Research Square

Preprints are preliminary reports that have not undergone peer review.
They should not be considered conclusive, used to inform clinical practice,
or referenced by the media as validated information.

Beyond Gender: A Mixed-method Study of Intersectional Exclusion from WASH Services for Women and Persons with Disabilities in Rural Ethiopia

Abireham Misganaw Ayalew

abrish1899@gmail.com

Pathfinder International

Research Article

Keywords: WASH, water access, sanitation, hygiene, disability inclusion, gender equity, Ethiopia, vulnerable populations, mixed-methods, GESI

Posted Date: July 2nd, 2026

DOI: https://doi.org/10.21203/rs.3.rs-10204507/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License.
Read Full License

Additional Declarations: No competing interests reported.

Beyond Gender: A Mixed-method Study of Intersectional Exclusion from WASH Services for Women and Persons with Disabilities in Rural Ethiopia

Abireham Misganaw Ayalew[1]*

[1]* Author and Corresponding Author, abrish1899@gmail.com/ehealth70@gmail.com, Pathfinder International, Watertown, United States.

ABSTRACT

Background: Access to safe water, sanitation, and hygiene is a fundamental human right, yet significant disparities persist in service delivery for vulnerable populations, particularly women and persons with disabilities (PWDs), in rural Ethiopia. Despite policy commitments to inclusive WASH, there is limited empirical evidence on the actual barriers these groups face at the household level.

Objective: This study assessed the accessibility, inclusiveness, and equity of services for women and persons with disabilities in Berebere woreda, Bale zone, Oromia Region, Ethiopia, with a focus on identifying structural, financial, socio-cultural, and institutional barriers to equitable service delivery.

Methods: A mixed-methods cross-sectional study was conducted using multiple data sources: (i) a structured household survey; (ii) focus group discussions and key informant interviews with community members, women, PWDs, and sector officials; (iii) structured observation checklists at households, schools, and health facilities; and (iv) a desk review of woreda- and zonal-level administrative records and policy documents. Quantitative data were analyzed using descriptive statistics, while qualitative data were thematically analyzed to identify patterns of exclusion.

Results: Only 9% of households had access to public taps, with the majority relying on rivers (38%) and springs (26%). Only 14% of respondents reported that WASH facilities were accessible to PWDs, and only 22% confirmed accessibility for women and girls. Water collection remained predominantly female responsibility (94%), with women spending 2-3 hours daily, and PWDs requiring several hours per trip. In WASH governance, while 43% of WASHCO members were women, representation was nominal, with women concentrated in cashier roles and holding no leadership positions; critically, not a single WASHCO member was a person with disability. No PWD-disaggregated indicators were present in the district water office's monitoring systems. Socio-cultural norms, including menstrual taboos, fears of violence during water collection, and stigma toward disability, further constrained equitable access. Schools and health facilities lacked accessible infrastructure, including ramps, handrails, adapted toilets, and menstrual hygiene management materials. Women and PWDs were absent from WASH-related enterprises, with barriers including limited capital, training, social stigma, and childcare responsibilities.

Conclusions: This study reveals systematic and compounding exclusion of women and persons with disabilities from WASH services in rural Ethiopia—a pattern driven by the convergence of infrastructural inaccessibility, financial barriers, socio-cultural norms, and institutional failures in governance, monitoring, and staffing. Despite formal policy commitments, the absence of accountability mechanisms, disaggregated data, and representation of vulnerable groups perpetuates inequity. Urgent policy action is needed to establish mandatory accessibility standards, fee waiver mechanisms, PWD-disaggregated indicators, and formal representation of women and PWDs in WASH governance structures to translate inclusive commitments into equitable service delivery.

Keywords: WASH, water access, sanitation, hygiene, disability inclusion, gender equity, Ethiopia, vulnerable populations, mixed-methods, GESI

1. INTRODUCTION

Access to safe Water, Sanitation, and Hygiene (WASH) is a cornerstone of public health, human dignity, and sustainable development. Globally, the Sustainable Development Goals (SDGs) explicitly address this through Targets 6.1 and 6.2, which call for "universal and equitable access to safe and affordable drinking water for all" and "access to adequate and equitable sanitation and hygiene for all," with special attention to the needs of women, girls, and those in vulnerable situations (1). This commitment is further reinforced by international human rights frameworks, such as the Convention on the Rights of Persons with Disabilities (CRPD), which, in Article 28, obligates states to ensure persons with disabilities have equal access to clean water services (2).

Despite these frameworks, significant populations remain excluded. The World Health Organization estimates that over 1 billion people, or 15% of the global population, live with some form of disability, with a higher prevalence in developing countries (3). These individuals often face severe socioeconomic disadvantages, including poorer access to essential services like WASH. Data from 34 countries indicate that persons with disabilities are disproportionately more likely to live in households without adequate water and sanitation (3).

The lack of accessible WASH facilities imposes a disproportionate burden on women and girls, who are often the primary collectors, transporters, and managers of water for household use. This responsibility exposes them to significant risks, including sexual harassment and assault when traveling long distances to fetch water or when forced to practice open defecation in secluded areas after dark (4). Furthermore, the considerable time invested in water collection, often many hours per day, represents a critical form of "time poverty," limiting opportunities for education, income generation, and community participation. The availability of safe water and sanitation near homes directly addresses this time poverty, improves health, and reduces the caregiving burden associated with waterborne illnesses.

Simultaneously, gender inequality continues to be a major barrier to development. Gender equality, defined as a state where the rights and opportunities of individuals do not depend on their sex (5), remains elusive in many parts of the world. Women and girls are frequently burdened with the primary responsibility for household water collection and management of sanitation, a role that exposes them to safety risks, limits their educational and economic opportunities, and consumes significant time and energy (6). When these two dimensions of exclusion intersect, the challenges are compounded. Women and girls with disabilities face multiple and intersecting forms of discrimination, leading to even greater barriers in accessing essential WASH services and products (7).

In Ethiopia, a country where approximately 80% of the population resides in rural areas, these global challenges are acutely felt. Women are the backbone of agricultural labor, performing up to 75% of farm work, yet their productivity is hampered by limited access to resources and extension services (8). The nation also suffers from some of the lowest gender equality performance indicators in Sub-Saharan Africa. The 2018 UNDP report highlights a low Gender Development Index, with a significant deviation from gender parity, and a Gender Inequality Index ranking of 121 out of 160 countries, reflecting substantial gaps in health, empowerment, and economic opportunity (9).

This inequality is further compounded for marginalized groups, particularly persons with disabilities (PWDs), who represent an estimated 17.6% of the Ethiopian population (3). A vast majority live in rural areas with limited access to basic services. Women and girls with disabilities face multiple and intersecting forms of discrimination, placing them at a severe disadvantage. While inclusive WASH services that involve women and PWDs in all stages, from planning to management, are critical for sustainable development and empowerment, such practices are not the norm.

Despite a progressive constitutional framework that guarantees women's equality (Article 35) and the rights of children (Article 36), and despite Ethiopia's ratification of key international human rights charters,

a significant gap persists between policy intent and on-the-ground reality. While high-level political empowerment of women is increasing, this progress has not yet translated into equitable access to essential services like WASH for many women and girls, particularly those in rural areas and those with disabilities. National policies, such as the One WASH National Programme (OWNP), explicitly aim to mainstream gender and social inclusion (10).

Despite a robust policy framework, a critical implementation gap persists. WASH programs in Ethiopia often lack a rigorous Gender and Social Inclusion (GESI) analysis from the outset, leading to interventions that fail to adequately address the specific needs of women and persons with disabilities. A critical barrier to bridging this gap is the consistent failure of WASH programs in Ethiopia to integrate a robust Gender and Social Inclusion (GESI) analysis during their design and implementation phases. This oversight leads to interventions that are not tailored to the specific needs, vulnerabilities, and capacities of women, girls, and persons with disabilities. Consequently, despite the recognized importance of WASH for gender equality, health, and economic productivity, these populations continue to face exclusion, heightened vulnerability, and limited benefits from WASH initiatives, thereby perpetuating cycles of poverty and inequality.

The study aims to conduct a mixed-method Gender and Social Inclusion (GESI) analysis that identifies the distinct barriers, enablers, and program gaps affecting equitable WASH access, with specific attention to the well-being of women, girls, and socially excluded groups, and to generate evidence-based, context-specific recommendations for advancing inclusive and sustainable WASH services in rural Ethiopia.

