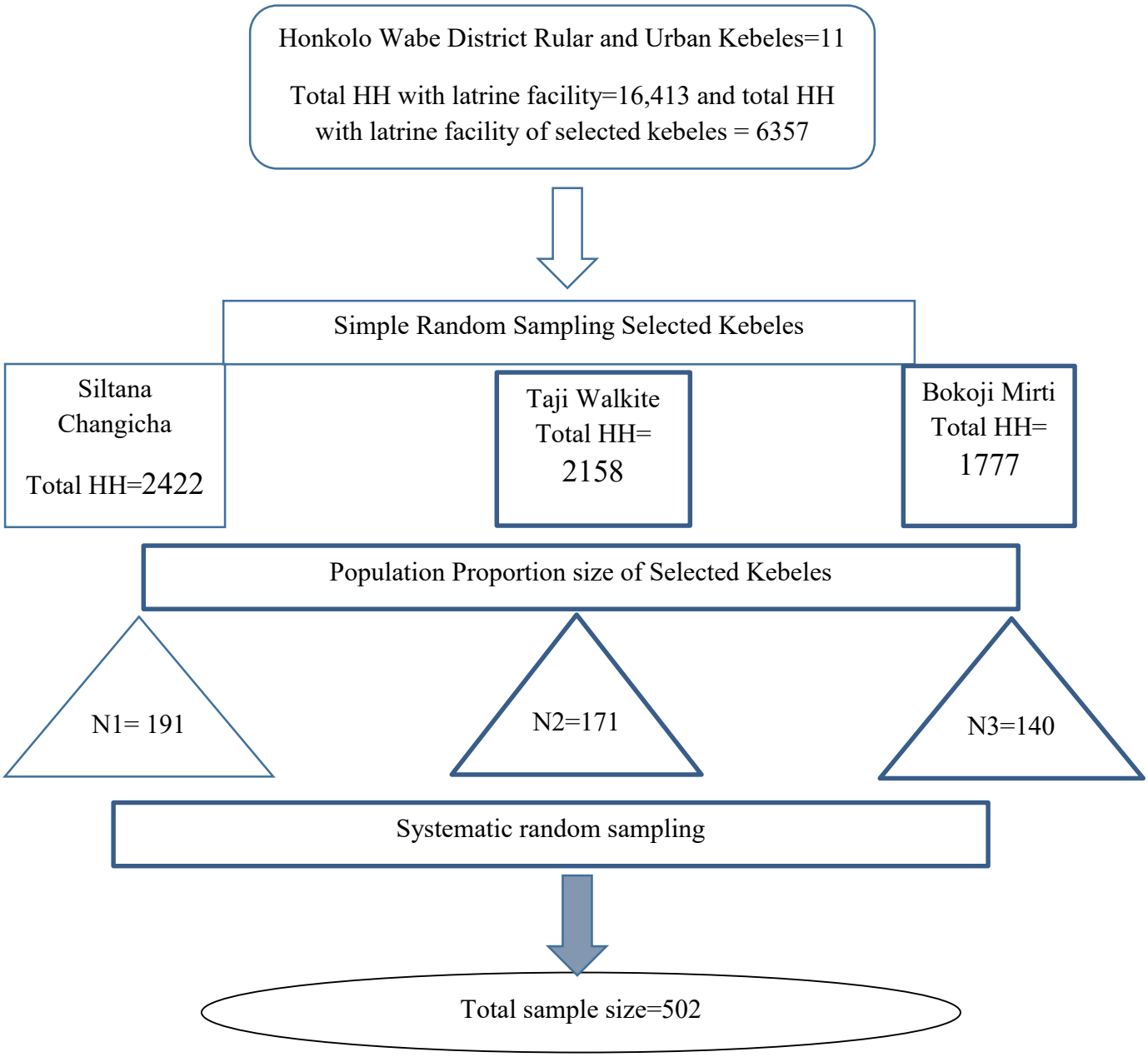

Figure 2: Schematic diagram of the sampling procedure for latrine utilization among households of Honkolo Wabe District, Oromia Region, Ethiopia, 2025.

3.6 .Study Variables

Dependent Variable: -

Latrine Utilization (yes/no)

Independent variables

Socio-Demographic characteristics: **-** Education level**,** Family size**,** Children <5 years**,** Family income**,** Religion**,** Occupation, Presence of students, Culture/norms, Mass media**,** Age**,** Residence**,** and Marital Status.

Environmental characteristics: **-** Availability of water near facility, Availability of Soap, Availability of material for maintenance, Proximity of latrine from HH, Structural integrity of the latrine**,** Seasonal accessibility, Construction condition, Cleanness condition, Fullness of the pit, Latrine service year, Lack of space to construct, and Availability of door.

Latrine Condition: **-** Type of latrine, Frequency of clean latrine, Year of latrine constructed, Length of the wall, Privacy closers, Year of latrine service, Functionality of latrine, Distance from the house, Cleanness of the facility, and Maintenance of latrine.

Behavioral (Individual) Factors: **-** Awareness, Motivation, Emotional driver, Beliefs and tradition, Hand washing practice, Social norms and taboos**,** Visits from HEW, knowledge, Culture preferences, Access to mass media, Interest in repairing latrine, Attitude, and Perception of open field defecation by family members.

3.7 Operational Definitions

Functional latrine –is defined as latrine that provides services at the time of data collection, even if the latrine requires maintenance[69].

Hand washing at critical times: is washing of one's hand using soap /substitute before eating, after using the toilet, before handling food, after cleaning a child's bottom, and before breastfeeding/feeding a child[70].

Hygiene and sanitation: is the process where people demand, develop, and sustain a hygienic and healthy environment for themselves by erecting barriers to prevent the transmission of diseases, primarily from fecal contamination[71].

Improved Latrine coverage: in this study is found that households have access to a sealed, used, not shared, maintained latrine, and if the facility used by the household separates the waste from human contact[40].

Unimproved Latrine facilities: are defined as latrines constructed of local materials and designs, may lack privacy, structural integrity, and proper coverage of pits. They are largely unsafe, short-lived, and unsustainable[72].

Clean latrine: No fecal matter in and around the pit latrine, properly swept[73].

Dirty latrine: Fecal matter littered in or around the pit latrine not swept[74].

Latrine Utilization: was assessed using the presence of functional, safe and improved latrines, proper use by all family members, absence of observable feces in the compound, and at least one observable sign of use(foot path to the latrine is not covered by grass, and observable splash water or urine on latrine floor)[75].

Attitude was assessed using 8 Likert scale items that ask the participants' feeling about using latrine, the mean of the attitude was computed, then recoded into positive attitude for the score equal or greater than mean, and negative attitude for the score less than mean [24].

3.8 Data collection procedures (Instrument, personnel, data collection technique)

Data Collection Tools and Procedures

Data was collected using interviewer interviewer-administered questionnaire adapted from previous studies[24][75]. In addition, an observation checklist was developed to collect additional data. The data collection tool contains socio-demographic characteristics, housing & household wealth status, latrine utilization, household water supply, and environmental hygiene. The Kobo Toolbox Android software tool was used for quantitative data collection. Data was collected using four BSc Nurse Professionals. For the qualitative study, the interview guide was developed for data collection. An interview was conducted in Afan Oromo, audio recorded, and supplemented with notes.

3.9 Data Quality Assurances

A standardized questionnaire was developed in English and translated into the local language (i.e. Afan Oromo) and then translated back to English to ensure consistency. Two days of training were given for data collectors and supervisors for two days. An observation checklist

was also prepared to observe households for their latrine utilization by data collectors. The questionnaire was pretested on 5% of the total sample size out of the selected kebele, which has the same characteristics, and checked for its consistency and clarity. An instruction manual that explains the questionnaire was developed and given to supervisors to check the data daily. The principal investigator communicated with supervisors daily and checked the completeness and consistency of the collected data.

For qualitative data, the data collected using note-taking and a tape recorder was transcribed to English by the principal investigator, and moderators.

