Vision of a Healthy Village Program Results

Bensa, Ethiopia
Project 3

A study evaluating the impact of Lifewater International's[1] Vision of a Healthy Village program in Bensa Project 3

December 2023

[1] Lifewater and Water for Good merged in 2024. Project implementation activities prior to January 2024 were conducted by Lifewater International.

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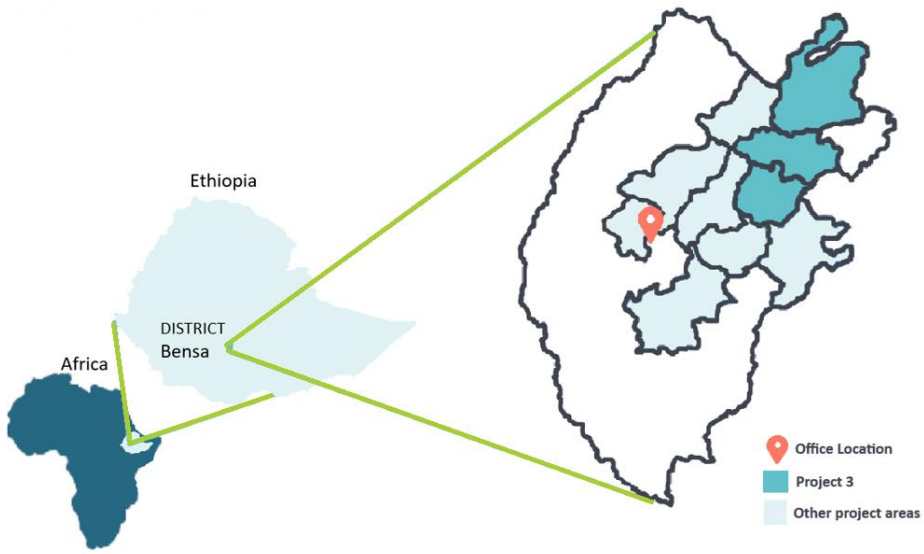
The Problem

Sub-Saharan Africa is estimated to have the lowest rates of water, sanitation, and hygiene (WASH) coverage globally. In rural Ethiopia, safe access to WASH is largely inadequate, with an estimated 58% of people lacking at least basic access to drinking water, 95% lacking at least basic access to sanitation, and 95% lacking basic access to handwashing facilities in 2022.[2]

Bensa, Ethiopia

The Bensa District is administratively divided into 37 kebeles with a total population of 227,815. Lifewater's third project in this region operated in three rural kebeles (Allo, Hamesho, and Murage) serving 20,773 people across 65 villages with WASH programming.

Figure 1. Map of the project area



During the baseline study conducted in this region in April 2021 (before project implementation had begun), Lifewater found that access to safe WASH facilities and WASH knowledge was limited:

- 28% of respondents reported using an improved water source (designed to deliver safe water)[3] in both the dry and rainy seasons. Additionally, households reported a median roundtrip journey time of 53 minutes to collect their water in the dry season, exceeding the 30-minute threshold for Basic access.
- 2.0% of households were observed to have improved latrines (hygienically designed to prevent contact with human feces)[4].
- Proper handwashing facilities were not common at households; 0.0% had a handwashing station with soap/ash and water near their latrine, and 1.4% had one near their kitchen. Furthermore, less than a quarter of respondents (23%) washed their hands with soap and water at the two most critical times (before eating and after using the latrine) in the 24 hours prior to the survey (self-reported).

[2] WHO/UNICEF Joint Programme for Water Supply, Sanitation and Hygiene (2022). Retrieved from: https://washdata.org/data/household#!/dashboard/4927
[3] WHO/UNICEF Joint Programme for Water Supply, Sanitation and Hygiene (2016). Retrieved from: https://washdata.org/monitoring/drinking-water
[4] WHO/UNICEF Joint Programme for Water Supply, Sanitation, and Hygiene (2016). Retrieved from: https://washdata.org/monitoring/sanitation.