2. METHOD AND MATERIALS

This study employed a concurrent triangulation mixed-methods study design, utilizing both desk review and primary data collection. The primary data was gathered through key informant interviews (KIIs), focus group discussions (FGDs), and observational sessions with diverse community groups, including women and Persons with Disabilities (PWDs). Concurrently, a comprehensive desk review was conducted, involving a systematic analysis of relevant literature, policy documents, declarations, guidelines, strategies, and prior research related to inclusive WASH.

Study units and site: This study was conducted at multiple levels: national, regional, and within Berbere Woreda. Data was collected from a range of stakeholders, including government policy implementers, Disabled Persons' Organizations (DPOs), Civil Society Organizations (CSOs), and community members. The primary study units were women, persons with disabilities, and staff from relevant sectoral offices. The primary data was supplemented by a comprehensive review of secondary documents from the national and woreda levels.

Study area: As shown in Fig. 1, the study was conducted in Berbere Woreda, Bale Zone, Oromia Region, Ethiopia.

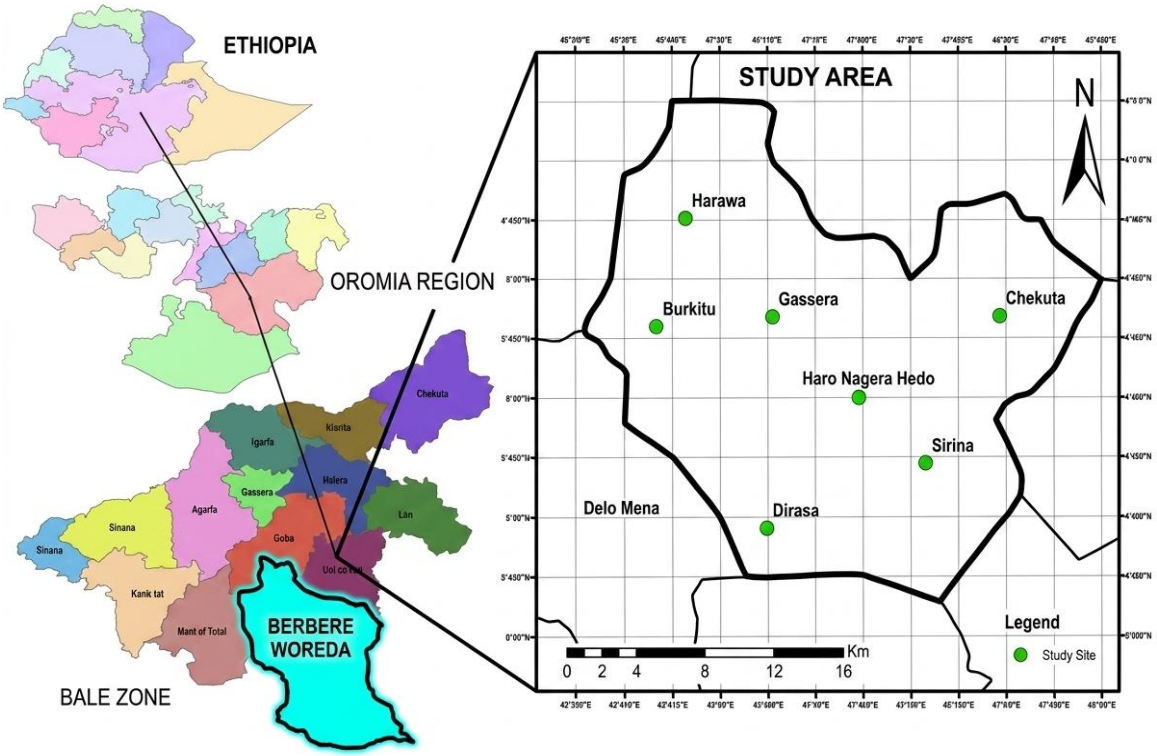


Figure 1: Map of the study area

Study Design: This study employed a concurrent triangulation mixed-methods design. Qualitative and quantitative data were collected simultaneously to provide a comprehensive analysis of Gender Equity and Social Inclusion (GESI) within Water, Sanitation, and Hygiene (WASH) services. While the study leans heavily on qualitative inquiry to capture nuanced social norms and lived experiences, it integrates a structured quantitative household survey to establish statistical patterns regarding facility accessibility. The quantitative component provides a descriptive baseline of household WASH infrastructure access, while the qualitative component explores underlying social norms, power dynamics, institutional barriers, and the specific lived experiences of marginalized groups. Integrating both approaches allows the quantitative trends to be contextualized by qualitative insights, ensuring a more holistic analysis than either method could provide alone.

Source Population: The source population encompassed all households, community members, institutional WASH facilities (schools and health centers), and formal WASH service providers within Berbere Woreda.

Inclusion Criteria

- Household Survey: Primary household caregivers (aged 18 or older, male or female) who are responsible for daily domestic water management and hygiene practices within the selected households.
- Focus Group Discussions (FGDs): Community members who had permanently resided in the selected kebele for at least the past 12 months. Discussions were organized into separate, homogenous groups based on demographic characteristics (adult women, adult men, adolescent girls, and PWDs) to mitigate power dynamics and encourage open dialogue.

- Key Informant Interviews (KIIs): Woreda and kebele-level institutional officials from water, health, education, and women/children affairs offices; heads of selected schools and health facilities; and representatives from local water administration committees.

Sampling Method: To effectively balance the quantitative and qualitative components, a multi-stage sampling framework was implemented:

- Stage 1 (Kebele Selection): Out of all the kebeles in Berbere Woreda, seven (7) kebeles were selected purposively. This selection ensured representation across different agro-ecological zones and captured varying degrees of baseline WASH service coverage (ranging from well-served to underserved areas).
- Stage 2 (Quantitative Household Selection): Within each of the 7 selected kebeles, a systematic random sampling technique was applied to select households. Using updated kebele community registries as the sampling frame, a sampling interval (n^{th}) was determined by dividing the total kebele household population by the allocated sample size for that kebele, beginning from a randomly selected starting point.
- Stage 3 (Qualitative Participant Selection): Participants for FGDs and KIIs were selected using purposive sampling. Researchers collaborated with kebele administrators and local health extension workers to locate and invite specific individuals who met the inclusion criteria, ensuring marginalized voices (such as women and PWDs) were explicitly centered.

Quantitative Sample Size: Because this component was designed as a descriptive survey rather than a highly powered hypothesis-testing study, the sample size was determined using Cochran's formula for a large population with a broader margin of error to accommodate logistical and resource constraints:

$$n_0 = \frac{Z^2 \cdot p \cdot (1-p)}{e^2}$$

Where:

- n_0 = Initial sample size (before finite population correction)
- Z = Z-score for the 95% Confidence Level (Constant = 1.96)
- p = Estimated proportion (0.5 or 50%)
- e = Margin of Error (Precision) = 0.08 (8%)

Rounding up to the nearest whole integer gives 151 households. One additional household was added to protect against data loss from incomplete records, resulting in a final sample size of 152 households across the seven kebeles. The actual survey successfully reached 152 respondents (73 male and 79 female household heads or primary caregivers). Within this sample, 13% of households reported having at least one member living with a physical or mental disability.

Qualitative Sample Size: For the qualitative components, sample sizes were governed by the principle of data saturation, the point at which subsequent interviews and discussions yielded no new themes, codes, or structural insights regarding GESI-WASH barriers. As shown in Table 1, a total of 7 FGDs, 14 KIIs, and 4 observations proved sufficient to reach saturation across the selected geographic sites.

Table 1: Summary of participants for each method

Method	Composition	Total Sessions	Participants per Session
FGD 1	Adult Women (Aged 18+)	2	7 – 9
FGD 2	Adult Men (Aged 18+)	1	6 – 8
FGD 3	Adolescent Girls (Aged 13–17)	2	5 – 7
FGD 4	Persons with Disabilities (PWDs) or Caregivers	2	6 – 8

KIIs	Woreda WASH Team (Water, Health, Agriculture, Education, Women & Children, Labor & Social Affairs)	6	1-on-1
KIIs	Institutional Heads (Primary School Directors, Health Center Administrators)	4	1-on-1
KIIs	Community Level (Water User Committee Leaders, Kebele Officials)	4	1-on-1
Observation	2 health centers and 2 schools	4	1

Data Collection Methods and Tools: Primary data collection was executed concurrently using four distinct tools: a structured household survey questionnaire, semi-structured KII guides, semi-structured FGD guides, and a standardized observation checklist.

