



DFID-Funded Government of Zambia
Sanitation and Hygiene Programme
(2011–2018)
UNICEF End-of-Programme Summative
Evaluation Report
Final Report – December 2019

Evaluation conducted by the American Institutes for
Research (AIR)

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Executive Summary

Background

Although Zambians made significant progress towards better Water Sanitation and Hygiene (WASH) habits and WASH-related outcomes over the last two decades, there is still substantial room for improvement. According to the Joint Monitoring Programme (JMP)-2019, rates of open defecation in Zambia fell from 24% to 19% between 2000 and 2017, but 1 in 3 rural households still practise open defecation (JMP, 2019). Twenty-eight percent of Zambians have access to a limited handwashing facility (although many still lack water and soap), and there is a large rural–urban divide in WASH knowledge and practises (only 3% of urban residents still practice open defecation, for example), as well as proper WASH infrastructure (JMP, 2019).

WASH is particularly important for young children because inadequate sanitation and poor hygiene practices are leading causes of diarrhoea, and recurrent diarrhoea episodes can lead to poor nutritional status, as well as stunting and wasting among young children. In Zambia, maternal and child undernutrition is responsible for 50% of the deaths in children under age 5, and 35% of those under age 5 are stunted, 4% are wasted, and 12% are underweight (Demographic and health survey [DHS], 2019).

To address these challenges, the Government of Republic of Zambia (GRZ), in partnership with UNICEF and with funding from the UK's Department for International Development (DFID), implemented Zambia Sanitation and Hygiene Programme (ZSHP), during 2011 and 2018. The programme, which was led by the Ministry of Local Government till 2016 and Ministry of Water Development, Sanitation and Environmental Protection from 2017 onwards, covered 68 districts and over 3.6 million people across the country. The goal of ZSHP was to contribute to the reduction of morbidity among children under five due to WASH related diseases and also to discourage open defecation practices by enabling 3.6 million people to consistently use improved household toilets and practise handwashing with soap or ash thereafter. The programme included four main components: (1) community-led total sanitation (CLTS), which mobilises communities to take the lead in eliminating open defecation practises; (2) institutional sanitation, which targets improvements in sanitation and sanitation hardware, and aims to promote school-based management systems of the infrastructure; (3) sanitation marketing, which aims to build the capacity of the private sector, particularly local masons, to adequately respond to rising demand for sanitation, including more affordable and durable toilet options¹; and (4) promotion of hygiene and handwashing, which includes mass media campaigns, interpersonal communication, and celebration of national and global events, and targets wide-scale WASH-related behaviour change.

Methodological Approach

AIR adopted a mixed-methods approach that included data from surveys with 1,199 households and 81 schools, as well as a document review of WASH policies; qualitative interviews with UNICEF and key WASH-sector stakeholders; and focus group discussions with households, children, and WASH-sector stakeholders. For our quantitative analysis, we





¹ ZSHP focused on training local entrepreneurs/masons to respond to the rising demand for sanitation infrastructure. The programme trained 663 masons between 2014 and 2018.

incorporate findings from two previous rounds of data collection (baseline and midline) by a team of evaluators led by the Boston University Center for Global Health and Development (CGHD).² We present summary statistics of data available in CGHD’s baseline and midline reports.³ Both quantitative and qualitative data collection occurred across three geographic regions within Zambia: (1) North-Western and Copperbelt Provinces; (2) Central, Northern,⁴ and Luapula Provinces; and (3) Eastern and Southern Provinces.

Findings

The results of the evaluation are presented following the programme logframe which shows programme results at impact, outcome and output levels. We assign each indicator an achievement colour code using the traffic light system shown below (Table 1), prioritising indicators of coverage/reach. Wherever possible, results are compared with baseline and midline studies conducted in 2013 and 2016, respectively.

Table 1. Key for towards logframe achievements

	Target met or exceeded (100% and above)
	Target mostly met (75%-100% achievement)
	Target partially met (50% – 75% achievement)
	Target Not Met (Below 50% achievement)

Impact: Reduce diarrhoea morbidity among rural children from a baseline of 20.4% in 2013 to 16.3% at project endline in 2018.


Our results show that diarrhoea morbidity among children declined from 20.4% at baseline to 11% at endline, exceeding the target of 16.3% by four percentage points (see Table 2). In addition to the primary indicator, we also tracked progress of nutrition indicators of stunting and wasting as secondary indicators of impact. Results show a reduction in stunting from 46% at baseline to 32% at endline. Similarly, wasting decreased from 14% in 2013 to 6% in 2018. It is likely that improved sanitation and fewer diarrhoea episodes contributed to the reduction in diarrhoea morbidity and improved nutrition in the implementation areas.

² UNICEF commissioned the CGHD and ZCAHRD to conduct baseline and midline evaluations. Reports were finalized on 2013 (baseline) and 2017 (midline).

³ Previous reports available from UNICEF: <https://www.unicef.org/zambia/reports/impact-evaluation-sanitation-programme-2017>

⁴ Including Muchinga

Table 2. Progress towards programme impact

Key Indicator	Baseline (2013)	Target	Achievement (2018)	Colour code
Reduced diarrhoea morbidity amongst rural children under five	20.4%	16.3%	11%	
Stunting (secondary indicator)	46%	No target was set	32%	N/A
Wasting (secondary indicator)	14	No target was set	6%	N/A

Outcome: 3.6 million people consistently using improved household toilets and practicing hand-washing with soap or ash thereafter

The ZSHP intended to increase the proportion of households using improved sanitation facilities with a functional⁵ hand-washing facility at the toilet. The programme succeeded in increasing the proportion of households with an improved sanitation facility, *defined as "facilities that hygienically separate human excreta from human contact and that were not shared with other households. These include flush toilet, piped sewer system, septic tank, flush/pour toilet to pit latrine, ventilated improved pit latrine, pit latrine with slab and composting toilet*, from 36%⁶ in 2013 to 62% in 2018 (see Table 3). Unfortunately, the majority of households (91%) in our sample did not have a functional handwashing facility at the toilet. This outcome indicator requires the presence of a functional hand-washing facility at the toilet which had to be observed by our enumerators⁷. Thus, the lack of a functional hand-washing facility with soap or ash at the toilet was the primary reason for not achieving this outcome indicator. Our qualitative data shows that lack of access to water contributed to households not having a functional hand-washing facility at the toilet. In addition, some possible reasons for why most households do not have a hand-washing facility at the toilet include a lack of plastic basins, the plastic basin was cracked and not working, far distance to the nearest water source, and lack of soap or ash. Although 75% of households report washing their hands with an agent, it seems that for most households this activity did not occur near their toilet facility which means that they are not counted towards this outcome indicator. All these factors converged resulting in a low proportion of households with functional handwashing facilities, and consequently underachievement on this indicator.



Table 3. Progress Towards Improved Sanitation Outcome

Key Indicator	Baseline	Target	Endline	Colour code
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⁵ Functional handwashing facility is one with water and soap/washing agent

⁶ Different values are reported in the 2013 BU study and the 2017 BU study. For consistency, we use baseline values from the 2013 study. These reports do not indicate which shared facilities are improved pit latrines, so we conservatively use the number that corresponds to improved and unshared facilities at baseline.

⁷ Enumerators were trained to check for a container with water and to check if there was water on the ground or some other indication of recent use. To qualify as a handwashing facility in our data (in line with ODF certification requirements in Zambia), the handwashing facility had to be close to the toilet.

Proportion of population in target districts using improved sanitation facilities	36%	55%	62%	
Proportion of population in target districts with a functional hand-washing facility at the toilet	2.8% ⁸	No target was set	9%	N/A
The proportion of population in target districts using improved sanitation facilities with a functional hand-washing facility at the toilet	5.4%	55%	2.6% ⁹	






Programme Implementation

In this section we highlight key outputs of ZSHP for CLTS, SLTS, Sector Strengthening, Sanitation Marketing and Monitoring and Evaluation/Knowledge management.

Output 1: Community-Led Total Sanitation (CLTS) - Three million and six hundred thousand (3,600,000) people (new users) consistently utilizing improved sanitation facilities and hygiene practices.

According to UNICEF's Project Completion Report to DFID, the ZSHP achieved the targets on the number of people with sustained access to improved sanitation, number of verified ODF villages and number of people with sustained access to handwashing (see Table 4). The programme also succeeded in encouraging 81 chiefdoms in target districts to develop evidence based, feasible handwashing action plans.

Table 4. UNICEF Reported Progress Towards Output¹⁰

Key Output Indicator	Target	Achievement ¹¹	Colour code
Number of additional people with sustained access to improved sanitation	3,600,000	3,905,474 ¹²	
Number of verified open defecation free (ODF) villages achieved	12,000	12,427	
Number of people reached with hygiene promotion activities	8,000,000	8,846,160	
Number of people with sustained access to handwashing	3,600,000	3,607,208	
Number of chiefdoms in target districts with an evidence based, feasible Hand Washing (HW) action plan that is reviewed once per year	80	81	

Open Defecation Free (ODF): Reported open defecation decreased between baseline and endline as more households have access to a sanitation facility. At end line, 78% of respondents reported that they never defecated in the open—a 20 percentage point

⁸ Value corresponds to households with running water in a pipe stand or sink at baseline

⁹ This indicator is a combination of improved sanitation and functional handwashing **at the toilet** and does not include handwashing facility located elsewhere in the premises

¹⁰ As of September 2018

¹¹ Based on UNICEF Project Completion Report to DFID

¹² This could be a result of cumulative counting over the period of the project

increase from baseline (58%). While this is an important achievement, the full ODF certification also requires that households have and use a handwashing facility, which was still difficult for most households.

Just over half (53%) of the sampled households that built their own toilets (n = 882) reported that it was difficult or very difficult to access building materials for toilets. Triggering events, which involved hands-on exercises to help communities understand proper sanitation and hygiene practises, and local buy-in from local leaders (and traditional leadership) to enforce new social norms and WASH behaviours, motivated community members to construct latrines and try to achieve ODF status. However, our qualitative data confirms that households struggled to build high-quality toilets because they did not have sufficient capacity in terms of funding, building materials and skills.

Hygiene Promotion: Handwashing practises improved over time, although only 16% of respondents washed their hands at all critical times¹³ (up from 7.9% at baseline in 2013). The low rate of access to a handwashing facility at the toilet (9%) helps explain the low rates of handwashing. The ZSHP encouraged households to build toilets with a handwashing facility. However, there was no provision of water by the programme. As a result, very few (9%) had functional handwashing facilities at the toilet.

Household knowledge of the importance of treating water is near-universal, though they seemed to struggle to convert this new knowledge into action. In this evaluation, 97% of respondents at endline (up from 73% at baseline) said that they know treating and properly storing water lowers their risk of disease, but only one-third (34%) of sampled households report that they treat their water. This shows no change from baseline as 34% of households at baseline also reported that they treat their water. The low levels of households treating water is an indication of difficulties households encounter in translating knowledge to practice with regard to water treatment.

Equity and gender: Our qualitative data indicates that the programme was effective in including women in CLTS. Data from key informant interviews and focus group discussions suggests that women were largely involved in CLTS as community champions and SAG members. Community members, UNICEF staff, government officials, and implementing partners perceived women as the main household-level actors engaged in sanitation activities and believed that this motivated women to participate in community processes like CLTS. As a result, respondents felt that women attended meetings related to sanitation and hygiene and triggered meetings more frequently than men. However, on average, female-headed households reported attending fewer meetings than male-headed households (an average of 2.7 and 3.6 meetings, respectively).

Qualitative data also indicates that vulnerable groups like the extremely poor, elderly, and disabled could not participate in CLTS interventions and access its benefits – in particular, access to improved sanitation facilities and toilet construction -- to the same extent as other beneficiaries. While the programme included specific measures to engage women and meet the gender equity goals, there were no similar procedures to target vulnerable groups. As a




¹³ Critical times are as follows: before food preparation, before eating, before feeding children, after defecation, and after cleaning a baby's bottom

result, decisions to support the most vulnerable members of a specific community were made at the discretion of community members. While some qualitative respondents explained that village headmen and/or church leaders gathered able-bodied people to help the elderly, disabled, and widowed build toilets, this process did not happen in all villages in our qualitative sample.

Output 2: School-Led Total Sanitation (SLTS): One thousand additional schools have appropriate sanitation facilities including hand-washing facilities, and soap available; together with an appropriate management system and hygiene promotion activities.

The SLTS component of the ZSHP supported improvements in sanitation in schools, focusing on ensuring child-friendly toilet blocks for girls and boys, handwashing facilities, and menstrual hygiene management (MHM). Overall, the programme achieved all the output targets contained in the logframe.

Table 5. UNICEF Reported Progress Towards Output 2

Key Output Indicator	Target	Achievement ¹⁴	Colour code
Number of additional schools that have appropriate sanitation facilities	1000	1,064	
Number of Provincial Education Offices (PEOs) with a school WASH Action plan.	10	10	
Number of piloted schools with Education Statistics reported through real time monitoring system.	50	50	

Sanitation facilities: Ninety-three percent of the sampled schools had a permanent or improved pit latrines at endline, up from 68% at baseline. The number of schools that achieved the 1:50 toilet-to-pupil ratio recommended by the MoGE in 2013 almost doubled from 21% at baseline in 2013 to 40% at endline. Children were almost always partially responsible for maintaining school latrines (98%), but sometimes teachers and staff shared the responsibility (12%). Almost all schools had a WASH maintenance committee (89%), and most had a plan for maintaining their WASH facilities (80%).

Handwashing facilities in schools: More than three quarters of schools (77%) had dedicated handwashing facilities for students near latrines, up 11 percentage points from baseline (66%). Of these facilities, almost all (85%) provided water at the handwashing facility, and 68% provided some type of handwashing agent or soap, an increase of over 30 percentage points from baseline (31.8%). Schools, on average, spent about 104 kwacha per month to provide these supplies to students.

Menstrual Hygiene: At endline, 47% of schools conducted menstrual hygiene activities and provided improved sanitation facilities for girls, as well as sanitary towels. However, once the initial supply of sanitary towels provided under the programme ran out, many schools struggled to restock the towels and families were then responsible for providing them for girls, mostly because of lack of resources.




¹⁴ Based on UNICEF Project Completion Report to DFID

Gender Equity Under SLTS: Overall, we did not find any differences in facilities by gender for students or teachers. All the schools that had toilets had gender disaggregated facilities, an improvement from 98% at baseline. We found that roughly 75% of schools provided MHM education, and 64% provided facilities to dispose of sanitary towels. However, less than half (47%) provided sanitary towels for girls, meaning that the majority of girls needed to acquire the towels on their own.

Output 3: National, provincial and districts level administrations have capacity to plan, implement and monitor sanitation promotion (including cholera preparedness and emergency response).

Qualitative data suggests that ministry and UNICEF officials believed that the programme successfully created synergies with implementers in the WASH sector and avoided duplication of efforts. To ensure effective coordination, UNICEF and ministry officials conducted mapping exercises at the start of the project and maintained open communication at the national and district levels during the programme rollout. Several ministry officials noted that the information from the mapping exercise encouraged coordination among programmes and a better integration of complementary programming and planning. At the time of the evaluation, significant progress had been made in setting up structures and plans including the creation of a new ministry, the finalisation and launch of the ODF Strategy and annual review meetings at district level.

Table 6. UNICEF Reported Progress Towards Output 3

Output Indicator	Target	Achievement ¹⁵	Colour Code
Percentage of implementing district with at least an annual review / planning process dedicated to hygiene and sanitation interventions.	90%	96%	
Number of target districts with operational real-time monitoring system to report on rural WASH interventions.	68	68	
Number of target districts with operational, multi-sectoral cholera emergency preparedness, prevention and response implementation plans.	27	27	

Cholera emergency response: While the ZSHP did not originally include a component related to cholera preparedness and emergency response, based on GRZ request, UNICEF worked with DFID in 2017 and 2018 to adjust the programme and allocate resources to respond to the cholera outbreaks. The ZSHP provided support toward the end of the 2016–2017 outbreak, including the distribution of chlorine and other supplies, water trucking, hygiene promotion, capacity building for Ministry of Health (MoH) staff, and developing cholera preparedness plans at the district level. These activities served as preventive measures against future cholera outbreaks and supported a timelier response during the 2017–2018 outbreak. According to the UNICEF Project Completion Report to DFID, 1,489 cases and 30 deaths occurred in the period February – October 2016. Key stakeholders, including government officials, implementing partners, and DFID staff, believed that UNICEF launched its response to the cholera outbreak in a timely manner. UNICEF and DFID noted that there was a slight delay between the beginning of the 2017–2018 cholera outbreak and when

¹⁵ Based on UNICEF Project Completion Report to DFID


DFID approved programme adjustments, but they mentioned that this did not delay UNICEF’s implementation of activities. Respondents, including government officials and implementing partners, reported satisfaction with the timeliness of the monitoring activities and chlorine distributions.

According to the DFID’s ZSHP Project Completion Review (December 2018), UNICEF rapidly developed programme cooperation agreements with NGOs to allow them to undertake field activities, which also facilitated implementation (UNICEF, 2018b). Finally, government agencies partnering with UNICEF during the cholera outbreak demonstrated similar flexibility. For example, Lusaka Water and Sewerage Company began providing chlorine to communities prior to receiving liquid and granular chlorine from UNICEF with support from Centres for Disease Control and Prevention (CDC).

Output 4: Sanitation Marketing - Small scale service providers - including individuals - in targeted rural districts are enabled to supply sanitation and hygiene services in response to household demand

The ZSHP also addressed the sanitation-marketing objective by working to build capacity of small-scale service providers, including individuals, to supply sanitation and hygiene services in response to household demand. Under the ZSHP, the indicator tracking progress on sanitation marketing related to chiefdoms with difficult soil conditions having at least two active and accredited service providers enabled to respond to public and private demand for sustainable latrines, which the programme achieved.

Table 7. UNICEF Reported Progress Towards Output 4

Output Indicator	Target	Achievement ¹⁶	Colour Code
Number of chiefdoms with difficult soil conditions having at least 2 active and accredited service providers enabled to respond to public and private demand for sustainable latrines	65	106	

Qualitative data indicates that sanitation marketing was more effective in SLTS than it was in CLTS. Integrating the SLTS and the sanitation-marketing components by subsidising school toilet construction by masons encouraged the masons to construct more school toilets. For the households however, although ZSHP sanitation marketing introduced different models of toilets and trained 663 masons, the uptake of durable toilets was poor and focus group participants indicated this is because of lack of finances and other resources required to build durable toilets.

Monitoring and Evaluation (M&E) and Knowledge Management/Real-Time Monitoring (RTM)/District Health Information System 2 (DHIS2): The rollout of the RTM significantly improved the efficiency of monitoring interventions, particularly CLTS in the 68 targeted ZSHP districts, and thereafter, in 4 districts of Copperbelt (through EU/MDGi funded UNICEF and GRZ Sanitation and Hygiene Programme) and 16 additional districts in Western Province (through AfDB support to GRZ). Respondents noted that the RTM had been used for making decisions at district and national levels, including decisions related to resource allocation. Respondents identified several challenges related to using the RTM. Specifically,

¹⁶ Based on UNICEF Project Completion Report to DFID

respondents reported that sanitation action groups (SAGs) and community champions did not receive adequate support during the life of the programme. Community champions reported challenges with the phones themselves, as some phones became non-functional due to use. Bicycles procured also broke down. Additionally, community champions did not consistently receive airtime on time, which they required to transmit data. As a result, many community champions grew frustrated that they were not given proper resources to submit their reporting, which affected continued functionality of using the RTM.

Value for Money: There was agreement among key programme stakeholders interviewed as part of this evaluation that the programme struck a balance between cost and outputs. However, despite our qualitative data showing that most respondents indicated that programme costs were sufficient to effectively achieve programme outputs, a few respondents believed that the programme was too low cost, ultimately compromising the quality of the toilets constructed by communities. Because this data was collected qualitatively, there is no figure tied to 'low cost'.

Programme Sustainability

Behavioural/Social Sustainability: Our qualitative data suggest that while household beneficiaries remain enthusiastic about using improved household toilets, when toilets that were built as part of the ZSHP collapsed, many found it difficult to rebuild the improved facilities. This is a direct threat on ODF sustainability. Often beneficiaries must choose between short-term, cost-effective solutions and long-term, prohibitively expensive solutions. Toilets built with lower quality construction materials and processes are subject to frequent collapse, especially in regions with soft or sandy soil, and fill more quickly. The financial precarity of many household beneficiaries may prohibit them from continuously building new toilets after their household toilets collapse. These factors strongly prevent the overall sustainability of the programme, as improved sanitation facilities that are built initially may collapse and not be rebuilt due to financial and environmental constraints.

Our qualitative data also indicate that programme stakeholders struggled with how to maintain a community's ODF status after the community had been declared ODF. Often, after communities achieved and celebrated ODF status, they lost the momentum to continue striving toward the next sanitation goal. Other stakeholders confirm that they have seen the same problem and have proposed solutions such as a retriggering process, a reverification process, or new community-led sanitation initiatives to maintain the enthusiasm and momentum surrounding CLTS.

Development and launch of the Open Defecation Free Strategy 2018 – 2030 is likely to improve sustainability. This is because donors will be able to identify needy areas to support based on the strategy. Ultimately, support to areas identified in the Strategy will lead to improvements in behaviour.

Another aspect of behavioural sustainability relates to handwashing with soap or ash. In this evaluation, 98% of households know about the importance of handwashing. However, access to handwashing remains elusive as only 9% of sampled households have access to

handwashing facilities next to the toilet facility¹⁷, which threatens the sustainability of reduced disease burden.

Institutional Sustainability: The creation of the new Ministry of Water Development, Sanitation, and Environmental Protection (MWDSEP) is key to ensuring sustainability. Other than the creation of a new ministry, new positions were also created specifically for sanitation and hygiene both at national and sub-national levels. These are likely to influence the discourse on sanitation and steer conversations on sustainability of the investments made under the ZSHP. Institutional challenges, which threaten the sustainability of interventions supported under ZSHP, are linked to clarity of roles and responsibilities at the subnational (province and district) level. At the time of this evaluation, the MWDSEP did not have district-level structures and operated largely through the Ministry of Local Government and Housing (MLGH). The lack of structures at this level means that technical support and financial flows directly through the ministry is difficult.

Financial Sustainability: There are several areas of improvement but more needs to be done to sustain the required investments in sanitation. Sanitation has been given its own budget line in the government budget. Initially this was lumped under Water and Sanitation. This is likely to result in improved finances to the sector to sustain the results of the ZSHP. However, there are inconsistencies in the disbursement of funds and the current budget allocation does not meet the required demand.

Sanitation Marketing: ZSHP introduced the sanitation marketing component of the programme during the period 2014/15 with the aim of building the capacity of the private sector, including community-based artisans, in providing sanitation services and options and providing entrepreneur skills to local people. As part of sanitation marketing business model, toilet design options were developed to suit the local conditions and building styles. Local masons, selected by district officials in consultation with local chiefs/headmen, received training in construction of latrines. Although people were told about the different designs of toilets, they still built sub-standard ones that would not last the next rainy season mostly because of lack of materials or finances. According to our key informants, most of the trained masons had no interest in sanitation and lacked entrepreneur skills. Our qualitative data suggest that this is because the people targeted for masonry training did not necessarily have an interest in the topic, and often lacked entrepreneurial skills. Further, some qualitative respondents reported that trained masons would move out of programme areas to places where they would have more business. Involvement of the private sector, which is profit driven, require that they break-even to engage in sanitation which did not happen.

Gender: According to the qualitative data, the sanitation marketing component was not as effective as CLTS and SLTS in incorporating gender. Qualitative respondents mentioned that few women worked as masons and that men typically occupied this role. Respondents also suggested that women were less likely to work as masons because of the intense labour required to build toilets. Out of the 663 masons trained, only 61 were female, signifying fewer women were involved in the trainings.

Conclusion

This evaluation concludes a multiyear investigation into ODF knowledge and practises across 68 districts in Zambia where the ZSHP operated and provides insights to similar future programmes. The investigation built on knowledge previously generated in baseline and midline reports conducted by Boston University. The ZSHP includes many activities to address knowledge, behaviour, and access to WASH services in both villages and schools, making it an ambitious and important endeavour. We find improvement over time across many important indicators from the theory of change, such as decreased child malnutrition, increased latrine ownership and use, improved knowledge about proper practises, and a desire to change WASH practises (Table 8).

Children under 5 years of age greatly improved over time with respect to incidents of diarrhoea, with half as many cases at end line (11%) as occurred at baseline (20%) or midline (19%). Cases of severe stunting were reduced from 32% at baseline to 10% at end line. We also see that cases of non-severe stunting were reduced from 46% at baseline to 32% at end line. Last, we found incidents of wasting down from 14% at baseline to 6% at end line.

Table 8. Summary of household WASH outcomes over time (proportion of households)

Indicator	Baseline (2013) (n = 1204)	Endline (2018) (n = 1199)
Toilet facility and sanitation practices		
Improved toilet facility	0.36	0.62
Appropriate disposal of child faeces	0.87 (n = 1082)	0.91 (n = 631)
Hand hygiene		
Household has an improved sanitation facility with a functional handwashing facility at the toilet	0.05 (n = 1191)	0.03
Proportion of population in target districts with a functional hand-washing facility at the toilet	0.03 ¹⁸	0.09
Knowledge of all six critical times to wash hands	0.08	0.16
Most recent handwashing		
Washed hands before preparing food or feeding	0.83 (n = 700)	0.85 (n = 588)
Washed hands after activities	0.91 (n = 503)	0.86
Water sources		
Improved water source	0.35	0.56
Household treats water	0.34	0.34

¹⁸ The baseline value was calculated using handwashing figures in the Baseline Report. A total of 34 households had handwashing facility with water and soap. This is 3% of the total households interviewed (1173)

Treat water effectively	0.94 (n = 411)	0.99 (n = 407)
Nutrition and health of children under 5 years		
Two-week diarrhoea prevalence among children <5	0.20 (n = 1340)	0.11 (n = 875)
Two-week ARI prevalence among children under 5	0.26 (n = 1341)	0.29 (n = 875)
Stunting (height/length for age z-score ≤ -2) among children under 5	0.46 (n = 670)	0.32 (n = 691)
Wasting (weight for height/length z-score ≤ -2) among children under 5	0.14 (n = 1063)	0.06 (n = 714)

Limitations

The evaluation team designed and implemented a study that could address the research questions with rigor and validity so that the results can be used to make policy decisions. This evaluation encountered a few challenges, which the team mitigated accordingly. For example, the baseline and midline did not collect a number of parameters that are important for the evaluation and theory of change. In addition, the definition of key indicators has sometimes changed between 2013 and 2019, meaning that some indicators may not be comparable over time. We have noted the places this is likely to occur to help the reader understand why the levels of some indicators may be surprising. This evaluation has included various indicators outlined in this report to strengthen analysis of the theory of change. Similarly, the three rounds of data collection included different households at each wave, so this evaluation does not have panel data (data on the same households over time). Similarly, the lack of a control group means that we cannot account for what would have happened in the absence of the program, for which the evaluation teams is careful about making causal claims about impacts.

Our qualitative study is limited in that previous rounds of data collection done for the baseline and midline did not include qualitative focus group discussions or key informant interviews so we cannot discuss qualitative changes over time.

Lessons Learnt

1. *Community Involvement*: Involving community leaders and structures in the CLTS model increases uptake of sanitation. Coupled with the emphasis on the use of local resources, the results of CLTS can be fully realised.
2. *Complementarity of WASH interventions*: Improving sanitation alone will not lead to improvements in safe hygiene practices – as water is a pre-requisite for handwashing and maintaining personal hygiene.
3. *Sanitation and Stunting*: Asserting that improvements in sanitation can result in reduction in stunting and wasting should be interrogated further by using rigorous evaluation approaches. There are many other factors at play that may reduce stunting and wasting including feeding practices, vitamin supplementation, breast-feeding

practices among others. Caution, therefore, needs to be exercised when including stunting and wasting in sanitation project logics.