Lifewater's Program

Lifewater implemented its third project in the Bensa district of Ethiopia from January 2021 through December 2023. The project focused on changing WASH behaviors (such as handwashing, water treatment, and latrine use) as well as constructing WASH infrastructure. The project had the following high-level goal: *Reduce WASH-related diseases and improve the health and wellbeing of children and families in the Bensa district through safe water, sanitation, and hygiene.*

Water points were constructed in communities, schools, and health facilities, and ventilated improved pit latrines were constructed at schools and health facilities. Between baseline and endline[5], 48 water points were completed, and five ventilated improved pit latrines were constructed.

In addition to the construction of water and sanitation infrastructure, the project emphasized intensive behavior change activities at the household-level. For this purpose, 335 Community Conversation events were undertaken, in which the communities learned about 18 WASH-related topics, such as handwashing and clean compounds. In the communities, trained volunteers made educational visits to every household in the project (at least quarterly) to motivate and support behavior change and to monitor progress. Additionally, communities were encouraged to obtain government Open Defecation Free (ODF) certifications. Schools and health facilities in the project area were equipped with training on maintaining a healthy environment for students and patients, to prevent WASH-related diseases. Key outputs of Bensa Project 3 are displayed in Table 1.

Table 1. Bensa Project 3 outputs as of December 2023

Outputs	Number (Percent)
Healthy Homes[6]	3,508 (97%)
Open Defecation Free villages	65 (100%)
Trained water committees	20
New and rehabilitated water points completed	48
New and rehabilitated ventilated improved pit latrines (VIPLs) completed	5
Healthy Villages[7]	27 (42%)

Since the data for the project endline was collected (December 2023), additional outputs have been achieved, including the registration of an additional 21 Healthy Village and one Healthy School. Twenty-four additional water points and two additional latrine blocks have also been constructed.

[5] Data for the baseline study were collected in April 2021; data for the endline were collected in December 2023. This project operated on a three-year schedule.

[6] Healthy Homes are verified to be drinking safe water in the dry and rainy seasons, use safe water storage containers, have improved latrines with dignity (with walls, a roof, a pit cover, and a door), two handwashing stations with soap/ash and water (one near the latrine and one near the kitchen), a hygienically raised dish drying rack, a bathing shelter that allows water to drain without pooling, and a clean compound.

[7] Healthy Villages are those that become Open Defecation Free (ODF), have access to safe water, functional water committees, and at least 90% Healthy Homes in their village

Study Methods

For this study, the following data were utilized:

Household survey: A household Knowledge, Attitudes, and Practices (KAP) survey was conducted in April 2021 (baseline) and December 2023 (endline), combining both observation and interview data. Using a cluster sampling method, 306 households at baseline and 435 households at endline were surveyed from the three kebeles. The baseline sample had a 90% confidence level[8] and a 5% margin of error[9], while the endline sample had a 95% confidence level and a 5% margin of error. Households were sampled from the 65 government villages in the project. Enumerators chose which households to randomly sample in each village using the "Spin a Pen" method[10].

Data was collected electronically by enumerators through mWater, a mobile data collection software platform, and downloaded into Excel where it was analyzed. If the data for an indicator were normally distributed, the average value is reported. If they were not normally distributed, the median is provided to give a more representative estimate.

School assessment data: Data on the five schools within the target area were collected in February 2024. Information on school enrollment, dropouts, and absences were analyzed using Excel.

Health care facility case data: Data from the health care facilities within the target area were collected in March 2024, including information on the number of annual outpatient visits and cases of various WASH-related illnesses.

Qualitative data: Five focus group discussions (FGDs) and 14 in-depth interviews (IDIs) were conducted at endline with key project stakeholders and community members. Data were analyzed using ATLAS.ti, a qualitative data analysis software tool. For each theme that emerged from the data, a detailed description was created.