- **Structured Household Survey:** A structured community survey tool was administered to the 152 randomly selected households. multi-stage sampling, purposive selection of 7 kebeles to represent agro-ecological diversity; systematic random sampling of households from kebele registries. It captured quantitative indicators regarding household water access metrics, distance to points of collection, facility safety, structural accessibility features for vulnerable members, and specific domestic hygiene behaviors.
- **Focus Group Discussions (FGDs):** A total of 7 FGDs were conducted, averaging one per selected kebele. To maintain the standard methodological recommendation for small-group dynamics (typically 6–10 participants) and allow everyone a chance to speak, group sizes were strictly kept between 5 and 9 participants. Groups were split into distinct, homogenous cohorts to prevent social hierarchies from silencing vulnerable participants. Adolescent girls (aged 13–17) were sampled exclusively without adolescent boys to safely explore sensitive topics like Menstrual Hygiene Management (MHM) and school drop-out rates. Persons with Disabilities (PWDs) or their primary caregivers were interviewed in dedicated sessions to focus directly on mobility and structural barriers.
- **Key Informant Interviews (KIIs):** Semi-structured interviews were held with key stakeholders to collect institutional perspectives, policy implementation gaps, and systemic challenges regarding inclusive WASH. Because formal civil society entities like registered women's rights groups or disabled user associations were absent in these rural localities, researchers bridged this gap by engaging with informal community networks alongside formal woreda administrators.

Data quality control measures: Data collection was managed through several quality control steps:

- Training and Ethics: Field workers completed a 1-day training course covering basic survey administration, ethical consent protocols, and GESI-sensitive interviewing techniques.
- Pre-testing: Tools were pre-tested in a neighboring, non-selected kebele within Berbere Woreda to check clarity and language.
- Translation: The survey instruments were designed in English, translated into Amharic for local field deployment, and back-translated into English to preserve conceptual integrity.
- Field Supervision: Survey questionnaires were checked for completeness by data collectors before concluding each interview. Supervisors conducted daily evening reviews of all completed forms to fix discrepancies immediately. To limit data contamination and tracker bias, geographic zones were systematically coded.

Data analysis and management: Quantitative datasets from household surveys and observation matrices were cleaned, coded, and entered into Epi-Info and SPSS. Analysis was restricted to descriptive statistics (frequencies, percentages, means) alongside cross-tabulations disaggregated by respondent gender and household disability status to highlight accessibility gaps.

For the qualitative data, audio recordings from FGDs and KIIs were transcribed verbatim and translated into English. The text was analyzed using manual thematic content analysis. Researchers read through transcripts line-by-line to generate initial codes, which were then systematically compiled into overarching categories that reflected the major institutional, social, and structural barriers to inclusive WASH.

3. RESULTS

Water Source Access and Accessibility for the General Population and Vulnerable Groups

Although WASH practices and interventions have improved, inclusive WASH service delivery remains challenged by policies, practices, attitudes, and capacity limitations at the district and zonal levels. The lack of access to adequate water and sanitation services continues to disproportionately affect women and girls, the poor, and people with disabilities in the area.

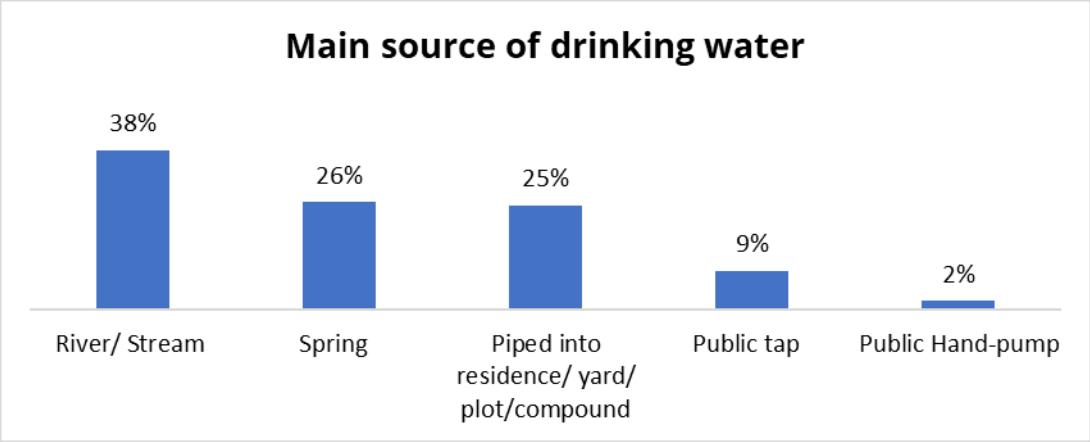


Figure 2: Main source of drinking water

Household survey data show that most respondents lack access to a public water supply because such systems are unavailable in their villages: only 9% reported access to public taps, while rivers (38%) and springs (26%) were the primary sources used (Fig 2). A quarter of respondents, primarily in urban kebeles, reported access to piped water on premises.

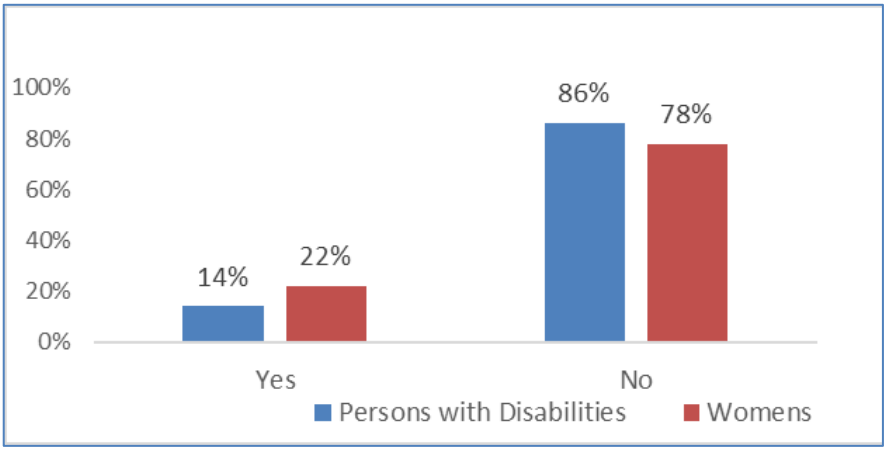


Figure 3: Accessibility of water points to PWDs and women

Accessibility of existing WASH infrastructure for vulnerable groups was markedly lower than general coverage. As shown in Fig 3, only 14% of respondents agreed that current facilities are accessible to PWDs, and only 22% confirmed that water points are accessible to women and girls. These survey findings were corroborated in FGDs, in which both PWDs and other community members independently described

WASH facilities as largely inaccessible. Sanitation facilities were reported as the most exclusionary: household and institutional toilets were described as entirely inaccessible to individuals with physical or visual disabilities. The primary water sources for many households, rivers and springs, are often located at a significant distance. While non-disabled individuals may require over an hour for a collection trip, PWDs report journeys lasting several hours.

Table 2. Physical and infrastructural barriers to accessible WASH facilities

Facility type	Barrier reported
Water points (rivers, springs, taps)	Steep or slippery steps
Water points	Swampy or muddy approach paths
Water points	Unstable platform construction lacking handrails
Water points	Tap stands are positioned at inappropriate heights
Household and institutional toilets	No accommodation for physical disability (e.g., no raised seats, handrails)
Household and institutional toilets	No accommodation for visual disability (e.g., no tactile or guided pathways)

Furthermore, even households with improved sources, such as public taps or on-premises piped water, frequently have water points that are not accessible to PWDs. Common barriers include steep or slippery steps, swampy or muddy paths, unstable constructions lacking handrails, and taps positioned at inappropriate heights. Sanitation facilities are similarly exclusionary. Existing household and institutional toilets were reported as entirely inaccessible to individuals with physical or visual disabilities. This systemic inaccessibility is linked to a critical policy gap: the absence of an inclusive water scheme design standard at the woreda level. Consequently, most water and sanitation infrastructure is not designed to be accessible for PWDs or easily operable by women and children. FGD participants and observation of water points identified a consistent set of physical barriers, summarized in Table 2.