4. *Monitoring Systems:* Using technology improves reporting, uptake of sanitation services and can lead to cost-saving if properly implemented. The volunteers that implement the applications must be well-trained and incentivised to be proactive in updating IT solutions such as the mobile to web (M2W)/DHIS2.
5. *Value for Money:* Performing value-for-money analysis at multiple stages of the programme and resourcing it adequately is important if utilisation of the results is to be achieved. Although the VFM analysis was included in the annual reports that UNICEF submitted to DFID, multiple respondents asserted that they were done to satisfy donor requirements and not to inform decision-making processes. Utilisation of a value-for-money (VFM) analysis should be improved and conducted annually to reflect trends in costs/benefits across years and programme influencing factors.
6. *Sanitation Ladder:* There has to be continuous encouragement of communities to move up the sanitation ladder, from simple latrines to basic and then safely managed sanitation, acknowledging that ODF is an important milestone. This is particularly important given the high expectations contained in the Sustainable Development Goals (SDGs) and Vision 2030 (Republic of Zambia, 2006), which contain aspects related to eliminating open defecation.
7. *Sanitation Marketing:* Introducing sanitation marketing early in sanitation improvement programmes, and adequately funding it is important for early uptake of various toilet solutions. Under ZSHP, this component was introduced later which reduced the resultant effect on communities' choice of toilets.

Recommendations

Table 9. Summary of Recommendations

Recommendation Number	Challenge/issue	Recommendation	Stakeholders
1	Most households did not have a handwashing facility at the toilet and cited difficulties in access to water as the cause. Households also were encouraged by NGOs to construct handwashing facilities using local materials, but this could not materialise as there was no water.	<p>Future WASH programmes should include water supply as an integral component. Government and cooperating partners (CPs) should not only improve sanitation but also access to water facilities. This is important as the ODF criteria also includes availability of handwashing facilities, which require the presence of water. This could be done through construction of additional water-points alongside improvements in sanitation.</p> <p>In addition, development and implementation of the WASH behaviour change communication (BCC) strategy should be prioritised by both government through the MWDSEP and UNICEF to accelerate behaviour change.</p> <p>Finally, there is a need to undertake research to better understand the motivators and demotivators for handwashing and come up with an appropriate strategy in this regard.</p>	GRZ and UNICEF
2	Lack of a “WASH in schools strategic plan” Lack of harmonized WinS designs and guidelines for the different challenging environment (hydrogeologic/socio – economic context)	<p>UNICEF should consider supporting MoGE development of a WinS Strategic plan and harmonised WinS Standard designs and guidelines</p> <p>MoGE can consider convening a WinS Technical Working Group to coordinate strategic harmonization</p>	UNICEF, MoGE
3	Lack of access to sanitary towels not only creates a sanitation problem but is one of the main reasons girls do not attend school	There is need to encourage the private sector to manufacture low-cost reusable sanitary towels for girls in schools. UNICEF should partner with NGOs and private sector to leverage resources and meet the challenges together.	UNICEF

Recommendation Number	Challenge/issue	Recommendation	Stakeholders
	regularly. Demand has been created through the MHM component of the ZSHP, but this has not been matched by supply of the towels.		
4	The programme model includes regular monitoring by community champions so that the programme can learn if there are challenges and address them quickly. Monitoring also supports accountability. However, the programme relies on volunteers to conduct monitoring, villagers in most cases. These volunteers have limited resources. A small investment in them will enable them to sustain the programme model and carry out monitoring activities (including entering data into the DHIS2 and M2W systems) at a relatively low cost.	Government should provide small incentives and resources (e.g. phone minutes, and transport) for local volunteer monitoring staff for sustainability of the DHIS2/M2W platform. This should also be included in the national budget. Government may also consider the potential for leveraging existing GRZ institutional arrangements – e.g. leverage on existing MoH EHTs (within health facility catchment areas) through operationalisation of MoU between MoH and MWDSEP. In this way, government can build capacity of MWDSEP at sub national level	GRZ and UNICEF
5	Many communities made great strides to achieve ODF certification but fear that they will not maintain the status after being certified. Communities seem to be responsive to incentives to motivate behaviour change. Perhaps creating effective post-ODF certification mechanism will help sustain the achievements of the programme over time.	UNICEF and GRZ should review and update the GRZ Mass ODF verification and certification protocols and develop post ODF monitoring protocol Government with support from stakeholders should operationalise the ODF Strategy 2018 – 2030. UNICEF and the government should develop and implement a post-ODF strategy that ensures continuity of the gains of the ZSHP. In addition, standard protocols and guidelines must be developed for ensuring that people aspire to move up the sanitation ladder.	UNICEF and GRZ

Recommendation Number	Challenge/issue	Recommendation	Stakeholders
6	Financial gaps: There are inconsistencies in the disbursement of funds, and the current budget allocation is not sufficient to meet the required demand.	Government should operationalize the WASH-sector financing mechanism that suggests alternative resource mobilisation options. The implementation of this action plan will contribute to increased mobilisation of resources for the WASH sector, including new investments, as well as funds for operation and maintenance.	GRZ and UNICEF
7	Lack of subnational structures: Subnational structures are lacking for MWDSEP and capacity of staff is low at these levels. This is despite using other ministries like MLGH to implement programs such as ZSHP	<p>Government should work towards filling the vacant positions at subnational level to deliver sanitation services. This calls for a coherent transitional plan with clear roles and responsibilities for staff at provincial and district levels.</p> <p>UNICEF should continue to support MWDSEP capacity building of staff and clarification of roles and responsibilities of its various units.</p> <p>UNICEF should support the Joint WASH and Environmental Protection Sector Review and finalisation of the National WASH Policy.</p> <p>Strengthen Sanitation and Hygiene Technical Working Group and develop specific coordination arrangements</p>	GRZ UNICEF
8	Durability/strength of toilets built by households: The toilets are weak and often do not last to the next rainy season.	<p>Operationalise the Sustaining Demand component of the ODF Strategy 2018 – 2030</p> <p>Government and UNICEF should strengthen sanitation marketing, which involves availing toilet design options applicable to specific conditions such as type of soil. Through the National Rural Water Supply and Sanitation Programme (NRWSSP) & ODF Strategy 2018 - 2030, deliberate steps should be taken to strengthen private-sector involvement in building toilets.</p>	GRZ and UNICEF

Recommendation Number	Challenge/issue	Recommendation	Stakeholders
10	While the programme included specific measures to engage women and meet the gender equity goals, there were no similar procedures to target vulnerable groups. As a result, decisions to support the most vulnerable members of a specific community were made at the discretion of community members.	For future programmes, UNICEF must include actions that deliberately target the most vulnerable members of the community, such as the disabled, by developing inclusive procedures or guidelines.	UNICEF

Acronyms and Abbreviations

7NDP	Seventh National Development Plan
AIR	American Institutes for Research
ARI	Acute respiratory infection
BU	Boston University
BCC	Behaviour change communication
CATS	Community approaches to total sanitation
CDC	Centre for disease control
CLTS	Community-led total sanitation
CSO	Central statistical office
DAC	Development Assistance Committee
DDCC	District Development Coordinating Committee
DFID	United Kingdom's Department for International Development
DHIS2	District health information system 2
DHS	Demographic and health survey
DWASH	District water, sanitation, and hygiene
DWASHE	District Water, Sanitation, and Hygiene Education Committee
EA	Enumeration area
FANTA	Food and Nutrition Technical Assistance
FGD	Focus group discussion
GRZ	Government of the Republic of Zambia
HFIAS	Household Food Insecurity Access Scale
JMP	Joint Monitoring Programme
KII	Key informant interview
LCMS	Living Conditions and Monitoring Survey
LWSC	Lusaka Water and Sewerage Company
M2W	Mobile to web
MDGs	Millennium Development Goals
MGM	Menstrual hygiene management
MoGE	Ministry of General Education
MoH	Ministry of Health
MLGH	Ministry of Local Government and Housing
MWDSEP	Ministry of Water Development, Sanitation, and Environmental Protection
NGO	Nongovernmental organisation
NRWSSP	Zambia's National Rural Water Supply and Sanitation Programme
ODF	Open defecation free
ODK	Open data kit
OECD	Organisation for economic cooperation and development
RTM	Real-time monitoring
SAG	Sanitation action group
SDG	Sustainable development goals
SHN	School health and nutrition club
SLTS	School-led total sanitation
TOR	Theory of change
UK	United Kingdom
UNICEF	United Nations International Children's Emergency Fund

VFM	Value-for-money
WASH	Water, sanitation, and hygiene
WHO	World Health Organisation
ZCAHRD	Zambia Centre for Applied Health Research and Development
ZMW	Zambian Kwacha
ZNPHI	Zambia National Public Health Institute
ZSHP	Zambia Sanitation and Hygiene Programme

1. Introduction

Open defecation has negative consequences for public health, especially child health, because faecal contamination can lead to child mortality, morbidity, undernutrition and stunting, and cognitive developmental challenges (UNICEF, 2018a). Zambia has made significant progress in decreasing rates of open defecation since 2000 (World Bank, 2015). However, the Joint Monitoring Programme (JMP) (2019) estimates that open defecation is practiced by = 19.3% (rural = 31.8%, urban = 2.8%), and only 14% of households have handwashing facilities (observed) with soap and water. Both open defecation and poor sanitation disproportionately occur in society's most vulnerable groups (e.g., women, the disabled, the elderly, and low-income populations) (UNICEF, 2018a).

To further decrease rates of open defecation and improve sanitation and handwashing facilities and behaviours nationwide in line with the Millennium Development Goals (MDGs), the Government of the Republic of Zambia (GRZ), in partnership with UNICEF and with funding from UK's Department for International Development, began implementing the Zambia Sanitation and Hygiene Programme (ZSHP) in 2011. The ZSHP was implemented in a phased approach from 2011 to 2018 in a total of 68 rural districts in 10 provinces¹⁹ throughout Zambia. The ZSHP includes a comprehensive series of complementary activities, including (1) a community-led total sanitation (CLTS) activity; (2) a school-led total sanitation (SLTS) activity; (3) sanitation marketing; (4) sector strengthening; and (5) knowledge management and monitoring and evaluation (M&E).

The American Institutes for Research (AIR) was commissioned, in 2018, by UNICEF Zambia to conduct an evaluation of the ZSHP. In appreciation of the ZSHP Evaluation TOR (see Appendix I), the evaluation criteria have been distilled into three broad areas as follows: (1) programme implementation, (2) programme impact and effectiveness, and (3) programme sustainability. To address these three areas, AIR conducted a mixed-methods evaluation that included household and school surveys, administrative data analysis, key informant interviews, focus group discussions, and direct observations. This report presents the findings from AIR's evaluation of the ZSHP in the three areas, as well as recommendations for improving WASH programming in the future.

We provide background information and details about the evaluation theory of change and methodology in the appendices of this report. We previously include the information in the inception report that AIR submitted to UNICEF Zambia in October 2018, with revisions in February 2019²⁰. We have updated details within these sections, but since most of the information is repetitive, we include it only in appendices here. In addition, two previous published reports from ZCAHRD and BU present information about the Zambian WASH context, ZSHP programme activities and theories of change, and data collected at baseline

¹⁹ Western province was not covered under CLTS interventions (including real time monitoring system) as activities in this Province, and based on MWDSEP guidance, were taken up by AfDB. The province, however, did benefit from the WASH Media Support Project that was implemented as part of the ZSHP.

²⁰ Inception report is available upon request from UNICEF or AIR

and midline (Boston University, 2013; ZCAHRD, 2017)²¹. We present these information in Appendices A – D instead of in the body of the report.

Appendix E presents demographic characteristics of our sample. These characteristics are useful to understand the type of households targeted and because they show that the endline sample is comparable to the baseline and midline samples. However, the programme does not affect the characteristics presented. Moreover, the ZSHP logframe does not include elements related to these characteristics. For brevity, we present evaluation findings in the body of the report and the sample description in Appendix E.

1.1 Structure of the Report

The body of this report provides the purpose of the evaluation and specifies the key evaluation questions in Chapter 2. Chapter 3 presents the evaluation findings. We present lessons learned in Chapter 4 before concluding and providing recommendations in Chapters 5 and 6, respectively. In the Appendices, we provide background information and context for the ZSHP programme, including the programme’s logframe and the evaluation theory of change, the evaluation methodology, and a description of our endline sample. We also provide additional information on the TOR and evaluation questions, our sampling strategy and process for ethical approvals, the specific schools we visited, and additional quantitative analysis and comparisons with baseline and midline surveys in the appendices.

1.2 Evaluation Roles and Responsibilities

AIR was responsible for the evaluation design, data collection and analysis, report writing, and dissemination. UNICEF, through the WASH Specialist, and in close coordination with UNICEF Programme Monitoring and Evaluation Section, directly supervised the work and constituted an evaluation steering committee that was led by MWDSEP. The steering committee approved the deliverables in consultation with UNICEF and DFID. This evaluation was funded by both DFID and UNICEF.

2. Evaluation Overview

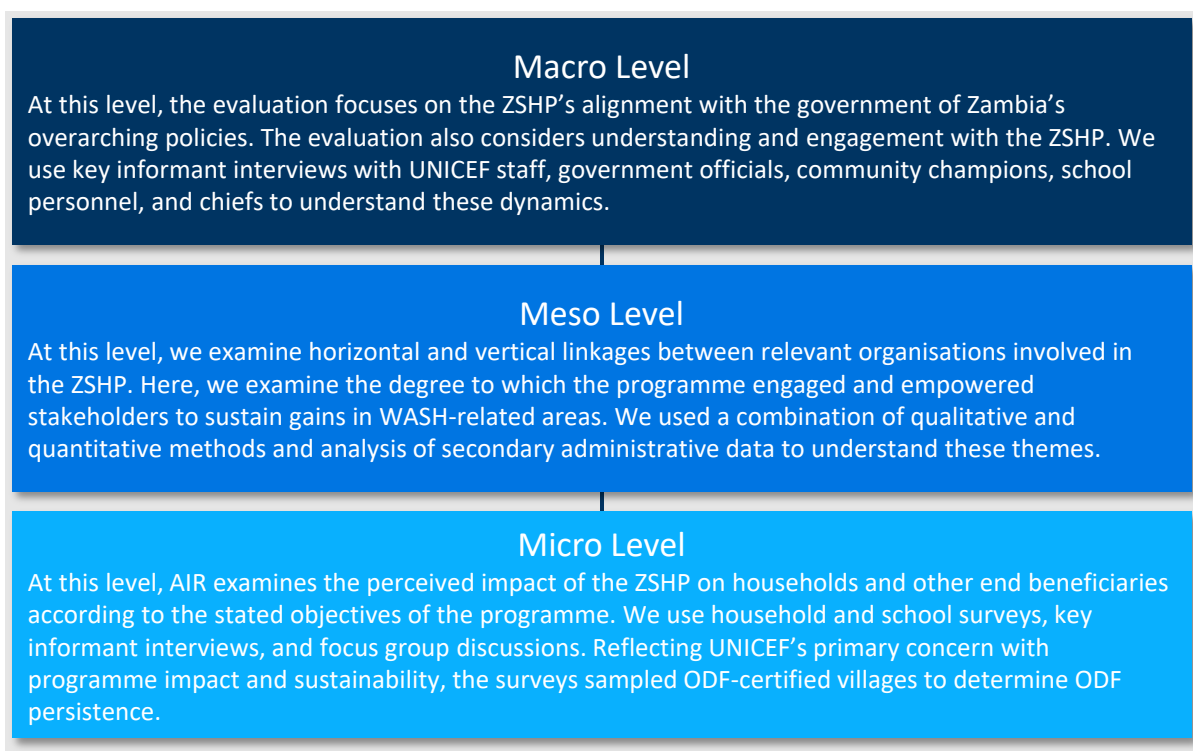
AIR’s mixed-methods summative evaluation combines quantitative and qualitative approaches to rigorously assess the ZSHP using the criteria of the Development Assistance Committee (DAC) of the Organisation for Economic Co-operation and Development (OECD): relevance, effectiveness, efficiency, sustainability, equity, timeliness, coherence, and adequacy. According to our interpretation of the TOR, the above nine OECD–DAC criteria are distilled into three thematic areas in this report—programme implementation, programme effectiveness, and programme sustainability—and integrate relevant DAC criteria into each area. In the programme implementation section, we consider efficiency using a value-for-money analysis; equity through an examination of the way the programme includes vulnerable populations, especially women and girls; timeliness by looking at the way the programme improved cholera prevention and preparedness; and adequacy by looking at whether programme elements were sufficient to produce behaviour change. The

²¹ UNICEF commissioned the CGHD and ZCAHRD to conduct baseline and midline evaluations. Reports were finalised in 2013 (baseline) and 2017 (midline). Previous reports available from UNICEF: <https://www.ungm.org/UNUser/Documents/DownloadPublicDocument?docId=575558> and <https://www.unicef.org/zambia/reports/impact-evaluation-sanitation-programme-2017>

programme effectiveness section includes an examination of programme effects (changes over time and perceived effects), in addition to equity (i.e., the way the programme affected male- and female-headed households). In the sustainability section, we examine whether the social/behaviour change required to sustain open defecation-free (ODF) status occurred, whether the institutional and financial aspects of sustainability exist and whether the legal aspects are present to support continuation of program effects. This section also contains a discussion of the long-term relevance of the programme for beneficiaries, as well as factors that need to be in place if long-term programme goals are to be achieved, and we specifically examine sustainability for the most vulnerable and for women and girls. We also present lessons learnt that could inform future programming of similar large-scale rural sanitation and hygiene programmes.

Our analysis draws on data collected from multiple sources at the macro, meso, and micro levels (Figure 1).

Figure 1. Evaluation Levels



We designed this summative evaluation to determine whether the improvements seen in the 2016 impact evaluation (conducted by Boston University [BU] and the Zambia Centre for Applied Health Research and Development [ZCAHRD]) have persisted and to examine several other criteria not covered in this 2016 evaluation, including gender, child rights, and equity for the most marginalised groups, as well as long-term sustainability.

For the quantitative portion of this evaluation, AIR conducted household surveys, school surveys, and direct observations. Our sample included representative households from selected districts that received ZSHP programming. Specifically, we conducted household surveys and direct observations with 1,199 randomly sampled households in 40 enumeration areas (EAs) across three geographic regions within Zambia—(1) North-Western

and Copperbelt Provinces, (2) Central, Northern, and Luapula Provinces, and (3) Eastern and Southern Provinces²²—to evaluate programme implementation, effectiveness, and sustainability (for a full description of AIR’s quantitative sampling approach, see Appendix D). We used the child health cards, when available, to record the height and weight of children to create anthropometric measures related to nutrition. These cards were not always available, so we do not have nutrition information for all households. We also collected qualitative data from policy makers, village leaders, programme implementers, and residents to provide insights on stakeholders’ priorities and capacities, as well as the perspective of programme beneficiaries and water-sector workers on the effectiveness, implementation processes, and overall sustainability of the ZSHP.

2.1 Evaluation Purpose and Questions

2.1.1 Evaluation Purpose

The main purpose of this evaluation is to provide external, independent assessment of whether the ZSHP has met its objectives. The evaluation specifically interrogates the relevance, effectiveness, efficiency, sustainability, equity, timeliness, coherence, and adequacy of the programme, and extracts lessons learnt about good practices and provides recommendations. The ensuing recommendations will guide DFID, UNICEF, the government, implementing partners, and beneficiary communities to improve future WASH programme designs and implementation strategies.

The intended users of the evaluation are DFID, UNICEF, GRZ, and NGOs implementing sanitation programmes in similar settings, as well as research institutions and academics.

2.1.2 Evaluation Questions

According to our conceptualisation of the theory of change (Appendix B), the evaluation questions that guide this evaluation fall into three categories: (1) programme implementation, (2) programme effectiveness, and (3) programme sustainability. Structuring the evaluation in this way highlights the connection of these questions to the nine OECD–DAC criteria for development evaluation that were previously listed. These criteria have been overlaid on the theory of change causal chain (as shown in Appendix B).

UNICEF shared a list of tailored evaluation questions in the TOR, which AIR used to guide the design of the evaluation. Below we present a subset of these questions, grouped by the three priority evaluation areas and linked to the relevant OECD–DAC criteria (for the full list of evaluation questions see Appendix F). Reflecting the high priority that UNICEF placed on ensuring that gender equity concerns were mainstreamed into the ZSHP, we incorporated these criteria into every aspect of the evaluation.

1. Programme implementation (OECD–DAC criteria: relevance, efficiency, timeliness, adequacy, coherence, and equity/gender)

- a. To what extent are the programme interventions relevant to the government’s priorities and the actual needs of the target population?

²² Western province was not included, as it was not part of ZSHP. The province has a similar programme supported by the African Development Bank.

- b. How efficiently has the programme implemented its activities?
 - c. How timely was the programme in responding to the (cholera) emergency?
 - d. What was the programme's overall Value for Money?
 - e. How was the ZSHP real-time monitoring (RTM) implemented? How effective was the RTM?
- 2. Impact and effectiveness (OECD–DAC criteria: impact, effectiveness, sustainability, and equity/gender)**
- a. To what extent has the programme realised its goals?
 - b. How and to what extent has the programme affected target groups, particularly the most marginalised communities?
- 3. Sustainability (OECD–DAC criteria: sustainability, coherence, and equity/gender)**
- a. To what extent is the programme sustainable?
 - b. To what extent will programme outcomes (e.g., villages attaining ODF status) be maintained after development support is withdrawn?
 - c. To what extent was behaviour change related to sanitation and hygiene sustained after the programme's intervention?
 - d. To what extent has the programme enabled institutional partners (i.e., public- and private-sector partners, schools, and communities) to sustain progress?

To examine programme implementation, it is important to first understand whether the ZSHP was implemented as intended—including whether programme personnel had the capacity to carry out the tasks required of them and whether beneficiaries could afford and access the materials and facilities required to change their WASH habits—and if not, why not? Understanding this helps to explain why some expected outcomes may not be present and to identify programme mechanisms that may need to be modified to ensure long-term sustainability.

As described previously and in Appendix B, behaviour change around WASH is found to occur after households receive more or better information about the importance of WASH habits. We therefore examine the way sources of information about WASH, reported WASH knowledge, and reported WASH practises change over time to understand overall programme effectiveness. The effectiveness section also includes information about the way access to WASH facilities has changed over time. We include disaggregated results by the gender of the household head to understand if the programme is more or less effective for women.

In our approach to evaluating sustainability, a key concern is the extent to which WASH-related behaviours and practises learnt as a result of involvement in the ZSHP will be sustained over time. In this section, we examine the factors that may prevent future sustainability as a means to better understand ways to improve programming in the future. We also examine whether marginalised groups have undergone a sustained change in WASH practises as a result of the ZSHP and the extent to which these marginalised people

have been enabled to maintain and manage built infrastructures and information systems. Again, we consider heterogenous effects on marginalised populations, especially women and girls.

3. Evaluation Findings

The following section of the report presents findings from AIR’s summative evaluation of the ZSHP. The findings are organised around three evaluation themes of interest—programme implementation, programme effectiveness, and programme sustainability—and we integrate an analysis of these themes as they relate to relevant OECD–DAC criteria in each section. We begin this section with findings related to programme implementation.

3.1 Programme Implementation

Programme Implementation Highlights

- **ZSHP Triggering and Information Sharing.** According to qualitative data, the ZSHP improved knowledge about WASH practises and encouraged community members to build toilet facilities.
- **Involvement of Local Leaders.** The active engagement of local leaders (including chiefs and village headmen) in CLTS was frequently cited by qualitative informants as important for changing WASH behaviours in target communities.
- **Equity for Women and Other Disadvantaged Populations.** While qualitative data suggest that the ZSHP effectively included women in its programming, many communities in our qualitative sample reported that other vulnerable populations (e.g., the elderly and disabled) were not actively included in programming.
- **Value for Money.** The majority of respondents believed programme expenditures were sufficient to effectively achieve programme outputs, but a small number of respondents believed that the programme was too low cost, ultimately compromising the quality of toilets constructed and leading to cost inefficiencies associated with rebuilding toilets. The programme designed model ‘low-cost’ toilets that households could pick from, but they also had a choice to use their own design.
- **Information Dissemination Under SLTS.** Among the target schools, about 50% conducted information dissemination activities related to sanitation and hygiene with students, but there is still some room for improvement. What is the change after these dissemination activities?
- **Implementation Challenges.** Qualitative data indicate that limited resources made it difficult for community members to build high-quality toilets and for ZSHP community champions to monitor and support communities.

In the following section, we examined the overall effectiveness of the ZSHP implementation model and considered several OECD–DAC criteria related to programme implementation, including relevance, perceptions of programme outputs, efficiency, timeliness, adequacy and coherence with cholera response, and equity. We examined relevance by assessing the extent to which the ZSHP is aligned with GRZ and UNICEF plans and policies. We examined perceptions of outputs by considering whether programme elements were implemented as planned and were sufficient to produce the intended outcomes (including the real-time monitoring component of the programme). We examined efficiency by carrying out a value-for-money analysis, and timeliness, adequacy, and responsiveness by looking at how the programme improved cholera prevention and preparedness. Finally, we examined equity by looking at the extent to which the programme included vulnerable populations, especially women and girls.

3.1.1 Programme Relevance

This section presents an analysis of the relevance of the ZSHP based on a review of government planning documents, ZSHP programme implementation documents, DFID planning documents (such as the DFID business case and country strategy), DFID annual progress reports, UNICEF's country programme documents, programme cooperation agreements, progress reports, sustainability checks, and the draft programme completion review. We reviewed the documents to assess the relevance and alignment of ZSHP with the GRZ's national plans and strategies, as well as UNICEF policies and programmes in Zambia.

3.1.1.1 Alignment with national policies, strategies, and plans

ZSHP objectives of reducing open defecation and the prevalence of WASH-related diseases, diarrhoea, and upper respiratory infections are largely in alignment with GRZ policies and priorities on sanitation and hygiene.

Improving sanitation has become a critical priority for GRZ, as detailed in the 7NDP, the Vision 2030 (Republic of Zambia, 2006), and the NRWSSP (2016–2030). For instance, the 7NDP's "Development Outcome 3: Improved Access to Water Supply and Sanitation" includes a sanitation and hygiene promotion component. Under this outcome, "Strategy 1: Enhance provision of adequate safe water and sanitation" provision of adequate safe water and sanitation will be enhanced through local authorities, commercial utilities, the private sector, and communities. In line with this strategy, the ZSHP includes a CLTS approach, which mobilises communities to take the lead in eliminating open defecation, and a sanitation-marketing component that builds the capacity of the private sector to respond to rising demand for sanitation. In addition, the 7NDP's "Strategy 2: Improve availability of water and sanitation infrastructure" prioritises rural communities, as does the ZSHP programme.

The ZSHP also furthers the objectives of Zambia's Vision 2030 (Republic of Zambia, 2006) and the NRWSSP. Zambia's Vision 2030 (Republic of Zambia) aims to achieve 90% access to sanitation and 100% clean water supply provision by 2030 (GRZ, 2006). The draft NRWSSP includes the following aims:

- Eliminate open defecation by 2030 and increase the number of people in rural areas using safely managed sanitation facilities. This will be done through a mixed approach, which will combine work on demand creation, hygiene behaviour change communication, and sanitation marketing.
- Improve the quality of sanitation and hygiene programming in all districts to ensure that communities invest in improved facilities and move up the sanitation ladder; districts will promote behavioural change in sanitation and hygiene practises.
- Strengthen capacities at the district and subdistrict levels for sanitation and hygiene promotion in communities and schools and ensure that this is part of the school curriculum.
- Support innovations and approaches that will help improve sanitation and hygiene in rural communities and schools (Ministry of Water Development, Sanitation and Environmental Protection, 2017).

The ZSHP is in line with NRWSSP and Vision 2030 (Republic of Zambia, 2006) objectives of eliminating open defecation and increasing the use of safely managed sanitation facilities in rural areas through demand creation, hygiene behaviour change communication, and sanitation marketing. The ZSHP programme aims to create demand for sanitation facilities and promote hygiene behaviour change by conducting triggering presentations in communities, obtaining buy-in from traditional leaders, and engaging community champions, whose role is to visit households to mentor, advise, and remind community members of the importance of WASH. The ZSHP also addresses the sanitation-marketing objective by working to build capacity of small-scale service providers, including individuals, to supply sanitation and hygiene services in response to household demand.