3.10 Data analysis procedures

Data collected by Kobo Toolbox was cleaned, coded, and exported to SPSS version 25.0 statistical software for analysis. The result was summarized by descriptive statistics. Bivariate analysis was conducted to assess whether there is an association between the dependent and independent variables. Variables with $p < 0.25$ in bivariate analysis were included in the final multivariate logistic regression model to determine the factors that independently influence latrine utilization. Ap value <0.05and Adjusted odds ratio (AORs) with 95 % Confidence intervals (CI) were calculated to identify predictors of latrine utilization. For qualitative analysis, the audio-recorded data were transcribed verbatim and retranslated into English. A coding scheme was thematically analyzed using open code software version 4.03, and the codes were categorized into thematic areas.

3.11 .Ethical consideration

The ethical approval was obtained from Arsi University Research Ethics Review Committee (RERC). Then, the support letter was written to Honkolo Wabe district from Arsi University College of Health Sciences for cooperation to facilitating the process of data collection. Information regarding the purpose of the study was explained to the participant, including the procedures, potential risks, and benefits, and all confidentiality maintained. Verbal Informed consent was obtained from respondent household, before interview.

3.12 Dissemination plan

The result will be presented to Arsi University College of Health Sciences and the Department of Public Health. The findings would also be communicated to the stakeholders at different levels, like the Zonal health department, District Health office, District Administration office, and Kebeles administration. Efforts will be made to publish it in peer-reviewed scientific journal.

5. RESULTS

5.1. Socio-demographic characteristics of study respondents

Out of 502 study participants, 488 respondents were interviewed, making the response rate 97.2%. The majority, 237(49.6%) of the respondents were females, while 446(91.4%) of them were married. The majority, 188(38.5%) of the respondents were in the age group of 30-39 years, with a mean age of 39.3 years and a standard deviation of ±11.14. Around half (49.0%) of the study participants attended primary education (1-8), whereas 53(10.9%) of them attained secondary and above education. In addition, 222(45.5%) of the respondents had a monthly income of 2000-4999 birr, whereas 348(71.3%) of the respondents had a family size of less than five (Table 2).

Table 2: Socio-demographic characteristics of households in Honkolo Wabe district, southern Eastern Ethiopia, 2025

Characteristics		Frequency (%)
Sex	Male	251(51.4%)
	Female	237(49.6%)
Age	18-29	97(19.9)
	30-39	188(38.5)
	40-49	116(23.8)
	50 and above years	87(17.8)
Educational status respondent	No formal education	196(40.2%)
	primary	239(49.0%)
	Secondary and above	53(10.9%)
Education of the mother	No formal education	239(49.0%)
	primary	224(45.9%)
	Secondary and above	25(5.1%)
Marital status	Single	34(7.0%)
	Married	446(91.4%)
	Divorced	8(1.6%)
Ethnicity	Oromo	421(86.3%)

	Amhara	67(13.7%)
Occupation of household head	Farmer	477(97.7%)
	Merchant	11(2.3%)
Occupational of respondent	Farmer	294(60.2%)
	Merchant	19(3.9%)
	Housewife	175 (35.9%)
Religion	Muslim	159(32.6%)
	Orthodox	313(64.1%)
	Protestant	16(3.3%)
Monthly income	Less than 2000	55(11.3%)
	2000-4999	222(45.5%)
	5000-9999	191(39.1)
	Above 10,000	20(4.1%)
Family size	Less than 5	348(71.3%)
	5 and above	140(28.7%)

5.2. Latrine condition

Among 488 households interviewed, all households had a functional latrine during data collection. Around three -fourths (73.8%) of study participants had a Pit latrine with a slab, whereas 91(18.6%) of them pit latrine without a slab. The presence of pit latrines without slabs (18.6%) reflects basic functionality amid economic barriers, where rural households prioritize pit digging over slab additions due to costs like cement and labor, as evidenced by Latrine building or repair material not available in the market is 115(23.6%) indicated in table 5. Regarding latrine facilities, 257(52.7%) of latrines had a wall/ door, and 242(49.6) of latrines were found structurally sound. These findings are nourished by qualitative findings that found the majority of their latrines are not structurally sound due to economic constraints or lack of construction materials.

"I *have not built an improved latrine due to insufficient financial resources, and the unavailability of construction materials nearby*" (46 year's old, female)

Concerning latrine health facilities, only 83(17%) latrines had hand washing facilities, with 56(67.5%) and 56(67.5%) having ash/soap and water near the latrine, respectively. Of the total, 172(35.2%) of a latrines need emptying services (Table 3).

Table 3: latrine condition of households in Honkolo Wabe district, southern Eastern Ethiopia, 2025

Characteristics		Frequency (%)
Type of latrine	Pit latrine with a slab	360(73.8%)
	Pit latrine without a slab	91(18.6%)
	Ventilated improved latrine	9(1.8%)
	Other	28(5.7%)
Years latrine constructed	<5 years	132(27.0)
	≥5 years	356(73.0)
Latrine has privacy wall/door.	Yes	257(52.7%)
	No	231(47.3)
Latrine structurally sound	Yes	242(49.6)
	No	246(50.4)
A latrine has a pit cover	Yes	19(3.9)
	No	469(96.1)
Latrine hand-washing facilities	Yes	83(17)
	No	405(83)
Soap/ash present around the latrine	Yes	56(67.5%)
	No	27(32.5%)
Hand washing with water present in the latrine	Yes	64(77.1)
	No	19(22.9)
The latrine needs maintenance.	Yes	293(60.0)
	No	195(40.0)
Latrine needs emptying services	Yes	172(35.2)
	No	316(64.8)
Frequency of latrine cleaning	Occasionally	246(50.4)

	Daily	7(1.4)
	Weekly	198(40.6)
	Never	37(7.6)

5.3. Individual and behavioral factors

In this study, 323(66.2%) of respondents are aware of the health risks associated with open field defecation. In addition, around three-fourths (75.6%) of study participants know that using a latrine prevents diseases. This finding is supplemented by the focus group discussion, in which low awareness about the importance of using latrines as the main cause for diarrheal disease.

"*…A 42-year-old woman responds that "I have no information about hand washing and use of latrine is to prevent diarrhea*" (42 years woman).

Only 218(44.7%) of participants received visits from health extension workers about latrine use during the six months. However, this proportion may be underestimated or overestimated due to difficulties recalling specific visits. This quantitative finding is also nourished by the qualitative findings that reported most participants have low awareness about the benefits of latrine use due to a lack of frequent visits from Health extension workers.

"*…I didn't get a visit from Health Extension workers for a long time, due to this, my family and I didn't have awareness about the benefits of latrine*."(28 years, woman)

Moreover, 212(43.2%) of respondents had access to mass media-related sanitation promotion. Regarding hand washing after latrine use, 290(59.4%) reported as sometimes, followed by 130(26.6%) as rarely and 55(11.3%) never (Table 4).

Table 4: Individual and behavioral characteristics of households in Honkolo Wabe district, southern Ethiopia, 2025

Characteristics	categories	frequency
Aware of the health risk associated with open field defecation	Yes	323(66.2%)
	No	165(33.8%)
know using a latrine prevents diarrheal diseases	Yes	369(75.6%)
	No	119(24.4%)

Received visits or education from Health extension workers about latrine in 6 months	Yes	218(44.7%)
	No	270(55.3%)
Presence of cultural beliefs or traditions that discourage latrine use	Yes	0(0%)
	No	488(100%)
Presence of social pressure or community norms encouraging latrine use	Yes	488(100%)
	No	0(0%)
Hand washing with soap/ash after using the latrine	Always	13(2.7%)
	sometimes	290(59.4%)
	Rarely	130(26.6%)
	Never	55(11.3%)
Access to mass media sanitation promotion	Yes	212(43.2%)
	No	276(56.8%)
Do you take measures to repair or improve the latrine when damaged	Yes	314(64.3%)
	No	174(35.7%))

5.4. Environmental Characteristics

The majority of the latrines were located at a distance of greater than 10 meters (43.6%), followed by 5-10 meters (33.6%), and less than 5 meters (22.8%). Four hundred sixty-two (94.7%) of the study participants reported that the latrine is easily accessible throughout the year, including the rainy season. Almost three-fifths (57.0%) of respondents feel safe while using the latrine at night. Concerning latrine construction materials, 259(53.1%) of participants responded that the construction material is sometimes available, whereas 398(81.6%) of participants think the material is affordable. In addition, 171(35.0%) of the study respondents had a challenge of space for latrine construction (Table 5). This finding is also supported by a qualitative finding that stated space for latrine construction limits their ability to have a standardized latrine.