[8] How sure you can be of your results
[9] The amount of error you are willing to tolerate
[10] UNICEF (n.d.). Retrieved from: https://mics.unicef.org/files?job=W1siZiIsIjIwMTUvMDQvMDMvMDYvNDIvNDgvMzgyL2NoYXAwNi5wZGYiXV0&sha=6509e495a61af931

Key Indicators

Table 2. Summary of key data from baseline and endline household KAP survey of Bensa Project 3

Theme	Indicators	Baseline	Endline	P-values
Health Indicators	% of households with at least one child under 5 that had diarrhea in past 7 days	8.9%	5.7%	0.177
	% of respondents reporting that child health has improved in the past year	76%	79%	0.189
	% of respondents reporting that their health has improved in the past year	63%	75%	<0.01
Water Indicators	% of households using an improved primary drinking water source in the dry and rainy season[11]	28%	75%	<0.01
	% of households drinking safe water (source and/or treatment)	28%	76%	<0.01
	Median journey time to fetch water (travel to/from water source plus queue time) during dry season[12]	53 minutes	20 minutes	<0.01
	% of households storing water safely (observed)[13,14]	11%	92%	<0.01
Latrine Indicators	% of households with latrines that are improved[15] (observed)[16]	2.0%	63%	<0.01
	% of households with latrines that are improved with dignity (slab, walls, roof, pit cover, and door) (observed)[17]	0.0%	57%	<0.01
Hygiene Indicators	% of respondents who washed hands in past 24 hours (with soap/ash and water or alcohol-based rub) at the two most critical times (after defecation and before eating)	23%	97%	<0.01
	% of households with handwashing facility and materials (soap/ash and water or sanitizer) located close to latrine (within 10 paces) (observed)[18]	0.0%	71%	<0.01
	% of households with handwashing facility and materials (soap/ash and water or sanitizer) inside or near the kitchen (observed)[19]	1.4%	37%	<0.01
	% of households using a hygienic (raised) drying rack (observed)[20]	0.9%	99%	<0.01
	% of households with a bathing shelter (observed)[21]	0.9%	70%	<0.01
	% of households with a clean compound (no visible rubbish or feces) (observed)	13%	91%	<0.01
Healthy Homes	% of households meeting all Healthy Home requirements[22]	0.0%	7.4%	<0.01

[11] Improved sources of water include "those that have the potential to deliver safe water by nature of their design and construction, and include: piped water, boreholes or tubewells, protected dug wells, protected springs, rainwater, and packaged or delivered water". WHO/UNICEF Joint Programme for Water Supply, Sanitation and Hygiene (2016). Retrieved from: https://washdata.org/monitoring/drinking-water

[12] This includes all households for whom we had sufficient data to evaluate their water fetching time (n=306 at baseline; n=435 at endline)

[13] This includes all households for whom we had sufficient data to evaluate their water storage containers (n=306 at baseline; n=435 at endline)

[14] Safe water storage containers are those that are narrow mouthed, covered, and clean/mostly clean

[15] Improved latrines are "designed to hygienically separate excreta from human contact, and include: flush/pour flush toilets connected to piped sewer systems, septic tanks or pit latrines; pit latrines with slabs (including ventilated pit latrines), and composting toilets". WHO/UNICEF Joint Programme for Water Supply, Sanitation, and Hygiene (2016). Retrieved from: https://washdata.org/monitoring/sanitation.