Further, the ZSHP is aligned with the NRWSSP objective of strengthening capacity for sanitation and hygiene promotion at the district and subdistrict levels in communities and schools through the programme's activities around capacity building of national-, provincial-, and district-level administrations to implement and monitor sanitation promotion. The ZSHP focuses specifically on institutional sanitation in schools by providing resources for the construction of school-level improved sanitation facilities and handwashing facilities. Finally, the ZSHP supports innovations that aim to improve sanitation and hygiene in rural communities and schools, such as using a mobile to web (M2W) application, developed in partnership with Akros, to monitor the sanitation and handwashing status of the households and schools.

3.1.1.2 Alignment with UNICEF policies and programming

ZSHP programme advanced the sanitation and hygiene components of UNICEF's Zambia Country Programme 2016–2020 and UNICEF's ODF strategy 2016–2030. But ZSHP did not include a clean water supply component, as suggested by the policy objectives below, or make adequate provisions for the disabled.

UNICEF's Zambia Country Programme 2016–2020 WASH component aims to benefit pregnant women and children in rural and peri-urban areas to benefit from improved and equitable access to and use of systems that deliver safe drinking water, improved sanitation, and improved hygiene practices by 2020 (UNICEF, 2015). To do so, UNICEF aims to scale up sustainable and pro-poor service delivery methods, build WASH infrastructure in schools and health facilities, and establish real time monitoring and surveillance to maintain services and infrastructure. UNICEF's 2020 goal for Zambia is a component of its global 2030 goal, outlined in the UNICEF's 2016–2030 ODF strategy. UNICEF's ODF 2030 strategy aims to realise Sustainable Development Goal 6: "Ensure availability and sustainable management of water and sanitation for all." To achieve SDG 6, UNICEF's global ODF strategy covers two objectives:

1. Achieve universal and equitable access to safe and affordable drinking water for all by 2030.
2. Achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations by 2030.

Achieving WASH-sector goals will also facilitate improvements to cross-sector goals, such as reducing maternal, infant, and child (under 5) mortality rates; stunting rates; and diarrheal

disease burden, and increase school attendance and performance and workforce participation, especially for women and girls (UNICEF, 2016).

UNICEF argues that adequate and equitable sanitation and hygiene can be best achieved by (1) improving the quality of sanitation programming to increase the demand for sanitation and (2) creating local markets with adequate supply chains to make sanitation goods durable, affordable, and of high quality. To be sustainable, WASH infrastructure must be made resilient to shocks, account for environmental conditions, and must be equitable. Improvements to sanitation supply and demand require a healthy national enabling environment in which there is a strong WASH-sector policy and strategy; institutional arrangements for coordination, service delivery, accountability, and regulation; budgeting and financing; planning, monitoring, and review; and capacity development (UNICEF, 2016).

ZSHP addressed the sanitation and hygiene components of WASH, as outlined in UNICEF policy objectives, by increasing demand for sanitation through triggering presentations and increasing supply by training masons to construct toilets. However, since ZSHP did not provide supply-side incentives for making toilet construction materials, soap, and water treatment products affordable, the program was often not accessible or sustainable for poorer and more vulnerable beneficiaries. In addition, toilets in schools and households were often not designed to accommodate the disabled (see the “Programme Sustainability” section for more information). Therefore, ZSHP was partially not aligned with UNICEF’s pro-poor service delivery objective, outlined in the Zambia Country Programme 2016–2020.

Further, the lack of a water supply component is a point of misalignment between the ZSHP and UNICEF and GRZ policies. As highlighted in the DFID business case, ZSHP was designed to fill a gap in the WASH sector in Zambia, where most GRZ and donor investments were focused on water supply. ZSHP’s investment in rural sanitation was considered more cost-effective than water supply investments, especially given the high unit cost of infrastructure construction in rural areas and the high effectiveness of sanitation interventions on reducing the incidence of diarrhoea (DFID Zambia, 2011). However, our qualitative data indicate that lack of reliable water sources was a major challenge in participants’ ability to practise handwashing and obstructed the achievement of ODF status (see section on CLTS and SLTS Implementation Challenges for details). Coordinating sanitation and rural water supply interventions may help make programmes like the ZSHP better aligned with UNICEF and government objectives in Zambia.

3.1.2 Perceptions of Programme Outputs

Overall, ZSHP implementation improved knowledge about WASH practises in target communities, reduced open defecation, and improved access to sanitation in target communities.²³ Qualitative data show that the triggering events and buy-in from local leaders were highly effective and motivated community members to construct latrines and, in some cases, help their communities achieve ODF status. However, programme

²³ According to our quantitative data, the proportion of households with knowledge of the relationship between WASH and disease risk improved from an average of 60% at baseline to an average of 97% at end line; the proportion of households that reported that they never defecated in the open increased from 58% at baseline to 77% at end line. Further, our qualitative data suggest that the programme facilitated the construction of toilets in beneficiary communities – the access to improved sanitation in the target communities increased from a baseline value of 36% to endline value of 62%. See Section 7.2 for more details.

implementation was constrained in many communities by lack of access to water, insufficient support for community champions, poor maintenance of sanitation facilities, and lack of access to affordable materials required to construct improved sanitation facilities.

Specifically, under CLTS, the lack of access to reliable water sources, inadequate support for community champions, and the lack of durable and affordable materials required to construct toilets constrained programme implementation. SLTS implementation faced similar challenges, including the lack of reliable water sources needed for handwashing facilities and limited effectiveness of school clubs to maintain and clean school toilets.

Below, we describe the effectiveness of ZSHP model components, as well as some of the challenges that constrained implementation.

3.1.2.1 The Role of Community Champions Under CLTS

The reliance on community champions facilitated successful implementation of the ZSHP. According to the Ministry of Local Government and Housing (MLGH)/MWDSEP community champion handbook, community champions have several responsibilities under the programme, including triggering villages, forming SAGs, collecting and reporting data from SAGs based in different villages, and supporting the ODF verification process. The booklet does not include guidelines on the provision of phones for community champions for reporting purposes but notes that, if champions lack a phone, they can work with a “super champion” to input relevant monitoring data. According to the handbook, airtime is provided as a reward for timely reporting, and champions will receive 2 Zambian Kwacha (ZMW) for every report that is sent on time. Finally, champions will be awarded 100 ZMW for each village that reaches ODF status.

According to councillors, district officials, and community members interviewed for the qualitative portion of this evaluation, champions were often selected by the local council. Following selection, champions were trained in a variety of topics, including triggering and monitoring data collection.

Despite official implementation guidelines, community champions reported that long distances and limited resources and incentives complicated their ability to carry out their responsibilities. Stakeholders claimed that community champions received bicycles at the beginning of the ZSHP, but some champions stated that they never received bicycles, or they stopped functioning during the course of implementation. According to an Akros stakeholder, community champions were often responsible for working with 10 to 15 village SAGs. A community champion explained, “We were assigned more than one village to monitor, and because of lack of transport, we could not carry out our work more effectively because of long [travel] distances.” A UNICEF official also noted that the lack of payment for community champions undermined monitoring: “There is no clear policy on how to remunerate or incentivise community champions and they are very, very central in terms of data collection. [And to the] extent that they go out and feel motivated to collect the data, the real-time monitoring remains very vulnerable.” Many community champions complained that their phones broke down over time and that they had not been given replacements to support monitoring. One champion explained, “When the phones were non-functional, they [UNICEF] did not distribute any more phones thereafter and it has been

a year since the phones were replaced.” Further, community champions also reported that they were not provided with protective gear such as boots and gloves for inspecting toilets.

In addition to lack of resources, several respondents in our qualitative sample mentioned that the selection of champions could have been improved. Involving local councillors in the selection of champions was meant to foster buy-in from local stakeholders, but a few respondents suggested that it would have been better to involve community leaders, instead of councillors, in the selection process. Specifically, community members felt the involvement of the council encouraged champions to answer to the council instead of the community itself, which led to challenges with reporting and monitoring.

3.1.2.2 ZSHP Triggering Events Under CLTS

Beneficiaries, national and district government officials, community champions, and chiefs believed that the triggering events and the involvement of local leaders in encouraging positive WASH practises were highly effective and helped many communities achieve ODF status. Community champions conducted triggering events, which involved hands-on exercises to help communities understand proper sanitation practises. This process was seen as the first step in encouraging broader behaviour change related to WASH practises and inspiring communities to achieve ODF status. A community champion described the triggering presentation on open defecation:

[Community champions] would go in the village and gather people [and] then look for faeces in the village where [people] have defecated openly. They would get the faeces, put [them] near the fish and the flies would move from the faeces to the fish. Then they asked the community members who would eat the fish but everyone was refusing to eat because the fly was moving from the faeces to the fish.

Triggering events were referenced most frequently in the qualitative data as a key motivator of behaviour change to stop open defecation and achieve ODF status.²⁴ While the triggering events included messages related to open defecation, handwashing, and improved water sources, community members explained that the activities related to open defecation were especially influential and encouraged them to construct latrines after realising that, according to one respondent, “they were eating their own faeces.” Other community members agreed that they were “disgusted” by the fish demonstration and built latrines shortly after they witnessed the triggering event. Local leaders, community champions, and SAG members agreed that the provocative nature of triggering events encouraged people to adopt more hygienic and sanitary practises and to seek resources to build the infrastructure necessary for more hygienic practises.

3.1.2.3 Sources of WASH Information Under CLTS

Respondents in our sample heard about proper WASH practises from a variety of sources, but many agreed that information shared by community members was the most effective because of existing trust and rapport between members of the same community.

²⁴ Triggering did not take place in all villages included in the qualitative sample. We cannot say to what extent villages were triggered, as the qualitative sample is not representative, but it is important to note since triggering has been identified as a major catalyst for behavior change.

Community members noted that they heard messages about hygiene and sanitation from CLTS actors (community champions, SAGs, village headmen, etc.), the radio, at health clinics, and at schools (Table 10). Survey data showed that households received WASH information from health workers (56%), community health workers (12%), and the radio (16%), which represents a shift from baseline, when community health workers were the main source of most WASH information (75%). When asked, “have you heard of CLTS?”, most households said no, with only 29% responding yes. Of those who had heard of the programme, 70% said it was active in their village and had started more than 12 months before.

In addition to the triggering events, community champions and other CLTS actors adopted different strategies to spread information, such as by going door to door, holding village meetings, or giving talks after church. A beneficiary explained, “Our champion was even teaching on Sundays in churches after church service, he would teach about water and sanitation. In that way everyone was receiving the information.” Community members mentioned that there were often posters at clinics and schools with illustrations reminding people to practise good hygiene like handwashing.

Half of the households interviewed said that they received sensitisation for WASH practises in their village, with 70% of these households saying that the meetings were run by local health staff or district WASH members. On average, they attended 3.38 meetings about WASH. Baseline and midline studies did not collect indicators about community hygiene and sanitation meetings or specifics of CLTS meetings, as shown in Table 10, so we cannot report how they changed over time (see Table 10). Qualitatively sampled beneficiaries agreed that the most effective messaging was delivered by members of the community because it was delivered by someone that residents knew and trusted: “I think the one where people go around door to door is better than just listening to TV or radio.”

In the tables throughout the remainder of this report, we present the proportion of families (values between 0 and 1) that respond to yes to each indicator. For example, in Table 10, line three shows the proportion of households that reported that they receive WASH information from health works. At endline, this proportion is 0.56, or 56%. Column titles show the sample size for each table. In cases where indicators only apply to a subset of the sample, we note the new N in parentheses. For example, in Table 10, the line CLTS active in villages (n = 352) means that only 352 households answered this indicator, as opposed to 1,199. Therefore, the endline proportion, 0.70, applies to the 352 households.

Table 10. Sources of WASH Information

Variables	Baseline mean ^a (n = 1,204)	Midline mean (n = 1,170)	End line mean (n = 1,199)
Reported source of WASH info (proportion of households)			
Health workers	0.02	0.24	0.56
Community health workers	0.75	0.52	0.12
CLTS or ZSHP volunteers	0.13	0.39	0.05
Radio	0.06	0.04	0.16

Variables	Baseline mean ^a (n = 1,204)	Midline mean (n = 1,170)	End line mean (n = 1,199)
TV	0.04	0.03	0.03
WASH information from other source ^b	0.13	0.13	0.28
CLTS initiation (proportion of households)			
Has heard of CLTS.	—	—	0.29
CLTS active in village (n = 352).	—	—	0.70
CLTS not active in village (n = 352).	—	—	0.23
Doesn't know if CLTS is active in village (n = 352).	—	—	0.07
CLTS initiated in village (n = 352).	—	—	0.73
CLTS not initiated in village (n = 352).	—	—	0.14
Doesn't know if CLTS has ever been initiated in village (n = 352).	—	—	0.13
CLTS initiated more than 12 months ago (n = 257).	—	—	0.73
CLTS initiated within last 12 months (n = 257).	—	—	0.11
CLTS not yet initiated or respondent does not know if it has been initiated (n = 257).	—	—	0.08
Government initiated CLTS (n = 257).	—	—	0.41
ZSHP (CLTS) project initiated CLTS (n = 257).	—	—	0.26
Community initiated CLTS (n = 257).	—	—	0.30
Other NGO not related to ZSHP or other entity initiated CLTS (n = 257).	—	—	0.31
Community hygiene, water, and sanitation meetings (proportion of households)			
Had meetings/were sensitised to hygiene and water and sanitation.	—	—	0.50
Meeting leader (proportion of households; n = 602)			
Meeting led by local health staff or district WASH member.	—	—	0.70
Meeting led by CLTS volunteer or community health workers.	—	—	0.30
Meeting led by other NGO or other entity.	—	—	0.28
Meeting frequency (proportion of households; n = 602)			
Meetings held more than 12 months ago.	—	—	0.40
Meetings held within last 12 months.	—	—	0.55
No meetings held or respondent unsure.	—	—	0.05
Number of meetings attended by respondent.	—	—	3.38

^a Dash in a cell indicates that data were not collected at baseline and midline.

^b Other sources of WASH info included posters/billboards, drama groups, and newspapers.

3.1.2.4 WASH Information Sharing Under SLTS

About 50% of target schools conducted information dissemination activities with students, but there is still some room for improvement (Table 11). Under the SLTS, the ZSHP aimed to improve access to sanitation facilities in 1,000 schools. SLTS encompassed a variety of activities, including triggering, formation of WASH clubs, construction of latrines, and integration of menstrual hygiene management (MHM). Most school administrators and students in our qualitative sample mentioned that informational events took place at their particular school, but survey data show that only around half of the schools (46%) had CLTS volunteers talk to students about sanitation and hygiene. Of those schools, 62% had the CLTS volunteer visit in the last 6 months, and roughly 41% trained students and teachers. More schools (60%) had other groups or the local health staff (41%) come to discuss sanitation and hygiene, with most of these visits occurring in the last 6 months (82%). Table 11 shows the end line indicators related to school hygiene curriculum. When discussing the content of informational events, students described presentations that focused on the effects of open defecation and the importance of handwashing at key moments.

In terms of school leadership around WASH issues, almost all the schools designated a sanitation manager (89%), but rarely was the sanitation manager a CLTS volunteer (4%) or district water, sanitation, and hygiene (DWASH) member (17%). Respondents, including school administrators and district officials, also stated that students formed WASH clubs, often known as school health and nutrition (SHN) clubs, and teachers and students joined to form WASH committees. School teachers and administrators were often responsible for monitoring the conditions of the toilet, and pupils were responsible for cleaning the toilets once or twice a day. Pupils reported that SHN clubs and/or WASH committees taught them how to properly maintain school toilets through plays, songs, posters, and regular reports on toilet conditions. Student leaders, such as prefects, monitored the handwashing station to ensure that pupils washed their hands after leaving the toilet. Stakeholders like district officials, school administrators, and pupils believed that school toilets were regularly cleaned, and pupils were able to articulate the importance of WASH best practices during FGDs. Nonetheless, pupils reported that toilets were sometimes dirty because of misuse (pupils urinating or defecating on the floor and not into the pit).

Table 11. WASH Knowledge in Schools

Variables	Baseline mean ^a (n = 44)	Midline mean (n = 47)	End line Mean (n = 81)
CLTS involvement in school (proportion of schools)			
CLTS volunteers talked to pupils about sanitation and hygiene.	—	—	0.46
CLTS volunteers came to this school in the last 6 months (n = 37).	—	—	0.62
CLTS volunteers had not come to school in at least 6 months (n = 37).	—	—	0.38

Variables	Baseline mean ^a (n = 44)	Midline mean (n = 47)	End line Mean (n = 81)
CLTS volunteer trained pupils/teachers in sanitation and hygiene.	—	—	0.41
Training took place in the last 6 months (n = 33).	—	—	0.42
Training had not taken place in at least 6 months (n = 33).	—	—	0.58
Other hygiene education in school (proportion of schools)			
Other groups came to school to discuss sanitation and hygiene.	—	—	0.60
Local health staff talked to pupils about hygiene and sanitation (n = 49).	—	—	0.41
Community members or health committee members talked to students about hygiene and sanitation (n = 49).	—	—	0.06
Other entity talked to students about hygiene and sanitation (n = 46).	—	—	0.00
Hygiene presentation took place in the last 6 months (n = 49).	—	—	0.82
Training had not taken place in at least 6 months (n = 49).	—	—	0.18
School WASH education management (proportion of schools)			
School had designated sanitation manager, champion, or group responsible for hygiene promotion and education.	—	—	0.89
Sanitation manager was a CLTS volunteer (n = 72).	—	—	0.04
Sanitation manager was a DWASH member or local health staff member (n = 72).	—	—	0.17
Sanitation manager was someone else (n = 72).	—	—	0.74

^a Dash in a cell indicates that data were not collected at baseline and midline.

3.1.2.5 Involvement of Local Leaders

The active engagement of local leaders (including chiefs and village headmen) in CLTS, which often involved collaboration with community champions to enforce social norms around proper WASH practises, was frequently cited as an important mechanism in changing behaviours around sanitation and hygiene in target communities. Community champions mentioned that they worked “hand in hand” with village headmen (with both groups reporting to local chiefs) to monitor the construction of improved sanitation facilities and make sure that community members stopped practicing open defecation following the triggering events. An implementing partner highlighted the importance of the local leaders to encourage behaviour change: “If the village headman is strong, he will ensure that things move.” Government officials and stakeholders noted that chiefs were well positioned to

encourage their chieftom to adopt more hygienic practises because of their respected position of authority, and many took ownership of the ZSHP. Specifically, these respondents noted that many chiefs created informal laws or punishments to hold community members accountable if they did not take steps to reduce open defecation. Many community members in our qualitative sample mentioned that they would be fined by the chief if they did not construct a latrine, and avoiding these fines incentivised them to take action quickly.

3.1.2.6 CLTS and SLTS Implementation Challenges

There were several challenges—including lack of reliable water sources needed for handwashing facilities and lack of durable materials to construct toilets—that constrained CLTS and SLTS implementation. UNICEF staff, district officials, community members, and students mentioned that the programme aimed to improve sanitation but did not include a water supply component: “So the big gap in this programme was the fact that there was no provision for water supply. So you want to promote handwashing and you don’t [have] water.”²⁵ This compromised participants’ ability to practise handwashing at the household and school level and thus obstructed the achievement of ODF status, as the presence of handwashing facilities was a key requirement. Similarly, a community member described challenges related to water at the school level: “Sometimes you find that the school has no hand pump. The pupils will use the toilets, but they won’t wash their hands due to lack of water.” The lack of water was especially a challenge in community schools, which often have fewer resources than government schools because they were funded and maintained by communities.

Many community-level respondents also agreed that households and schools often lacked durable tools and access to affordable materials needed to construct toilets. A local official noted that community members often erected temporary latrines that were likely to collapse: “People just built quick toilets just using sticks.” While the ZSHP aimed to introduce low-cost toilets, the materials required to create permanent structures were often too expensive for many residents.

Under SLTS, communities provided some materials and labor to construct toilets in line with the interim latrine design for government schools and the low-cost latrine design for community schools. Masons who received training under the ZSHP also supported the construction of school toilets. A UNICEF official noted that integrating the SLTS and the sanitation-marketing components for subsidising school toilet construction by masons encouraged the masons to construct more school toilets. In community schools, respondents from UNICEF mentioned that the ZSHP financed toilet construction but the community provided material inputs. In other cases, community members constructed toilets on their own. Despite these resources, many schools still faced a lack of durable materials for the construction and poor siting (e.g., in waterlogged areas) of school latrines.

²⁵ DFID Zambia (2011) details why DFID decided to fund a sanitation and hygiene programme rather than a water supply programme. In summary, prior to ZSHP, the majority of WASH-sector funding by GRZ and its CPs was dedicated to water supply interventions. Only UNICEF and a few NGOs had interventions related to sanitation and hygiene promotion, and the U.S. Government’s Millennium Challenge Account was already heavily invested in urban sanitation in Lusaka. Therefore, DFID decided to fill the rural sanitation and hygiene promotion programming gap. In addition, the business case argues that sanitation and hygiene promotion would produce more value for money than water supply provision and would reach four times as many beneficiaries for the same cost.

According to UNICEF (2018), this resulted in 50 school toilets' being rebuilt before the project closed because of poor initial construction (UNICEF, 2018b).

3.1.2.7 Real-Time Monitoring

Real-time monitoring (RTM) was deployed in all 68 districts of the ZSHP on a rolling basis. The scaling up of the system started in 2013, and by 2018 all the districts had access to the system. The RTM used a low-cost mobile phone technology combined with simple protocols to capture data on important water and sanitation indicators. SAGs checked the status of household toilet construction, the number of people in the household, and the condition of household toilets on a monthly basis. Community champions visited 10 to 15 SAGs each month to verify the information the SAGs had collected by visiting select households, and community champions entered the verified data into the mobile platform. The system would automatically update and generate aggregated data for each village, ward, chiefdom, or district, depending on the interest. The system would also send an SMS to the environmental health technicians and the chiefs or village headpersons who were responsible for monitoring aggregate data.

Prior to RTM, the programme used a paper-based system in all its target districts to transfer information from the community level to the district and provincial levels and finally to the central level, where it was aggregated into a central spreadsheet. This system was associated with heavy workloads in processing the data, transcription errors, and long delays in data transfer to the central level (UNICEF, 2015). It is noteworthy that the RTM was referred to as "mobile-to-web" and "DHIS2."

The rollout of the RTM significantly improved the efficiency of monitoring interventions, particularly CLTS. According to UNICEF Project Completion Report to DFID (2019), the ODF conversion rates also increased over time partly because of mass campaigns and the introduction of RTM. The conversion rate increased from 22% in 2014–15 to 56% in 2018. Respondents noted that the RTM has been used for making decisions at the district and national levels, including decisions related to resource allocation. At the national level, the government was able to use the RTM to guide donors and CPs towards areas with the greatest need for sanitation. Within the districts, the RTM made it easy to identify wards that had lower sanitation coverage. The chiefs were also involved in monitoring the sanitation status of their chiefdoms. Using the RTM, they would know which headpersons were lagging behind, not being compliant, or not submitting data and would find remedial measures.

At the district level, the RTM was also used during D-WASHE and District Development Coordinating Committee (DDCC) meetings to make decisions based on data.

There were several challenges related to using the RTM. Specifically, respondents from our qualitative sample reported that SAGs and community champions were not adequately supported. Community champions reported challenges with the phones themselves, as some phones became non-functional. In addition, community champions did not consistently receive airtime on time, which was required to transmit data to the next level. As a result, many community champions grew frustrated that they had not been provided with the proper resources to submit their reporting. As one community champion explained:

[Akros] said monthly you have to report. If the phone has stopped working, [Akros] ha[s] to replace [it] with a new one. When my phone stopped working it's been long now, and those things never happened. What Akros promised us we don't see them, so there is no motivation. That's why the program [doesn't] succeed, but I can be success[ful] if things can improve.

Further, some community champions neglected some of their monitoring assignments or disengaged altogether because of low morale and motivation. Community champions have observed that the same is the case with many SAGs—some of which are highly active, while others disbanded after a year. The government CLTS coach argued that resources were heavily invested in training at the national and district level, but additional resources needed to be invested in SAG and community champion training and engagement.

The Project Completion Report points to the fact that indicators measured by the RTM were not consistent with programme definitions. For example, the RTM system tracks “adequate”²⁶ sanitation and does not track “sustained” usage. The discrepancies with the indicator wording and data reported bring into question the ability of the system to generate accurate information over time. We therefore could not compare across years for these indicators to maintain consistence.

At the end of the programme, the RTM was handed over to the MWDSEP, with the expectation that it will continue to be used. However, at this stage it is unclear whether the programme will be sustained, since its continuation will require significant investment by the government. The costs of the monitoring framework include funds necessary to maintain the server, mobile phones, and district laptops/computers and to pay for SMS messaging, talk time top-ups given to community volunteers for timely reporting, spot checks to validate data, and support visits to wards and villages to ensure that management meetings are occurring as planned. In addition, the continued use of the system is under threat, as our qualitative data suggest that the community champions and SAGs no longer have the incentive to report, and some have stopped using the system.

3.1.3 Programme Efficiency

ZSHP efficiency was examined through a value-for-money analysis, as well as an evaluation of the overall programme communication and coordination between key WASH stakeholders in the country. Overall, we find that the majority of respondents believed programme expenditures were sufficient to effectively achieve programme outputs, but a small number of respondents believed that the programme was too low cost, ultimately compromising the quality of the household toilets constructed and leading to cost inefficiencies associated with rebuilding toilets. In terms of programme coordination, we find that UNICEF was able to effectively coordinate ZSHP activities with existing programmes in the country because of ongoing communication and collaboration with other key programme and policy actors in the country's WASH sector.

²⁶ Adequate sanitation facility is defined as improved unshared sanitation facility with smooth latrine floor, fly prevention (lid), privacy; and handwashing facility with water and soap, other detergent or ash

3.1.3.1 Value for Money²⁷

When examining overall cost-efficiency, we find that the ZSHP had a total programmable funding of \$32,579,777, with the largest share of funding being allocated to CLTS (43%), followed by SLTS (25%). It's worth noting that the programme had an original budget of £19 million from DFID and completion date of March 2016. In 2015 the programme received a cost extension of £4.3 million to run until the end of March 2018. This cost extension period is referred to as 'Phase 2' of the ZSHP and aimed to help complete the ongoing activities of the project, added a further 600,000 people for sanitation and hygiene targets, and put a focus on sustaining gains made. In January 2018 DFID agreed to an additional no-cost extension, allowing time for the completion of remaining activities, and also reprogramming of funds earmarked for the programme Post ODF Sustainability Assessment (POSA) to cholera response activities for the October 2017 Lusaka cholera outbreak.

The cholera response expended about \$815,000, funds initially meant for the POSA and a summative evaluation. The other cost changes were related to a cost-benefit study that was to be undertaken but was instead replaced with a detailed value-for-money analysis conducted by Oxford Policy Monitoring in September 2015.

According to the UNICEF Zambia's 2018 Project Completion Report, most of the funds allocated for activities were spent (99.94%), implying that the burn rate for the programme across activities grew exponentially as the implementation of the programme went on. Table 12 shows project budget and total expenditure by activity as of September 30, 2018.

²⁷ The financial and programmatic data used in this analysis are based on the Programme Completion Report (November 2018) and the UNICEF *Final Donor Report* to DFID (January 2019), both of which contain more recent information required for conducting a value-for-money analysis. We also reviewed the annual progress and utilisation reports submitted by UNICEF to DFID. Where appropriate, the results of the value-for-money analysis are benchmarked against the business case developed by UNICEF at the beginning of the programme. In the absence of programmes comparable to the ZSHP in Zambia, the value-for-money analysis presented in this report only considers internal variations of the programme across time and activity where applicable. In addition, the selection of indicators used in the analysis is based on available information from the reports as well as the surveys conducted as part of this evaluation.