"....I have no adequate space to construct the latrine. My latrine is almost full and needs emptying services, and some of my family members didn't use the latrine" (56 years old, male)

Table 5: Environmental characteristics of households in Honkolo Wabe district, southern Ethiopia, 2025

Characteristics		Frequency (%)
Distance of Latrine from household dwelling	<5 meters	111(22.8)
	5-10 meters	164(33.6)
	>10 meters	213(43.6)
Is the latrine easily accessible all year round, including the rainy season	Yes	462(94.7%)
	No	26(5.3%)
Do you encourage children to use a latrine?	Yes	146(29.9)
	No	342(70.1)
Presence of elderly or disabled individuals in the household who have difficulty accessing the latrine	Yes	120(24.6%)
	No	368(75.4%)
Is the latrine easily accessible for the elderly or disabled?	Yes	94(73.3%)
	No	26(21.7%)
Do you feel safe using the latrine at night	Yes	278(57.0%)
	No	210(43.0%)
Latrine building or repair material available in the market	Always available	114(23.4)
	Sometimes available	259(53.1)
	Nor available	115(23.6)
Maintenance material affordable	Very affordable	49(10.0)
	Sometimes affordable	398(81.6)
	Not affordable	41(8.4)
Space for constructing a latrine is challenging	Yes	171(35.0%)
	No	317(65.0%)
Cleanliness of the latrine environment	Clean	324(66.4%)
	Dirty	164(33.6%)
Odors, flies, or cleanliness problems that affect latrine usage	Yes	227(46.5%)
	No	261(53.5%)

5.5. Health and health-related characteristics of respondents

Seventy-three (15%) of the households had at least one member who had encountered illnesses in the last two weeks prior to data collection. Among the members who got ill, 67(91.8%) had sought treatment for the illnesses they experienced. Of 67 who got treatment, 63(94%) preferred to go to health facilities. Concerning the common causes of diarrheal diseases, 363(74.4%) of the households thought using dirty water, followed by poor sanitation and hygiene (313, 64.1%)(Table 6).

Table 6: Health and health-related characteristics of households in Honkolo Wabe district, Oromia Region, Ethiopia, 2025

Characteristics	Categories	Frequency (%)
A household member experienced illness in two weeks	Yes	73(15.0)
	No	415(85.0)
Age of affected household member(n=73)	Child under 5 years	36(49.3)
	Child above 5 years	19(26.0)
	Adult	18(24.7)
Number of episodes affected members had in the past two weeks(n=73)	single	54(74)
	Multiple episode	19(26)
Seek treatment for diarrheal diseases(n=73)	Yes	67(91.8)
	No	6(8.2)
From where you sought treatment(n=67)	Health facilities	63(94.0)
	Traditional healer	4(6.0)
How do you consider diarrheal diseases as a health problem	Very serious	229(46.9)
	Somewhat serious	163(33.4)
	Not serious	96(19.7)
What do you think about the causes of diarrhea	Dirty water	363(74.4)
	Poor sanitation and hygiene	313(64.1)
	Contaminated food	268(54.9)
Is there a household member who missed school due to sanitation problem diseases(n=73)	Yes	36(49.3)
	No	37(50.7)

5.6. Attitude towards latrine utilization

In this study, 305(62.5%) of respondents agreed that using a latrine is important for keeping their family healthy. In addition, 313(64.1%) study participants agreed that using a latrine is a good way to prevent contamination of water sources. Moreover, 240(49.2) respondents agreed that children should always use latrines instead of open defecation. Furthermore, 295(60.5) of respondents agreed lack of privacy or poor condition of the latrine discourages its use(Table 7).. Overall, 264 (54.1%) had a positive attitude of latrine utilization, whereas 224(45.9%) had a negative attitude of latrine utilization (Fig 3)

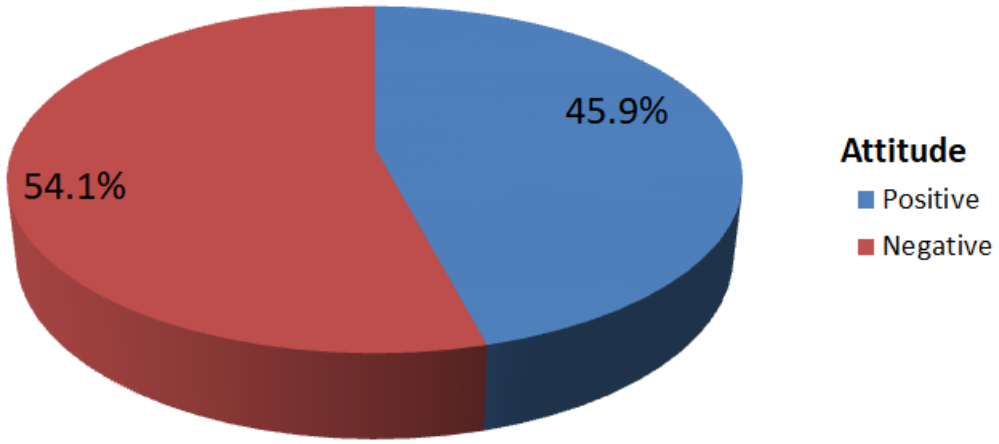

Figure 3: Households' attitude towards latrine use in Honkolo Wabe District, Oromia Region, Ethiopia, 2025

Table 7: Household attitude toward latrine utilization in Honkolo Wabe district, South Eastern Ethiopia, 2025

Items	Strongly disagree (%)	Disagree (%)	neutral (%)	agree (%)	Strongly agree (%)
Using a latrine is important for keeping my family healthy	20(4.1%)	41(8.4%)	82(16.8%)	305(62.5%)	40(8.2%)
Defecating in the open field increases the risk of diarrheal diseases.	12(2.5%)	43(8.8%)	88(18.0%)	269(55.1%)	76(15.6%)
It is essential for every household to have a latrine.	13(2.7%)	41(8.4%)	74(15.2%)	298(61.1%)	62(12.7%)
Using a latrine is a good way to prevent contamination of water sources.	11(2.3%)	47(9.6%)	50(10.2%)	313(64.1%)	67(13.7%)
I feel comfortable and safe using a latrine in my household.	5(1.0%)	37(7.6%)	53(10.9%)	335(68.6%)	58(11.9%)
Children should always use latrines instead of open defecation.	9(1.8%)	77(15.8%)	100(20.5%)	240(49.2%)	62(12.7%)
I believe using a latrine shows that I care about the environment.	10(2.7%)	38(7.8%)	53(10.9%)	320(65.6%)	67(13.7%)
Lack of privacy or poor condition of the latrine discourages its use.	7(1.4%)	80(16.4%)	69(14.1%)	295(60.5%)	37(7.6%)

5.7. Magnitude of latrine utilization

Out of 488 households interviewed, 370(75.8%) of households reported consistent latrine utilization by all household members, whereas 118(24.2%) of them reported improper latrine use by all family members. In addition, human feces were observed in 146(29.9%) of household compounds. This finding is nourished by focus group discussion that the main reason to observe feces in the compound was due to inconsistent use latrine by some family members, especially children and young.

"….*our compound is not clean, mostly due to low habit of using latrine, especially among children who are sometimes encouraged to defecate in open field spaces*"(30 years, female)

Besides, a fresh foot path leading to the latrine was seen in 301(67.1%) study participants' compound (Table 8). In this study, the proportion of respondents who utilized latrine was 31.4 %(95%CI: 27.3%-35.7%) (Fig 4). The main reason for not utilizing latrine was bad smell (57.8%), followed by inconvenient path to latrine covered by grass and lack of privacy wall (38.1%), and fear of safety at night (34.8%) (Fig 5). This quantitative finding was supported by the reason raised by the majority of qualitative participants.