[16] This includes all households for whom we had sufficient data to evaluate their sanitation facility (n=204 at baseline; n=435 at endline)

[17] This includes all households for whom we had sufficient data to evaluate their sanitation facility (n=204 at baseline; n=435 at endline)

[18] This includes all households for whom we had sufficient data to evaluate their handwashing facility (n=211 at baseline; n=431 at endline)

[19] This includes all households for whom we had sufficient data to evaluate their handwashing facility (n=211 at baseline; n=431 at endline)

[20] This includes all households for whom we had sufficient data to evaluate their area for drying dishes (n=228 at baseline; n=432 at endline)

[21] This includes all households for whom we had sufficient data to evaluate their bathing shelter (n=115 at baseline; n=430 at endline)

[22] This includes all households for whom we had sufficient data to evaluate Healthy Home criteria (n=195 at baseline; n=420 at endline)

Health

Diarrhea is the third leading cause of death for children under 5 globally, resulting in approximately 443,832 deaths per year.[23] The majority of these deaths are attributed to inadequate WASH.

In this study, the percentage of households who had at least one child under five with diarrhea in the past week decreased from 8.9% at baseline to 5.7% at endline (this decrease was not statistically significant, with a p-value >0.05). The percentage of respondents reporting that their children's health had improved in the last year increased from 76% at baseline to 79% at endline, although this change was not statistically significant. When the respondents were asked what the most common illnesses were affecting children under five in their household, the percentage reporting stomach pain decreased from 30% at baseline to 5.1% at endline, and the percentage reporting diarrhea decreased from 29% of at baseline and 9.0% at endline.

The burden of medical visits and fees also decreased from baseline to endline. The median number of visits to medical facilities in the four weeks prior to the survey decreased from three visits at baseline to zero visits at endline. Additionally, the percentage of households reporting to have spent money on medical treatment in the four weeks prior to the survey decreased from 15% at baseline to 9.4% at endline. Of the respondents who spent money on medical treatment (n=45 at baseline, n=41 at endline), the median amount spent on medical treatment (including travel, food, and accommodations) decreased from 913 ETB ($17.84 USD) at baseline to 500 ETB ($9.77 USD) at endline.

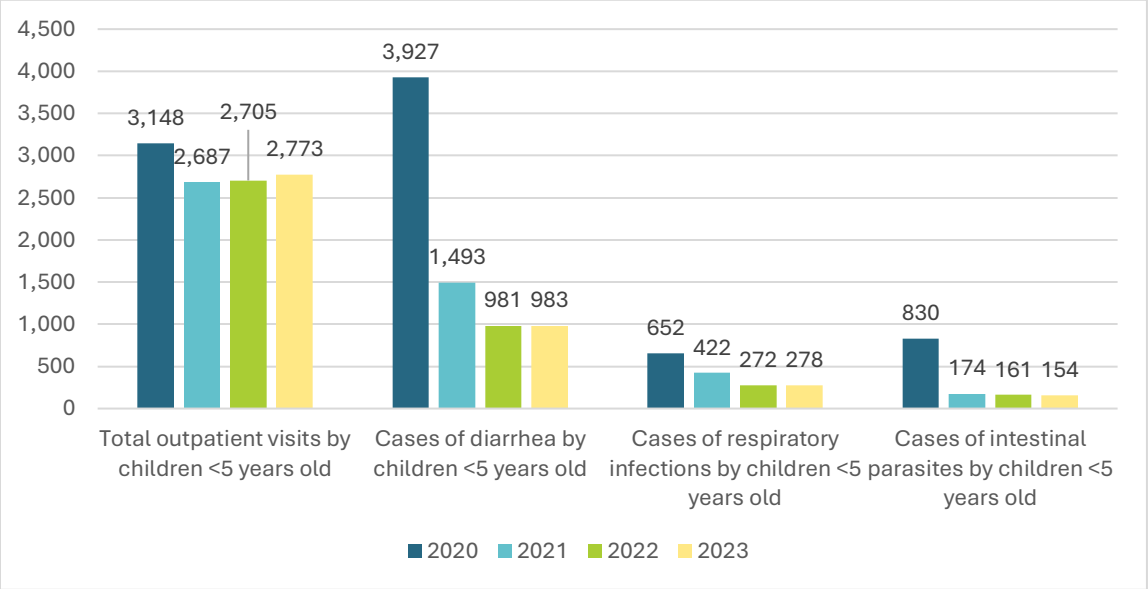
In summary, awareness of how behaviors and environments contribute to WASH-related illness increased from baseline to endline. WASH-related illnesses have decreased from baseline to endline, likely due in part to increased WASH knowledges and improved WASH practices. In an interview, one respondent observed the following:

> *"Clean environment will lead to a healthy village, and a healthy village means a village with a smaller number of diarrhea cases. So, there is a direct relationship between a healthy environment and diarrhea cases."*

Case data for children under five was collected from the five health centers in the project area. Recorded cases of WASH-related illnesses such as diarrhea, intestinal parasites, and respiratory infections decreased overall from before the project began (2020) to the last year of the project (2023).

[23] WHO (2024). Retrieved from: https://www.who.int/news-room/fact-sheets/detail/diarrhoeal-disease

Figure 2. Health facility case data



Water

Lifewater is interested in understanding the level of "basic access" to drinking water within the project area, which is defined as "Drinking water from an improved source, provided collection time is not more than 30 minutes for a roundtrip including queuing"[24]. Lifewater was able to assess the rate of basic access for 96% (n=295) of respondents for the dry season at baseline, 87% (n=265) of respondents for the rainy season at baseline, 85% (n=371) of respondents for the dry season at endline, and 74% (n=324) of respondents for the rainy season at endline. Basic access to water increased from baseline to endline., from 7.8% to 58% in the dry season and 10% to 68% in the rainy season (Table 3).

Table 3. Drinking water source types in the dry and rainy seasons

Study	Season	Source type	% of respondents	Median water fetching time	% with basic access
Baseline	Dry	All sources Improved Unimproved	100% (n=295) 30% (n=89) 70% (n=206)	53 minutes 65 minutes 45 minutes	7.8% (n=23)
	Rainy	All sources Improved Unimproved	100% (n=265) 25% (n=67) 75% (n=198)	25 minutes 37 minutes 23 minutes	10% (n=27)
Endline	Dry	All sources Improved Unimproved	100% (n=371) 76% (n=283) 24% (n=88)	21 minutes 19 minutes 27 minutes	58% (n=215)
	Rainy	All sources Improved Unimproved	100% (n=324) 80% (n=258) 20% (n=66)	15 minutes 16 minutes 17 minutes	68% (n=221)

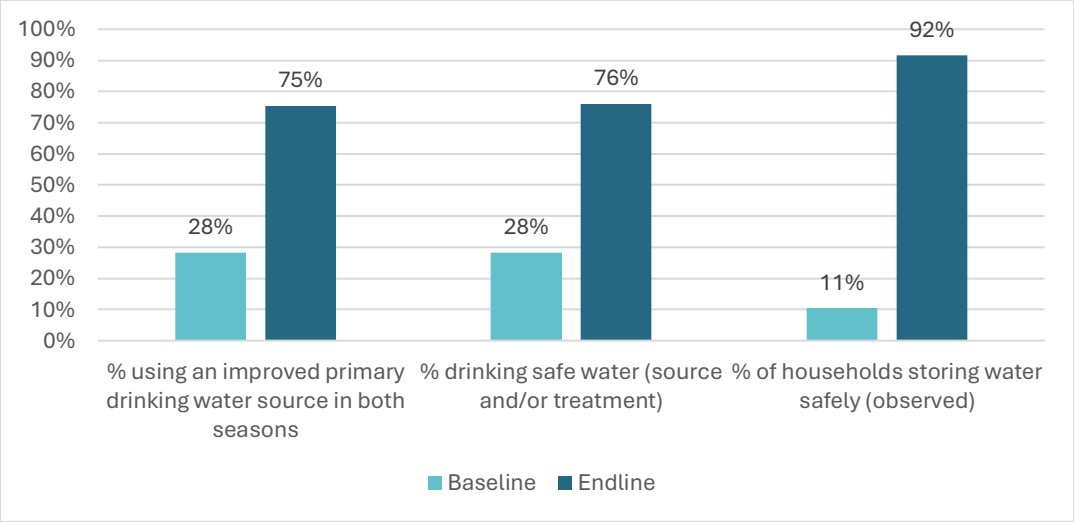
A household is considered to be drinking safe water if they fetch water from an improved source in both seasons, or if they do not use an improved source, they always treat their water with an acceptable water