Table 12. Distribution of Expenditure, by Activity

Financial planning (some amounts are given in both GBP and USD)										
No.	Activities	(a) Budget allocation—annual review 2015 (GBP)	(b) Proposed budget allocation, extension budget (GBP)	(c) = (a) + (b) Total allocation	% project budget allocated	Total allocation (in USD; weighted average exchange rate used of 1 GBP = 1.5214 USD)	Total spent as of Sept 30, 2018 (USD)	Total spent as of Sept 30, 2018 (GBP)	Proportion of budget utilised	Programme expenditure
1	Community approaches to total sanitation (CATS/CLTS)	7,585,671	1,977,961	9,563,632	42%	14,550,076	14,275,597	9,383,220	98%	44%
2	Sanitation marketing	1,446,424	100,000	1,546,424	7%	2,352,724	1,666,306	1,095,248	71%	5%
3	School sanitation and hygiene	4,511,957	209,977	4,721,934	21%	7,183,933	7,119,575	4,679,632	99%	22%
4	Hygiene promotion and environment sustainability	1,418,068	220,000	1,638,068	7%	2,492,150	2,339,184	1,537,524	94%	7%
5	Sector coordination	274,378		274,378	1%	417,437	520,315	341,998	125%	2%
6	Monitoring and evaluation and knowledge management	800,000	668,577	1,468,577	6%	2,234,288	2,413,853	1,586,603	108%	7%
7	Project support costs	1,720,513	480,866	2,201,379	10%	3,349,170	3,409,385	2,240,958	102%	10%
	Cholera response				0%	0	815,267	535,868		3%
	Programme total	17,757,010	3,657,381	21,414,391	93%	32,579,777	32,559,481	19,955,924	93%	100%

Financial planning (some amounts are given in both GBP and USD)										
No.	Activities	(a) Budget allocation—annual review 2015 (GBP)	(b) Proposed budget allocation, extension budget (GBP)	(c) = (a) + (b) Total allocation	% project budget allocated	Total allocation (in USD; weighted average exchange rate used of 1 GBP = 1.5214 USD)	Total spent as of Sept 30, 2018 (USD)	Total spent as of Sept 30, 2018 (GBP)	Proportion of budget utilised	Programme expenditure
8	UNICEF recovery cost 8%	1,242,991		1,242,991	5%	1,891,082			0%	
	UNICEF recovery cost 7%		292,590	292,590		445,146				
TOTAL (GBP)		19,000,000	3,949,971	22,949,972		34,916,005			0%	

GBP = British pounds; USD = U.S. dollars.

Adapted from UNICEF, 2018b.

There was agreement among key programme stakeholders interviewed as part of this evaluation that the programme struck a balance between cost and outputs. Many respondents indicated that the outputs of the programme justified the costs, and UNICEF estimates that 3,905,474 new people had access to improved sanitation over the course of the programme. According to a national-level programme implementer, “Looking at costs we are able to improve sanitation in a very short space of time one with the modest resources. So, I think economically it was very beneficial.” However, despite general agreement that programme costs were sufficient to effectively achieve programme outputs, a few respondents believed that the programme was too low cost, ultimately compromising the quality of the toilets constructed. DFID Project Completion Review indicates that the “low-cost design” may have been too low cost for some areas, requiring rebuilding toilets that had collapsed and resulting in the cost inefficiencies associated with rebuilding (UNICEF, 2018b). The low-cost latrines for schools also resulted in a “brittle fracture” as a result of latrine designs that had high potential risk for collapse that were deemed a safety risk for teachers and pupils thus necessitating the review/re-design.

Value-for-money indicators of economy were measured across time using the per-unit cost of school toilet per drop hole in schools and the per-person reach of mass hygiene promotion (Table 13). The cost per toilet dropped from £1,266 in the 2013 business case to £561 in government schools in 2018. This was mostly because of the introduction of school low-cost packages and significant improvements in the procurement procedures, which became highly competitive. Competitive procurement contributed to lowering costs as bidders were incentivised to be cost-competitive in the bidding. Further, the cost per person reached with mass hygiene promotion was reduced from an estimated £0.37 in the business case to £0.066 in September 2018. The reliance on mass campaigns such as radio programmes and drama performances helped the programme reach more people at a reduced cost. UNICEF was also able to negotiate prices with the NGOs that were responsible for project implementation, resulting in a reduced per-beneficiary cost.

The main indicator used for efficiency was the ODF conversion rate, defined as the proportion of triggered villages that had been verified ODF. According to the Project Completion Report to DFID, the number of villages triggered to become ODF was 12,427—more than the target of 12,000. The village ODF conversion ratio was different each year, with the highest being recorded toward the end of the programme, in 2018 (see Table 13). Notably, the high conversion ratio also resulted in the attainment of impact-level indicators such as reduced diarrhoea and reduced stunting/wasting at least cost. The incidence of diarrhoea was reduced from 20% at baseline to 11% at end line, whereas the incidence of stunting among children was reduced from 46% at baseline in 2013 to 32% at end line in 2019. These results were attained with progressive reduction of cost per beneficiary both for the SLTS and the CLTS.

Table 13. Summary of Value-for-Money Measures

Type	Measure	From business case	2012–13	2013–14	2014–15	2015–16	2016–17	2017–18	Final (Sept 2018)
Effectiveness	Cost per new sanitation user	£1.85 estimated	£10.70	£4.17	£3.83	£2.20	£2.20	£2.00	£1.98
	Cost per person reached with mass hygiene promotion and environment sustainability		£0.37 estimated	£0.72	£0.12	£0.18	£0.21	£0.06	£0.066
Efficiency	Village ODF conversion ratio	Not explicit in business case		58%	22%	35%	46%	53%	56%
Economy	Cost of school toilet (£ per drop hole)	£1.266 (based on the original design of Ministry of Education)		£578 (GRZ school)	£578 (GRZ school)	£517 (GRZ school)	£596 (GRZ school)	£557 (GRZ school)	£561 (GRZ school)
				£265 (community schools)	£265 (community schools)	£348 (community schools)	£464 (community schools)	£423 (community schools)	£427 (community schools)

Adapted from *UNICEF Final Donor Report, 2019*.

3.1.3.2 Sector Coordination

Ministry and UNICEF officials believed that the programme successfully created synergies with implementers in the WASH sector and avoided duplication of efforts. To ensure effective coordination, UNICEF and ministry officials conducted mapping exercises at the start of the project and maintained open communication at the national and district levels during the programme rollout. At the district level, a government official mentioned that stakeholder mapping was conducted as part of the District Total Sanitation Plan UNICEF also recounted conducting mapping at the national level. The mapping exercises were used to determine which organisations were conducting WASH interventions, where they were implementing these programmes, and the amount of resources allocated for these interventions. Several ministry officials noted that the information from the mapping exercise encouraged coordination among programmes and a better integration of complementary programming. A respondent from UNICEF described the decision to select a different province for implementation after realising that similar interventions were taking place in Western Province. UNICEF and government officials agreed that this constant communication helped ensure that there was no duplication throughout the ZSHP implementation. Programme implementation also created synergies related to MHM. The rollout of MHM encouraged the Zambian government to prioritise MHM interventions at the national level. A UNICEF official explained how the Ministry of General Education had started allocating resources to support MHM: “MoGE has seen the logic and the implications of not investing in MHM and therefore, they have taken it forward as an area that MoGE has prioritised and will continue to invest in. They have set aside now a focal point in the ministry.”

3.1.4 Programme Timeliness, Adequacy, and Coherence to Cholera Response

AIR evaluated the ZSHP’s responsiveness with regard to the way the programme improved cholera prevention and preparedness. We find that, while the ZSHP did not include a specific component related to emergency preparedness at the design stage, key programme stakeholders were able to effectively communicate and coordinate their efforts to respond to recent cholera outbreaks in Zambia.

3.1.4.1 Cholera in Zambia and ZSHP Timeliness

Although the ZSHP did not originally include a component related to cholera preparedness and emergency response, UNICEF worked with DFID in 2017 and 2018 to adjust the programme and allocate resources to respond to the cholera outbreaks. There were two separate cholera epidemics during the lifespan of the ZSHP, one in 2016–2017 and the other in 2017–2018. The ZSHP provided support toward the end of the 2016–2017 outbreak, including the distribution of chlorine to communities, the distribution of bar soap, liquid chlorine, and liquid handwashing soap to schools, capacity building for Ministry of Health (MoH) staff, and development of cholera preparedness plans at the district level. These activities served as preventive measures against future cholera outbreaks and supported a timelier response during the 2017–2018 outbreak.

The second cholera outbreak was declared on October 2017, and, in the same month, the MoH requested the Centre for Disease Control and Prevention (CDC), the Africa CDC, UNICEF, WHO, the Zambia Red Cross, and Doctors Without Borders to support the response. . In December 2017, the MoH and the Lusaka Water and Sewerage Company (LWSC)

increased chlorine levels throughout Lusaka's water distribution system, placed 282 emergency water tanks in the most vulnerable neighbourhoods, and distributed 1 million household water treatment products. MoH and LWSC conducted daily monitoring of the chlorine and water levels of the tanks to ensure safe water supplies.

In January 2018, MoH, the Zambia National Public Health Institute (ZNPPI), CDC, and LWSC randomly tested water sources in Lusaka and found that 73% of water sources did not have adequate levels of chlorine and 31% of those sources tested positive for *E. coli*; households dependent on shallow wells and boreholes were deemed the most vulnerable. MoH distributed cholera vaccines to approximately 1 million people in the most vulnerable regions of Lusaka. In addition, from January to February 2018, the ZNPPI, CDC, and District Health Management Team organised cholera case management training for 100 health care workers. Those health care workers distributed cholera prevention and water treatment informational materials through door-to-door sensitization efforts and mass media (Sinyange et al., 2018). UNICEF complemented the government's efforts during the 2017–2018 outbreak by supporting improvements to water quality and availability, messaging, WASH conditions in schools, and WASH-sector coordination. .

Key stakeholders, including government officials, implementing partners, and DFID staff, believed that UNICEF launched its response to the cholera outbreak in a timely manner. UNICEF and DFID noted that there was a slight delay between the beginning of the 2017–2018 cholera outbreak and the time when programme adjustments were approved by DFID, but they mentioned that this did not delay UNICEF's implementation of activities. Implementing partners, government officials, and programme staff provided different estimates for the amount of time it took for DFID to approve reallocations within the budget and changes to planned activities. However, all confirmed that programme adjustments were approved following the MoH's declaration of a national emergency in December 2017. Once a state of emergency was declared, DFID was able to earmark funds under the ZSHP for allocation to the cholera response. At this point, the approvals happened almost simultaneously. An implementing partner relayed his satisfaction with the rapid approvals provided by UNICEF: "It was the first time that I saw them [UNICEF] approve something via email. (...) So I think in terms of the processes that are involved in trying to approve something [and] changing of budget lines—I think they responded timely." The same respondent lamented that certain activities, like cholera messaging, were not rolled out earlier, which is discussed in more detail below.

Respondents, including government officials and implementing partners, were satisfied with the timeliness of the water quality monitoring activities and chlorine distributions. According to the ZSHP's Project Completion Review, UNICEF's cholera response was characterised by quick mobilisation of supplies, including chlorine, soap, and behaviour change communication materials (UNICEF, 2018b). UNICEF also worked in 19 schools among the 108 schools in Lusaka that were closed by the MoH to rehabilitate water sources by repairing taps and chlorinating water, as well as carrying out renovations. UNICEF and implementing partners selected those schools by targeting primary schools lacking the needed funds to perform the rehabilitations. A respondent noted the efficiency of this approach: "After 4 weeks most of the schools had reopened, some on conditions of consecutive rehabilitations." The swift reopening of schools allowed learners to resume their studies without a more protracted gap in learning.

Respondents discussed several factors that facilitated the timely implementation of activities, including preparedness planning, as well as donor and partner flexibility related to funding. A key stakeholder explained that UNICEF already had conversations with the government and DFID related to preparedness planning prior to the cholera outbreak in October 2017. Discussions at the district level helped identify the steps that should be taken in the case of an outbreak, including the processes for sourcing required materials like chlorine. According to the ZSHP log frame, the programme developed cholera preparedness plans with 28 districts, which involved the identification of prevention, response, and coordination mechanisms to deal with cholera epidemics (UNICEF, 2018b). UNICEF also worked with DFID to ensure that a pot of money would be allocated to the emergency response in the case of an outbreak. UNICEF utilised internal funds to launch activities before DFID approved changes to the budget (UNICEF, 2018b).

Several stakeholders in our qualitative sample mentioned that DFID encouraged UNICEF and implementing partners to take rapid action by allowing costs to be reimbursed later. According to the Project Completion Review, UNICEF rapidly developed programme cooperation agreements with NGOs to allow them to undertake field activities, which also facilitated implementation (UNICEF, 2018b). The CDC's outbreak investigation (Sinyange et al., 2018) concluded that the timely, robust, and collaborative public health response to the 2017–2018 cholera outbreak was essential for achieving sustained outbreak control.

3.1.5. Programme Equity

In line with the UNICEF human-rights based, approach, we examined the equity of ZSHP implementation by evaluating the way the programme included vulnerable populations, especially women and girls, in both programme components—SLTS and CLTS. To ensure that the programme supports members of vulnerable populations in addition to treating all beneficiaries with dignity and respect, it is important to speak specifically with female ZSHP beneficiaries. Overall, we found that the programme was effective in including women in CLTS and in fostering effective conversations around MHM under SLTS. However, our qualitative data suggest that other vulnerable populations, like the elderly and disabled, still lacked access to improved sanitation facilities and faced challenges constructing them on their own.

3.1.5.1 Gender Equity Under CLTS

Respondents in our qualitative sample agreed that women were largely involved in CLTS but participated to a lesser extent in the sanitation-marketing component of the ZSHP. Under CLTS, women served as community champions and participated in SAGs. A district official highlighted the equal representation of men and women under CLTS: "... In the two chiefdoms that we were handling we have got a number of community champions who are women. . . You find that in every sanitation action group, there are four women or five..." Community members, UNICEF staff, government officials, and implementing partners perceived women as the main household-level actors engaged in sanitation activities and believed that this motivated women to participate in community processes like CLTS. As a result, respondents felt that women attended meetings related to sanitation and hygiene and triggered meetings more frequently than men. Relatedly, one beneficiary noted that the "programme would fail without women's participation." However, on average, female-headed households attended nearly the same number of meetings as male-headed

households (2.8 and 2.7, respectively). A few respondents, mostly at the community level, noted that, while women did participate in CLTS, they were sometimes outnumbered by men.

Although women were involved in CLTS as community champions and SAG members, respondents mentioned that few women worked as masons and that men typically occupied this role. One local official explained: “We have a lady who [has a] team and they build in schools, in institutions.... That was happening in other districts as well but of course the proportion was not the same, we would have more men and less women in some cases.” Respondents suggested that women were less likely to work as masons because of the intense labour required to build toilets. However, a local leader mentioned that women in his village were well positioned to work as masons under the ZSHP, which was unusual in other communities:

The women were more involved in maintenance of water infrastructure which was quite strange given that where I had been coming from it was more the men that were doing the repair of water points and stuff like that. But here it's more like the district women's association was heavily involved and their women were trained in how to repair boreholes.

This account suggests that experience constructing sanitation facilities prior to the ZSHP could encourage women to work as masons.

3.1.5.2 Vulnerable Communities Involvement in CLTS

Vulnerable groups like the extremely poor, elderly, and disabled could not participate in CLTS and access its benefits to the same extent as other beneficiaries. For example, households reported that they were unable to afford to build a toilet, and several elderly respondents noted that they were physically unable to construct their toilets. While the programme included specific measures to engage women and meet the gender equity goals, there were no similar procedures to target vulnerable groups, despite a demonstrated need for this assistance. UNICEF's Project Completion Report confirms that ZSHP did not establish formal mechanisms to help more vulnerable households construct toilets, nor did ZSHP work to create subsidies or financing mechanisms to assist extremely poor households.

As a result, decisions to support the most vulnerable members of a specific community were made at the discretion of community members. While some sampled villages explained that village headmen and/or church leaders would gather able-bodied people, often young boys, to help the elderly, disabled, and widowed build toilets, this process did not happen in all villages. For example, household beneficiaries in the Nchelenge region said that their village did not have social institutions to help the disabled:

Respondent: There are orphans, widows, some have lost those who were taking care of them, some have lost their children. . . . From the time this programme was introduced, they have never taken a step to help those people.

Interviewer: In making toilets for them?

Participant: Yes [as in], helping them make toilets. Because in other areas things like this happen, but here there is nothing like that.

Since our qualitative sampling is not representative of all participating communities, we are unable to determine how widespread the problem of toilet construction is for more vulnerable households (e.g., orphans, widows, the disabled, and the elderly). In addition, we did not collect quantitative data on vulnerable groups to further analyse the question of equity, so we are unable to fully explore this theme.

3.1.5.3 Gender Equity Under SLTS

According to our quantitative and qualitative data, the ZSHP targeted girls through the incorporation of MHM under SLTS, but more needed to be done to increase girls' school attendance and retention. This component of programme implementation included the construction of separate toilets for boys and girls, trainings in MHM, and the distribution of MHM kits at schools. A local official detailed the process for identifying the pupil-to-toilet ratio: "It is stipulated in the guidelines how many toilets should be for boys and how many should be allocated for girls. You find that because of the different kind of usage of the toilet facilities, with girls normally using the facilities more than boys, the number of toilets allocated to the girls are usually more." While 98% of surveyed schools had separate facilities for boys and girls at end line, only 19% of girls' latrines had a door. The lack of privacy in school latrines limited the potential benefits for girls under the ZSHP. According to the quantitative data, 47% of schools reported that they provided sanitary towels for girls. Many qualitative respondents noted that schools lacked the financial resources to continue providing "emergency pads" to girls once they exhausted the supply of sanitary pads included in the MHM kits (each school received one kit that included 200 pads in total). Beyond financial constraints, the supply of sanitary pads at schools might be affected by the number of female teachers. According to our quantitative data, schools that supplied sanitary pads had 6.3 female teachers on average, whereas schools that did not supply sanitary pads had 3.6 female teachers. Schools that supply sanitary pads also have slightly lower rates of female absence over the past 7 days, but the differences are not statistically significant.

Further, children reported that they discussed issues related to sanitation and hygiene with their parents after seeing the triggering event at their schools. This contributed to opening up discussion around sanitation. More specifically, there was resistance to discussing issues around menstrual hygiene in homes and schools, but with the introduction of the ZSHP, this had changed, as noted by a key partner:








For a long time the conversation on MHM has been one of those . . . under the table [conversations]. . . . I think through this particular intervention [that] the conversation on MHM [has grown] and [is now] not just a conversation, but constructing and utilizing those facilities. So, in that respect I think the SLTS part or piece of the equation has also been extremely, extremely relevant at that policy level, at the service delivery level, at the behaviour change level and in terms of triggering the conversation at the household level.

One way the ZSHP helped break this cultural communication barrier was by including boys in discussions on MHM. A key informant explained, “In Chinsali [District], the young boys are the ones building the Menstrual Hygiene Management (MHM) facilities for girls, which is helping to reduce the stigma towards the girls.” Breaking cultural norms related to conversations around menstruation was crucial to beginning to more openly address these issues in school.


3.1.6 Section Summary: Progress on ZSHP Logframe

According to UNICEF’s Project Completion Report, the ZSHP achieved the targets on the number of people reached via hygiene promotion activities and the number of chiefdoms in target districts that developed evidence based, feasible handwashing action plans (Table 14). The desk review also indicates that efforts to create WASH Action plans and monitoring systems for schools and at district, provincial, and national levels were also successful. According to UNICEF documentation, the people trained in key areas for facility construction also exceeded the programme goal.

Table 14. UNICEF Reported Progress on Programme Logframe

Key Output Indicator	Target	Achievement ²⁸	Colour code
Output 1: 3.6 million new users consistently utilizing improved sanitation facilities and hygiene practices.			
Number of people reached with hygiene promotion activities	8,000,000	8,846,160	
Number of chiefdoms in target districts with an evidence based, feasible Hand Washing (HW) action plan that is reviewed once per year	80	81	
Output 2: 1,000 additional schools have appropriate sanitation facilities including hand-washing facilities, and soap available; together with an appropriate management system and hygiene promotion activities			
Number of Provincial Education Offices (PEOs) with a school WASH Action plan.	10	10	
Number of piloted schools with Education Statistics reported through real time monitoring system.	50	50	
Output 3: National, provincial and districts level administrations have capacity to plan, implement and monitor sanitation promotion (including cholera preparedness and emergency response)			
Percentage of implementing district with at least an annual review / planning process dedicated to hygiene and sanitation interventions.	90%	96%	
Number of target districts with operational real-time monitoring system to report on rural WASH interventions.	68 districts	68	
Number of target districts with operational, multi-sectoral cholera emergency preparedness, prevention and response implementation plans.	27	27	

²⁸ Based on UNICEF Project Completion Report to DFID, as of September 2018

Output 4: Sanitation Marketing - Small scale service providers - including individuals - in targeted rural districts are enabled to supply sanitation and hygiene services in response to household demand			
Number of chiefdoms with difficult soil conditions having at least 2 active and accredited service providers enabled to respond to public and private demand for sustainable latrines	65	106	

3.2 Effectiveness and Impact of the ZSHP on Households and Schools

In this section we present the end line values for outcome indicators at the household and child levels and discuss changes from baseline and midline to end line. We provide a detailed picture of the status of households and children across many areas of Zambia to understand people's current situation with respect to WASH and ODF indicators. In this section, we cover the following domains, highlighting indicators from across the domains: handwashing, sanitation, open defecation, water quality/access, WASH knowledge, child health and nutrition, and ODF certification criteria. Following the section on CLTS, we examine school-level indicators. Both sections include gender-specific indicators to examine the effects of the programme on men and women.

Section Highlights—Effects of the ZSHP on Households and Schools

- **Knowledge of WASH Practises.** Knowledge about the relationship between hygiene and diseases like diarrhoea and cholera increased from baseline to end line.
- **Improved Sanitation Facilities and Maintenance.** Qualitative data show that ZSHP target communities built and used improved sanitation facilities in their homes and communities, but many also struggled to maintain these facilities because of overuse, inability (or unwillingness) to maintain the facilities, and poor infrastructure. However, quantitative data cannot support these findings because of the evaluation design and sampling.
- **ODF Status.** At end line, 78% of respondents reported that they never defecated in the open—a 20 percentage point increase from baseline, although achieving full ODF status was still difficult for most households because of lack of handwashing facilities.
- **Child Health and Nutrition.** The prevalence of diarrhoea and indicators of malnutrition (stunting, severe stunting, and wasting) decreased from baseline to end line.
- **Gender Equity Under SLTS.** Overall, we did not find any differences in facilities by gender for students or teachers. We found that roughly 75% of schools provided MHM education, and 64% provided facilities to dispose of sanitary towels. However, less than half (47%) provided sanitary towels for girls, meaning that the majority of girls needed to acquire the towels on their own.

3.2.1 Community-Led Total Sanitation Effects

3.2.1.1 Knowledge of WASH Practises and Handwashing Habits

We begin by looking at knowledge of WASH practises, as gaining knowledge is the first step in changing someone's behaviour—knowing what to do and why. We also discuss handwashing habits, as handwashing is arguably the easiest practise to propagate given the low reliance on infrastructure and the low cost of implementation. Overall, we find that WASH knowledge and handwashing habits improved at end line from baseline and midline,

with knowledge about proper practises being quite high. Handwashing practises and access to washing facilities, however, are still relatively uncommon, so there is room to improve. At baseline, knowledge levels were between 55% and 65%, depending on the indicator. At end line, almost everyone knew about the proper WASH practises (~98%), including how the practises related to health risk. This level of knowledge is a great improvement over the past, when roughly half of the evaluation sample knew about proper practises and how they related to disease. The almost universal knowledge of WASH practises represents an important step on the way to ultimately achieving ODF status because behaviour change rarely occurs without knowledge about why and how to change. Knowledge of causes of specific illnesses such as ARI and diarrhoea is also more common than in the past, but there is still room to grow (the percentages of households with such knowledge range between 7% and 74%). Households tend to have more knowledge of the causes of diarrhoea than of the causes of ARI, indicating this is an area for more focused education and information.

According to many respondents in our qualitative sample, increased knowledge of proper WASH practises and ODF was due largely to the triggering events and the information dissemination model that was adopted under the programme. Several residents, village leaders, and district-level officials noted that, prior to the ZSHP, the use of words like *faeces* was viewed as culturally inappropriate in many communities in Zambia, preventing many from openly discussing ODF and proper sanitation practises. This, in turn, prevented many communities from addressing the challenges head on and speaking about possible solutions. A district-level official explained the effect of the triggering and the ZSHP on WASH knowledge:

In 2010, it was quite a big challenge to talk about open defecation and aspiring to become an open defecation free village, ward, chiefdom. [Now,] we see key government officials speaking very frankly on this particular practise. So that basically indicates how far we have come within a fairly short period of time to break the silence on a [sanitation] topic, on a subject that is of significant importance to the country. [This is] because of the ZSHP.

While some community members noted an initial resistance to the triggering events from traditional leaders (because of the fact that these discussions were taboo), once these leaders agreed to the programme model, the programme could rely on traditional leadership structures to help spread information about proper WASH practises and develop social norms around these practises. Overcoming cultural taboos around WASH practises is the first step to openly discussing and sharing information about proper approaches. Many respondents in our qualitative and quantitative sample reported a high level of knowledge about WASH practises, and those in our qualitative sample largely attributed this to the ZSHP efforts.

Another key ZSHP programme objective was to ensure consistent handwashing with soap or ash in the beneficiary communities. Quantitative data show that handwashing practises improved over time; however, only 16% washed their hands at all critical times (up from 7.9% at baseline). The low rate of access to a functional handwashing facility with water next to the toilet (9%) might help explain the low rates of handwashing. Unfortunately, the baseline and midline studies did not ask the ODF survey question about having a handwashing facility (which needed to be verified through observation by the enumerator),

so we are unable to discuss the levels in the past. Many community members in our qualitative sample reported that handwashing facilities were often vulnerable to vandalism or theft, leading many to stop maintenance of these facilities. Also, many households in our qualitative sample lacked access to a consistent water supply as seen in the quantitative data, preventing them from accessing a proper handwashing facility at the toilet. As discussed in greater detail below, lack of access to proper handwashing facilities has prevented many communities from achieving ODF status, making this an important area for improvement.

The rates of reported handwashing varied across different kinds of activities. The least common time respondents washed their hands occurred after washing a baby's bottom (21%), while the most common times were before eating (89%) and after defecating (95%). The near universality of handwashing at these two times shows it is possible to achieve high levels of adherence across all critical times. The key will be to improve knowledge and behaviour for activities related to caring for children, such as cleaning and feeding.

Qualitative data echo findings from the survey data, with many community members describing how they had internalised norms around proper handwashing practises. For example, one community member explained how she felt uncomfortable if she did not wash her hands after visiting the toilet: "People know that they are supposed to wash their hands after using the toilet. It just feels bad that you have not washed your hands after using the toilet, so you are forced to wash your hands once you leave the toilet." This sentiment was echoed by the numerous community members who expressed discomfort with not washing their hands after defecating. What is important to note, however, is that while rates of handwashing after defecating and before eating were high, there were other moments when it was important to wash one's hands (e.g., after washing a baby's bottom). Because the triggering process focused primarily on washing one's hands after defecating and before eating, this could be why these practises are reportedly more common than other practises, like handwashing after washing a baby's bottom (which was not explicitly discussed during triggering but was focused on in other dissemination efforts by community health workers, for example).

Table 15 reports current and past levels of knowledge about WASH, disease risk, and handwashing practises.