"*Some family members, especially young children, are urinating and defecating outside the squatting hole, the latrine floor stays unclean, and it's offensive and uncomfortable for me to use*" (67 years old, male)

Table 8: Household magnitude of latrine utilization in Honkolo Wabe district, South Eastern Ethiopia, 2025

Characteristics	categories	frequency
Do all household members utilize the latrine	Yes	370(75.8%)
	No	118(24.2%)
Observe human feces in the compound	Yes	146(29.9%)
	No	342(70.1%)
Is there a fresh foot path leading to the latrine	Yes	301(67.1%)
	No	187(32.9%)
Is there splash water/ Urine on the latrine floor	Yes	128(26.2%)
	No	360(73.8%)

Evidence of a hand-washing facility used	Yes	30(6.1%)
	No	458(93.9%)

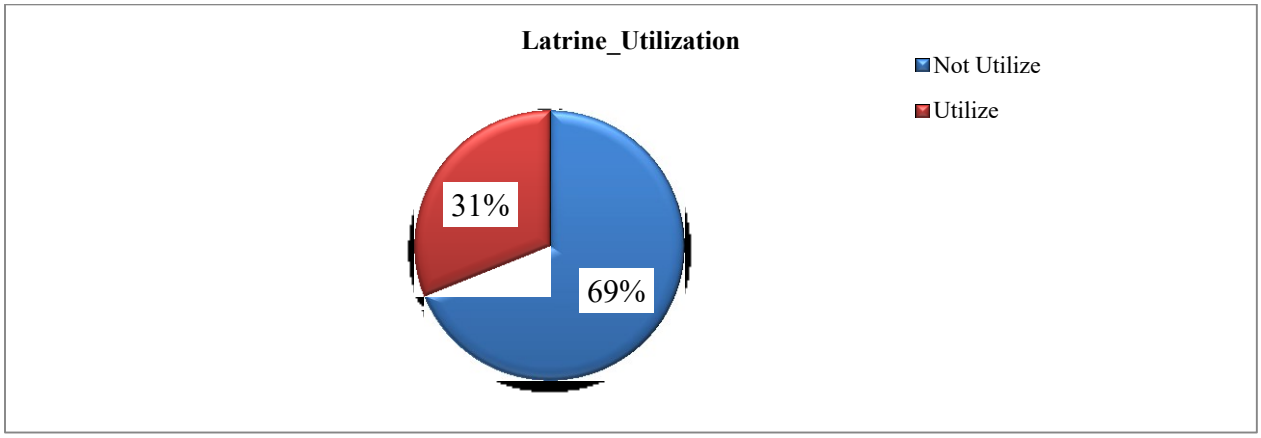

Figure 4: Magnitude of latrine utilization among households of Honkolo Wabe district, southern Eastern Ethiopia, 2025

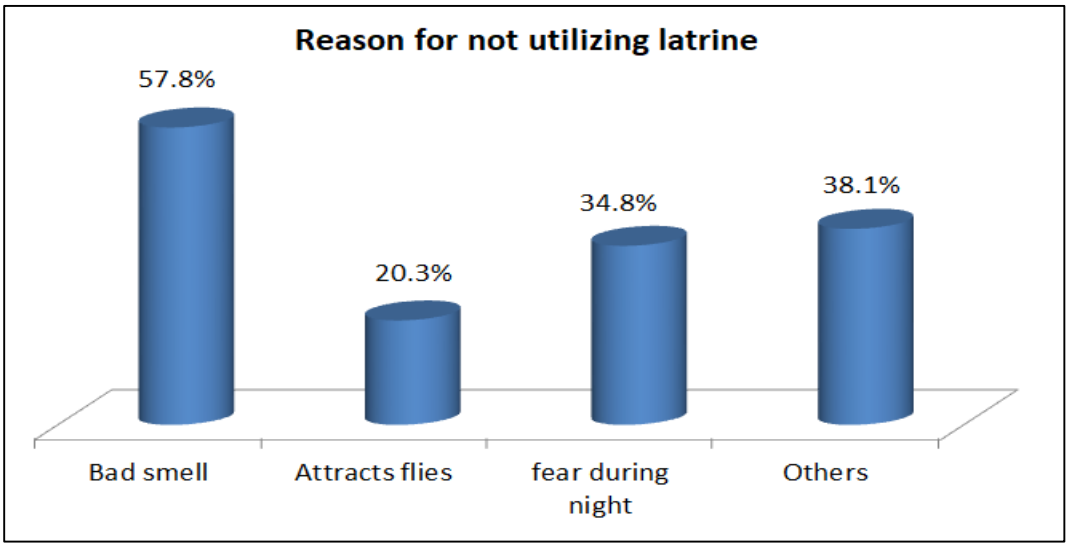

Figure 5: Reasons for not utilizing latrine among households in Honkolo Wabe district, Oromia Region, Ethiopia

5.8. Factors associated with latrine utilization

In bivariate logistic regression, sex, education levels of mother, family size, presence of under-five children, safe latrine at night, presence of hand washing facilities, latrine with wall/ door, received education on diarrhea from HEW, access to mass media, and attitude towards latrine utilization were considered as candidate variables for multivariable logistic regression. In multivariable logistic regression, sex, education levels of mother, family size, presence of under-five children, safe latrine at night, and latrine with wall/door were found to be significantly associated with latrine utilization (Table 9). The results showed that female had almost two times higher odds of utilizing latrine compared to their counterparts (AOR = 2.03, 95%CI: 1.28–3.21). The odds of utilizing latrine among households with mother having secondary and above education were almost four times higher than compared to their counterparts (AOR =4.42, 95%CI: 1.91–10.23). In addition, respondents with no children under five had almost two times higher odds of utilizing latrine compared to those who had under five children (AOR = 1.87, 95%CI: 1.16–3.01). This finding is consistent with qualitative findings that stated the main reason for the observance of signs of feces in the compound is inappropriate use latrine, especially by children.

"*...most of us encourage our children to defecate in the open field rather than using the latrine properly due to fear of falling into the latrine hole as it is not properly constructed*." (46 year's old, male)

Moreover, respondents less than five family size had 2.44 times higher odds of utilizing latrine compared to their counterparts (AOR = 2.44, 95%CI: 1.41–4.21). Furthermore, the likelihood of utilizing a latrine was 5.95 times higher among respondents who think the latrine is safe at night compared to their counterparts (AOR = 5.95, 95%CI: 3.48–10.16). This finding is also nourished by qualitative findings, which found that constructing a latrine in an unsafe location in the compound limits its utilization.

"*There is no question at all about the necessity of a latrine. But the location the latrine was built and its safety. My family's latrine is at the corner of our compound, and the path to the latrine is covered with bushes and grass, and it is not safe at night*."(25 years old woman).

The odds of utilizing latrine among respondents whose latrine has a privacy wall/door were almost two times higher than compared to their counterparts (AOR =1.63, 95%CI: 1.02–2.61).

These findings are also consistent with the qualitative findings in which participants expressed concern that stated latrine lacking a wall/door for privacy limits their proper use of the latrine.

"….I chooses not to use a latrine because my latrine lacks a privacy wall/door. I am not building an improved latrine due to insufficient financial resources" (35 years old, man)

Table 9: Multivariate logistic regression analysis results on the relationships between latrine utilization and influence factors among households in Honkolo Wabe District, South Eastern Ethiopia, 2025

Categories	Latrine utilization		COR(95%CI)	AOR(95%CI)	P-value
	Yes	No			
Sex of respondent					
Male	71	214	1	1	
Female	82	121	2.04(1.39,3.01)	2.03(1.29, 3.21)	0.002
Educational status					
No formal education	59	168	1	1	
Primary education	70	151	1.32(0.88,1.99)	0.71(0.40, 1.26)	0.243
Secondary and above	24	16	4.27(4.13,8.59)	4.42(1.91, 10.23)	0.001
Family size					
<5	124	224	2.12(1.33,3.37)	2.44(1.41–4.21)	0.001
≥5	29	111	1	1	
Presence of under five children					
Yes	83	214	1	1	
No	70	121	1.49(1.01,2.20)	1.87(1.16, 3.01)	0.01
Presence of hand-washing facilities					
Yes	38	45	2.13(1.32,3.45)	1.60(0.88, 2.93)	0.127
No	115	290	1	1	
Latrine is safe at night					