A review of woreda-level water-scheme design specifications found no provision requiring inclusive or accessible design, confirming, at the policy level, why most existing infrastructure is not built to be usable by PWDs or easily operable by women and children. This inaccessibility translates directly into a disproportionate time burden, summarized comparatively in Table 6.

Table 3. Water collection time by population group

Population group	Reported time	Source
Persons without disabilities (one-way collection trip)	Over 1 hour	FGDs with PWDs and community members
Persons with disabilities (one-way collection trip)	Several hours	FGDs with PWDs
Urban households (shortest reported, on-premises water point)	1 minute	Household survey
Rural households (longest reported)	1.5 hours	Household survey
Overall household survey mean (general collection time)	22 minutes	Household survey
Mean time per collection trip — urban kebeles	21 minutes	Household survey
Mean time per collection trip — rural kebeles	49 minutes	Household survey
Mean time per collection trip — all areas	43 minutes	Household survey

As shown in Table 3, the figures illustrate a compounding disadvantage at the intersection of gender and disability: women and girls already undertake the overwhelming majority of water collection, and where a

woman or girl also lives with a disability, she faces both the gendered expectation to fetch water and a built environment that is, by design, not accessible to her.

Financial Costs and Affordability Barriers

The financial cost of accessing potable water is a significant burden, disproportionately affecting women and PWDs because of their greater economic vulnerability. As reported in Table 4, monthly household water expenditure ranges from 22–300 ETB, with an average of 110 ETB and a median of 50 ETB across the sample. Households containing a person with a disability reported an average monthly expenditure of 90 ETB, ranging from 32–300 ETB.

Table 4: Monthly expenses for accessing water

	Average (Birr)	**Median (Birr)**
HH with disability	90	57
HH without disability	119	51
Total	110	50

A review of Woreda Water Office service and fee policies confirmed that communities are required to pay upfront installation and application fees, and that, unlike the health sector, no formal fee waiver mechanism exists for households unable to afford these costs. This was illustrated directly by a female participant with a disability during an FGD: "*I formally requested the water office to install a tap at my house. They are aware I have no permanent income, yet they required me to pay application and installation fees that I cannot afford. The staff understood my vulnerability but were unwilling to bypass official policy. There should be a fee waiver system for vulnerable groups, like the one in the health sector. I, for example, receive free medical care because of my condition.*"

This testimony shows that affordability barriers are not simply a function of low income but of the absence of a policy mechanism to translate documented vulnerability (disability, lack of permanent income) into a waiver, a gap that affects female-headed households and PWD households specifically, since both groups are also the most likely to be excluded from the wage employment captured later in Table 9.

Gendered Division of Labour and Time Burden in Water Collection

As shown in Table 5, Fetching water remains a predominantly female responsibility: survey respondents identified women as the primary collectors (94%), followed by girls (38%) and men (34%) (multiple responses were permitted, reflecting shared household responsibility). Comparative collection times by residence and group are reported above in Table 2.

Table 5. Household members reported as responsible for water collection

Household member	**% of households reporting this member collects water**
Women	94%
Girls	38%
Men	34%

The activity calendar derived from women's and men's FGDs (Table 6) further illustrates the disparity in daily time allocation: women's reported schedule is occupied almost continuously by water collection and other domestic chores from early morning until late evening, with collection trips embedded between cooking, cleaning, and childcare tasks, whereas men's schedule includes defined periods for rest and social activity. This pattern was reinforced qualitatively. As one rural FGD participant described: "*Most women fetch water from the river using 20-liter jerry cans, making two to three trips a day. Each trip takes about an hour. Because women are occupied with other household chores, we often send our adolescent daughters. The girls*

travel in groups due to fear of violence from boys and men. We frequently hear of gender-based violence occurring on these journeys to collect water."

Table 6: Activity calendars based on women's FGD session

Time	Women's activities	Time	Men's activities
5:00–6:00 am	Bathing, prayer	5:00–8:00 am	Cattle grazing, prayer
6:00–7:00 am	Cooking, breakfast, firewood	8:00–9:00 am	Breakfast
7:00–8:00 am	Collecting water	9:00 am–2:00 pm	Farming
8:00–9:00 am	Washing clothes, children's hygiene	2:00–3:00 pm	Taking cattle to water
9:00 am–1:00 pm	Cooking, cattle feeding, and household chores	3:00–7:00 pm	Cattle grazing, other activities
1:00–1:30 pm	Lunch	7:00–8:30 pm	Prayer, socializing
1:30–7:30 pm	Household chores, water collection	8:30–9:30 pm	Dinner
7:30 pm onward	Cooking, serving dinner, and further chores	9:30 pm–5:00 am	Sleeping
Late evening	Sleeping (limited hours)		

FGD participants also reported that women carry disproportionate anxiety about household water security, consistent with their productive and reproductive roles, cooking, washing, childbirth, and caregiving, all of which require a constant water supply. This burden was also linked to a risk of intra-household conflict, as described by one participant: "*Boys and men consume large quantities of water in the household. They do not use it sparingly. If we cannot make it readily available, they may become disappointed or angry, sometimes to the point of beating us.*" The unequal time burden documented here is not only a labour and safety issue but a structural constraint on women's capacity to participate in other spheres, including the WASH governance structures discussed below, where women's representation is nominal rather than substantive.

Socio-Cultural Norms Shaping WASH-Related Behaviour

FGDs identified several socio-cultural norms that constrain women's WASH practices independently of physical infrastructure. Some women reported feeling shame and stress when defecating during daylight hours, leading them to prefer nighttime use of sanitation facilities, itself a safety risk given the long distances and lack of lighting at many facilities. Menstruation and menstrual hygiene management (MHM) were reported as rarely discussed openly in most rural communities; menstruation is frequently associated with a girl's sexual debut and readiness for marriage and is culturally framed as a "curse" or as "dirt." One household-level FGD participant explained: "*Women are ashamed to tell our husbands about menstruation. Even if we did, they might feel ashamed and think it is a curse or sin.*"

FGD participants further reported that male-dominated community structures undermine women's contributions within WASH Committees (WASHCOs), a pattern examined quantitatively in the next sub-section. These taboos have practical service-delivery consequences beyond stigma: because menstruation is not openly discussed, demand for MHM materials and facilities is not voiced through normal community or WASHCO channels, which helps explain the shortage of MHM materials and dedicated hygiene rooms documented later in schools.

Participation and Representation of Women and PWDs in WASH Governance

Decision-making structures for WASH at the kebele level were predominantly male-dominated. According to Woreda Water Office records, of 329 total WASHCO members, approximately 43% are women (Fig 4), but not a single member is a person with a disability. PWD FGD participants confirmed they had not been invited to participate in WASHCOs and described their exclusion in stark terms: "*We, people with disabilities, are excluded from all activities in our district. Specifically in the WASH sector, we are not involved in planning, decision-making processes, or the construction and management of WASH facilities. When facilities were built, the special needs of disadvantaged groups like us were not considered. This is primarily due to the lack of a disabled persons' organization in the Woreda to advocate for our WASH-related issues. Additionally, a lack of awareness and understanding of our needs is a contributing factor*."

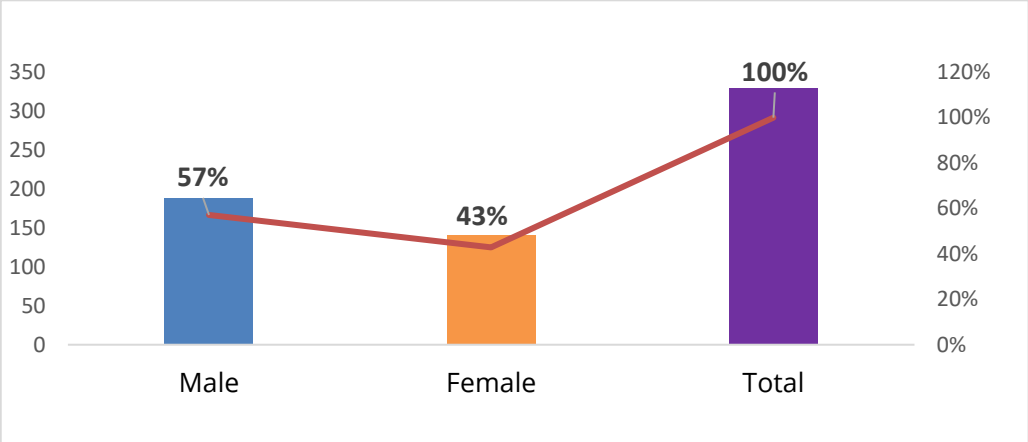


Figure 4 Gender composition of WASHCOs

Qualitatively, women's nominal representation in WASHCOs (43% membership) did not translate into influence: women were most frequently nominated as cashiers, a role FGD participants attributed to community perceptions of women as trustworthy with finances, but rarely held leadership positions, and female WASHCO members reported receiving no specific training in WASH management or leadership.