Table 15. Knowledge of WASH, Disease Risk, and Handwashing Practises

Variables	Baseline mean ^a (n = 1,204)	Midline mean (n = 1,170)	End line mean (n = 1,199)
Knowledge of WASH and disease risk (proportion of households)			
Knows treating and properly storing water is associated with lower risk of disease.	0.73	0.79	0.97
Knows washing hands with soap and water is associated with lower risk of disease.	0.66	0.66	0.98
Knows using clean latrine is associated with lower risk of disease.	0.53	0.52	0.98

Variables	Baseline mean ^a (n = 1,204)	Midline mean (n = 1,170)	End line mean (n = 1,199)
Knows open defecation is associated with higher risk of disease.	0.49	0.50	0.98
Knowledge of causes of diarrhoea (proportion of households)			
Dirty water	0.52	0.49	0.70
Dirty food	0.59	0.60	0.74
Uncleanliness/bad hygiene	0.35	0.49	0.50
Dirty environment	0.12	0.18	0.30
Flies	0.31	0.32	0.30
Knowledge of causes of acute respiratory infections (proportion of households)			
Dirty water	—	—	0.18
Dirty food	—	—	0.12
Uncleanliness/bad hygiene	0.25	0.32	0.45
Dirty environment	0.25	0.35	0.49
Flies	—	—	0.07
Household handwashing facilities (proportion of households)			
Household has handwashing facility at the toilet (observed by enumerator).	0.12	—	0.09
Of those who have a handwashing facility, it is close to toilet area (end line n = 110).	—	—	0.99
Reported washing hands with water and washing agent. ^b	0.63	0.61	0.75

When asked about improved sanitation infrastructure as a result of the ZSHP, many district officials noted that the broader sensitisation efforts and the monitoring of communities (both external and internal via local leaders) was a central reason for the construction of higher quality toilets across many communities. According to one official, “The adequacy of the toilets can be attributed to the program because initially before we could roll out the program, we went to see what was there. Households did not even have toilets, but after sensitization, toilets were constructed.” Others noted that sanctions from community leaders (in the form of local laws, fines, and/or social sanctions) were also a key reason for the construction and use of improved facilities, as many residents constructed toilets to avoid potential fines from local headmen.

Despite these positive findings and the perceived positive impacts reported from our qualitative sample, almost a quarter of households did not have access to a toilet (23%), showing that room to improve remains. Survey data also show that households that shared toilets were more likely to self-report being “very poor” and also more likely to be categorised as “severely food insecure.” The room for improvement related to access to improved toilets is further supported by that fact that only 45% of households reported

satisfaction with their toilet facilities and that 35% reported being unsatisfied. Lack of privacy or safety at night represented the primary reason for dissatisfaction with their toilets (44%), with cleanliness second, at 21%. Households reported a number of other reasons for being unsatisfied with their sanitation infrastructure, including that other households had nicer toilets, the toilet was almost full, and the toilet was also used as a shower. Qualitative data show that many community members also had challenges with their toilets during the rainy season, as some of the toilets collapsed because of the insufficiency of the infrastructure to withstand the rain. Several respondents noted that shared toilets were more time-consuming to maintain and that, if they were not maintained, many people would simply revert to open defecation.

Of those who had a toilet facility, approximately 71% cleaned it daily, and qualitative data demonstrate that women were often the ones responsible for maintaining the overall cleanliness of the toilets. Households reported that it cost, on average, 82 kwacha to build a latrine, and almost all households provided their own materials to build their latrines (96%). Qualitative data show that, for many, the initial cost of constructing a standard toilet was too high, leading many community members to forgo constructing a toilet altogether or, in the face of potential fines from village leaders, constructing a subpar toilet or sharing a toilet with multiple households. This result suggests that cost or lack of access to materials prevents some households from having their own latrines, making this an area for improvement. Table 16 shows the end line results for sanitation facilities and practises, including baseline and midline results where available. It is important to note that improved, not shared, sanitation increased from 36% to 62%, indicating a movement up on the sanitation ladder. Conversely, the proportion of households with no facility stayed roughly the same (19% at baseline and 23% at endline). This scenario could be explained if those who were initially sharing toilets with neighbours, stopped sharing their toilets. That change would mean improved, not shared would increase, but those who benefitted from accessing their neighbor's toilet now do not have any toilet access, hence an increase in "no facility" too.

Table 16. Sanitation Facilities and Practises

Variables	Baseline mean ^a (n = 1,204)	Midline mean (n = 1,170)	End line mean (n = 1,199) ²⁹
Household toilet facilities (proportion of households)^b			
Improved, not shared, toilet facility	0.36	0.51	0.62
Shared improved toilet facility	0.29	0.29	0.12
Unimproved facility	0.16	0.05	0.15
No facility	0.19	0.15	0.23

²⁹ The endline columns do not add up to 100% because they are not mutually exclusive. The "shared improved" is a sub-category of 'unimproved'. The definition of "improved" requires the toilet facility to be unshared.

Variables	Baseline mean ^a (n = 1,204)	Midline mean (n = 1,170)	End line mean (n = 1,199) ²⁹
Reported satisfaction with current toilet facilities (proportion of households)			
Satisfied or very satisfied	—	—	0.45
Neither satisfied or unsatisfied	—	—	0.03
Unsatisfied or very unsatisfied	—	—	0.35
Reasons for dissatisfaction with current toilet facilities (proportion of households) (n = 570)			
Not hygienic/clean	—	—	0.21
Not comfortable, not private, or unsafe at night	—	—	0.44
Other reason for dissatisfaction ^c	—	—	0.69
Toilet construction			
Cost of toilet construction (kwacha; n = 882)	—	—	82.40
Household provided funding, resources, or materials for toilet construction (proportion of households; n = 918).	—	—	0.96
Government provided funding, resources, or materials for toilet construction (proportion of households; n = 918)	—	—	0.01
Other entity provided funding, resources, or materials for toilet construction (proportion of households; n = 918).	—	—	0.03
Very easy- or easy-to-access building materials for toilet (proportion of households; n = 882)	—	—	0.47
Toilet maintenance			
Average monthly maintenance cost of toilet facility (kwacha; n = 882)	—	—	2.76
Cleans toilet at least once a day (proportion of households; n = 918)	—	—	0.71

^a Dash in a cell indicates that data were not collected at baseline and midline.

^b Enumerators observed toilet facilities and marked them as inside, connected, or within 10 m of the main living quarters.

^c Other reasons for dissatisfaction with toilets include other households' having nicer toilets, the toilet was almost full, and the toilet was also used as a shower.

3.2.1.3 ODF Practises and Certification Criteria

The ZSHP followed several procedures, such as verification and certification, to declare ODF status. According to the GRZ verification protocol, community champions were responsible for claiming that a village achieved ODF status. Following such a claim, a representative from the council and a verification team composed of District Water, Sanitation, and Hygiene Education Committee (DWASHE) members would conduct a verification visit to make sure the village met all of the ODF criteria. The verification team would share the ODF verification result with members of the community like the village headmen and the local SAG. Once all villages in a ward or chiefdom were verified as ODF, the ZSHP conducted the certification process. Under this process, a delegate from the Provincial–Department of

Housing and Infrastructure Development carried out a certification assessment with a group of DWASHE members. For a ward or chiefdom to be granted ODF status, 90% of the households visited by the team must meet the ODF criteria, listed in Table 19 below. According to the GRZ certification protocol, ODF celebrations should then be carried out in the certified ward or chiefdom.³⁰

Overall, we find that open defecation was reduced over time (12% for children under 5 and 10% for children over 5), and positive practises of never defecating openly improved from 58% at baseline to 77% at end line, suggesting that the programme might have had a positive effect on reducing open defecation. In addition, no household reported leaving child faeces in the open, with most disposing of it down the latrine (74%). Similarly, most households disposed of their trash in a pit or bin (73%), while the rest put it down the latrine (22%). Table 17 provides the proportion of households that satisfy each ODF indicator related to disposing of faeces and trash.

Qualitative data confirm findings from the survey data, with the majority of respondents interviewed noting a perceived reduction in open defecation in their communities.

According to one resident:

We can say there is some change in the behaviour because initially it was normal for people to use the bush to their extractor. They could do it with a free conscious without having any sense of guilty; that was the most predominant behaviour. . . The behaviour now is that people no longer go in the bush to dispose of their waste. One really can say it's the programme which has brought that behavioural change.

Several focus group participants also noted that they used to practise open defecation but had since stopped because of the information dissemination and triggering from the ZSHP. In particular, several respondents noted feelings of shame and embarrassment related to the practise of open defecation, indicating that the efforts to foster positive social norms around sanitation and hygiene were effective in many of our sampled communities.

Table 17. ODF Practises

Variables	Baseline mean ^a (n = 1,204)	Midline mean (n = 1,170)	End line mean (n = 1,199)
Household garbage disposal practises (proportion of households)			
Buries or puts trash in pit.	—	—	0.73
Burns trash.	—	—	0.05

³⁰ Although celebrations were supposed to be part of the official ODF process, community members noted that not all chiefdoms held a celebration following ODF certification. Community members from Nchelenge and Choma admitted that their chiefdoms did not organise a celebration, which was meant to encourage people to continue using improved sanitation facilities. Several beneficiaries mentioned that they celebrated on their own with family members instead. The lack of celebrations demonstrates a missed opportunity to reinforce and help stabilise a new social norm.

Variables	Baseline mean ^a (n = 1,204)	Midline mean (n = 1,170)	End line mean (n = 1,199)
Puts trash in latrine or disposes of it in another way.	—	—	0.22
Night-time toilet use habits (proportion of households)			
Uses same toilet night and day.	—	—	0.77
Waits to use toilet until morning.	—	—	0.05
Uses chamber pot, bucket, or plastic bag.	—	—	0.28
Other night-time toilet practises.	—	—	0.24
Household disposal of child faeces (proportion of households) (n = 631)			
Disposes of child stool in toilet or latrine.	0.74	—	0.74
Buries child faeces.	0.11	—	0.17
Leaves child faeces in open.	0.04	—	0.00
Puts child faeces in ditch or garbage or disposes of it in other way.	0.09	—	0.09
Child uses toilet/latrine	0.02	—	—
Household open defecation habits (proportion of households)			
Members of household above 5 years of age defecate in open daily.	0.17	0.14	0.12
Members of household above 5 years of age defecate in open occasionally.	0.17	0.16	0.10
Members of household above 5 years of age never defecate in open.	0.58	0.62	0.77
Knowledge of ODF certification process (proportion of households)			
Knows what ODF is.	—	—	0.44
Knows ODF certification process (n = 523).	—	—	0.20
Knows if own village is ODF certified (n = 523).	0.03	0.10	0.18
Thinks ODF certification is important (n = 523).	—	—	0.98
Someone talked to them about ODF, latrines, or handwashing in past 6 months.	0.82	0.68	0.50
Sensitised about ODF once in past year.	—	—	0.26
Sensitised about ODF more than twice in past year.	—	—	0.24

^a Dash in a cell indicates that data were not collected at baseline and midline.

Overall, we find that female-headed households perform similarly to male-headed households across all domains except for defecating in the open. We find that women and girls of all ages consistently defecated in the open less than men, by 6 percentage points. Moreover, women and girls over the age of 5 years never defecated in the open 13 percentage points more than men. Therefore, men performed worse on this indicator and

could use more behaviour change than women. Table 18 shows the outcomes for open defecation by gender and the mean difference.

Table 18. ODF Practises and Status, by Gender of the Household Head

Variable	Male		Female		Mean
	Mean	N	Mean	n	Difference
Household open defecation habits (proportion of households)					
Members of household above 5 years of age defecate in open daily.	0.13	898	0.07	229	-0.06*
Members of household above 5 years of age defecate in open occasionally.	0.11	898	0.05	229	-0.06*
Members of household above 5 years of age never defecate in open.	0.74	898	0.88	229	0.13*

*Difference is significant at 95% confidence level.

When examining the achievement of ODF certification, we find overall that some criteria were widely met, such as having a latrine (true of 77% of sampled households), using soap or ash to wash hands (true of 75% of sampled households), and having a private setting for the latrine (true of 74% of sampled households). Although more than half of the households had a cover and a smooth, cleanable floor for their latrine (62% of sampled households for each), there is still room for improvement (Table 19).

However, the main criterion preventing ODF certification is the lack of household handwashing facilities at the toilet, with only 9% of households having one. Households are required to have a dedicated handwashing facility at the toilet in order to meet ODF certification, but more than 90% of households do not have one, making this an important area for improvement.

Several respondents, including government officials, local leaders, and implementing partners, suggested that the strict ODF criteria prevented more chiefdoms from being certified as ODF. These stakeholders felt that certain requirements, such as the presence of a lid; a smooth, cleanable floor; and a handwashing device, were difficult for some households to meet. An implementing partner explained, "Maybe that is the reason why we have so few ODF chiefdoms in the country, not that the households don't have the toilets but then because they do not meet the parameters set." Similarly, a government official lamented, "One household can make the whole chiefdom not to attain ODF." These sentiments aligned with quantitative findings indicating that households often lacked the handwashing facilities necessary to fully achieve ODF status.

Table 19. ODF Certification Criteria^a

Criteria	Proportion of households that answer Yes	N
Latrine status		
Improved latrine present	0.62	1,199
Signs of use	0.96	918
Drop hole cover ^b	0.62	1,199
Privacy provided	0.74	918
Smooth, cleanable floor ^c	0.62	1,199
Handwashing facility		
Functional handwashing facility at the toilet	0.09	1,199
Household usually uses soap/ash to wash hands	0.75	1,199
Verification		
Any signs of faeces around compound ^d	0.77	918
All ODF criteria satisfied	0.001	1,199

^a All criteria are entered as Yes/No by the observer; a household must satisfy *all* criteria to be considered ODF.

^b Although the survey did not specifically ask if households had a drop hole cover, we assume that flush toilets, ventilated improved latrines, and latrines with slabs all have covers.

^c We again assume that all flush toilets, ventilated improved latrines, and pit latrines with slabs have smooth, cleanable floors.

^d This row presents the proportion of households that had no signs of faeces in their yard as observed by our enumerators.

3.2.1.4 Water Quality and Access

At end line, we find that households' access to safe water, which is an improved water source within 30 minutes (roundtrip) of the household improved. We also see improvements as the percentage of households using surface water and unimproved sources decreased from baseline to endline (28% to 21% and 38% to 23%, respectively). We found that almost all women were responsible for fetching water (93%), compared with about one third of men (29%) and girls under 15 years old (27%). On average, it took 104 minutes round trip to fetch water; however, we do not know how much of this time was spent walking to and from the water access site and how much time was spent waiting in line. Only 16% of households reported that their water source changed in the past 2 years, with half of those saying that the new water source was closer and improved in quality. Last, we found that only one third of households treated their drinking water, either through boiling (12%) or adding chlorine (22%), similar to the baseline and midline percentages. Table 20 lists the proportion of households that fall into each category for water access and water treatment indicators.

Table 20. Safe Water Access and Water Treatment

Variables	Baseline mean ^a (n = 1,204)	Midline mean (n = 1,170)	End line mean (n = 1,199)
Household water source (proportion of households)			
Safely managed water source	0.01	0.03	0.01
Basic water source	— ^c	— ^c	0.44
Limited water source	0.33	0.49	0.11
Unimproved water source	0.38	0.32	0.23
Surface water	0.28	0.0.16	0.21
Fetching water			
Time to get water and return (minutes)	—	—	104.60
Adult women responsible for fetching water (proportion of households) (n = 1,197)	—	—	0.93
Adult men responsible for fetching water (proportion of households) (n = 1,197)	—	—	0.29
Female children under age 15 responsible for fetching water (proportion of households) (n = 1,197)	—	—	0.27
Changes in water source (proportion of households)			
Household water source changed in last 2 years.	—	—	0.16
New water source closer than old water source (n = 189).	—	—	0.47
New water source same distance from house as old water source (n = 189).	—	—	0.28
New water source further than old water source (n = 189).	—	—	0.25
Changes in water quality (proportion of households)			
Household water quality changed in last 2 years.	—	—	0.19
Water quality better than 2 years ago (n = 232).	—	—	0.55
Water quality the same as 2 years ago (n = 232).	—	—	0.08
Water quality worse than 2 years ago (n = 232).	—	—	0.37
Water quality improved because household constructed new borehole (n = 127).	—	—	0.45
Water quality improved because household now treats water (n = 127).	—	—	0.19
Water quality improved for a different reason (n = 127).	—	—	0.36
Household water treatment practises (proportion of households)			
Household treats drinking water	0.34	0.25	0.34
Boils water to treat it (baseline n = 411, midline n = 292, end line n = 407)	0.29	0.48	0.34

Variables	Baseline mean ^a (<i>n</i> = 1,204)	Midline mean (<i>n</i> = 1,170)	End line mean (<i>n</i> = 1,199)
Adds bleach or chlorine to treat water (baseline <i>n</i> = 411, midline <i>n</i> = 292, end line <i>n</i> = 407)	0.76	0.56	0.65
Treats water by letting it stand and settle or in another way (baseline <i>n</i> = 411, midline <i>n</i> = 292, end line <i>n</i> = 407)	0.08	0.12	0.01
Started treating water in last 6 months (<i>n</i> = 407)	-	-	0.18
Started treating water in last 2 years (<i>n</i> = 407)	-	-	0.23
Started treating water more than 2 years ago (<i>n</i> = 407)	-	-	0.49
Don't know/cannot remember when household started treating water	-	-	0.11

^a Dash in a cell indicates that data were not collected at baseline and midline.

^b Other water sources included rainwater, protected and unprotected spring water, public or private taps, piped water, and water kiosks.

^c Please note that the distinction between basic and limited drinking water sources is the distance from the household. As the baseline and midline data does not report corresponding trip times, we conservatively report all improved water sources as limited, meaning that they might be more than 30 minutes roundtrip from the household.

3.2.1.5 Health and Nutrition for Children Under 12 Years Old

The primary goal of improving households' WASH behaviours is to reduce disease and malnutrition. This evaluation investigated illness (ARI and diarrhoea) for children under 12 years and malnutrition for children under 5 years (Figure 2). Overall, we found promising results, especially for diarrhoea and malnutrition indicators for children under 5, for which improvement was often difficult. However, we saw less improvement for children 5 to 12 years old, possibly because the incidence rate was already low at baseline, leaving little room for progress. We found that most children received treatment at the clinic if they suffered from ARI or diarrhoea, although we cannot say how this behaviour changed over time because the baseline and midline studies did not collect these indicators.

Children under 5 years greatly improved over time with respect to the incidence of diarrhoea, with half as many cases at end line (11%) as occurred at baseline (20%) or midline (19%). This exciting result may have played a role in the reduction of malnutrition, for which we saw continuous improvement over time, from baseline to midline to end line. Incidents of severe stunting were reduced from 32% at baseline to 10% at end line—a strong result not commonly found in most nutrition studies in Sub-Saharan Africa. We also saw that incidents of stunting were reduced from 46% at baseline to 32% at end line, demonstrating that there was still some room for improvement here. Last, we found incidents of wasting down from 14% at baseline to 6% at end line. Unfortunately, we did not see any changes in the occurrence of ARI from baseline to end line; however, 77% of those with a cough sought treatment at the clinic—a promising result for treating coughs.

The situation for older children (aged 5–12) is more stagnant, with no change in instances of diarrhoea over time, although the level is quite low, at 5%, so perhaps there is a floor effect (i.e., there is little room for improvement). Instances of ARI seem to have consistently

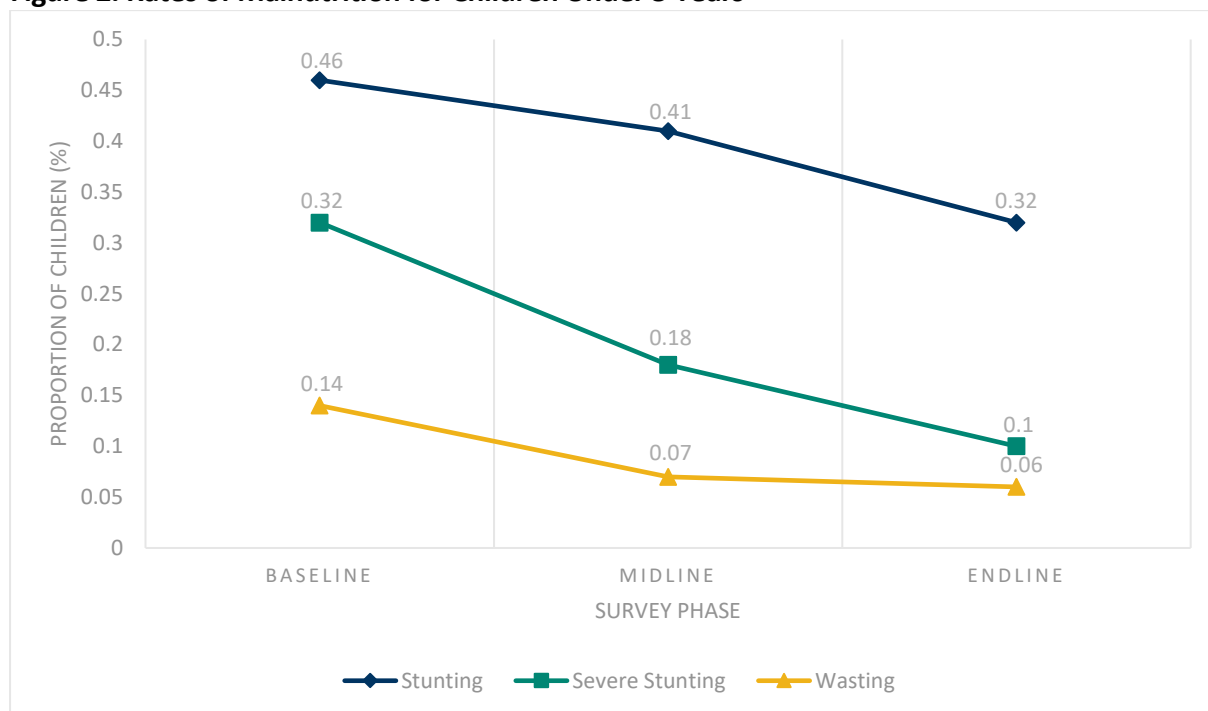
increased slightly over time, from 8% at baseline to 19% at end line. Once again, we find that roughly 74% of households took their children to the clinic to be treated for a cough. Table 21 lists all of the indicators for children under 12 related to ARI, diarrhoea, and malnutrition.

Table 21. Health and Nutrition Outcomes for Children

Variables	Baseline mean ^a <i>n</i> = 1,340	Midline mean <i>n</i> = 1,664	End line mean <i>n</i> = 875
Children under 5 years (proportion of children)			
Diarrhoea prevalence			
Had diarrhoea in last 2 weeks.	0.20	0.19	0.11
Sought treatment for diarrhoea (<i>n</i> = 199).	—	—	0.34
Went to public clinic for diarrhoea treatment (<i>n</i> = 68).	—	—	0.98
ARI prevalence			
Had cough or trouble breathing in last 2 weeks.	0.26	0.28	0.29
Sought treatment for cough (<i>n</i> = 256).	—	—	0.83
Went to public clinic for cough treatment (<i>n</i> = 256).	—	—	0.77
Malnutrition indicators^b			
Stunted (<i>n</i> = 691)	0.46	0.41	0.32
Severely stunted (<i>n</i> = 691)	0.32	0.18	0.10
Wasted (<i>n</i> = 714)	0.14	0.07	0.06
Children 5 to 12 years old (proportion of children; <i>n</i> = 1,806)			
Diarrhoea prevalence			
Had diarrhoea in last 2 weeks	0.04	0.04	0.05
Sought treatment for diarrhoea (<i>n</i> = 65)	—	—	1.00
Went to public clinic for diarrhoea treatment (<i>n</i> = 65)	—	—	0.87
ARI prevalence			
Had cough or difficulty breathing in last 2 weeks	0.08	0.12	0.19
Sought treatment for cough (<i>n</i> = 347)	—	—	0.79
Went to public clinic for cough treatment (<i>n</i> = 345)	—	—	0.74

^a Dash in a cell indicates that data were not collected at baseline and midline.

^b Stunting is defined as having a height- or length-for-age WHO z score less than -2. Severe stunting is defined as having a height- or length-for-age WHO z score less than -3. Wasting is defined as having a weight-for-height or -length WHO z score less than -2.

Figure 2. Rates of Malnutrition for Children Under 5 Years^a

^a *Stunting* is defined as having a height- or length-for-age WHO z score less than -2. *Severe stunting* is defined as having a height- or length-for-age WHO z score less than -3. *Wasting* is defined as having a weight-for-height or -length WHO z score less than -2.

Findings from the survey data on the decreased incidence of diarrhoea echo those provided by respondents in our qualitative evaluation sample. Many community members and programme stakeholders believed the ZSHP reduced WASH-related diseases like diarrhoea and cholera in their communities. According to a community health worker, “We were giving a report to the district for diarrhoea before you came. There were nine [cases in this report]. . . . But sometime back, we had some cases, maybe 20 something, 30 something, 40. . . . I think there is a difference [because of the ZSHP].” Respondents believed that the reduced disease burden was a result of reductions in open defecation and access to improved sanitation facilities. While cholera was not examined in our survey, community members and policy makers in our qualitative sample agreed that there were reductions in the incidence of cholera (both within communities and at a national level). One policy maker attributed this overall reduction in cholera to the scale and coverage of the ZSHP. By reaching communities across Zambia in numerous districts, the programme increased the likelihood that the resources it provided could benefit more communities and reduce their vulnerability to diseases like cholera.

3.2.2 School-Led Total Sanitation Effects

In addition to looking at households, this evaluation collected data at the school level, since the ZSHP implemented activities at schools, as well as in villages. Here we present three categories of indicators: indicators pertaining to school sanitation facilities/maintenance, the school water supply, and the WASH information included in the school curriculum. Overall, we found that school WASH indicators improved over time, especially with respect to handwashing facilities. However, many indicators were not collected in the baseline or

midline studies, so we cannot say how these indicators changed over time and can thus only discuss the levels at the end of the evaluation.

3.2.2.1 School Sanitation Facilities and Maintenance

We began by looking at school WASH facilities, both latrines and handwashing. The percentage of schools with improved pit latrines improved from 68% at baseline to 93% at endline. However, we did find that the percentage of schools with 50 or fewer students per toilet improved over time, with twice as many such schools at end line (40%) as at baseline (21%). However, only two schools have achieved the new pupil-to-toilet ratio recommended by the MoGE for girls (1:20) and one school achieved the new pupil-to-toilet ratio recommended for boys (1:25) (MoGE, 2015). This finding indicates that schools built more latrines over time (assuming that the student population did not decrease substantially). We find that latrine construction occurred through a variety of sources, with schools reporting that government was the most common (60%)³¹, NGOs the second most common (47%), and the ZSHP the third most common (15%). It is important to note that schools had multiple latrines and could thus have had multiple sources of construction within the same school.

All schools had separate toilets for girls and boys, an indicator that was constant throughout the evaluation period. However, at endline only 75% of schools had separate facilities for staff and pupils, indicating that children and teachers needed to share facilities in some schools. Data on staff toilets was not disaggregated by gender at baseline.

We found consistent improvement of handwashing facilities across the board from baseline to end line. More than three quarters of schools (77%) had dedicated handwashing facilities for students near latrines, up 11 percentage points from baseline (66%). Of these facilities, almost all (85%) provided water at the handwashing facility, and 68% provided some type of handwashing agent or soap, an increase of over 300% from baseline (18%). Schools on average spent about 104 kwacha per month to provide these supplies to students.

Children were almost always partially responsible for maintaining school latrines (98%), but sometimes teachers and staff shared the responsibility (12%). Almost all schools had a WASH maintenance committee (89%), and most had a plan for maintaining their WASH facilities (80%). Table 22 lists all the indicators related to school sanitation facilities and maintenance.

Table 22. School Sanitation Facilities and Maintenance

Variables	Baseline mean ^a (n = 44)	Midline mean (n = 47)	End line mean (n = 81)
School sanitation facilities			
Pit latrine, temporary (proportion of schools; n = 79)	0.32	0.11	0.21

³¹ ZSHP did not construct sanitation facilities in schools directly. UNICEF Zambia funded NGOs and the government to construct the facilities. We report the percentages based on how respondents answered, as some may not have been aware of these funding streams.