[24] WHO/UNICEF Joint Programme for Water Supply, Sanitation and Hygiene (2016). Retrieved from: https://washdata.org/monitoring/drinking-water

treatment method.[25] Overall, the percentage of households reporting that they were drinking safe water in both seasons (either from an improved source or through consistent treatment of drinking water) increased from 28% at baseline to 76% at endline.

The percentage of respondents with safe water storage containers (defined as being covered, narrow mouthed, and clean/mostly clean) increased from 11% at baseline to 92% at endline (p-value <0.05). Water consumption (liters per person per day) was calculated based on the reported volume of water fetched per day. At baseline, the median number of liters of water per person per day was 9.0 liters and increased to 10 liters at the time of endline. These results are lower than the Ethiopian national standard of 25-liters per person per day. The percentage of households who reported being satisfied with the current water situation increased from 20% at baseline to 75% at endline.

Figure 3. Changes in water key indicators from baseline to endline



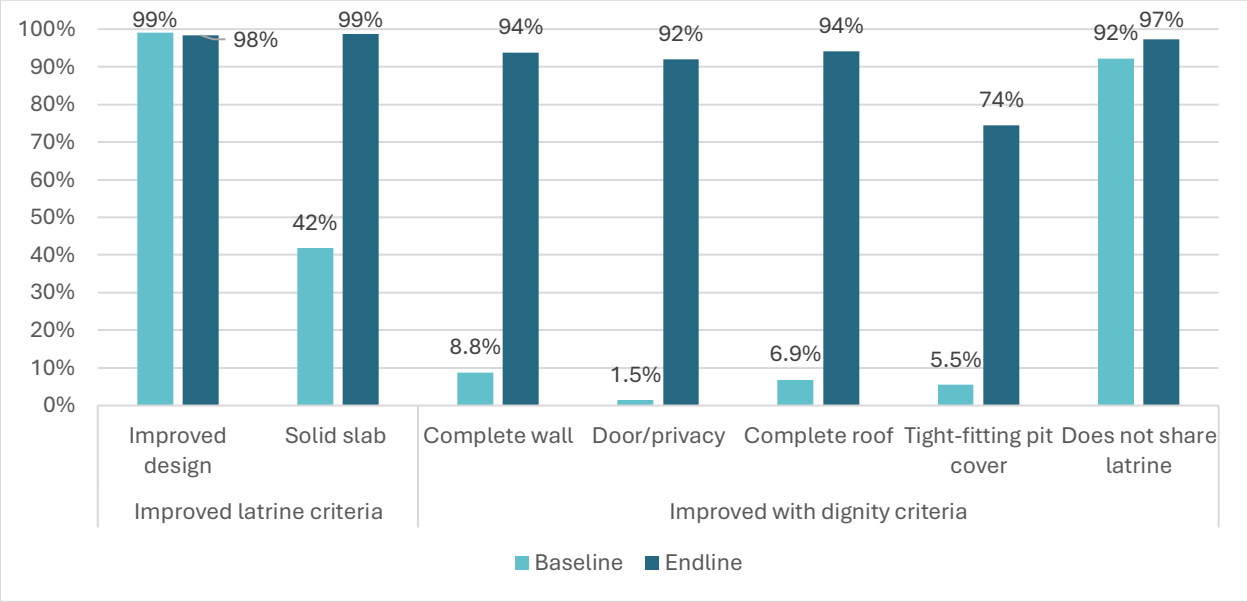
Sanitation

Lifewater trains households to invest in "improved latrines with dignity", which meet all the criteria to be considered an improved latrine[26] while also protecting the dignity of the users. Improved latrines with dignity have walls, a roof, and a door that provide complete privacy, as well as a tight-fitting pit cover that keeps flies and insects out. One participant in the qualitative interviews at endline reported that the promotion of healthy competition among community members effectively encouraged households to build their latrines in a timely manner.