This is a clear case where a quantitative inclusion indicator (43% female membership) would, on its own, overstate progress: the qualitative data show that representation without role diversity, training, or leadership access does not constitute meaningful participation, and for PWDs, the figure is not nominal but a complete absence (0%).

Gender and Disability-Disaggregated Monitoring and Evaluation Practices Across Sectors

A desk review of sector reports and administrative records, supplemented by KIIs with sector office staff, found uneven and largely informal practices for collecting gender- and disability-disaggregated WASH data, summarized in Table 7.

Table 7. Gender- and disability-disaggregated M&E practices by sector

Sector	Data routinely collected	Disaggregation in place	Key gap identified
Health Extension Program	Number of household latrines constructed; WASHCO meeting attendance	By gender	No independent verification mechanism
Education	Student enrollment; number of school toilets	By gender and disability type	Toilets are reported as "gender-segregated," but PWD access to WASH is not tracked

		(enrollment only)	
Labor and Social Affairs Office	Annual registration of PWDs	By disability type (partial)	Registration is not exhaustive; it does not cover all kebeles or all disability types
District Water Office	General WASH beneficiary counts	None systematic	No standardized gender indicators; no PWD indicators or mechanism at all

Across all four sectors, KIIs converged on the same cross-cutting gaps: the absence of clearly defined, SMART (Specific, Measurable, Achievable, Relevant, Time-bound) indicators for gender and disability inclusion; weak reporting mechanisms such as standardized checklists; the absence of dedicated databases; and limited use of whatever data is collected in actual decision-making.

The absence of any PWD-disaggregated indicator at the district water office is the most consequential gap identified in this theme: without it, woreda and zonal authorities have no mechanism to detect, let alone respond to, the disability-based exclusion documented throughout the rest of this Results section, or to be held accountable for closing it.

Engagement of Women and Persons with Disabilities in WASH-Related Enterprises

Although Market-Based Sanitation (MBS) approaches have been introduced through training at the woreda water office, they have not yet been implemented at the time of the assessment. Direct enumeration of operating WASH enterprises during the assessment found that existing businesses are predominantly owned and managed by men; the research team did not identify any women-led or PWD-led enterprise engaged in market-based sanitation activities. KIIs and FGDs with women, PWDs, and sector staff identified a consistent set of barriers, which cluster into four levels, shown in Table 8.

Table 8: Barriers to women's and PWDs' participation in WASH enterprises, by level

Level	Barriers reported
Individual / capacity	Limited access to business skills training, regulatory knowledge, and confidence-building opportunities
Family/household	Balancing business with care responsibilities, patriarchal values, and a lack of spousal support
Community / social	Gender stereotypes and misconceptions about women's business acumen, harassment
Structural/institutional	Limited workspace access; bureaucratic hurdles; absence of female-targeted business associations; limited access to capital, collateral, or loans; restricted mobility due to childcare/domestic duties and fear of violence; the "triple burden" of productive, reproductive, and community roles, reducing available working hours

A zonal WASH office KII participant linked these structural barriers directly to institutional attitudes: "*WASH focal persons are sometimes gender-blind or insensitive and do not make any extra effort to support or enhance the performance of businesses owned by women. Women also often receive derogatory and discouraging statements from their community while actively running their businesses.*"

FGD participants nonetheless identified several sanitary marketing niches viewed as viable entry points for women- and PWD-led enterprises: shower and toilet services in market areas; distribution of water treatment tablets; production and distribution of WASH products such as latrine slabs and cookstoves;

production of local reusable sanitary pads; waste collection and recycling services; and plant nursery/gardening operations.

Notably, none of the barriers reported are specific to PWDs as distinct from women, and no PWD-specific barrier (e.g., physical accessibility of enterprise training venues or production sites) was independently raised in KIIs or FGDs, itself a finding, suggesting that PWD exclusion from WASH enterprises is not yet recognized or discussed as a distinct issue at the district level.

Institutional Coordination Mechanisms and Staffing for Gender and Disability Inclusion

At the regional (Oromia) level, a coordination mechanism exists under the One WASH National Program to address gender equity and disability inclusion, though its mandate is not exclusive to these issues; KIIs indicated that inclusiveness concerns are raised periodically in coordination meetings but that engagement from disability organizations (e.g., the Federation of Ethiopian Associations of Persons with Disabilities) and the Labor and Social Affairs Office in regional WASH activities remains minimal.

At the woreda level, a WASH committee comprising representatives from the Water, Education, Health, and Women and Children Affairs offices is operational but convenes irregularly, and a desk review of committee membership confirmed that neither disabled persons' organizations (DPOs) nor organized women's groups hold formal membership, primarily because no such associations exist locally. A district-level KII participant summarized the resulting gap: "*WASH sectors at the woreda level are primarily engaged in monitoring the progress of WASH activities. A significant gap is that we do not assess the inclusiveness of WASH facilities for socially excluded groups such as PWDs, women, the elderly, or People Living with HIV. Our focus remains predominantly on maximizing water access for the general community. Issues of inclusiveness for vulnerable groups are largely overlooked or poorly understood.*"

Table 9: Number of staff in the office

Sector	Male	Female	Total	% of women	PWDs
Barbere Health office, including health facilities	80	74	154	48%	0
Barbere Education Office	6	4	10	40%	0
Barbere WoLSA office	3	1	4	25%	0
Barbere Women and Children's Office	3	6	9	67%	0
Barbere water office	11	7	18	39%	0
Total	**103**	**92**	**195**	**47%**	**0**

Staffing data obtained through desk review of sector office records (Table 9) show that the health sector and the Women and Children's Affairs Office employ the highest proportion of women among district offices, while the water office employs women in only 39% of posts (7 of 18 staff), concentrated in administrative and finance functions rather than technical roles. Across all five district sector offices surveyed, zero staff identified as a person with a disability.

This indicates a consistent pattern across both community-level (WASHCO) and institutional (district office) structures: women have a numerical presence but are concentrated in non-technical, non-leadership roles, while PWDs are absent from both governance and staffing structures entirely.

WASH Inclusiveness in Schools and Health Facilities

Findings in this subsection are derived primarily from structured observation checklists administered directly at schools and health facilities, supplemented by KIIs with facility staff. KII respondents demonstrated a general awareness of national gender-equity and disability-inclusion principles for WASH infrastructure; however, the observation data showed that practical application of related national standards, strategies, and guidelines was minimal at the district level. In schools, gender-disaggregated

student latrines had generally been constructed, but disability-inclusion features were largely absent, particularly in older buildings. Observation also identified a specific gender-equity concern: most girls' latrine doors were missing, non-functional, or lacked internal locks, compromising privacy. The full set of gaps identified through the observation checklist is summarized in Table 10, organized by whether each gap primarily affects gender equity, disability inclusion, or both.

Table 10. WASH inclusiveness gaps identified in schools and health facilities by the primary affected group

Primarily affects	Gap identified
Disability inclusion	Pathways from the main gates to classrooms, latrines, and water points are not passable by wheelchair
	No ramps or handrails at handwashing stations and water taps
	Toilet doors, lighting/ventilation, and seating not adapted for physical or visual disability (no raised seats with handrails)
	Assistive devices for PWDs unavailable; wheelchairs in short supply
Gender equity	Shortage of menstrual hygiene management (MHM) materials for schoolgirls; no dedicated education-office budget for MHM (some donor-supplied stock from Hunde, UNICEF)
	No shower facilities or dedicated hygiene rooms for girls
	Latrine privacy compromised by broken doors and non-functional locks
General infrastructure	Most health facilities use a single latrine block with gender-segregated doors rather than separate blocks
	Critical water shortages, poor water-line infrastructure, and inadequate storage at both schools and health facilities

The pattern across Table 10 shows that disability-related gaps are overwhelmingly structural/infrastructural (requiring capital investment), whereas gender-related gaps are a mix of infrastructure (locks, doors) and recurrent supply/budget issues (MHM materials), implying that the two inclusion agendas may require different remediation pathways and budget lines, not a single combined intervention.