Variables	Baseline mean ^a (<i>n</i> = 44)	Midline mean (<i>n</i> = 47)	End line mean (<i>n</i> = 81)
Pit latrine, permanent or improved (proportion of schools; <i>n</i> = 79)	0.68	0.72	0.93
Flush toilet (proportion of schools)	0.00	0.02	0.01
Other type of facility (proportion of schools)	0.00	0.00	0.01
Schools that achieved 1:50 toilet : student ratio (proportion of schools)	0.21	0.28	0.40
Sanitation facilities construction (proportion of schools)			
ZSHP project constructed toilet facilities.	0.00	—	0.15
Government constructed toilet facilities.	0.27	—	0.60
Community constructed toilet facilities.	0.24	—	0.05
Other NGO or entity constructed toilet facilities.	0.49	—	0.47
School has separate facilities for boys and girls.	0.98	0.97	0.98
Staff toilets (proportion of schools)			
School has separate facilities for staff and pupils.	—	—	0.74
Pit latrine, temporary or permanent	—	—	0.01
Garbage facilities (proportion of schools)			
School deposits garbage in the dumping space.	—	—	0.96
Handwashing facilities			
School has specific place where pupils wash hands after toilet use (proportion of schools).	0.66	0.53	0.77
Water available for handwashing (proportion of schools; <i>n</i> = 47).	0.73	—	0.85
Handwashing agent available (proportion of schools; <i>n</i> = 47). ^b	0.32	0.23	0.68
Average monthly cost of providing handwashing supplies (kwacha; <i>n</i> = 62).	—	—	104.47
Handwashing station allows simultaneous use by several children (proportion of schools; <i>n</i> = 62).	0.50	0.44	0.68
Students use just water or water and ash to wash hands (proportion of schools).	—	—	0.15
Sanitation facility maintenance (proportion of schools)			
Pupils responsible for cleaning toilet facilities.	—	—	0.98
Teachers or hired staff responsible for cleaning toilet facilities.	—	—	0.12
School has functioning school maintenance committee or WASH committee.	—	—	0.89
School has work plan for maintaining WASH facilities.	—	—	0.80

^a Dash in a cell indicates that data were not collected at baseline and midline.

^b Available handwashing agents include soap, detergent, and ash. Most schools reported that the government paid for handwashing supplies, and none reported that ZSHP projects covered these costs.

3.2.2.2 School Water Supply

The evaluation also investigated the water source at schools to determine quality, provider, and access. Overall, we found little change in the main water source at schools from baseline to end line, with roughly 80% using improved water sources and 11% using surface water. Most schools had their water supply very nearby, with only 19% having their water supply more than 200 meters away. We only have end line data for the rest of the indicators because the evaluation did not collect the data at baseline or midline; thus, we cannot report on how the indicators changed over time. More than half (53%) of the school water sources were provided by the government, with 44% provided by the community or an NGO and 3% by the ZSHP (as part of the UNICEF contribution under the ZSHP). Almost all schools (91%) had water available year-round, and 33% stored drinking water for students, mostly in covered buckets (33%). Table 23 lists all the school water supply indicators for baseline, midline, and end line, when available.

Table 23. School Water Supply

Variables	Baseline mean ^a (n = 44)	Midline mean (n = 47)	End line mean (n = 81)
School water source (proportion of schools)			
Safely managed water source	0.07	0.02	0.01
Basic water source	0.80	0.81	0.82
Limited water source	0.00	0.00	0.00
Unimproved water source	0.00	0.15	0.05
Surface water	0.11	0.00	0.11
No water source	0.02	0.02	0.01
Water source farther than 200 meters (n = 80)	—	—	0.19
Provider/funder of water source (proportion of schools)			
Government provided water source for school (n = 70).	—	—	0.53
ZSHP project provided water source for school (n = 70).	—	—	0.03
Community or other entity provided water source for school (n = 70).	—	—	0.44
School water access (proportion of schools)			
Water available year-round (n = 77).	—	—	0.91
Water not available year-round (n = 77).	—	—	0.09
School stores drinking water for pupils.	—	—	0.33
Drinking water stored in buckets.	—	—	0.30
Water storage buckets completely covered (n = 80).	—	—	0.33
Drinking water cup on site (n = 29).	—	—	0.86

^a Dash in a cell indicates that data were not collected at baseline and midline.

3.2.2.3 School Sanitation Facilities for Girls

We also investigated WASH indicators for girls in school, looking at both menstrual hygiene (Table 24) and differences in WASH facilities by gender (Tables 24 and 25). Overall, we did not find any differences in facilities by gender for students or teachers. We found that roughly 75% of schools provided MHM education, and 64% provided facilities to dispose of sanitary towels. However, less than half (47%) provided sanitary towels for girls, meaning that the majority of girls needed to acquire the towels on their own. Unfortunately, these indicators were not collected at baseline or midline, so we do not know how they have changed over time. As we discuss in greater detail in the “Programme Sustainability” section, below, many schools that received sanitary towels as part of the ZSHP were not able to continue to purchase them after the initial supply from the programme ran out. According to our qualitative data, schools often lacked funds to purchase these towels, which likely explains why less than half of schools provide sanitary towels for female students.

Table 24. Menstrual Hygiene

Variables (proportion of schools)	Baseline mean ^a (n = 44)	Midline mean (n = 47)	End line mean (n = 81)
School offers MHM education.	—	—	0.74
School has facilities to dispose of sanitary towels.	—	—	0.64
School provides sanitary towels for girls.	—	—	0.47

^a Dash in a cell indicates that data were not collected at baseline and midline.

Table 25. Student Toilet Facilities, by Gender

Variables	Average facilities for boys (n = 79)	Average facilities for girls (n = 79)
Toilet characteristics (proportion of schools)		
Pit latrine, temporary or permanent	1.00	1.00
Clean toilet	0.58	0.63
Faecal smell in toilet area	0.62	0.56
Flies or insects in toilet area	0.68	0.65
Door for latrine	0.16	0.19
Latrine door lockable from inside	0.11	0.12
Visible stool on slab or floor	0.37	0.33
Toilet paper, water, or other material available	0.06	0.09
Water for washing hands available nearby	0.61	0.62



Table 26. Staff Toilet Facilities, by Gender

Variables	Average facilities for men (n = 48)	Average facilities for women (n = 48)
Female staff toilets (proportion of schools)		
Faecal smell in toilet area	0.31	0.31
Flies or insects in toilet area	0.30	0.26
Door for latrine	0.31	0.33
Latrine door lockable from inside	0.12	0.14
Visible stool on slab or floor	0.17	0.15
Toilet paper, water, or other material available	0.10	0.10
Water for washing hands available nearby	0.65	0.67

3.2.3 Section Summary: Progress on ZSHP Logframe

Findings from this section indicate that while ZSHP achieved the desired impact, the programme missed the output target related to sanitation facilities having a functional handwashing facility at the toilet. As previously described, our results show that diarrhoea morbidity among children declined from 20.4% at baseline to 11% at endline, exceeding the target of 16.3% by four percentage points (Table 27). Children under the age of five suffer less from diarrhoea at endline compared with baseline. The ZSHP did not achieve the target for improved sanitation facilities with a functional handwashing facility at the toilet. The proportion of households with an improved toilet facility improved over time from 36% to 63%. However, only 9% of households had a functional handwashing facility at the toilet. The indicator measurement requires both conditions of improved sanitation and functional handwashing facility at the toilet to be valid. Only 2.6% of households had *both* an improved sanitation facility and a functional handwashing facility at endline.





Table 27. Progress on ZSHP Logframe

Key Indicator	Baseline	Target	Achievement	Colour code
Reduced diarrhoea morbidity amongst rural children under five	20.4%	16.3%	11%	
Stunting (secondary indicator)	46%	No target was set	32%	N/A
Wasting (secondary indicator)	14%	No target was set	6%	N/A
The proportion of population in target districts using improved sanitation facilities with a functional hand-washing facility at the toilet	5.4%	55%	2.6%	

Additionally, UNICEF's Program Completion Report showed that ZSHP achieved many of the targets set on outputs 1 and 2 in the logframe. For example, UNICEF data indicates that the

number of people with sustained access to improved sanitation and the number of villages declared ODF exceed programme targets (Table 28). This data also indicates that the programme achieved the goal of at least 1,000 additional schools with appropriate sanitation facilities.

Table 28. UNICEF Reported Progress on Programme Logframe

Key Output Indicator	Target	Achievement ³²	Colour code
Output 1: 3.6 million new users consistently utilizing improved sanitation facilities and hygiene practices.			
Number of additional people with sustained access to improved sanitation	3,600,000	3,905,474	
Number of verified open defecation free (ODF) villages achieved	12,000	12,427	
Number of people with sustained access to handwashing	3,600,000	3,607,208	
Output 2: 1,000 additional schools have appropriate sanitation facilities including hand-washing facilities, and soap available; together with an appropriate management system and hygiene promotion activities			
Number of additional schools that have appropriate sanitation facilities	1000	1,064	

3.3 Programme Sustainability

Sustainability requires the successful transition from a new, fragile social norm to a stable social norm that encompasses the desired behaviour change. A new social norm will change individual and collective preferences and behaviours and will be reinforced by formal and informal rules at the local level. Sustained ODF behaviour over time indicates that the new social norm has been established. In order to fully assess sustainability, we considered the following pillars to be cornerstones of sustainability for the ZSHP: (1) social and behavioural, (2) institutional, (3) financial, and (4) policy/legal.

Social and Behavioural Sustainability: This is the ability of people to change their behaviour or habits as a result of the introduction of new infrastructure, new processes, and new products as part of the ZSHP. Under this pillar, we address specific evaluation questions, such as to what extent will the outcomes of the ZSHP be maintained after development support is withdrawn, will latrines be cleaned and maintained after initial intervention (for both school and household), and to what extent has sanitation marketing contributed to enhanced and sustained private-sector capacity and interest?

Institutional Sustainability: This is the establishment of new or improved forms of organization that are tasked with performance of certain functions. These functions may include budgeting and/or technical performance. This dimension of sustainability includes questions such as to what extent has government capacity, including information management systems, for the delivery of sanitation and hygiene been strengthened as a

³² Based on UNICEF Project Completion Report to DFID

result of this programme, and how are local authorities at the provincial and district levels involved in the programme?

Financial Sustainability: This component of sustainability covers the financial viability of continuing sanitation facilities maintenance and WASH behaviour change promotion.

Policy/Legal Sustainability: The last pillar, the political/legal dimension of sustainability, is the extent to which new governmental institutions can ensure the continuity of service provision.

The section is organised by the sustainability of key outcomes of interest, as outlined in the framework above.³³ Overall, we find that household beneficiaries faced several environmental, financial, and social challenges to consistently using improved sanitation facilities³⁴ and practicing handwashing with soap or ash in their households and schools. These challenges may impede beneficiaries from sustaining their ODF practises in the future. Sampled beneficiaries were enthusiastic about ZSHP's objectives, experienced benefits to their community's well-being, and desired to further improve their communities. But beneficiaries often were unable to build improved sanitation facilities capable of withstanding the rainy season because of financial limitations and environmental conditions. Further, the definition of *improved sanitation facilities*—specifically, the requirement that toilets not be shared with other households—does not align with social norms. Sampled beneficiaries commonly cited cases of sharing toilets with extended family, neighbours, and travellers, but these communal toilets were often left in disarray and discouraged beneficiaries from using them further.

³³ The majority of the findings in this section rely on data collected through qualitative interviews. Because the data represent a point-in-time perspective, we are only able to speak to the likelihood that the programme model will be sustained, not to whether programme outcomes and effects have been sustained over time.

³⁴ Improved sanitation facilities were designed as facilities that “hygienically separate human excreta from human contact and that were not shared with other households. These include flush toilet, piped sewer system, septic tank, flush/pour toilet to pit latrine, ventilated improved pit latrine, pit latrine with slab and composting toilet” (Boston University, 2013).

Section Highlights—Programme Sustainability

- **Sustained Use of Improved Household Toilets.** Many household beneficiaries remain enthusiastic about using improved household toilets, but when toilets that were built as part of the ZSHP collapsed (as was the case for many beneficiaries in our qualitative sample), the beneficiaries found it difficult to rebuild the improved facilities because of cost.
- **Environmental Factors Affect Sustainability of Improved Toilets.** Beneficiaries that live near rivers are unable to dig durable pit latrines because of the environmental constraints of their region, and they felt that the ZSHP did not provide them with an alternative plan.
- **Gendered Toilet Use.** The awkwardness of sharing toilets with extended family members leads some beneficiaries, particularly female beneficiaries in our qualitative sample, to resort to open defecation.
- **Sustained Behavior Change.** ZSHP-induced behaviour change efforts have been more successful in addressing open defecation than in addressing handwashing practises because the ZSHP targeted open defecation practises as part of its programme model.
- **Sustained ODF Status.** Many programme stakeholders noted that many communities were at risk for slipping back from their achieved ODF status because of lack of consistent follow-up and incentives to maintain that status. Proposed solutions include a retriggering process, a reverification process, or new community-led sanitation initiatives to maintain the enthusiasm and momentum surrounding CLTS.
- **ZSHP and National-Level Policy Change.** The ZSHP was instrumental in the development of the ODF Strategy 2018-2030 and in fostering a broader conversation within the country on the importance of sanitation.

3.3.1 Social and Behavioural Sustainability

3.3.1.1 Sustained Use of Improved Household Toilets

Many household beneficiaries remained enthusiastic about using improved household toilets, but when toilets that were built as part of the ZSHP collapsed (as was the case for many respondents in our qualitative sample), many found it difficult to rebuild the improved facilities. Beneficiaries in Choma said that they were “thankful” and “grateful” for the way using toilets had changed their lives. And they described their previous behaviour of open defecation as “careless” and “dirty.” Beneficiaries reported that they felt that they could “sit freely,” unlike when they were openly defecating and feared they might be caught by a passing person or bitten by a snake. Primarily, beneficiaries were happy to be “protecting their lives” by reducing their exposure to disease, and many stated that they would never go back to their previous practises.

Beneficiaries, however, were often faced with a shortage of resources and made shoddy-quality toilets that frequently collapsed. In communities where beneficiaries instituted laws mandating toilet use, those whose toilets collapsed were forced to quickly build new toilets of poor quality to avoid being fined. Many beneficiaries found this constant cycle of toilet construction and destruction taxing physically and financially.

Constructing a durable toilet with a deep latrine; a brick-, stone-, or cement-reinforced pit lining; and a cement slab for easier cleaning was not financially feasible for many of the

household beneficiaries that AIR sampled. Our quantitative analysis showed that the average cost of toilet construction was 82.4 kwacha, but household beneficiaries in the Choma region explained that their financial constraints limited their ability to build quality, lasting toilets:

Participant 1: The challenge is having temporary toilets. We wished we could have permanent ones where you can rest from rebuilding for 4 to 5 years. We can't afford that type of toilet. Instead we just build for the sake of building a toilet that we can use.

Participant 2: The challenge [is that we build these toilets] ourselves. They are for poor people who can't afford to build. [We] just build with mud or soil. [A few people] have cement on the slab. . . . The second challenge is that, because people have no money and [are] in fear of the law that hygiene must be practised, they dig short pits which get full fast or early.

These household beneficiaries wanted to construct toilets with deep pit latrines that would last for 4 to 5 years. But they must continuously build shallow, temporary toilets out of necessity. In this case, they had to quickly construct a new toilet to avoid being fined for not complying with community-imposed sanitation laws. In addition, households reported sharing their toilets with neighbours and with members of their extended families. Households with the resources to construct long-term toilets with deep pit latrines found that sharing their toilets with people who did not build their own toilets led to their toilets' filling up faster than anticipated. And low-income households were only able to dig short pits that filled up quickly and needed to be replaced often.

While household beneficiaries desired toilets that would last 4 to 5 years, the toilets that they were able to afford often did not last through the rainy season. As a household beneficiary in the Choma region explained, "You can use mud and build [the toilet]. But when the rains come, it will collapse, and you have to start again building it." Vulnerable households did not have the resources to build their toilets again. A beneficiary from Mbala stated, "When it is raining, you find that the toilet collapses . . . [but] you don't have money to build a new toilet, so you have a problem in that case to maintain that toilet." Household beneficiaries find themselves in a double bind, because they cannot afford to prevent their toilets from collapsing or to build new ones. Because of the financial difficulty of toilet construction, beneficiaries may not be able to afford another toilet and may again resort to open defecation. Household beneficiaries in Mambwe, Mbala, Nchelenge, and Musele suffered frequent toilet collapse from soft or sandy soil. Household beneficiaries in Nchelenge and Musele reported that their regions' high-water tables compromised latrine structure and could lead to groundwater contamination. Household beneficiaries in Nchelenge who lived close to rivers felt that pit latrines were not designed with their environmental conditions in mind. A beneficiary explained:

The ground is difficult [because] when you just dig a bit you find water or maybe it is only sand. So the hole is not supposed to be very deep. It should be shallow. . . . But there is no help that is given to [those who live by the river] to make a plan for them so that they can have toilets that can last long. . . . When you find water wherever you move to, you will find water.

Beneficiaries that lived near rivers were unable to dig durable pit latrines because of the environmental constraints of their region, and they felt that the ZSHP did not provide them with an alternative plan.

Lining pit latrines with materials such as brick, stone, or cement helps to prevent toilet collapse in regions with soft or sandy soil, but these building methods do not guarantee a long-lasting toilet and have their own difficulties. Most beneficiaries reported that they could not afford the materials or the labour necessary to line their pits, and beneficiaries who did use cement or bricks became more financially precarious. A beneficiary in the Mkushi region stated: “People are supposed to buy cement and iron sheets which is not cheap. People have no capacity to do that. In most cases you have to hire a bricklayer to do [the] plastering for you because not everyone can do that on their own.” Focus group members in Choma and Mbala also attested that purchasing cement set them back financially. Nonetheless, using cement does not guarantee that a toilet will not collapse. Beneficiaries in the Nchelenge region frequently saw school toilets collapse even though they were built with cement and bricks and met the Ventilated improved pit toilet standard.

Last, during the dry season, toilet superstructures are at risk of burning down during bush fires. Because many household residents cannot afford to construct their superstructures with iron sheets, they use flammable tall grass to thatch their toilets.³⁵

Often beneficiaries must choose between short-term, cost-effective solutions and long-term, prohibitively expensive solutions. Toilets built with lower quality construction materials and processes are subject to frequent collapse, especially in regions with soft or sandy soil, and fill more quickly. The financial precariousness of many household beneficiaries may prohibit them from continuously building new toilets after their household toilets collapse. Households that had toilets collapse and households that had never built a toilet often used their neighbours’ toilets or they were at risk of returning to open defecation. These factors strongly prevented the overall sustainability of the programme, as improved sanitation facilities that were built initially might collapse and not be rebuilt because of financial and environmental constraints.

3.3.1.2 Toilet Maintenance and Cleanliness

Many households reported sharing sanitation facilities among households because of the difficulty of constructing private sanitation facilities and rural Zambia’s competing social norms. Despite social norms that promoted neighbourliness, many household beneficiaries lamented that their shared toilets were left unclean.³⁶ A child in Lufwanyama explained the effect of toilet cleanliness on open defecation: “When some people are using the toilet, they leave it dirty. You end up going in the bush because the toilet is dirty.” As this child

³⁵ Household beneficiary in Lufwanyama, Zambia.

³⁶ The WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation (JMP) defines *improved sanitation facilities*, in part, as facilities that are not shared with other households. The JMP discourages sharing sanitation facilities because shared facilities are often poorly maintained and increase the risk of diarrhoea (Joint monitoring programme, 2019; Fuller, Clasen, Heijnen, & Eisenberg, 2014).

indicated, households might return to open defecation if it was difficult for them to maintain toilet cleanliness.³⁷

In many of the regions that we qualitatively sampled, sharing toilets among extended family members, neighbours, and strangers was common and socially obligated. Our quantitative findings confirmed that 40% of households reported sharing their toilet facilities with other households. As a household beneficiary explained, “After you build [a] toilet and [your] neighbour has nothing and there is no one to help, they start coming to use your toilet.” Neighbouring households can also be made up of extended family members, which can make toilet maintenance “very complicated.” Toilets that are clean in the morning may be dirty by the afternoon, and the extended family members who do not own the toilets are frequently identified as the ones making a mess. Our quantitative analysis confirmed that households that shared their toilets were 15% more likely to consider their toilets dirty and were 29% more likely to be dissatisfied with their toilets.

Toilet owners, in addition, attributed messy toilets to drunkards, unattended children, travellers, and unknown passers-by. Women are predominantly tasked with cleaning toilets. One woman explained the near futility of toilet cleaning: “Our toilet we do clean with soap, so you clean and sweep the floor because it is made of cement. You even scrub the wall as well. Now, even if you do these things you find that they make [the] wall as toilet paper. . . . In spite of you cleaning, it’s just the same.” Thirty-five percent of the respondents from our quantitative sample reported that they were unsatisfied with their toilets. Of those respondents, 68% reported that they cleaned their toilets at least daily. Further, uncleanliness and lack of comfort and privacy were cited as the most common reasons for toilet dissatisfaction. Toilet owners found that their toilets quickly became dirty and that their attempts to educate their neighbours and family members on how to clean up behind themselves were ignored. Toilet maintenance was reported to be especially poor when there were household gatherings for events such as funerals. A few respondents mentioned that there were “very bad” toilet smells coming out of the pit. These respondents indicated that they were unable to afford chemicals to pour into the pit to address the smell. Our quantitative data confirmed that 15% of respondents listed bad smell as one of the reasons that they were dissatisfied with their toilets.

3.3.1.3 Gendered Toilet Use

The awkwardness of sharing toilets with extended family members led some beneficiaries to resort to open defecation. Female beneficiaries expressed the need for toilets separated by gender because they were embarrassed to meet their fathers-in-law coming from the toilet. Similarly, a man finding a woman in the toilet could be embarrassing. As one woman

³⁷ According to sanitation literature, maintaining toilet cleanliness and odourlessness are key factors for increasing household satisfaction and preventing beneficiaries from returning to open defecation. A study in urban Uganda found that sharing facilities with too many users and bad smells and uncleanliness were the most cited reasons for dissatisfaction with sanitation facilities (Tumwebaze & Mosler, 2014). The same study also found that households that shared toilets with close family members were more satisfied than households that shared toilets with extended family members. The study in Uganda took for granted that people who were dissatisfied with their toilets would practise open defecation, but other studies indicate that this may be the case. A study by McFarland (2008) found that women in urban India preferred open defecation to using unclean toilets. And households in Bangladesh that were dissatisfied with their shared improved facilities were more likely to practise open defecation than households that were satisfied with their shared improved facilities (Nelson, Carver, Kullman, & Graham, 2014).

explained, “Sometimes we feel shy [going] to the toilet when there are men around. So we decide to go to the bush. You know it is very shameful to go to the toilet if your father-in-law is [sitting] next to the toilet.” Women may also be less comfortable and rush to leave the bathroom just in case someone may come by.

Because, as a beneficiary stated, “You cannot deny someone to use [the toilet], and anyone can come and use it.” Toilets are often shared with neighbours, extended family members, and strangers. Shared toilets are filled more quickly, are more likely to be dirty, and are associated with higher levels of dissatisfaction. Those who share their toilets are 40% more likely to practise open defecation occasionally. As a result, the social obligation of toilet sharing may make sustaining consistent toilet use difficult.

3.3.2 Sustainability of Handwashing Behaviours

The JMP estimates that 58% of the Zambian population have no access to handwashing facilities (UNICEF/WHO 2019). Handwashing is an important behaviour that helps to maintain health and prevent the spread of diseases among people. In this evaluation, 98% of households know about the importance of handwashing. However, access to handwashing still remains elusive, as only 9% have access to handwashing facilities at the toilet, and this threatens the sustainability of reduced disease burden.

None of the beneficiaries in our qualitative sample openly admitted to not washing their hands when asked, likely because of social desirability bias. However, when asked about the handwashing practises of others, community residents were likely to report that many do not wash their hands after defecating for various reasons. For example, children in a focus group in Lufwanyama District, describing other children’s behaviour, suggested that sometimes children do not wash their hands because of laziness:

Participant 1: There are others. When they come from the toilets they just go without washing hands, and others are used [to it]. They are able to wash their hands every time they use the toilet.

Participant 2: Others feel that when they come from the toilet, washing hands is [a] waste of time.

Participant 3: Sometimes you just feel lazy.

While some beneficiaries have not made a habit of handwashing because of “feeling lazy,” broader constraints can prevent beneficiaries from using handwashing facilities, like crowded water sources. As an adult beneficiary from Mambwe District explains, “On the issue of boreholes, some villages have them, but other villages don’t have enough. You find that children want to eat, and they find a lot of people at the borehole so kids end up eating without washing [their] hands.” This beneficiary believes that children are not washing their hands because they do not have water readily available outside of the toilet.

There are several other barriers, such as vandalism, poor water container quality, and lack of access to water and soap, that prevent proper handwashing. Households may travel long distances to reach boreholes, and when they reach the boreholes, they must wait in line for hours to get water. According to many respondents in our qualitative sample, water is

difficult to obtain for those who do not live in close proximity to boreholes, as well as for the disabled and for pregnant women. Also, those who fetch water from a borehole often must pay for use of the borehole; therefore, low-income families must treat water as a scarce resource.

As the UNICEF WASH specialist and beneficiaries state, handwashing facilities are subject to vandalism. According to the specialist, in some communities' children will vandalise the handwashing station or steal the 5-litre water container. Further, when exposed to the weather elements, water containers may crack over time and need to be replaced.

In addition to lack of access to water and poorly maintained handwashing facilities, many beneficiaries reported that they were unable to regularly use soap because of its cost and lack of availability. As beneficiaries in Mambwe explained:

Participant 1: From my side, soap is difficult to find especially that I am not married how can I afford?

Participant 2: The problems are there. My husband has no job. So, I can't manage every time to ask for soap for my child.

Once beneficiaries ran out of soap, they commonly reported using ash, since it was readily available from cooking.

Most beneficiaries did not have a problem with using ash, but one beneficiary mentioned the negative effects of long-term use of ash: "Ash is acidic. All your hands will be torn. You cannot be using ash all the time. You will not be human." While concern about washing with ash was not widespread among our respondents, ash has higher pH³⁸ than soap, which can result in greater skin irritation.

According to our qualitative data, crowded water sources, lack of access to water, poorly maintained facilities, and the high costs of soap all present critical barriers to long-term use of handwashing facilities and sustained handwashing practises. Even with a willingness to adopt proper handwashing practises, many communities may not be able to properly wash their hands because of these constraints.

3.3.3 Sustainability of ODF Status

Qualitative data show that programme stakeholders, including a UNICEF WASH specialist, community health workers, ministry officials, and beneficiaries, struggled with how to maintain a community's ODF status after the community had been declared ODF. The UNICEF WASH specialist explains, "By the time the community becomes open defecation free, (...) it becomes extremely challenged now to collectively monitor and collectively put pressure on those who could be sliding or slipping back to the practice of open defecation." The UNICEF WASH specialist realised that after communities achieved and celebrated ODF status, they lost the momentum to continue striving toward the next sanitation goal. A community health worker confirmed this analysis: "Even the mentality of the community, they stopped maintaining that status. The toilets collapsed, things for washing hands got

³⁸ Ash has a higher pH than soap; therefore, it is more basic, not more acidic.

lost. People had gone backward a bit.” Other stakeholders confirm that they have seen the same problem and have proposed solutions, such as a retriggering process, a reverification process, or new community-led sanitation initiatives to maintain the enthusiasm and momentum surrounding CLTS.

At the national level, the CLTS coach remarked that attention was shifted away from chiefdoms after they had celebrated. As the coach explains, “Once the [chiefdom] celebrates [that] there is ODF, we stop. We go to the next one (...) By the time you reach the last one, the first one is already OD.” Our qualitative data suggests that the relapse into open defecation occurs because there are no programmatic systems in place to maintain ODF certification, once achieved. As a beneficiary in Mambwe explained, “There is need to continue encouraging everyone in the community.” Community health workers in Shimukunami observed that neighbour-to-neighbour encouragement was not an effective means of ensuring continued ODF status. Rather, beneficiaries needed outside enforcement and encouragement from community health workers, headmen, and chiefs. Similarly, community health workers felt that they needed outside monitoring to ensure that they could maintain their morale as well. A community health worker in Shimukunami explained, “What is important is that you should continue coming and encouraging us. (...) If you continue like this, even us, will have that morale to be going around time to time.” In other words, once attention shifts away from engaging and monitoring chiefdoms, they slip back into open defecation practises.