Yes	128	150	6.32(3.91,10.20)	5.95(3.48, 10.16)	0.001
No	25	185	1	1	
Latrine has a privacy wall or door					
Yes	99	158	2.05(1.38,3.05)	1.63(1.02, 2.61)	0.044
No	54	177	1	1	
Access to mass media					
Yes	79	130	1.68(1.15,2.48)	1.11(0.62, 1.99)	0.726
No	74	205	1	1	
Received education on preventing diarrhea from HEW					
Yes	83	137	1.68(1.15,2.48)	1.31(0.74, 2.35)	0.356
No	70	198	1	1	
Attitude towards latrine utilization					
Positive	99	165	1.68(1.15,2.48)	1.15(0.72, 1.86)	0.561
Negative	54	170	1	1	

6. DISCUSSION

Sanitation is a fundamental requirement to be accessible to every individual to protect them from diarrheal-related infections. Appropriate utilization of latrines is an effective strategy to prevent diarrhea and malnutrition[2]. This finding (31.4%, 95% CI: 27.3%-35.7%) aligns closely with studies in Chencha district, 31.08%[76], and Gondar City, 31.5%[77]. However, it is lower than the previous systematic review and meta-analysis, 50.02%[78], study conducted in Denbia, 61.2%[79], Wollega, 52.7%[68], Takussa District, 41.9%[80], and Southwest Ethiopia, 67.1%[24]. This low utilization rate (31.4%) matches findings from Chencha (31.08%)[76], and Gondar (31.5%)[77], but remains below the national meta-analysis average (50.02%) [79], likely due to rural socio-economic challenges and poor latrine design as confirmed by FGDs.

This study showed that females had higher odds of utilizing a latrine compared to male individuals. In addition, family size was found to determine the latrine utilization status of the household. The study findings revealed that respondents who had less than five family members had 2.44 times higher odds of utilizing a latrine compared to their counterparts. This result was supported by the studies done in northeastern Ethiopia[81], Sebeta Hawas Woreda[82], and Gurage Zone, Southern Ethiopia[5]. This is explained by the fact that respondents who had fewer family members might use the latrine less frequently, making the latrine more likely to be cleaner, which in turn may increase latrine utilization. However, utilizing a latrine by a large family increases the frequency of latrine daily, thereby making the latrine more likely to be dirty, which in turn may decrease utilization of the latrine. The study found that mothers' education status was significantly associated with latrine utilization. This finding is consistent with a previous systematic review[78], a study done in East Wollega[68], Maichew Woreda[83], and Sebeta Hawas Woreda[82]. This is explained by the fact that individuals who had secondary and above education had good awareness of the importance of utilizing latrine and the impact of diarrheal diseases, which is caused by the lack of not utilizing latrine consistently and appropriately.

The other factor that was found to be associated with latrine utilization was the presence of children under five in the household. The findings of the study revealed that respondents who had no children under five had increased odds of utilizing latrine compared to those who had under five children. This finding is supported by studies conducted in East Wollega[68], Aneded

District, North West Ethiopia[84], and Wondo Genet district, Southern Ethiopia[85]. This might be because children under five could not use the latrine by themselves, and they might defecate in the compound, which leads to observing feces in the compound during observation of the latrine utilization. In this study, safe access to a latrine at night was found to determine the level of latrine utilization. The study findings revealed that respondent who's their latrine is safe at night had a higher odds of latrine utilization compared to their counterparts. This is might be because respondents who have unsafe latrine at night fears to use and opt for open field defecation, which in turn leads to observing feces in the compound. In addition, respondent who's their latrine is had privacy wall/door had a higher odds of latrine utilization compared to those who had no privacy wall. This finding is in line with study conducted in Denbia district[79], Southwest Ethiopia[24], Maichew Woreda, North Ethiopia[83]. This is explained by the fact that respondents who had a latrine without a privacy wall/door might fear for their privacy and opt not to utilize the latrine, which leads absence sign of latrine use during data collection.

7. STRENGTHS OF THE STUDY

This study had the following strengths.

- The study used standardized structured questionnaires for data collection.
- The quantitative findings of the study were supplemented by qualitative findings to explore the factors determining latrine utilization in detail

8. LIMITATIONS OF THE STUDY

This study has some limitations.

- There may be over- and under-reporting by the interviewee and observational bias
- The study was a cross-sectional design nature which didn't support the cause-and-effect relationship.

9. CONCLUSIONS

Based on this study, the latrine utilization among households of Honkolo Wabe District was low compared to other study findings and the country level planned target for SDG (sustainable development goal). Sex of participant, maternal secondary education, family size <5, abcence of under-5 children, safe nighttime access, and privacy walls/doors, with FGDs confirming child fall fears, unsafe paths, and privacy/cost had a significant asso- ciation with latrine utilization. Therefore, health education should be given on associated findings to get full coverage latrine utilization in this District.

10. RECOMMENDATIONS

I recommend the following based on the findings of the study

For Health Institutions:

- ✓ Health institutions should encourage households to construct the latrine at an accessible and safe distance from the dwelling in a manner that promotes its utilization
- ✓ The health institutions should also support the household to construct a latrine that easily utilized by under five children in addition adult latrine.

For the health provider

- ✓ Health workers should provide health education to improve awareness among mothers on the importance of utilizing latrines consistently and correctly to halt diarrhea diseases.

For researches

- ✓ The researchers should also conduct a comparative study to indicate the level of latrine use among model households and non-model households.

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12. ANNEXES

Annex 1: English version Information Sheet and Consent Form

Information Sheet and Consent Form Prepared for households who will going to participate in the research project, Latrine utilization and associated factors among households in Honkolo Wabe District, Arsi Zone, Oromia Regional State, Ethiopia, 2025

Title of the Research Project:

Utilization of Latrine and associated factors among households in Honkolo Wabe District, Arsi Zone, Oromia Regional State, Ethiopia, 2025

Name of Investigator: Kasim Shunda Gebewo

Name of the Organization: ARSI UNIVERSITY COLLEGE OF HEALTH SCIENCES DEPARTMENT OF PUBLIC HEALTH

Name of the Sponsor: Arsi University

Introduction:

This information sheet and consent form will prepare to explain the study you are being asked to join. Please listen carefully and ask any questions about the study before you agree to join. You may ask questions at any time after joining the study. This research team includes one principal investigator, four data collectors, two supervisors and one advisor from Arsi University.

Purpose of Research Project

The purpose of this research will to assess the Utilization of latrine and associated factors in Honkolo Wabe District, Arsi zone, Oromia regional state, Ethiopia, 2024. The study will helpful in determining the current utilization of latrine in Honkolo Wabe district and associated factors among Households and contributes much to design appropriate prevention and intervention strategies. It also will serve as baseline information for subsequent studies in the country.

Procedure

To assess the utilization of latrine and associated factors in Honkolo Wabe District, Arsi Zone, Oromia regional state , Ethiopia, 2024. We invite you to take part in this project randomly. If you are willing to participate in this project, you need to understand and sign the agreement form. Then after, you will interview using interviewer-administered questionnaire... You do not need to tell your name to the data collector or write on the questionnaire and all your responses and the results obtained will be kept confidentially by using coding system whereby no one will have access to your response.

Risk/ Discomfort

By participating in this research project, you may feel that it has some discomfort especially on wasting your time about 30 minutes. We hope you will participate in the study for the sake of the benefit of the research result. There has no any risk to you for participating in this research project.

Benefits

If you participate in this research project, there may not be direct benefit to you but your participation is likely to help us in assessing utilization of latrine and associated factors among HH in Honkolo Wabe District. Ultimately, this will help us to work on prevention and intervention strategies.

Incentives/Payments for Participating

You will not provide any incentives or payment to take part in this project.

Confidentiality

The information collected from this research project will be kept confidential and information about you that will be collected by this study will be stored in a file, without your name, but, a code number assigned to it and it will not be disclosed to anyone except the principal investigator and will be kept locked with key.

Right to refuse or withdraw

You have full right to refuse from participating in this research. You can choose not to respond to some or all questions if you do not want to give your response. You have also the full right to withdraw from this study at any time you wish, without losing any of your right.

Are you interested to participate in this study? Yes____No____,if no skip to next house.