WASH Inclusiveness at the Household Level

FGDs and household observation found that most community members, particularly in rural areas, have limited awareness of disability types and the specific needs of PWDs, with disability often attributed to "an act of God", a belief associated with stigma and discrimination against students and household members with disabilities. Direct household observation confirmed that households lack separate or accessible WASH facilities for PWD members, and that even families who could otherwise afford assistive devices such as wheelchairs are unable to purchase them locally, since no markets supplying such equipment exist in the area.

At the household level, women reported spending 2–3 hours daily fetching water over long distances, and, in the absence of access to animal carts, must carry a minimum of 20 liters of water by hand, on their backs, or using donkeys. The unavailability of safe, accessible, and gender-sensitive toilets was also reported as a barrier preventing many women from using facilities during daytime hours, reinforcing the night-use pattern. The full range of household-level barriers identified through FGDs and observation is organized by category in Table 11.

Table 11. Barriers to inclusive WASH at the household level, by category

Category	Barriers reported

Awareness / attitudinal	Limited community and family understanding of PWD and gender issues; disability attributed to "an act of God"; negative social perceptions and attitudes toward PWDs; family fear of stigma and discrimination
Socio-cultural	Cultural taboos around discussing menstrual hygiene; prevailing gender norms restricting WASH service use; lack of women's independence and decision-making power
Economic	Absence of local markets for assistive devices; high cost of WASH facility adaptations for PWDs; low socioeconomic status of households with a PWD member
Infrastructural/technological	Scarcity of low-cost technology options for PWDs and women; lack of locally developed accessibility solutions; shortages of water and poor water quality; lack of suitable handwashing facilities and storage containers

Table 11 shows that household-level exclusion is driven less by a single dominant factor than by the interaction of all four categories at once: even where a household has the economic means to adapt a facility, it may not do so because of attitudinal barriers (stigma), and even where attitudes are favorable, the absence of local markets and low-cost technology options means adaptation may not be physically possible.

Intersecting Gender and Disability Exclusion Across the WASH System

Triangulating the survey, administrative, observational, and qualitative findings as presented in Table 12, shows that exclusion operates consistently across four domains for both women/girls and PWDs, though the mechanisms differ by group.

Table 12. Cross-cutting barriers by domain and group

Domain	Women and girls	Persons with disabilities
Physical access to water/sanitation	Long collection distances (mean 43 min/trip); safety risk en route; lack of privacy at latrines	Steep/slippery paths, no handrails, inappropriate tap heights; latrines "entirely inaccessible" per FGDs; only 14% rate facilities accessible
Financial burden	Female-headed households cited as facing prohibitive connection fees with no waiver	Households with a member with disability average 90–94 Birr/month with no fee-waiver mechanism, despite precedent in the health sector
Governance and decision-making	43% of WASHCO members, but concentrated in cashier roles, not leadership; no WASH-specific leadership training provided to women	0 of 329 WASHCO members; no DPO at the woreda level; not invited to WASHCO participation
Institutional capacity/employment	Water office staff 39% female, concentrated in administrative/ finance, not technical roles	0 staff with disabilities across all five district sector offices reviewed

This pattern indicates that while women have gained nominal representation in WASH structures (membership, staffing), that representation has not translated into technical authority or decision-making power. For PWDs, exclusion is near-total across every domain examined, survey reported accessibility, administrative WASHCO and staffing records, observational infrastructure assessment, and FGD testimony

are all internally consistent in showing zero meaningful institutional inclusion, distinguishing the depth of PWD exclusion from the more partial, role-limited exclusion experienced by women.

4. DISCUSSION

This assessment documents persistent and intersecting barriers to safe, gender-transformative, and disability-inclusive WASH in the study area (11). Despite national progress in WASH coverage, women, girls, and persons with disabilities (PWDs) remain disproportionately excluded from safe water supply, sanitation, hygiene, and decision-making (11). These findings align with evidence that infrastructure expansion alone does not ensure inclusive access without explicit design, financing, and governance measures (11,12). Furthermore, research demonstrates that harmful social norms often limit the ability of women and girls to participate in decision-making related to WASH, and the lack of GESI-responsive services increases the risk of harassment, violence, injury, and illness (13).

Household reliance on rivers and springs and the low public tap coverage (9%) mirror patterns observed in rural Ethiopia and similar low-resource settings, where dependence on unprotected sources and long collection times are common (14,15). The long mean collection times and the small proportion reporting sufficient water indicate chronic water insecurity that elevates the risk of waterborne disease, consistent with local morbidity reports of diarrheal illness (14). This pattern is also consistent with national and global analyses linking limited water quantity to poor hygiene and child illness (12,16). Extended collection journeys also increase women's exposure to gender-based violence during water and firewood collection, an association documented in other Ethiopian and sub-Saharan African studies (17,18). Importantly, wet seasons make sanitation situations worse through flooding, mud, and stagnant water that compromise cleaning outcomes, particularly in resource-constrained settings (19).

The disproportionate responsibility for water collection and household hygiene borne by women and girls (women 94%, girls 38%) concurs with national DHS data and international literature showing that women carry the bulk of unpaid care work in water-scarce settings (14,17,20). The high time burden, multiple daily trips, and reported fear of assault align with studies demonstrating that water collection constrains women's education, economic participation, and safety (9–11). Persistent menstrual stigma, lack of MHM supplies, and inadequate privacy in schools are consistent with evidence linking poor MHM facilities to girls' absenteeism and reduced school performance (21,22). Studies from Vanuatu found that harmful menstrual beliefs were still prevalent, leading women to internalize these beliefs and isolate themselves during menstruation, with negative implications particularly for women with disabilities who face attitudinal and physical barriers to WASH (23,24). These findings underscore that hardware provision must be complemented by supplies, privacy protections, and norm-change interventions (21).

Low accessibility of WASH facilities for PWDs (14%) and the absence of PWDs from WASH committees reflect widespread exclusion (25,26). The physical barriers observed, steps, slippery paths, inappropriate tap heights, lack of handrails, and non-adapted toilets, are consistent with global assessments showing that infrastructure typically fails to meet universal design standards unless specifically mandated and enforced (3,27). A qualitative study in Malawi identified 50 distinct barriers to WASH access for disabled people, including long distances to water points, slippery or uneven surfaces, and hard-to-reach taps, stagnant water around facilities, and infrastructure with steps or narrow doors, barriers that closely match those observed in this assessment (28). The scarcity of assistive devices and local markets for such equipment exacerbates exclusion and mirrors findings from Ethiopian studies that highlight limited availability and referral systems for assistive technologies (29,30). Research from Vanuatu found that less than 10% of people with disabilities had access to any type of assistive device or technology, and not being able to reach water or see containers were reported as the two biggest barriers (23,24). People with disabilities were statistically more likely to experience barriers in seven of eight intra-household indicators,

with WASH-related stigma, reliance on informal caregivers, and under-resourcing of WASH personnel being critical issues (24,31).

Discriminatory societal norms, including stigma, ignorance, and prejudice, were identified as major social barriers encountered by PWDs in accessing WASH, with the biggest problems being social discrimination and environmental obstacles rather than impairment itself (28,32,33). Body function limitations, such as incontinence, pain, and inability to communicate WASH needs, are in and of themselves significant barriers to adequate WASH access. No two individuals face the same set of barriers, highlighting the need for personalized approaches to inclusion (28,32,33).

The distribution of household water expenditures and the requirement for upfront installation fees without fee-waiver arrangements place a disproportionate burden on female-headed households and households with PWDs (34,35). Similar evidence from Ethiopia and sub-Saharan Africa identifies connection costs and user fees as barriers that perpetuate inequality unless pro-poor subsidies or targeted financing are provided (35,36). Urban disabled people face a double financial burden when relying on water kiosks, paying both for water and for someone to carry it, leading to compromises on the quantity of use(28). Testimonies calling for fee waivers reflect feasible policy options modeled in other social sectors (37,38).