The CLTS coach believes that many communities never achieved ODF status or lost their momentum after achieving ODF status because community champions were trained to provide sensitisation rather than triggering. Sensitisation transfers knowledge to beneficiaries, while triggering sparks a self-diagnosis associated with fear, disgust, or shame. Those strong feelings are then followed by action and sustainable behaviour change. For example, beneficiaries in Choma explained that, after seeing the presentation they, “felt bad and almost vomited,” and immediately began to build their toilets. On the other hand, some villages were triggered and showed “no results,” according to the CLTS coach.

In addition, if community champions did not properly collect and report data throughout the ODF certification process, villages that were identified as being ODF might in fact still have been practicing open defecation. The CLTS coach gives an example of an ODF certification that occurred in a region in which almost every village continued to practise open defecation, but the reporting of the community champions indicated that the region was ODF. The CLTS coach explained, “Sometimes we are doing too [many] superficial things. We are just monitoring phones [and] numbers but we are not monitoring the activity.” Because of the challenges that community champions face with recording, a region that is declared ODF may still practise open defecation. Poor reporting systems may make it difficult to make sanitation policy decisions at the district and national levels.

3.3.4 Institutional Sustainability

National-Level Capacity. The ZSHP was instrumental in capacity development within the newly created MWDSEP, especially in issues of WASH, MIS, district-level capacity, and resources related to ODF. In addition, the ZSHP facilitated the development of a road map to achieve the Zambia 2030 ODF strategy. The 2030 ODF strategy was launched during the first Zambia National Sanitation Summit, hosted by the MWDSEP in November 2018. In

addition to the creation of a new ministry, there are new positions that have been created specifically for sanitation. These are likely to influence the discourse on sanitation and steer conversations on sustainability of the investments spurred by ZSHP.

The ZSHP was designed to actualise the goals of the Zambia 2030 ODF strategy. A Ministry of Local Government and Housing official believed that Zambia might have been one of few countries implementing CLTS that developed its own training methodology. The ministry official explained that Zambia used Bangladesh's CLTS training manual as an example but then "Zambianised" it. The UNICEF WASH specialist confirms that the ZSHP spent time trying to understand the specificities of open defecation in the Zambian context to effectively catalyse behaviour change.

3.3.4.1 District-Level Capacity

District WASH committees lead rural water supply and sanitation coordination units, and these units develop district total sanitation plans. These plans empower districts to integrate their sanitation agenda into their overall district strategic plan. As part of their coordination efforts, rural water supply and sanitation units bring together town clerks, mayors, district commissioners, and department heads to provide training in sanitation, as well as resource mobilisation.

Institutional challenges, which threaten the sustainability of interventions supported under ZSHP, are linked to clarity of roles and responsibilities at the subnational (province and district) level. At the time of this evaluation, the MWDSEP did not have district-level structures and operated largely through the Ministry of Local Government and Housing (MLGH). The lack of structures at this level means that technical and financial support and financial flows directly through the ministry is difficult. This subsequently limits the capacity-building efforts required to sustain the investments and resulting effects of the ZSHP

3.3.4.2 Subdistrict Capacity

Implementation primarily occurs at the subdistrict level because Zambian law places sanitation under the jurisdiction of chiefs. As a Ministry of Local Government official explains, "It's the duty of the chief to ensure that there is good education, health, and sanitation in the chiefdoms or in their vicinities. The law is very clear and explicit that the owners of sanitation [are] actually the traditional leaders themselves." Therefore, the approach of the ZSHP has been to tap into the chiefs' existing ability to create community norms through sanctions, coercion, and force.

3.3.4.3 Financial Sustainability

Funding. In terms of financial sustainability, there are several areas of improvement but more needs to be done to sustain the required investments in sanitation. Sanitation has been given its own budget line in the government budget. Initially, this was lumped in with Water and Sanitation. This independent budget is likely to result in improved finances to the sector to sustain the results of the ZSHP. However, there are inconsistencies in the disbursement of funds, and the current budget allocation does not meet the required demand. For instance, the UNICEF donor report to DFID states:

Availability of adequate funds to sustain and increase coverage of WASH services so as to meet GRZ's Vision 2030 as well as SDG targets remain a major challenge. It has been estimated that Zambia would need to provide basic sanitation and hygiene services to 1.16 million and 1.46 million additional people per year, respectively, to be able to meet the SDGs targets of providing universal access to basic WASH services by 2030. This will require an annual investment of at least ZMW 3.94 billion (approx. US\$394 million) against the current Government allocation of around US\$57 [million] during 2018.

Sanitation Marketing. Sanitation marketing was introduced under ZSHP during 2014 and 2015 with the aim of building the capacity of the private sector—including community-based artisans, in providing sanitation services and options—and providing entrepreneur skills to local people. As part of sanitation-marketing business model, toilet design options were developed to suit the local conditions and building styles. Local masons, selected by district officials in consultation with local chiefs/headmen, were trained in construction of latrines.

However, our qualitative data indicate that this model had several implementation challenges. Although beneficiaries were told about the different designs of toilets, mostly because of lack of materials or finances, they built substandard toilets that would not last through the next rainy season. Further, some of the masons who were trained had no interest in sanitation and lacked entrepreneurial skills. A DFID official described the problem in the following way:

Masons are trained by UNICEF but they are still behaving like this is a project instead of gaining business skills such as designing sanitation products which are to be marketed in the villages. But perhaps the training of the masons was not so strong enough as to ignite the idea of self-sustenance and acquire the entrepreneurship needed.

Further, sanitation work did not yield a profit margin, which hindered involvement of the private sector. For example, a UNICEF WASH specialist explained, “We tried to engage Toilet Yanga but did not gain traction for the simple reason that (...) it was not making any sense economically to be involved.” As a result, most of the private-sector firms could not be part of the ZSHP.

These findings raise questions about the future impact of the sanitation marketing component in the GRZ's ODF Strategy 2019-2030. Unless some sort of private sector incentive is provided and targeting of training participants is improved, pockets of masons may still build toilets but not to the scale required to make meaningful impact.

3.3.4.4 Policy / Legal Sustainability

The policy/legal environment in Zambia is supportive of improvements in sanitation. This is exemplified by the recently created ministry dedicated to water and sanitation, a completed ODF strategy, among other policies.

4. Lessons Learnt

1. *Community Involvement*: Involving community leaders and structures in the CLTS model increases uptake of sanitation. Coupled with the emphasis on the use of local resources, the results of CLTS can be fully realised.
2. *Complementarity of WASH interventions*: Improving sanitation alone will not lead to improvements in safe hygiene practices – as water is a pre-requisite for handwashing and maintaining personal hygiene.
3. *Sanitation and Stunting*: Asserting that improvements in sanitation can result in reduction in stunting and wasting should be interrogated further by using rigorous evaluation approaches. There are many other factors at play that may reduce stunting and wasting including feeding practices, vitamin supplementation, breast-feeding practices among others. Caution, therefore, needs to be exercised when including stunting and wasting in sanitation project logics.
4. *Monitoring Systems*: Using technology that improves reporting, uptake of sanitation services and can lead to cost-saving if properly implemented. The volunteers that implement the applications must be well-trained and incentivised to be proactive in updating IT solutions such as the mobile to web (M2W)/DHIS2.
5. *Value for Money*: Performing value-for-money analysis at multiple stages of the programme and resourcing it adequately is important if utilisation of the results is to be achieved. Although the VFM analysis was included in the annual reports that UNICEF submitted to DFID, multiple respondents asserted that they were done to satisfy donor requirements and not to inform decision-making processes. Utilisation of a value-for-money (VFM) analysis should be improved and conducted annually to reflect trends in costs/benefits across years and programme influencing factors.
6. *Sanitation Ladder*: There has to be continuous encouragement of communities to move up the sanitation ladder, from simple latrines to basic and then safely managed sanitation, acknowledging that ODF is an important milestone. This is particularly important given the high expectations contained in the Sustainable Development Goals (SDGs) and Vision 2030 (Republic of Zambia, 2006), which contain aspects related to eliminating open defecation.
7. *Sanitation Marketing*: Introducing sanitation marketing early in sanitation improvement programmes, and adequately funding it is important for early uptake of various toilet solutions. Under ZSHP, this component was introduced later which reduced the resultant effect on communities' choice of toilets.

5. Conclusions

This evaluation concludes a multiyear investigation into ODF knowledge and practises across 68 districts in Zambia where the ZSHP operated. The programme includes many activities to address knowledge, behaviour, and access to services in both villages and schools, making it an ambitious and important endeavour. This end line report follows two previous rounds of evaluation, a baseline and midline (conducted by another organisation), and attempts to follow a similar structure, only deviating when it can improve the quality of data and results. The inclusion of qualitative data to investigate programme implementation and effects represents the primary difference between this report and previous programme reports. Here we summarise and highlight the main findings from the end line evaluation, first focusing on positive changes and successes, then discussing some of the challenges with the programme. We end with a few recommendations derived from the lessons learnt.

The goals of the ZSHP were to improve knowledge of ODF practises and increase the use of these practises, moving toward 100% ODF certification across Zambia, with the ultimate goal of improving everyone's health, especially the health of children. With regard to these goals, we found a number of positive changes over the evaluation period from baseline to follow-up. Perhaps most exciting was that young child nutrition indicators improved from baseline. Children under 5 years of age greatly improved over time with respect to incidents of diarrhoea, with half as many cases at end line (11%) as occurred at baseline (20%) or midline (19%). Cases of severe stunting were reduced from 32% at baseline to 10% at end line. We also see that cases of non-severe stunting were reduced from 46% at baseline to 32% at end line, demonstrating that there is still some room for improvement here. Last, we found incidents of wasting down from 14% at baseline to 6% at end line. With respect to health in general, we found reductions in disease burden for certain age groups and perceived reductions overall—and in diarrhoea in particular. It is interesting to note that the recent DHS report (2019) found similar levels of stunting and malnutrition in rural areas across the country. The ZSHP occurred in roughly two thirds of the country, so it is difficult to say whether the decreases over time were a national trend or were partially due to the widespread ZSHP.

We investigated the steps along the causal pathways to improved child nutrition and found areas that helped contribute to reductions in child malnutrition. Overall, we found that WASH knowledge and handwashing habits improved at end line from baseline and midline, with knowledge about proper practises being quite high; handwashing practises and access to handwashing facilities were still relatively low, however, with room to improve. At end line, almost everyone knew about the proper WASH practices (~98%), including the way the practises related to health risk. This level of knowledge represents a great improvement from the past, when roughly half of the sample knew about proper practises and the way they related to disease. The almost universal knowledge of WASH practises is an important step toward eliminating open defecation and improving health because knowledge about why and how to change is necessary for behaviour change.

Handwashing practises also improved over time, although only 16% of respondents washed their hands at all critical times (up from 7.9% at baseline). The low rate of access to a handwashing facility (9%) might help explain the low rates of handwashing. The least common time respondents washed their hands occurred after washing a baby's bottom

(21%), while the most common times were before eating (89%) and after defecating (95%). The near universality of handwashing at these two times demonstrates the potential to achieve high levels of adherence across all critical times.

Although we cannot attribute the quantitative changes solely to the programme because of limitations of the evaluation design, we found qualitatively that people perceived the programme activities to be effective at motivating behaviour change. They felt that the triggering activities were especially important for improving practises. Similarly, we found that the programme changed the taboo around speaking openly about defecation, making it easier and more common to talk about it. Removing this taboo, then, enabled communities to speak more freely about reducing open defecation.

We found that schools also improved their WASH conditions, especially with respect to handwashing facilities, which increased over time, as did the number of latrines per school, leading to fewer children having to share a latrine.

We found a number of challenges with the programme that could help explain why certain areas experienced less improvement over time. These challenges related to access to water and services and the cost of materials. For example, one of the goals of the programme was to achieve ODF certification, which entailed meeting a number of WASH-related criteria. However, almost none of the households in the sample (99%) met all the ODF certification criteria, mostly because they did not have a separate handwashing facility at the toilet. Many households used a pitcher and bucket to wash hands, but that did not meet the ODF criterion of having a designated handwashing facility. Households said that a lack of access to water made it difficult to sustain handwashing practises, while some also complained about not being able to buy soap.

The cost of materials proved a challenge not only for handwashing but for latrines. Households reported that it cost on average 82 kwacha to build a latrine, and almost all households provided their own materials to build their latrines (96%). And once they had a latrine, the cost of maintaining or rebuilding toilets was also high. Heads of households said that the fines they incurred as a result of not having a toilet forced them to build a makeshift toilet if their existing one fell apart. This result suggests that perhaps cost or lack of access to materials prevents more households from having their own latrines, making this a fertile area for improvement.

The same issue of lack of resources and access to water created challenges in schools. A lack of sanitary towels at schools meant that families had to incur the cost of obtaining the towels. Many schools ran out of sanitary towels when the initial supply ended. Schools also reported running out of soap for their handwashing facilities. A lack of access to water caused a challenge for maintaining their handwashing facilities.

At the programme level, limited resources prevented strong monitoring systems. Community volunteers did not receive payment and were not able to travel enough to sufficiently engage in real-time monitoring, an area in which the programme suffered. Even where the programme is successful, it faces challenges with sustainability. For those communities that achieved ODF certification, it was unclear what to do after that, and there

is a concern about “slippage” back into the practise of open defecation unless there is an incentive to sustain ODF status.

In conclusion, the ZSHP is an ambitious programme trying to tackle an important and prevalent problem across Zambia—the neglect of proper WASH practises. We find improvement over time across many important indicators from the theory of change, such as decreased child malnutrition, increased latrine ownership and use, improved knowledge about proper practices, and a desire to change. The programme faced several challenges to achieving its full goals, mostly due to limited resources. People and schools are unable to implement what they learn because they do not have the funds and cannot access the necessary services (especially water) to carry out their intentions.

These findings have several implications for the future of the intervention and the sustainability of the results. Finding ways to facilitate beneficiaries’ access to clean water and handwashing facilities is key for the intervention to achieve better results in handwashing practices. In addition, developing a system of incentives for community volunteers may contribute to improvements in programme monitoring. Further, creating a continued or renewed process of certification will help sustain the achievements of communities that have obtained ODF certification but are at risk of slipping back into open defecation. In the final section of this report, we provide detailed recommendations for ways to improve the programme while maintaining its current successes.

6. Recommendations

We provide recommendations based on our evaluation of ways to improve the programme and its effectiveness, recognising that there are budgetary and policy constraints on what can be changed. The recommendations presented in this section are a result the study findings and are presented in order of priority.

Table 29. Summary of challenges and recommendations

Recommendation Number	Challenge/issue	Recommendation	Stakeholders
1	Most households did not have a handwashing facility and cited difficulties in access to water as the cause. Households also were encouraged by NGOs to construct handwashing facilities using local materials, but this could not materialise as there was no water.	<p>Future WASH programmes should include water supply as an integral component.</p> <p>Government and cooperating partners (CPs) should not only improve sanitation but also access to water facilities. This is important as the ODF criteria also includes availability of handwashing facilities, which require the presence of water. This could be done through construction of additional water-points alongside improvements in sanitation.</p> <p>In addition, development and implementation of the WASH behaviour change communication (BCC) strategy should be prioritised by both government through the MWDSEP and UNICEF to accelerate behaviour change.</p> <p>Finally, there is a need to undertake research to better understand the motivators and demotivators for handwashing and come up with an appropriate strategy in this regard.</p>	GRZ and UNICEF

2	Lack of a “WASH in schools strategic plan” Lack of harmonized WinS designs and guidelines for the different challenging environment (hydrogeologic/socio – economic context)	UNICEF should consider supporting MoGE development of a WinS Strategic plan and harmonised WinS Standard designs and guidelines MoGE can consider convening a WinS Technical Working Group to coordinate strategic harmonization	UNICEF, MoGE
3	Lack of access to sanitary towels not only creates a sanitation problem but is one of the main reasons girls do not attend school regularly. Demand has been created through the MHM component of the ZSHP, but this has not been matched by supply of the towels.	There is need to encourage the private sector to manufacture low-cost reusable sanitary towels for girls in schools. UNICEF should partner with NGOs and private sector to leverage resources and meet the challenges together.	UNICEF
4	The programme model includes regular monitoring by community champions so that the programme can learn if there are challenges and address them quickly. Monitoring also supports accountability. However, the programme relies on volunteers to conduct monitoring, villagers in most cases. These volunteers have limited resources. A small investment in them will enable them to sustain the programme model and carry out monitoring activities (including entering data into the DHIS2 and M2W systems) at a relatively low cost.	Government should provide small incentives and resources (e.g. phone minutes, and transport) for local volunteer monitoring staff for sustainability of the DHIS2/M2W platform. This should also be included in the national budget. Government may also consider the potential for leveraging existing GRZ institutional arrangements – e.g. leverage on existing MoH EHTs (within health facility catchment areas) through operationalisation of MoU between MoH and MWDSEP. In this way, government can build capacity of MWDSEP at sub national level	GRZ and UNICEF
5	Many communities made great strides to achieve ODF certification but fear that they will not maintain the status after being certified. Communities seem to be responsive to incentives to motivate behaviour change. Perhaps creating effective post-ODF certification mechanism will help sustain the achievements of the programme over time.	UNICEF and GRZ should review and update the GRZ Mass ODF verification and certification protocols and develop post ODF monitoring protocol Government with support from stakeholders should operationalise the ODF Strategy 2018 – 2030. UNICEF and the government should develop and implement a post-ODF strategy that ensures continuity of the gains of the ZSHP. In addition, standard protocols and guidelines must be developed for ensuring that people aspire to move up the sanitation ladder.	UNICEF and GRZ

6	Financial gaps: There are inconsistencies in the disbursement of funds, and the current budget allocation is not sufficient to meet the required demand.	Government should operationalize the WASH-sector financing mechanism that suggests alternative resource mobilisation options. The implementation of this action plan will contribute to increased mobilisation of resources for the WASH sector, including new investments, as well as funds for operation and maintenance.	GRZ and UNICEF
7	Lack of subnational structures: Subnational structures are lacking for MWDSEP and capacity of staff is low at these levels. This is despite using other ministries like MLGH to implement programs such as ZSHP	Government should work towards filling the vacant positions at subnational level to deliver sanitation services. This calls for a coherent transitional plan with clear roles and responsibilities for staff at provincial and district levels.	GRZ
		UNICEF should continue to support MWDSEP capacity building of staff and clarification of roles and responsibilities of its various units. UNICEF should support the Joint WASH and Environmental Protection Sector Review and finalisation of the National WASH Policy. Strengthen Sanitation and Hygiene Technical Working Group and develop specific coordination arrangements	UNICEF
8	Durability/strength of toilets built by households: The toilets are weak and often do not last to the next rainy season.	Operationalise the Sustaining Demand component of the ODF Strategy 2018 – 2030 Government and UNICEF should strengthen sanitation marketing, which involves availing toilet design options applicable to specific conditions such as type of soil. Through the National Rural Water Supply and Sanitation Programme (NRWSSP) & ODF Strategy 2018 - 2030, deliberate steps should be taken to strengthen private-sector involvement in building toilets.	GRZ and UNICEF
9	Sanitation Designs: Some of the designs for schools increased the cost of construction as a result of the brittle structure. Rebuilding the toilets that collapsed proved costly for the programme.	The National WinS Strategy, currently under development, should include low-cost but stronger toilet options. The toilet designs should withstand different environmental conditions.	GRZ/MoGE and UNICEF

10	While the programme included specific measures to engage women and meet the gender equity goals, there were no similar procedures to target vulnerable groups. As a result, decisions to support the most vulnerable members of a specific community were made at the discretion of community members.	For future programmes, UNICEF must include actions that deliberately target the most vulnerable members of the community, such as the disabled, by developing inclusive procedures or guidelines.	UNICEF
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Appendix A. Background

A.1 WASH Outcomes in Zambia

Despite large gains in WASH outcomes in Zambia over the last 2 decades, there is still substantial room for improvement. Rates of people practising open defecation in Zambia fell from 25% to 19% between 2000 and 2017, implying that 1 in 4 households still practises open defecation (Joint Monitoring Report, 2019). Open defecation rates are significantly higher in rural areas (32%) than in urban ones (3%). Progress on access to sanitation infrastructure is similar: About 28% of Zambians have access to a limited washing facility without water or soap (compared with 26% in rural areas), and almost 58% nationally have no access to any washing facilities (compared with 71% in rural areas) (Joint Monitoring Report, 2019).

Lack of adequate sanitation and poor hygiene practises are the leading causes of diarrhoea, among other illnesses, which in turn leads to poor nutritional status in young children, who then suffer from the conditions of stunting and wasting. In fact, improving poor water quality and sanitation conditions is likely to be a precondition to dramatically decreasing stunting. Consistently poor hygiene conditions can lead to clinical conditions such as chronic diarrhoea and environmental enteropathy, which may limit nutritional uptake and lead to chronic malnutrition despite high nutritional intake (Mondal et al., 2012). Stunting, wasting, and micronutrient deficiencies contribute to nearly 3.1 million child deaths annually (Bhutta et al., 2013). In Zambia, maternal and child undernutrition is responsible for 50% of the deaths in children under age 5—in part attributable to poor WASH conditions. The recent Zambia Demographic and Health Survey estimates that 35% of children under age 5 are stunted, 4% are wasted, and 12% are underweight (Demographic and health survey, 2019).

A.2 Zambia's National Rural Water Supply and Sanitation Programme

Globally, close to 90% of deaths due to diarrhoea are attributable to lack of safe drinking water and adequate sanitation and hygiene practises (Black, Morris, & Bryce, 2003). Simple solutions, such as washing hands with soap and clean water, are very effective at reducing the risk of this disease, as well as respiratory infections such as pneumonia (Jamison et al., 2006; UNICEF, 2018a). Washing hands with soap reduces the incidence of diarrhoea by more than 40% (Curtis & Cairncross, 2003; Fewtrell et al., 2005; Luby et al., 2005).

Diarrhoea also weakens children's nutritional status, which significantly increases the risk of stunting in young children (Black et al., 2008). There is a growing body of evidence that examines the direct link between poor sanitation and stunting. The results of these studies have been mixed, with some showing direct cause-effect linkages between WASH and nutrition indicators like stunting and wasting, while others show no effects at all. For example, open defecation was responsible for more than half the variation in child height in India (Spears, 2013), and a study of a CLTS programme in Mali showed that the intervention successfully reduced stunting and had a positive effect on children's height (Pickering, Djebbari, Lopez, Coulibaly, & Alzua, 2015). However, a randomised control trial conducted in Bangladesh, Zimbabwe and Kenya showed no effect of WASH interventions alone on linear growth of children (Pickering et al., 2019).

A.3 Costs of Poor Sanitation

Poor sanitation costs Zambia approximately US\$194 million every year, equivalent to US\$12.5 per person or 1% of gross domestic product. Approximately 8,700 Zambians, including 6,600 children under age 5, die each year from diarrhoea. This result in an estimated US\$167 million loss each year because of premature deaths, with additional costs from the adverse impact of malnutrition on child development. Approximately US\$10.6 million is spent each year on health care treating diarrhoea-related diseases, malnutrition, and other diseases linked to poor sanitation (Water and Sanitation Project (WSP), 2012).

This evidence and the current context in Zambia make improving sanitation a critical priority for GRZ, as detailed in the Seventh National Development Plan (7NDP), the Vision 2030 (Republic of Zambia, 2006), and the recently drafted NRWSSP (2016–2030). According to the NRWSSP Phase 2, rural communities need access to improved sanitation and hygiene practises to survive and thrive. The sanitation objectives of the draft NRWSSP are as follows:

1. Eliminate open defecation by 2030 and increase the number of people in rural areas using safely managed sanitation facilities. This will be accomplished through a mixed approach, which will combine work-on-demand creation, hygiene behaviour change communication, and sanitation marketing.
2. Improve the quality of sanitation and hygiene programming in all districts to ensure that communities invest in improved facilities and move up the sanitation ladder; districts will promote behavioural change in sanitation and hygiene practises.
3. Strengthen capacities at the district and subdistrict levels for sanitation and hygiene promotion in communities and schools and ensure that this is part of the school curriculum.
4. Support innovations and approaches that will help improve sanitation and hygiene in rural communities and schools (Ministry of Water Development, Sanitation and Environmental Protection, 2017).

A.4 Zambia Sanitation and Hygiene Programme (ZSHP)

To achieve the objectives of the NRWSSP, with funding support from UKaid (through the Department for International Development [DFID]) and the GRZ, UNICEF and partners began implementing ZSHP in 2011 in 45 districts and later scaled up to 68 districts in rural Zambia. Within the 68 districts, this US\$35m programme covered 150 traditional chiefdoms and approximately 3.9 million people, 12,427 villages, 1,064 schools across the country, and aimed to reduce open defecation and the prevalence of WASH-related diseases, diarrhoea, and upper respiratory infections.

The programme features four main implementation activities:

5. **Community Approaches to Total Sanitation (CATS).** CATS features CLTS, which mobilises communities to take the lead in eliminating open defecation. The target output includes consistent use of improved sanitation facilities.
6. **Institutional Sanitation.** This component includes SLTS programmes that target improvements in sanitation and sanitation hardware and aims to promote school-based

management systems of the infrastructure. The target output includes additional schools' having appropriate sanitation facilities (including handwashing facilities with soap available), as well as an appropriate management system and hygiene promotion activities.

7. **Sanitation Marketing.** This component aims to build the capacity of the private sector to adequately respond to rising demand for sanitation, including more affordable and durable toilet options. The target output for this activity is enabling small-scale service providers, including individuals, in targeted rural districts to supply sanitation and hygiene services in response to household demand.
8. **Hygiene Promotion/Handwashing.** The hygiene promotion/handwashing component, which includes mass media campaigns, interpersonal communication, and celebration of national and global events, targets wide-scale WASH-related behaviour change. The primary outputs for this activity include enhancing the capacity of national-, provincial-, and district-level administrations to implement and monitor sanitation promotion (including cholera preparedness and emergency response) and drawing useful lessons from the implementation and the monitoring and evaluation of the sustainability component of rural sanitation programmes and the quality of behaviour change interaction.

Specifically, the programme aimed to achieve the following outputs:

Output 1: Three million six hundred thousand people become new consistent users of improved sanitation facilities and hygiene practices.

Output 2: An additional 1,000 schools have appropriate sanitation facilities, including handwashing facilities with soap available, together with an appropriate management system and hygiene promotion activities.

Output 3: National-, provincial-, and district-level administrations have the capacity to plan, implement, and monitor sanitation promotion (including cholera preparedness and emergency response).

Output 4: Small-scale service providers, including individuals, in target rural districts are enabled to supply sanitation and hygiene services in response to household demand.

Output 5: Useful learning is drawn from the implementation and the monitoring and evaluation of the programme for the sustainability of rural sanitation programmes and quality of behaviour change interactions.

ZSHP adopted several approaches designed to spur behaviour change so that households could build toilets and provide resources for the construction of school-level improved sanitation facilities and handwashing facilities (all of which were constructed using low-cost methods and locally available materials). For example, the programme heavily involved traditional leaders in fostering behaviour change and engaged community champions, whose role was to visit households to mentor, advise, and remind community members of the importance of WASH—also, to collect data and to monitor the sanitation and handwashing status of the households and schools, initially using a paper-based reporting

format, and later transitioning to mobile to web (M2W)³⁹. In line with the GRZ mass verification and certification protocol, chiefdoms in which at least 90% of households practised improved sanitation and had working handwashing stations received an open defecation-free (ODF) status certification and were rewarded with a public celebration. The ceremony was meant to be a celebration of the achievement, an incentive for communities to achieve the goal, and a way to cement new social norms around the use of sanitation facilities (as opposed to open defecation).