Annex 2: English version of Questionnaire

Results of questionnaire

1. Completed

2. Respondent not available

3. Refused

4. Partially completed

Identification

Questionnaire No. _____

Data collector signature: _____Date: _____

Supervisor's name _____ signature _____

Thank you for your willingness!

Part I: Socio-demographic and economic Characteristics Information (please put/circle the answer on the space provided)

Serial No	Question /Variable	Response	When to skip	Response code
Part I- Socio-demographic and economic factors				
101	Sex	1. Male 2. Female		

102	Age	…… years		
103	Religion	1. Muslim 2. Orthodox 3. Protestant 4. Others		
104	Ethnicity	1.Oromo 2.Amhara 3.Tigre 4.Others		
105	Respondent Education level	1.No education 2. Primary 3.Secondary 4.More than secondary 5. Unknow		
106	Mother Education level	1.No education 2. Primary 3.Secondary 4.More than secondary 5. Unknown		
107	Marital status	1. Single 2. Married 3. Divorced 4. Widowed/er		
108	Occupation of household head	1. Farmer 2. Daily labor 3. Merchant 4. Employer 5.Others		

109	Occupation of the respondent	1. Governmental worker 2. Farmer 3. Merchant 4. House wife 5. student 6. Others		
110	Family size including the respondent	----------		
111	Annual Income of the household in birr	……Birr		
112	Are there children under five years old living in this household?	1. Yes 2.No		
113	Is there children aged for school in the household?	1. Yes 2.No		
114	In your house is there any of the following media devise?(multiple response)	1.Radio 2.Television 3.Telephone/mobile phone		
115	Who usually decides about building or repairing the latrine in your household?	1. Male head of household 2.Female head of household 3. Both male and female together 4. Other relative (please specify)		
116	Are materials needed for building or repairing latrines available in your local market?	1. Always available 2. Sometimes available 3. Not available		
117	How affordable are these materials for you?	1. Very affordable 2. Somewhat affordable 3. Not affordable		

118	Approximately how much money does your household spend per year on latrine construction, maintenance, or cleaning supplies?	_____ in Birr		
part 2 Latrine utilization				
201	Do all family members use the latrine for defecation? (if no skip to 203	1.Yes 2. No		
202	What is the resin all family members didn't use the latrine for defecation?	1. Bad smell 2. Attracts flies 3. Fear during night 4. Others		
203	How often do household members use the latrine?	1. Always 2. Sometimes 3. Rarely 4. Never		
204	Have you observed any feces in the compound outside the latrine?	1.Yes 2. No		
205	Are children under five years old allowed and encouraged to use the latrine?	1.Yes 2. No 3. Not appilicable		
206	Does your household have any rules or agreements about latrine use and maintenance?	1.Yes 2. No		
207	Is the latrine used by guests or visitors?	1.Yes 2. No		
208	Is anyone in your household elderly or disabled who has difficulty accessing the latrine?	1.Yes 2. No		
209	Is the latrine easily accessible for elderly or disabled?	1.Yes 2. No		

210	Do you feel safe using the latrine at night?	1.Yes 2. No		
211	Is the latrine cleaned regularly?	1. Daily 2. Weekly 3. Occationally 4.Never		
212	Is there any open defecation practiced within or near the household compound?	1.Yes 2. No		
213	Does your household have a dedicated handwashing facility near the latrine?	1.Yes 2. No		
214	Is soap or an alternative (ash) present at the handwashing facility?	1.Yes 2. No		
215	Do household members wash hands after using the latrine regularly?	1. Always 2. Sometimes 3. Rarely 4. Never		
Part III. Environmental Characteristics				
301	Is there a reliable water source available near the latrine?	1.Yes 2.No		
302	Is there adequate material available for latrine maintenance (tools, wood, etc.)?	1.Yes 2.No		
303	What is the approximate distance of the latrine from your household dwelling?	In meter_____		
304	Is the latrine easily accessible all year round, including rainy seasons?	1.Yes 2.No		
305	Are there any times or seasons when using the latrine is difficult due to environmental conditions?	1.Yes (specify)___ 2.No		
306	Is space availability a challenge for constructing or maintaining latrines in	1.Yes		

	your compound?	2.No		
307	How would you rate the cleanliness of the latrine environment?	1. Clean (no fecal matter inside/outside, swept regularly) 2. Dirty (fecal matter present or area not swept)		
308	Are there issues like odors, flies, or cleanliness problems that discourage latrine use?	1.Yes 2.No		
Part IV. Latrine Condition Characteristics				
401	What type of latrine do you have?	1.Pit latrine with slab 2. Pit latrine without slab 3.Ventilated improved pit latrine 4.Other (describe) _____		
402	How long has the current latrine been in use?	_____in years		
403	Does the latrine have a privacy wall or door?	1.Yes 2.No		
404	Does the latrine require maintenance or repairs currently?	1.Yes 2.No		
405	How often do you clean the latrine?	1. Daily 2. Weekly 3. Occasionally 4. Never		
406	Is the latrine structurally sound (walls, roof, floor)?	1.Yes 2.No		
407	Does the latrine have a proper pit cover?	1.Yes 2.No		
408	Have you experienced any issues with latrine fullness or need for emptying?	1.Yes 2.No		

Part V. Individual and Behavioral Factors				
501	Are you aware of the health risks associated with open defecation?	1. Yes 2.No		
502	Do you believe that using a latrine can prevent diseases?	1.Yes 2.No		
503	Have you or your family members received visits or education from Health Extension Workers (HEWs) within last six months about latrine use?	1.Yes 2.No		
504	Are there cultural beliefs or traditions in your community that discourage latrine use?	1.Yes (specify) 2.No		
505	Do you feel any social pressure or community norms encouraging you to use latrines?	1.Yes 2.No		
506	Do you or other household members wash hands with soap or alternative after using the latrine?	1. Always 2. Sometimes 3. Rarely 4. Never		
507	Is there access to mass media sanitation promotion messages (radio, TV, posters)?	1.Yes 2.No		
508	Do you or your household take any measures to repair or improve the latrine when it is damaged?	1.Yes 2.No		
509	Do any religious or traditional beliefs influence your use or construction of latrines?	1. Yes, they encourage use 2. Yes, they discourage use 3. No influence 4. Don't know		

Part VI. Attitude Towards Latrine Utilization							
601	Using a latrine is important for keeping my family healthy	1	2	3	4	5	
602	Defecating in the open field increases the risk of diarrheal diseases.						
603	It is essential for every household to have a latrine.						
604	Using a latrine is a good way to prevent contamination of water sources.						
605	I feel comfortable and safe using a latrine in my household.						
606	Children should always use latrines instead of open defecation.						
607	It is inconvenient or difficult to use the latrine regularly.						
608	I believe using a latrine shows that I care about the environment.						
609	Lack of privacy or poor condition of the latrine discourages its use.						
	Scale for responses: 1=Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree						

Part VII- Morbidity Related Questionnaire Items on Sanitation and Hygiene				
701	What is the main source of water used for drinking purpose?	1.Piped water (public) 2.Spring (protected) 3.spring (unprotected) 4.From well 5.Other,Specify_____		
702	How do you store water for latrine and handwashing use?	1. Covered container 2. Open container 3. Don't store water		
703	In the past two weeks, has any household member experienced	1.Yes 2.No		

	diarrhea?			
704	Specify the age(s) of the affected member(s):	1. Child under 5 years 2. Child under 5 years and above 3. Adult		
705	How many episodes of diarrhea did the affected member(s) have in the past two weeks?	1.Single episodes 2. Multiple episodes		
706	Was medical treatment sought for the diarrheal illness?	1.Yes 2.No		
707	From where was treatment sought?	1. Health facility 2. Traditional healer 3. Pharmacy 4. Home remedy		
708	Were any other hygiene-related illnesses reported in the household in the past month? (e.g., intestinal parasites, trachoma, helminthic infections)	1.Yes 2.No		
709	How serious do you consider diarrheal diseases as a health problem in your household?	1. Very serious 2. Somewhat serious 3. Not serious		
710	What are the common causes of diarrhea in your view?	1. Dirty water 2. Poor sanitation 3. Poor hygiene 4. Contaminated food 5. Other (specify)_____		
711	Has diarrhea or other hygiene-related diseases affected the usual activities (work, school attendance) of household members in the past two weeks?	1.Yes 2.No		