Although women constitute a substantial share of WASH committee membership in the woreda (43%), their concentration in non-technical roles and limited influence echoes literature on tokenistic inclusion that fails to shift decisions or resource allocations (39). The near absence of PWD representation in governance structures is particularly concerning, given evidence that meaningful representation improves service responsiveness (3). A lack of informed participation by women, persons with disabilities, and other excluded groups often results in WASH services that are inappropriate, inaccessible, and unaffordable (13). Barriers to women's and PWDs' participation in WASH enterprises, limited training, capital constraints, mobility and safety issues, and time poverty, are congruent with broader studies on gendered barriers in infrastructure value chains (22–24). Market-based sanitation training that remains unimplemented suggests a missed opportunity to strengthen inclusive local enterprises.

Weak M&E systems and the absence of routinely disaggregated data by sex, age, and disability in the woreda impede planning and accountability (40,41). This shortcoming is widely documented: without SMART, disaggregated indicators and routine mechanisms, inclusive programming cannot be effectively monitored or resourced (11,40). Only 42% of WASH intervention studies measured transformative GESI outcomes, and while most included studies disaggregated outcome data by sex, other forms of data disaggregation were limited (42). The incomplete identification and registry of PWDs reflect methodological and operational gaps seen elsewhere in Ethiopia and limit the targeting of interventions (29).

Programmatic and policy implications

- Integrate universal design and pro-poor financing into rural water planning. Invest in nearer, protected, and disability-accessible water points designed with community consultation, recognizing that environmental obstacles and social discrimination are the biggest problems for people with disabilities, not impairment itself. Adopt targeted connection subsidies or fee waivers for vulnerable households (women-headed, PWD households, extremely poor) to reduce economic obstacles to formal service access, addressing the double financial burden faced by urban disabled people
- Ensure inclusive WASH in schools and health facilities. Translate national guidelines into district-level action by retrofitting latrines with ramps, rails, privacy locks, and MHM disposal. Secure reliable water and handwashing supplies and allocate budget lines for MHM within education offices. Address harmful menstrual beliefs that lead to women's isolation during menstruation, particularly impacting women with disabilities

- Strengthen governance, representation, and capacity. Move beyond numerical representation by reserving leadership seats for women and PWDs on WASH committees. Provide tailored leadership and technical training and institutionalize DPOs' and women's groups' participation in planning and oversight. Recognize that a lack of informed participation by excluded groups results in inappropriate, inaccessible services.
- Implement gender-transformative protection and behaviour-change interventions. Complement infrastructure with programs that engage men in household water decisions, create local protection measures (community escorts, closer water points), and run community dialogues to reduce menstrual stigma and normalize women's leadership. Address discriminatory societal norms including stigma, ignorance, and prejudice that are major social barriers for PWDs.
- Support inclusive WASH enterprises. Implement Market-Based Sanitation with a gender and disability lens by offering seed capital, business skills training, child-care support, and preferential procurement for women- and PWD-owned enterprises in WASH value chains. Ensure at least 10% access to assistive devices and rehabilitation services, as currently less than 10% of people with disabilities have access.
- Strengthen data systems and M&E for inclusion. Establish SMART indicators, disaggregated by sex, age, and disability type, and deploy simple inclusion checklists for scheme commissioning. Create woreda-level databases and make disaggregated monitoring a condition for sector financing, addressing the gap where most studies lack disaggregation beyond sex. Recognize that no two individuals face the same barriers, requiring personalized monitoring approaches.

5. CONCLUSIONS

This study highlights a persistent disconnect between national intentions and local realities in achieving inclusive water, sanitation, and hygiene (WASH) services. While the necessary policies and strategic manuals exist at the federal level, their execution breaks down across regional, zonal, and woreda tiers. This implementation failure stems from deeply entrenched systemic barriers, including a lack of political commitment to prioritize inclusion, an absence of specialized inclusive WASH personnel, and inadequate funding for equity-focused initiatives. Because these institutional gaps exist, the specific needs of women, girls, and persons with disabilities (PWDs) are systematically overlooked during the design, construction, and management of infrastructure.

At the community and facility level, these systemic failures translate into severe, daily service deficits. Communities face extreme water shortages, a reliance on unimproved water sources, and widespread open defecation. Where sanitation facilities do exist, they are generally unsafe, inaccessible, and lack basic privacy. The consequences of these shortcomings are highly unequal: women and girls bear the disproportionate physical and safety burdens of water collection while lacking essential support for menstrual hygiene management. Simultaneously, physical barriers and a lack of assistive devices completely exclude PWDs from using most facilities, a vulnerability compounded by social stigma and a lack of empowered local associations to advocate for their rights.

Ultimately, infrastructure expansion alone will continue to yield unequal benefits. Moving forward, the WASH sector must move beyond high-level rhetoric and invest in a comprehensive package of accessible infrastructure, pro-poor financing, inclusive governance, and gender-transformative programming. Only by combining these targeted interventions with strengthened monitoring and evaluation can the sector eliminate these disparities and finally deliver safe, equitable, and dignified WASH services for everyone.

6. DECLARATION

- **Limitations of the study:** This cross-sectional assessment relies primarily on self-reported data that may be affected by recall or social desirability bias, and the design identifies associations and gaps

but cannot establish causal relationships between variables. Disability identification used the Woreda lists and household reporting and may undercount some disability types, limiting the precision of prevalence and needs estimation. Finally, while results are consistent with regional literature, caution is warranted in generalizing findings beyond woredas with similar rural–urban mixes. Although care was taken, subtle meanings in qualitative responses may have been lost during translation from Afaan Oromo to English. Data collected during one season may not reflect WASH access challenges during the dry or rainy seasons.

- **Ethics approval and consent to participate:** The study got ethical approval from the research review committee of the Oromia Health and Water Bureaus (specifically, the WASH Departments). In compliance with the Helsinki Declaration (*https://www.wma.net/policies-post/wma-declaration-of-helsinki/*), this study does not contain any person's data in any form (including individual details, images, or videos). Informed oral consent was taken from the participants before starting interviews and discussions by explaining the objective and how the results would be used. All interviews conducted with vulnerable populations were conducted with the understanding that privacy, confidentiality, and anonymity would be maintained.
- **Consent for publication:** Not Applicable
- **Availability of data and materials:** The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.
- **Competing interests:** The authors declare that they have no competing interests.
- **Funding:** I declare that no funding was received for this study.
- **Competing interests:** The authors declare no competing interests.
- **Author's contributions:** AM: developed the research proposal, collected data, coordinated the research field work, conducted the data analysis, developed the results and reports, and developed the manuscript and reports.
- **Acknowledgments:** First and foremost, I would like to express my sincere gratitude to the Oromia regional health and water bureaus for their unwavering support. I also extend our appreciation to the district and zonal WASH departments. I am profoundly thankful to my beloved family, whose unwavering support, encouragement, and prayers have been my greatest source of strength.