Overall, the percentage of households with improved latrines increased from 2.0% at baseline to 63% at endline, and the percentage of households with improved latrines with dignity increased from 0.0% at baseline to 57% at endline (p-value <0.01) (Figure 8). The most commonly missed improved latrine with dignity standard was having a tight-fitting pit cover, which caused many latrines to fall short of the latrine with dignity criteria at endline.

[25] Effective water treatment methods include boiling, adding chlorine, using a biosand filter, using a ceramic filter, or solar disinfection.
[26] The Joint Monitoring Programme (2016) defines improved latrines as those "designed to hygienically separate excreta from human contact", including pit latrines with solid slabs, above ground vaults, and pour/flush latrines to closed tanks.

Figure 4. Quality of observed latrines at baseline and endline



According to one interview respondent at endline, using latrines instead of open defecation is now a sign of "dignity and pride" for community members.

Hygiene

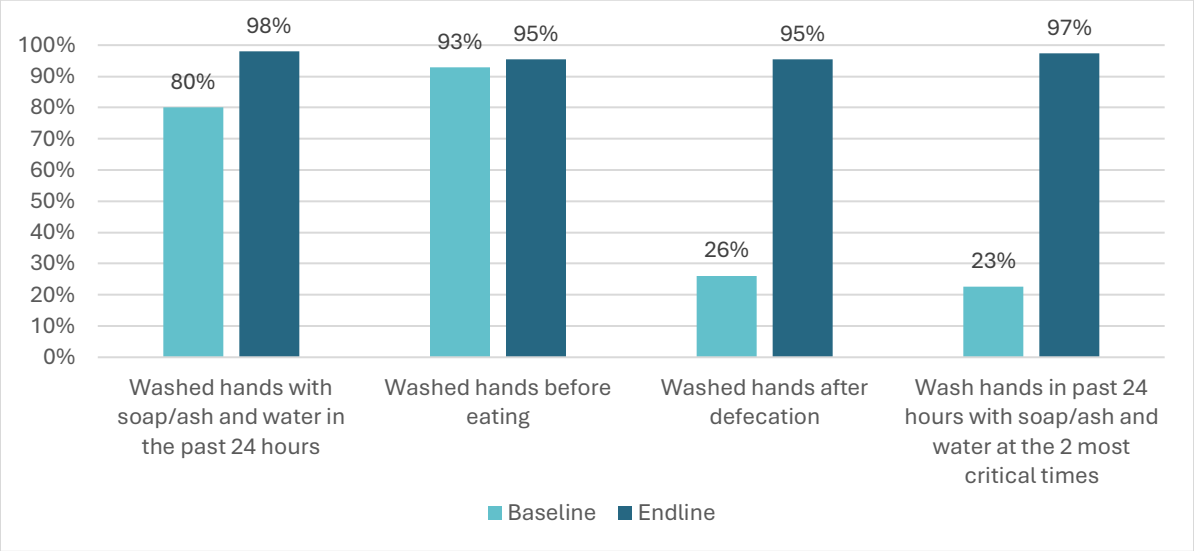
Handwashing facilities and self-reported handwashing behaviors were investigated in each study. The prevalence of handwashing stations near the latrine with the appropriate materials (soap/ash and water) increased from baseline to endline, from 0.0% to 71% (p-value <0.05). Additionally, the percentage of households with handwashing stations near their kitchen (with soap/ash and water) increased from 1.4% at baseline to 37% at endline (p-value <0.05).