712	Has anyone in your household ever missed school or work because of diarrhea or sanitation-related illness?	1.Yes 2.No		
713	How many days anyone in your household ever missed school or work?	_____Days		
714	Have you received information or education about preventing diarrheal disease and sanitation-related illnesses from health extension workers or other sources?	1.Yes 2.No		
715	Does your household practice any preventive measures against sanitation-related diseases? (e.g., boiling water, latrine use, handwashing)	1.Yes 2.No		
716	Which one of your household practice preventive measures?	1. Boiling water 2. Latrine use 3. Handwashing		

Observational checklist

A	What is the type of latrine?	1. Unimproved latrine 2. Improved latrine 3.Pour Flush 4.Other
B	What is the floor (slab) constructed of?	1. Wood 2. Sam plat /slab 3. Soil 4.Tin
C	Is there a cover/lid for the hole?	1.Yes 2.No
D	What is the latrine walls constructed of?	1. Only Wood 2. Wood & mud 3. By stones 4. No wall 5.Others
E	What is the latrine roof constructed of?	1.Thatch 2.Tin 3.Plastic 4. No roof 5. Others

F	Is there a vent pipe?	1.Yes 2.No
G	What is the latrine door constructed of?	1.Wood 2.Tin 3.Thatch 4.No Door 5. Others
H	Is there a hand washing facility with water near the latrine? (if no skip to q, K)	1.Yes 2.No
I	If yes to question H, Is there soap, ash or other cleansing agent?	1.Yes 2.No
J	Is there evidence that the hand washing facilities are used? (e.g. signs of wetness)	1.Yes 2.No
K	Are there observable feces in the compound?	1. Yes 2. No
L	Is there Observable of splash water or urine on the latrine floor?	1. Yes 2. No
M	Is there clearly visible foot path to latrine or uncovered with grass?	1. Yes 2. No

Annex 3: Afan Oromo version information sheet and consent form

Gaaffilee dhimma qorannoo fi qu'annoo Ittifayyadama mana fincaanii Hawaasa Baadiyyaa jiraatan Aanaa Honqooloo Waabee irratti gaggeeffamuuf gaafataman

Seensa

Akkam bultan/akkam ooltan?

Maqaan koo _____jedhama.

Har'a kanin asitti argameef qorannoo dhimma Itiifayyadama mana fincaanii irratti Yuuniversiitiin Arsii gaggeessaa jiru waliin ta'uudhaan raga tokko tokko funaanaa jirra. Nutis gaaffiidhuma dhimma itti fayyadama mana fincaanii tokko tokko isin gaafanna.Yoo fedhii qabaattaan Manni keessan caarraadhaan kan filataman keessaa tokko dha.

Wanti isin nutti himtan hundi qorannoo kanaaf qofa malee dhimma biraaf kan barbaadame miti. Kanaafuu, qaamni biraan beeku danda'u hin jiraatu jechuudha. Akkasumas maqaan keessan as irratti hin barreeffamu. Egaa yoo kan hirmaattan ta'e ragaa sirrii akka nuu laattan abdii qabna.

Ni hirmaattuu?_____Itti fufi

Hin hirmaattanii? _____Mana itti aanutti darbi

Unka ragaa Qorannoo Itti fayyadama mana fincaanii Hawaasa Aanaa Honqooloo Waabee Baadiyaa jiraatan bara 2017/18 ALI ittin funaanamu.

Annex 4: Afan Oromo version questionnaire

Lakk	Gaaffilee Gaaffilee Deebii	Deebii Irradarbuuf	Irradarbuuf	Koodi
Kutaa 1ffaa Ragaalee Dhuunfaa fi hawaasummaa				
101	Saala abbaa deebbii kennaa	1.Dhiiraa 2.Dhalaa		
102	Umurii	Waggaa_____		
103	Haala gaa'elaa	1.Kan fuudhe/heerumte 2.Kan hin fuune /hin heerumne 3.Kan walhiikan 4.Haati/abbaan manaa kanjalaa duute/du'e.		
104	Saala abbaa/haadha manaa	Dhiira Dhalaa		
105	Waliigala namoota mana keessa jiraatan	1.Dhiira_____ 2.Dhalaa_____		
106	Amantaa	1.Orthodoksii 2.proteestantii 3.Muusiliim		

		4.waaqeffata 5.kan biroo----------		
107	Saba(Qomoo)	1.Oromoo 2.Amaara 3.Tigiree 4.Kanbiraa_____		
108	Sadarkaa barnootaa abba manaa	1.Kan hin baratin 2.Barreessuu fi Dubbisuu dandaa'a 3.Kutaa 1-8 4.Kutaa 9-12 5.Diippiloomaa fi isaaoli		
109	Sadarkaa barnootaa haadha manaa	1.Kan hin baratin 2.Barreessuu fi Dubbisuu dandaa'a 3.Kutaa 1-8 4.Kutaa 9-12 5.Diippiloomaa fi isaaoli		
110	Hoji Abbaa manaa/Haadha manaa (Nama yaada kennu)	1.Qonnaan bulaa 2.Daldalaa 3.Haadha manaa 4.Hojjetaa mootummaa 5.Kan biroo _____		
111	Daa`imman mana keessa jiran Umurii barnootaa gahan	1.Barnoota idilee kan hordofan------ 2.Barnoota idilee hin hordofne____		
112	Galii waggaa	Qarshii_____		
Kutaa lama- Qabeenya maatii kan agarsiisu				

201	Mana keessan keessa meeshaaleen armaan gadii jiruu? Hin jiru =0, Jira=1	Raadiyoo __ Televiiziyoona __ Bilbilamanaa/moobayila		
202	Manni keessanii irri keessa maal irraa hojjetame?	1.Qorqoorroo 2.Citaa 3.Kan biroo		
203	Lafti mana keessanii/isaanii maalirraa hojjetame?	1.Simmintoo 2.Dhoqqee horii 3. Biyyoo 4.Kan biroo _____		
204	Kushinaa (bakka nyaatni itti qophaa'u) kophaatti qabdu?	1.Eeyyee 0. Lakki		
205	Beeyladni mana kessa galan ni jiru?	1.Eeyyee 0. Lakki		
Kutaa 3 ffaaMana fincaanii				
301	Manni fincaanii mooraa keessa jiraa?	1.Eeyyee 0.Miti		
302	Gosa mana fincaanii	1.Kan aadaa 2.Mana fincaanii fooyya'aa 3.Kan biroo		
303	Manni fincaanii sun ijaarsa irraan olee qabaa? /ilaali	1.Eeyyee 0.Lakki		
304	Abba qabeenyummaa mana fincaanichaa..	Kan dhuunfaa Kan waliinii		
305	Faayidaa mana fincaanii irratti odeeffannoo qabdu?	1.Eeyyee 0.Lakki		

306	Manaficaaniitt fayyadamuuf gorsa kan siif kenne eenyu?	1.Hojjettuu ekisteenshinii fayyaa 2.Raadiyoorraa 3. Barumsa wal-ga'iirraa 4.Gorsa ollaa 5. maatii keessaa		
307	Manafincaanii ergee hojjettatanii yeroggaa hangam?	Waggaa----------		
308	Haalli mana fincaanichaa haaromsa barbaadaa fakkaata ?	1.Eeyyee 0. Lakki		
309	Maal mana fincaanichaatu haaromsa barbaada?	1.kabaa/nannoosaa 2. Irra keessa/ajjeerra 3. Lafa isaa		
310	Meeshaaleen haaromsaaf ta'an naannotti argamu?	Eeyyee 0.Lakki		
311	Manni fincaanii mana irraa hagam fagaata?	Meetira----------		
312	Mana fincaaniitti yeroo kamkam itti fayyadmtu?	1.yeroo hundaa 2.yeroo bay'ee 3.dabree dabree 4.Inumaayyu itti hinfayyadamu.		
313	Mana fincaan iitti hin fayyadamtan yoo ta'e sababiin isaamaali?	1.Waan namatti hin toleef/ajaa'uuf 2. Mana irraa fagoodha. 3.Fayidaa qabaachuu isaa itti hin amanneef 4.waan guuteef ykn		