7. REFERENCE

1. United Nations. Goal 6: Clean water and sanitation. The Global Goals [Internet]. [cited 2026 Jun 19]. Available from: https://globalgoals.org/goals/6-clean-water-and-sanitation/
2. United Nation. Article 28 – Adequate standard of living and social protection | United Nations Enable. 2016.
3. WHO. World Report on Disability [Internet]. 2011. Available from: https://www.who.int/publications/i/item/9789241564182
4. UNICEF. Gender and WASH [Internet]. Available from: https://knowledge.unicef.org/wash/gender-and-wash
5. UN Women. Gender Mainstreaming [Internet]. 2001 [cited 2026 Apr 18]. Available from: https://www.un.org/womenwatch/osagi/gendermainstreaming.htm
6. UN Women. The World Survey on the role of women in development 2014: Gender equality and sustainable development | UN Women – Headquarters [Internet]. 2014 [cited 2026 Apr 18]. Available from: https://www.unwomen.org/en/digital-library/publications/2014/10/world-survey-2014

7. WHO. Disability. 2024.
8. USAID. USAID 2023 Gender Equality and Women's Empowerment Policy [Internet]. 2023. Available from: https://policycommons.net/artifacts/4307613/usaid-2023-gender-equality-and-womens-empowerment-policy/5117984/
9. UNDP. Human development indices and indicators :: 2018 statistical update [Internet]. UNDP,; 2018 [cited 2026 Apr 18]. Available from: https://digitallibrary.un.org/record/3794311
10. Ministry of Water and Energy. ONE WASH National Programme [Internet]. 2018 [cited 2026 Apr 18]. Available from: https://www.unicef.org/ethiopia/reports/one-wash-national-programme
11. WHO/UNICEF Joint Monitoring Programm. Progress on household drinking water, sanitation and hygiene 2000–2017: Special focus on inequalities [Internet]. [cited 2026 Jun 19]. Available from: https://www.who.int/publications/i/item/9789241516235
12. WHO/UNICEF Joint Monitoring Programm. Drinking-water, sanitation and hygiene in schools: Global baseline report 2018 [Internet]. [cited 2026 Jun 19]. Available from: https://www.who.int/publications/m/item/drinking-water-sanitation-and-hygiene-in-schools-global-baseline-report-2018
13. World Vision. Integrating Gender Equality and Social Inclusion in Water, Sanitation and Hygiene [Internet]. 2022. Available from: https://www.wvi.org/sites/default/files/2023-09/GESI-WASH-Reference-Guide_English.pdf
14. Ethiopia Stastics Agency. Ethiopia - Demographic and Health Survey 2016. 2017.
15. WaterAid. Ethiopia | WaterAid [Internet]. [cited 2026 Jun 19]. Available from: https://www.wateraid.org/global/our-work/where-we-work/ethiopia
16. Hutton G, Chase C. The Knowledge Base for Achieving the Sustainable Development Goal Targets on Water Supply, Sanitation and Hygiene. 2016. doi:10.3390/ijerph13060536
17. Abraham MN, Susan JE. Characterizing gender-based violence in the context of water, sanitation, and hygiene: A scoping review of evidence in low- and middle-income countries. 2. 2022;2:2. doi:10.1016/j.wasec.2022.100113
18. Ager LS Alastair. A Systematic Review of Prevalence Studies of Gender-Based Violence in Complex Emergencies - Lindsay Stark, Alastair Ager, 2011 [Internet]. 2011. Available from: https://journals.sagepub.com/doi/10.1177/1524838011404252
19. J,Kwiringira, P A, C N, R K, C R, R K, et al. Seasonal variations and shared latrine cleaning practices in the slums of Kampala city, Uganda. BMC Public Health. 2016 Apr 27;16. doi:10.1186/s12889-016-3036-7 PubMed PMID: 27121388.
20. Sorensen C, Murray V, Lemery J, Balbus J. Climate change and women's health: Impacts and policy directions. 2018.
21. Sommer M, Caruso BA, Sahin M, Calderon T, Cavill S, Mahon T, et al. A Time for Global Action: Addressing Girls' Menstrual Hygiene Management Needs in Schools. 2016. doi:10.1371/journal.pmed.1001962
22. Yimenu AA, Melaku Teshale G, Emnet Tesfaye Shimber, Patricia Ndugga. Barriers to water, sanitation, and hygiene (WASH) cluster coordination during emergencies in sub-Saharan Africa: A scoping review. 2025. doi:https://doi.org/10.1371/journal.pwat.0000434

23. Govt. Vanuatu, LSHTM, World Vision. Water, Women and Disability Study - Surviving versus thriving - Vanuatu | ReliefWeb. 2020.

24. I, Mactaggart, S B, L B, J I, Mj K, C M, et al. Water, women and disability: Using mixed-methods to support inclusive WASH programme design in Vanuatu. Lancet Reg Health West Pac. 2021 Mar 2;8. doi:10.1016/j.lanwpc.2021.100109 PubMed PMID: 34327430.

25. M PR, I M, H K, C D, J N, Gvs M, et al. Multidimensional poverty and disability: A case control study in India, Cameroon, and Guatemala. 2020. doi:10.1016/j.ssmph.2020.100591 PubMed PMID: 32405529.

26. Wilbur J, Dreibelbis R, Mactaggart I. Addressing water, sanitation and hygiene inequalities: A review of evidence, gaps, and recommendations for disability-inclusive WASH by 2030. 2024. doi:10.1371/journal.pwat.0000257

27. Wilbur J, Kovats S, Ruuska D, Nawaz S, Natukunda J. Climate change, disability, and water, sanitation and hygiene: A scoping review of evidence and interventions in low and middle-income countries. doi:10.1371/journal.pgph.0003676

28. S W, H K, A IP, R H, A B. A Qualitative Study of Barriers to Accessing Water, Sanitation and Hygiene for Disabled People in Malawi. 2016. doi:10.1371/journal.pone.0155043 PubMed PMID: 27171520.

29. Ministry of Labour and Social Affairs. Situation and access to services of people with disabilities and homeless people in two sub-cities of Addis Ababa [Internet]. 2019. Available from: https://www.unicef.org/ethiopia/media/3011/file/Report%20.pdf

30. Tangcharoensathien V, Witthayapipopsakul W, Viriyathorn S, Patcharanarumol W. Improving access to assistive technologies: challenges and solutions in low- and middle-income countries. 2018. doi:10.4103/2224-3151.239419

31. Govt. Vanuatu, LSHTM, World Vision. Time poverty and women's participation in non-farm work: Evidence from rural Ethiopia. Sci Afr. 2024;26:e02343. doi:10.1016/j.sciaf.2024.e02343

32. Water, Engineering and Development Centre (WEDC). Source [Internet]. 2014 [cited 2026 Jun 19]. Inclusive WASH and disability. Available from: https://asksource.info/topics/cross-cutting-issues/inclusive-wash-and-disability

33. Akter NAN Tuhin Roy,Shaharior Rahman Razu,Shahinur. Barriers to Accessing Water, Sanitation, and Hygiene Services for Persons With Disabilities in the Southwestern Region of Bangladesh. 2025.

34. World Bank. Reducing Inequalities in Water Supply, Sanitation, and Hygiene in the Era of the Sustainable Development Goals: Synthesis Report of the WASH Poverty Diagnostic Initiative [Internet]. 2017. doi:10.1596/27831

35. World Bank. Do Pro-Poor Policies Increase Water Coverage? 2014.

36. World Bank. World Bank [Text/HTML] [Internet]. 2024 [cited 2026 Jun 19]. The Gendered Burden of Water Collection in Sub-Saharan Africa. Available from: https://www.worldbank.org/en/data/interactive/2024/03/13/gendered-burden-of-water-collection-in-afe-afw-sub-saharan-africa

37. World Bank. Ethiopia - Water supply and sanitation. 2004.

38. World Bank [Internet]. [cited 2026 Apr 9]. Strengthening Sustainable WASH Access and Resilience in Ethiopia. Available from: https://projects.worldbank.org/en/results/2025/10/23/strengthening-sustainable-wash-access-and-resilience-in-ethiopia

703 39. Macgregor. Meaningful participation or tokenism for individuals on community based compulsory
704 treatment orders? Views and experiences of the mental health tribunal in Scotland. 2022.
705 doi:10.1080/09638237.2020.1818708 PubMed PMID: 32955380.

706 40. WHO, UNICEF. WHO/UNICEF Joint Monitoring Program for Water Supply, Sanitation and Hygiene
707 (JMP) – Progress on household drinking water, sanitation and hygiene 2000-2022: Special focus on
708 gender | UN-Water [Internet]. 2023 [cited 2026 Apr 7]. Available from:
709 https://www.unwater.org/publications/who/unicef-joint-monitoring-program-update-report-2023

710 41. WHO-UNICEF Joint Monitoring, Programme (JMP). The Measurement and Monitoring of Water Supply,
711 Sanitation and Hygiene (WASH) Affordability [Internet]. 2021. Available from:
712 https://washdata.org/sites/default/files/2021-05/unicef-who-2021-affordability-of-wash-services-
713 full.pdf

714 42. Macura B, Foggitt E, Liera C, Soto A, Orlando A, Duca LD, et al. Systematic mapping of gender equality
715 and social inclusion in WASH interventions: knowledge clusters and gaps. BMJ Glob Health. 2023;8(1).
716 doi:10.1136/bmjgh-2022-010850 PubMed PMID: 10.1136/bmjgh-2022-010850.

717