Interview data revealed that community members are motivated to wash their hands more frequently due to their increased awareness of disease pathways since the Lifewater WASH program. A community member living in a Healthy Home reported:

> *"After participating in the Lifewater program, we realized how bacteria may enter our bodies through our hands, go to our mouths, and cause disease. Now that we [know] how to stop the spread of sickness, we wash our hands with soap whenever necessary."*

The percentage of respondents who reported washing their hands after defecation/using the latrine increased from 26% to 96%, and the percentage who reported washing their hands before eating increased slightly from 93% to 95%. Overall, the percentage of respondents who washed their hands with soap/ash and water at the two most critical times increased from 23% at baseline to 97% at endline (p-value <0.05).

Figure 5. Self-reported handwashing behavior in the 24 hours prior to the survey



Enumerators also observed the households' waste management. The percentage of households observed to have animal feces on the compound decreased from 34% at baseline to 1.4% at endline, and the percentage observed to have rubbish on their compound decreased from 86% to 7.6%. Overall, the percentage of households observed to have clean compounds increased from 13% at baseline to 91% at endline (p-value <0.05).

Schools

Lifewater worked intensively with five schools in the project area, including Allo Primary School, Chilalaka Primary School, Hamesho Primary School, Murago Primary School, and Guyo Primary School. Enrollment and dropout data collected from these schools did not reveal any consistent reductions in absenteeism or dropouts over the course of the project. However, some respondents reported in qualitative interviews that before the Lifewater program, students would miss many school days due to WASH-related illnesses. Some school staff observed that dropouts related to illness have decreased since the implementation of the program.

When asked about changes in WASH in schools, interview participants identified several key changes that have positively impacted teachers and students, including the implementation of student WASH clubs, the construction of safe and appropriate sanitation facilities for male and female students, the sensitization of teachers on student menstrual hygiene management, and teacher WASH trainings. These factors have empowered teachers and students to reduce the transmission of WASH-related illnesses at their school and educate the wider community.

Conclusion

Water, sanitation, and hygiene conditions improved in the Bensa Project 3 area between baseline and endline. Households received training on WASH practices, schools were mobilized to teach their students about WASH, water points were rehabilitated and constructed, and water committees were established for ongoing maintenance and operations of water points. As a result, communities are equipped to prevent WASH-related diseases through healthy practices such as safe water consumption, handwashing, and improved latrine use. Of the 3,612 households in the project area, 97% were registered as Healthy Homes, and 100% of the villages were verified as Open Defecation Free.

Due to improved water, sanitation, and hygiene conditions, households at endline were generally more equipped to reduce the transmission of WASH-related diseases than at baseline. More households are using safe water, and they are spending less time collecting it; safe water usage increased from 28% to 76%, and the median journey time to collect water decreased from 53 minutes to 20 minutes.

Considerable improvements were observed in latrine quality, with the percentage of households with improved latrines with dignity increasing from 0.0% to 57%. Essential hygiene infrastructure was more prevalent at endline, when 71% had fully equipped handwashing stations near their latrine (compared to 0.9% at baseline), 99% had raised drying racks (compared to 0.9% at baseline), and 70% had bathing shelters (compared to 0.9% at baseline).

Households also demonstrated improved awareness of WASH practices and disease transmission. The percentage of respondents who believed that diarrhea is preventable increased from 49% at baseline to 91% at endline, and the percentage who recognized using a latrine as a key prevention method increased from 52% at baseline to 81% at endline. Reported handwashing behavior after using the latrine increased from 26% at baseline to 96% at endline, and 91% of households at endline were observed to have clean compounds, compared to 53% at baseline.

Reported WASH illness prevalence decreased as well. Diarrhea cases in children under the age of five decreased from 8.9% at baseline to 5.7% at endline, and the percentage of respondents who believed their health had improved in the previous year increased from 63% at baseline to 75% at endline.

These findings will be used to inform future project implementation. A post-project evaluation study will be conducted in December 2025 to evaluate the sustainability of these improvements at endline.