		dulloomeef 5.kan biroo		
314	Eenyufa'itu itti gargaarama?	1.Maatii hunda/mara 2.Namoota guguddoo qofa. 3.namoota guguddoo fi ijoollee wagga shan olii 4. Dubartootaa		
315	Itti fayyadadama mana fincaaniif mallattoo jiu ilaali 1.Udaan mooraa keessa hinjiru 2.Udaan ho'aan qaawwa bollaarratti mul'ata. 3. karaan mana fincaanii geessu margaan hin uwwiffanee	1. Eyye 0. Lakki 1. Eyye 0. Lakki 1. Eyyee 0. Lakki		
316	Mana fincaanii ni qulqulleesituu?	1.Eeyyee 0.Miti		
317	Qulqullinni mana fincaanii sun maal fakkaata? Ilali	1.Qulqulluu,itti fayyadamaa jiru. 2.Udaan irra keessa jira itti hin fayyadaman. 3.Kosii fi waraqaan ala guutee jira 4.itti fayyadamaa hin jiran		
318	Lafti mana fincaanichaa maragaa qaba?	1.Eeyyee 2.Lakk		
319	Qaawwii manni fincaanicha qadada qaba	1.Eeyyee 2.Lakki		
320	Manni fincaanii sun harka dhiqannaa qabaa?	1.Eeyyee 0.Lakki		

321	Bakki harka dhiqannaa sun saamunaa/daaraa qaba?	1.Eeyyee 0.Lakki		
322	Mana fincaanii booda harka keessan yeroo kam dhiqattu?	1.Yeroo hundaa 2.Al tokko tokko 3.Hin dhiqadhu		
323	Yeroo biroo yeroo kam kam harka keessan dhiqattu?	1.Nyaata nyaachuu dura 2. Nyaata qophesu dura 3.daa'mman sooruu dura 4.daa'imman qulqulleessuun booda 5.yeroo armaan olitti eerama hundaa		
324	Harka keessan yeroo hunda hin dhiqattan yoo ta'e Sababni maali?	1.Bishaan dhabuu 2.Irraanfachuu 3.Barbaachisaa natti hin fakkaatu 4. Kanbiroo ._____		
325	Mana fincaanitti fayyadamuun bu'aa maalii qaba?	1. Qulqullummaaf 2. Fayyaaf 3. Namni nama hin argu 4. Kan biroo----------		
326	Mana fincaaniitti fayyadamuun miidhaa qaba jette yaaddaa?	1. Eyyee 0. Lakki	yoo ta'e Gara lakk.328	Lakk3 28yoo ta'e	Gara lakk. 328
327	Eeyyee yoo jette …	1.Titiisa harkisa 2. Foolii yaraa qaba 3.Bakka qabata		

		4. Horiin keessa bu'u 5. Kan biroo……..		
328	Daa'mman waggaa shanii gad qabdu?	1.Eyye 0.Lakki	Lakki yoo ta'e	Gara lakk. 331
329	Yoo ta'e bobbaa isaanii essatti gattu?	1.Gara borootti 2. Manafincaaniitti 3. lafumatti dhiifama		
330	Bobbaan daa'mmanii miidhaa fayyaa qabaachuu isaa beektu?	1.Eeyyee 0.Lakki		
331	Ogeessifayyaa YKN Hojjettotni ekistenshiniinfayyaamnakee ssandaawwatu?	1.Ji;aa gaditti 2.ji;a ji'aan 3.Ji'a lamaahagaafuritti 4. Gonkuma nu hin daawwatne		
332	Manni keessan dhaabbata fayyaarra dhihotti argamurraa hangam fagaata?	Saa'a----------		
333	Maatii moodeela ta'uun eebbifamteetta?(ragaa qabu?)	1.eeyyee 0.lakki		
	KutaaAfur- Bishaan			
401	Bishaan dhugaatii eessaa argattu?	1.Bishaan Boombaakanwaliin 2. Lagaittifameirraa		

		3.Lagaahinittiffamnerraa 4.B isshaan boollaa 5.Kan biroo_____		
402	Bishaan guyyaa tti hangam fayyadamtu ?	Liitira _____		
403	Bishaan waraabuuf yeroo hagam sitti fudhata?	Daqiiqaa----------		
404	Bishaan yeroo mara kan fidu eenyuu?	1.Haadha manaa 2.Ijollee dubaraa 3.Ijollee dhiiraa 4.Maatii biroo		
Kutaa 5 Qulqullummaa Naannoo				
501	Boolla kosii itti gatan qabduu?	1.Eeyyee 0.Lakki		
502	Yoo eeyyee jette	1.Boolla kosi igogaa qofa 2.Boolla dhangalaa'aa 3.Lamaan isaa 4. Hundaa bakka tokkotti.		

Cheekliistii daawwannaa Itti Fayyadama Mana Fincaanii abbootii warraa ittiin hordofamu.

B1	Sadarkaan mana fincaanii isa kami?	1. kan sadarkaa hin eegatin 2. kan sadrkaa isaa eegate 3. kan bishaaniin hojjetu 4 kan biroo
B2	Lafti (slab) mana fincaanii maal irraa hojjettame?	1. muka 2.samplat/slab/dhagaa bocame 3. biyyoo

		4.qorqorroo
B3	Boolli mana fincaanii qadaada qabaa?	1. Eeyyeen 2. Miti
B4	Dhaabnni mana fincaanii maal irraa ijaarame?	1. muka qofarraa 2. mukaa fi dhoqqee irraa 3.dhagaadhaan 4. girgiddaa hin qabu 5. kan biroo
B5	Baaxiin mana fincaanii maal irraa hojjetame?	1. kabaa margaa 2.qorqoorroo 3.pilaastikii 4.quuxii hin qabu 5. kan biroo
B6	Ujumoo qillensa naanneessu jiraa	1. Eeyyeen 2. miti
B7	Balballi mana fincaanii maal irraa hojjetame?	1. muka 2. qorqoorroo 3. kabaa margaa 4.balbala hin qabu 5.kan biroo
B8	Meeshaan harka dhiqannaa bishaan qabu mana fincaanii bira jiraa?	1. Eeyyeen 2. Miti

B9	Gaafii A8 eeyyeen yoo ta'e, Saamunaa, daaraa ykn keemikaalli harka dhiqannaaf oolu meeshaa harka dhiqannaa cinaa jiraa?	1. Eeyyeen 2. Miti
B10	Meeshaan harka dhiqannaa tajaajila kennaa jiraachuu ragaan argisiisu jiraa? (fkn. mallattoo jiidhinnaa)	1. Eeyyeen 2. Miti
B11	Bobbaan dallawa keessatti muldhatu jiraa?	1. Eeyyeen 2. Miti
B12	Jiidhinsa bishaanii ykn fincaan boola mana fincaanii irratti muldhatu jiraa?	1. Eeyyeen 2. Miti
B13	Faanni gara mana fincaanii deemsisu ykn kan margaan hin ufiffamin jiraa?	1. Eeyyeen 2. Miti

Declaration of Investigator

I, the undersigned student of General Master of Public Health, declare that this thesis work is my original work in partial fulfillment of the requirement for the degree of General Master of public health to my best knowledge.

Name of investigator: _____

Signature: _____ Date_____

Declaration of Advisors

We, the undersigned Advisors, declare that this thesis is our original work in partial fulfillment of the requirement for the degree of General Master of public health for the stated student above to our best knowledge. We confirmed that this thesis is ready for examination with our approval as the university advisor(s).

Name of primary Advisors:	**Signatures**	**Date**
1. _____	_____	_____
Name of secondary Advisors:	**Signatures**	**Date**
2. _____	_____	_____

Examining Board Approval

We, the undersigned Examining board, approved that this thesis is original work with the basic scientific merits for partial fulfillment of the requirement for the degree of General Master of public health for the stated student above to our best knowledge. We confirmed that this thesis is sufficient for the student's promotion to the higher level.

Name of External Examiner:	**Signatures**	**Date**
1. _____	_____	_____
Name of Internal Examiner:	**Signatures**	**Date**
2. _____	_____	_____
Name of Department Head:	**Signatures**	**Date**
3. _____	_____	_____