³⁹ M2W/RTM/DHIS2 are electronic platforms that use mobile phones to collect, synthesize and summarize sanitation data

Appendix B. Programme Theory of Change

B.1 CATS Theory of Change

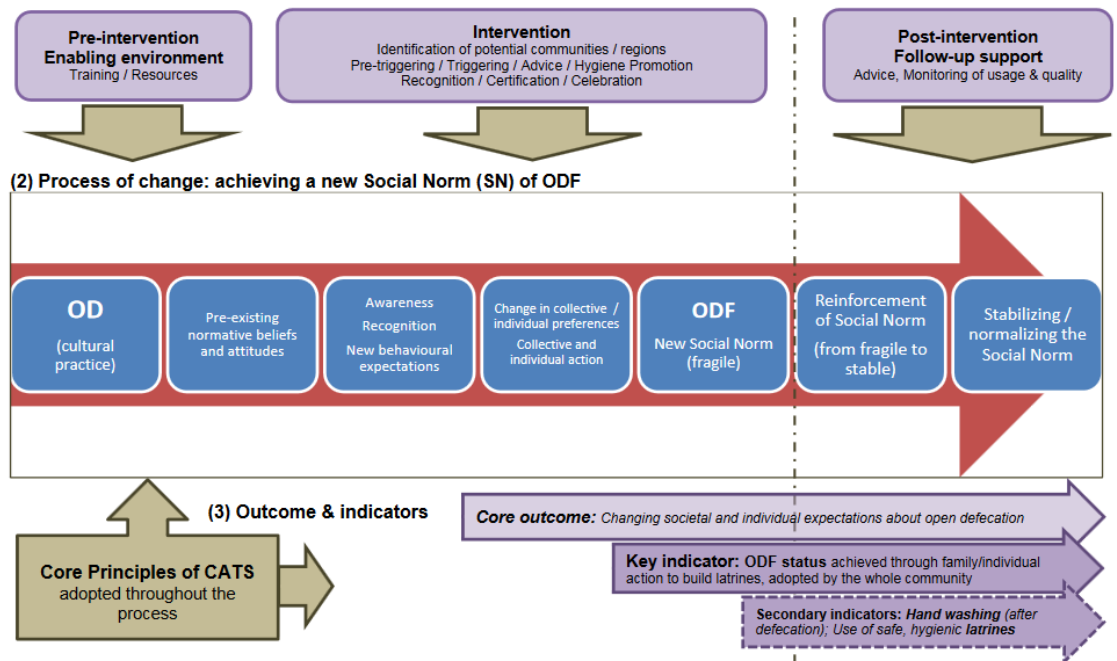
Evaluations of CATS and of CLTS, in particular, in countries outside of Zambia demonstrate that demand-side, community-based approaches decrease the prevalence of diarrhoea and sanitation-related morbidity more than supply-driven approaches. The development of new social norms around sanitation and hygiene practises is also key to the long-term success and sustainability of these approaches and underlies the broader theory of change of the ZSHP. Since the CATS theory of change (Figure B.1) informs the ZSHP, we first present this theory of change and then describe the ZSHP theory of change (Figure B.2).

There are many definitions of programme sustainability, with most of them entailing continuation of activities and program effects after program funding ends (World commission on environment and development, 1987). In this evaluation, we defined sustainability using a multi-pronged approach that looks at behavioural/social, institutional, financial and policy/legal sustainability. Sustainability requires the successful transition from a new, fragile social norm to a stable social norm that encompasses the desired behaviour change. In line with the CATS theory of change, our theory of change proposes that CATS programme inputs in the right enabling environment will create a new social norm of no open defecation. A new social norm will change individual and collective preferences and behaviours and will be reinforced by formal and informal rules at the local level. Sustained absence of open defecation over time indicates that the new social norm has stabilised. CATS operates through nine key principles (UNICEF, 2014):

1. The goal is to eliminate open defecation through affordable, appropriate technology and behaviour change, with an emphasis on the sustainable use of sanitation facilities rather than the construction of infrastructure.
2. Diverse members of the community should be engaged, including households, schools, health centres, and traditional leadership structures.
3. Communities should lead the change process and use their own capacities to attain their objectives. Their role is central in planning and implementing CATS, which requires taking into account the needs of diverse community members, including vulnerable groups, people with disabilities, and women and girls.
4. Subsidies should not be given directly to households.
5. Communities must determine for themselves what design and materials work best for sanitation infrastructure. Households should build toilets using locally available resources.
6. CATS builds the capacity of community facilitators and local artisans in order to enable sustainability.
7. The government should participate in CATS at the local and national levels.
8. Hygiene promotion needs to be integrated into the programme design.
9. CATS is an entry point for social change.

According to UNICEF’s evaluation of the WASH-sector strategy for CATS (UNICEF, 2014), CATS interventions are most likely to succeed when quality triggering sessions are provided, local leaders are involved, there is effective enforcement of community-developed rules, and there is ongoing monitoring of household behaviour.

Figure B.1. CATS Theory of Change

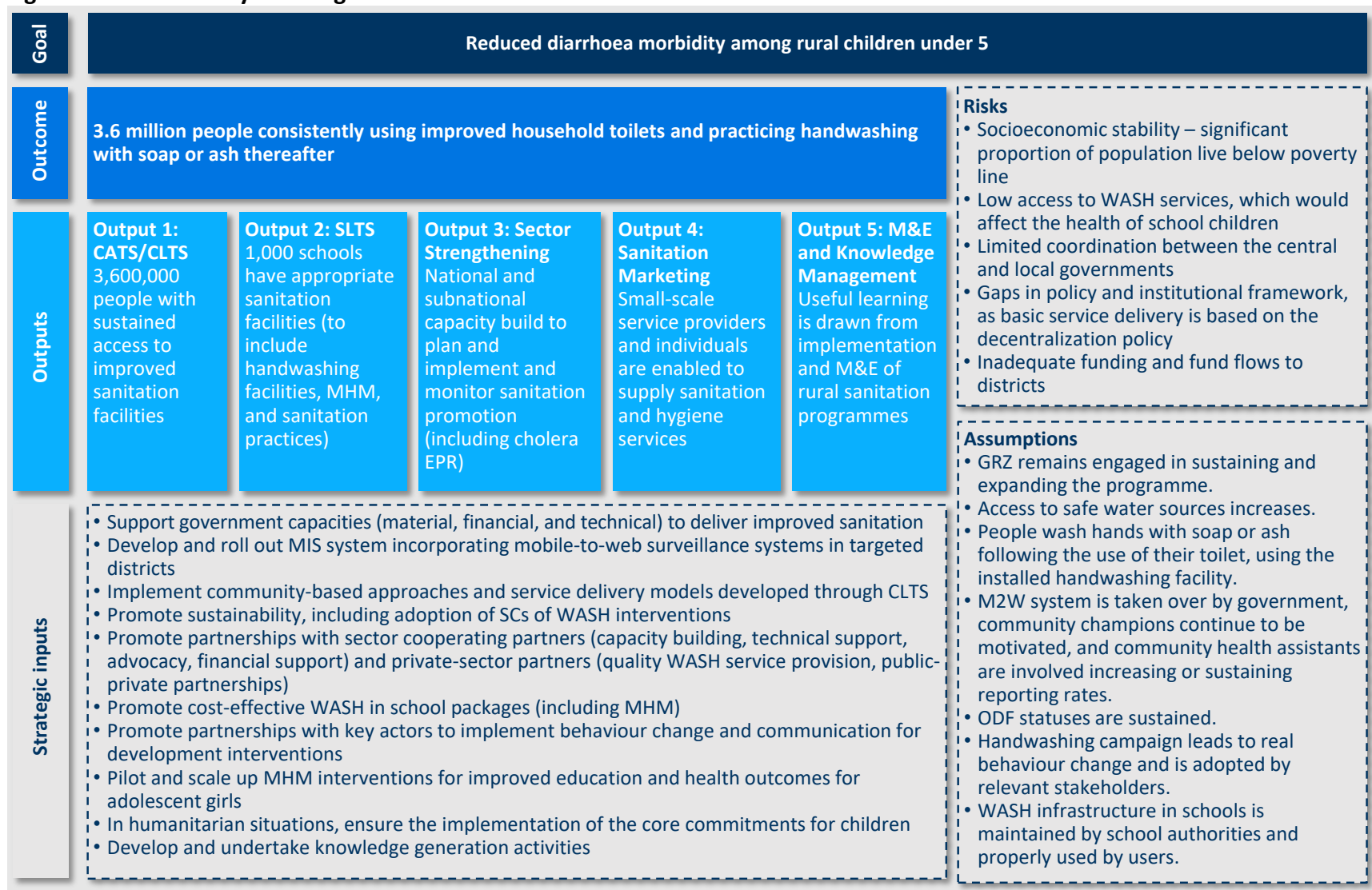


OD = open defecation; ODF = open defecation free. Adapted from UNICEF. (2014). *Evaluation of the WASH sector strategy for Community Approaches to Sanitation (CATS)* (Final evaluation report). Copyright © 2014 by United Nations Children’s Fund.

B.2 ZSHP Theory of Change

The ZSHP theory of change (Figure B.2) builds on the CATS theory of change, pairing the CATS activities with complementary institutional sanitation programming, sanitation marketing, and communication about development activities. In our theory of change, we focus on the “sustainability channels” column, which we see as an intervening stage of outcomes that ultimately ensure that final outcomes achieved by the ZSHP will persist after the programme concludes. We anticipate that various institutional constraints will serve as important moderators on the effectiveness of the programme and the efficiency of implementation.

Figure B.2. ZSHP Theory of Change and Evaluation Criteria



Appendix C. ZSHP Logframe

Result	Indicator and Target	Overall Cumulative Achievement ³³ (November 2011 to 30 September 2018)
IMPACT: Reduced diarrhoea morbidity amongst rural children under five	Reduced diarrhoea morbidity amongst rural children under five from 20.4 per cent ³⁴ to 16.3 per cent.	To be determined based on the ongoing ZSHP End of Programme Evaluation (please refer to Annex 1: ToR - ZSHP End of Programme Evaluation)
OUTCOME: 3.6 million people consistently using improved household toilets and practicing hand-washing with soap or ash thereafter	The proportion of population in target districts using improved sanitation facilities with a functional hand-washing facility at the toilet from 8.3 per cent ³⁵ to 55 per cent	
OUTPUT 1: Three million and six hundred thousand (3,600,000) people (new users) consistently utilising improved sanitation facilities and hygiene practices	1.1 Number of additional people with sustained access to improved sanitation (Target: 3,600,000)	Exceeded. 3,905,474 ³⁶ new users of improved sanitation cumulative total to date.
	1.2 National Sanitation and hygiene Behaviour Change Communication (BCC) Strategy and plans established with MoLG/MWDSEP and implemented, with both community level interventions and mass media components Target: BCC Strategy and plans developed and endorsed by the Government	Constrained. <ul style="list-style-type: none"> Draft Sanitation and Hygiene BCC Strategy was developed in 2016. Following creation of the new Ministry i.e. MWDSEP, the strategy was handed over to MWDSEP. MWDSEP, however, decided to widen the scope of the strategy so as to include water supply component as well. Subsequently, MWDSEP-led Thematic Working Group (TWG), involving participants from UN, NGOs and GRZ was established to finalise the Strategy. As of 30 Sept 2018, the process of engagement of a consultant was underway with funding from UNICEF). The Strategy is planned to be finalised during the first quarter of 2019³⁷.
	1.3 Number of verified open defecation free (ODF) villages achieved (Target: 12,000)	Exceeded. 12,427 villages verified
	1.4 Number of people reached with hygiene promotion activities (Target: 8,000,000)	Exceeded. 8,846,160 people reached ³⁸
	1.5 Number of people with sustained access to handwashing (Target: 3,600,000)	Met. 3,607,208 people with access to sustained handwashing
	1.6 Number of chiefdoms in target districts with an evidence based, feasible Hand Washing (HW) action plan that is reviewed once per year (Target: 80)	Met. 81 chiefdoms have action plans
OUTPUT 2: One thousand additional schools have appropriate sanitation facilities including hand-washing facilities, and soap available; together with an appropriate management system and hygiene promotion activities.	2.1 Number of additional schools that have appropriate sanitation facilities (Target: 1,000)	Exceeded. 1,064 schools have appropriate sanitation and hygiene facilities, benefiting 348,143 pupils (177,519 boys and 170,624 girls).
	2.2 Number of Provincial Education Offices (PEOs) with a school WASH Action plan. Target: 10 provincial education offices	Met. 10 PEOs have action plans
	2.3 Number of piloted schools with Education Statistics reported through real time monitoring system. Target: 50 schools	Met.

³³ Source: Unless otherwise specified, provided figures are based on data from the MWDSEP RTM/DHIS2 and or programme progress reviews/reports. It may be noted that the ZSHP commenced in November 2011, while the baseline survey was carried out in May – June 2013. This actual baseline figures would, therefore, be lower if the survey had been carried out during 2010/11.

³⁴ This baseline figure is informed by the Boston University Baseline study of June 2013

³⁵ This baseline figure is informed by the Boston University Baseline study of June 2013

³⁶ The cumulative harvest stands at 3,905,474. The report is available at: http://clts.dhis2.net/mwdsep_report.html, harvest section

³⁷ Latest status: the consultant is onboard, the Inception Report has been cleared by the TWG, and work is ongoing on finalisation of Strategy.

³⁸ Notes: (a) 16 media outlets (radio stations) were engaged under the ZSHP WASH media campaign, (b) To avoid double reporting, ZNBC Radio 1 listenership figures adopted for this report (note ZNBC has a national outreach, and ZSHP Media programme also supported 10 community radio stations), (c) According to ZNBC, it has a reach of 87 per cent of the population, (d) According to IPSOS, ZNBC Radio 1 has a listenership of 62 per cent; (e) ZNBC Radio1 aired local language radio drama/programmes in seven local languages

		50 schools have reported through real time monitoring system in one pilot district i.e. Namwala, and under the leadership of MoGE.
<p>OUTPUT 3: National, provincial and districts level administrations have capacity to plan, implement and monitor sanitation promotion (including cholera preparedness and emergency response).</p> <p>Note: Indicators 3.1a, 3.2a and 3.3a were met, and in December 2015, no new milestone was added, and decision was taken that these indicators be retained in the logframe, but no further action/investment be made.</p>	<p>3.1.a Percentage of implementing district with at least an annual review / planning process dedicated to hygiene and sanitation interventions. Target: 90 per cent</p>	Exceeded. 96 per cent
	<p>3.2.a Number of National Sanitation Technical Working Group meetings convened by MoLG with CPs participating. Target: 6 meetings</p>	Exceeded. 8 meetings, and African Sub-Regional Conference hosted in Zambia under the leadership of GRZ)
	<p>3.3.a Sanitation and Hygiene Performance Monitoring System (PMS) established. Target: 90% of the district reporting results on a regular basis covering an average 70% of wards.</p>	Met. Achieved 90% of districts are reporting in 70% of wards - as reported in the WASH Management Information System (MIS)
	<p>3.1 (included in 2016) National ODF Action Plan is reviewed, revised and reported annually. Target: <i>ODF Strategy developed (incorporating Vision 2030 and the SDGs), endorsed and under implementation.</i></p>	Met. ODF Zambia Strategy 2018-2030, which includes a costed action plan, has been finalised. The Strategy, which is aligned with the GRZ Vision 2030 and the SDGs, was launched on the sidelines of the National Sanitation Summit on 19 November 2018 and is under implementation.
	<p>3.2 (included in 2016) Advocacy and technical support provided to create and sustain WS&S Directorate within MoLG. Targets: <i>(i) Directorate within MoLG created and supported (ii) WASH Policy finalised; (iii) Joint Water Supply, Sanitation and Environmental Protection Sector Review for 2017/18 conducted (iv) National Rural Water Supply and Sanitation Programme 2016 - 2030 finalised (jointly with GIZ); (v) Costed ODF 2018 - 2030 Implementation plan developed.</i></p>	Met. A new Ministry i.e. Ministry of Water, Development, Sanitation and Environmental Protection created with a dedicated Department of Water Supply and Sanitation. Under MWDSEP leadership: (i) the National WASH Policy was finalised and is currently under internal GRZ review for submission to the Cabinet; (ii) the Joint WASH (and Environmental Protection) Review was conducted and the report is under finalisation; (iii) The National Rural Water Supply and Sanitation Programme 2016 - 2030 finalised and under print (this activity was supported jointly with GIZ); and (iv) As part of the ODF Zambia Strategy 2018 - 2030, a costed Implementation plan has been developed and adopted.
	<p>3.3 (included in 2016) Number of target districts with operational real-time monitoring system to report on rural WASH interventions. Target: 68 districts.</p>	Met. 68 districts
	<p>3.4 (included in 2017) Number of target districts with operational, multi-sectoral cholera emergency preparedness, prevention and response implementation plans. Target: 27 districts</p>	Met. 27 districts, and Lusaka
	<p>3.5 (included in 2018) Number of water points where chlorination levels are enhanced to ensure free chlorine residual of 0.5 mg/l Target: 300 water points</p>	Met. 300 water points in cholera affected areas in Lusaka

	<p>3.6 (included in 2018) Number of people who benefit from the improvements in the water supply service levels in the target areas (Target: 24,000 through water trucking)³⁹</p>	<p>Exceeded. Approx. 24,000 people in Lusaka were provided safe water through water trucking. It should be noted that, in consultation with DFID, most of the earmarked DFID funds for this activity were re-programmed to undertake the on-going ZSHP End of Programme Evaluation.</p>
	<p>3.7 (included in 2018) Number of people reached with messages on safe hygiene practices. Target: 100,000 people</p>	<p>Exceeded⁴⁰ 400,000 people</p>
	<p>3.8 (included in 2018) Number of schools provided with basic emergency WASH package⁴¹ Target: 41 schools</p>	<p>Met 41 schools</p>
<p>OUTPUT 4: Small scale service providers - including individuals - in targeted rural districts are enabled to supply sanitation and hygiene services in response to household demand</p>	<p>4.1 Number of chiefdoms with difficult soil conditions having at least 2 active and accredited service providers enabled to respond to public and private demand for sustainable latrines Target: 65 chiefdoms (and at least 250 entrepreneurs / masons)</p>	<p>Exceeded. 106 chiefdoms. A total of 106 chiefdoms and 663 masons trained entrepreneurs/ masons, out of which 288 masons in 81 chiefdoms are active (i.e. 81 chiefdoms have 2 or more active masons).</p>
<p>OUTPUT 5: Useful learning is drawn from implementation and M&E on sustainability of rural sanitation programmes and quality of behaviour change interaction.</p>	<p>5.1 Impact assessment of Phase I of the Programme is finalised and MoLG and partners use the findings as they continue to develop and strengthen WASH policies and systems beyond Target: Three reports (Baseline, End line and Impact) finalised</p>	<p>Met Three reports (Baseline, End line and Impact) finalised and disseminated. Findings utilised to inform programming (e.g. need for intra and inter synergistic/integrated programming, increased focus on drinking water quality and design of the KfW-supported WASH programme).</p>
	<p>5.2 Sustainability checks completed Target: Three sustainability checks are completed</p>	<p>Met Three sustainability checks 2012/13, 2015, 2016 completed, and findings used to guide / inform next cycle of programme implementation.</p>
	<p>5.3 (New, 2016) Post-ODF Sustainability Assessment finalised Target: Assessment finalised</p>	<p>Discontinued. In consultation with DFID, this indicator was discontinued in January 2018 and funds reprogrammed for cholera response (see under New Indicators 3.4, 3.5, 3.6, 3.7 and 3.8) Subsequently, parts of funds earmarked for cholera response were further reprogrammed for undertaking the ZSHP End of Programme Evaluation (currently in progress).</p>

³⁹ The target was agreed with DFID during 2018, based on the needs and changes in the context.

⁴⁰ Target exceeded as additional resources were provided by UNICEF. These resources were utilised to support the Ministry of Health with re-orientation and training of social mobilisers on cholera prevention and control to reach 400,000 most at risk in Lusaka District

⁴¹ The original target was 50 schools. This was revised in consultation with DFID, based on changes in the context. Scope included provision of Cholera hygiene kits, rehabilitation of key WASH facilities in targeted schools

Appendix D. Methodology

To address the evaluation questions listed above, AIR used a mixed-methods approach that included surveys with 1,199 households and 81 schools; a document review of WASH policies and programmes; qualitative interviews with DFID, UNICEF, and WASH-sector stakeholders; focus group discussions with heads of households, children, and social mapping with key WASH stakeholders in Zambia.

D.1 Quantitative Approach

Our quantitative approach combined household and school survey data and school observations from a representative sample of EAs to address the evaluation questions about effectiveness. The household survey assessed the ODF-related outcomes and certain programme assumptions (e.g., households exposed to ZSHP media campaigns on radio and TV), programme outputs (e.g., the number of users utilising improved sanitation facilities), and programme outcomes (e.g., the number of people with sustained access to improved sanitation facilities, including in marginalised communities, and the number of villages with sustained ODF status). The school survey measured certain programme assumptions, as well as additional programme outcomes (e.g., the number of schools with improved sanitation facilities and hygiene promotion activities). AIR also conducted a value-for-money analysis to examine programme efficiency.

D.1.1 Quantitative Instruments

D.1.1.1 Household Survey

The household survey focused on WASH-related knowledge, attitudes, and practises to examine whether villages granted ODF status as part of the programme still met the ODF criteria. The persistence of behaviour change would provide evidence in support of a lasting impact of the programme and overall programme sustainability. We designed the household-level measurements to be as comparable as possible to those of other representative surveys, such as the Demographic and Health Surveys Program and BU-ZCAHRD studies. We incorporated questions on sanitation and handwashing infrastructure and behaviour from the Village ODF Claim, Verification, and Certification Form into our household survey to ensure that we were assessing ODF certification in a manner consistent with the programme. These measurements included variables observed directly at the households by the enumerators, who were trained in observing the infrastructure and collecting data directly from their own observations.

Direct observations identify indicators for the presence of functional and improved latrines and handwashing infrastructure, improved access to water sources, signs of open defecation, and correct handwashing behaviour.

In addition to questions on knowledge of sanitation and handwashing infrastructure and behaviour, the survey included questions on demographics, assets, hunger scale, social capital, and gender decision-making and bargaining power, along with other sociological and economic factors that contributed to a household's open defecation and WASH practises. The survey also collected data on the incidence of diarrhoea and upper respiratory infection for all children under age 5. To assess fidelity of implementation, the survey asked about the presence and frequency of monitoring visits and other CLTS

activities and about exposure to the communications of development campaigns or other information and communication material.

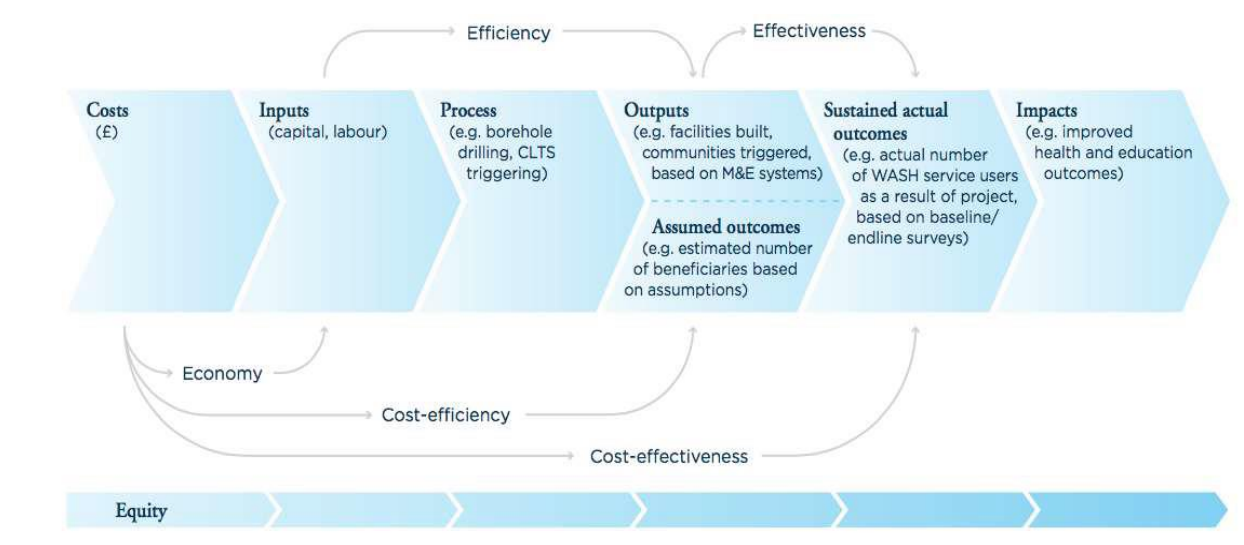
D.1.1.2 School Surveys

We conducted an abbreviated 81-schools survey that included data on the number of school staff and other stakeholders trained, the number of sanitation and handwashing facilities built, and pupil and teacher exposure to WASH training. The school survey also verified the presence of a school WASH committee and of WASH guidelines. In addition to the survey, we conducted school observations to assess (1) the functionality and status of latrines in the schools and assess whether the facilities are girl friendly, (2) the functionality and status of handwashing stations (such as availability of soap and clean water), and (3) pupil exposure to WASH training at school through the official curriculum or presentations by outside groups.

D.1.2 Value-for-Money Analysis

In conducting a value-for-money (VFM) analysis, we followed the standardised guidelines developed by Oxford Policy Monitoring for conducting VFM analyses in WASH projects (Prat, Ross & Tremolet, 2015). The VFM analysis was conducted across five set criteria—economy, efficiency, cost-efficiency, effectiveness, and cost-effectiveness—in a result chain (Figure D.1). The object of the analysis is to align unit costs with what is in the business case and also to maximise actual programme impacts.

Figure D.1. Result Chain for the Value-for-Money Analysis



Adapted from *Prat et al., 2015*.

D.2 Qualitative Approach

AIR used several qualitative methods—focus group discussions (FGDs), key informant interviews (KIIs), social mapping, and direct school observations—to answer evaluation questions related to programme implementation and sustainability, in addition to supplementing the quantitative impact analysis. FGDs helped us understand providers' and beneficiaries' perceptions of the programme, as well as the community-level norms that influenced the implementation of ZSHP interventions. KIIs helped us to understand

facilitators of and barriers to effective implementation, as well as perceived impacts of the programme overall. Social mapping enabled us to identify the main actors and agencies that shape the WASH landscape, and direct school observations helped us to understand WASH practises in communities.

The qualitative component complements the quantitative survey by (1) providing rich contextual insight regarding WASH practises, (2) capturing data on implementation factors that are difficult to measure through survey questions, (3) addressing potential biases in quantitative research that may emerge due to social desirability bias,⁴⁰ and (4) triangulating patterns from the survey and explaining unexpected results or outliers that emerge from quantitative findings. Below, we describe each method in greater detail.

D.2.1 Desk Review

AIR conducted a comprehensive desk review to assess the alignment of the ZSHP with UNICEF policies and programmes in Zambia; the comparative strengths of the ZSHP; and the programme's alignment with other government of Zambia programmes, government policies, and technical standard guidelines. These documents were also used to triangulate responses received during interviews and FGDs regarding programme implementation processes. AIR purposively selected relevant documents and reports in consultation with UNICEF, which provided an initial list of documents. A total of 42 documents were reviewed, including ZSHP programme implementation documents; DFID planning documents and progress reports; extractions from MWDSEP's management information system; and UNICEF's country programme document, programme cooperation agreements, progress reports, baseline reports, annual review reports, government planning documents, and sustainability checks. AIR coded these documents using the NVivo qualitative software programme to identify relevant themes.

D.3 Quantitative Sampling

We followed a two-stage sampling approach to select households for our survey. Our sampling was guided by two objectives: (1) to examine the persistence of behaviour change and potential and (2) to maintain comparability with the BU-ZCAHRD evaluation. In line with these objectives, AIR sampled at the EA level.

D.3.1 Sampling Enumeration Areas

The first step was to select 40 EAs. Of all the wards sampled in the BU-ZCAHRD evaluation, only 34 were part of the ZSHP program, and all of these were included in our sample (Table D.1). A list of EAs for each of the six wards (Table D.1) was obtained from the Central Statistical Office (CSO). One EA was then randomly selected for each ward to make up our sample size of 40 total. It should be noted that no wards from Copperbelt Province were included among these 34.⁴¹ The Southern Province was also underrepresented, accounting for only three of the 34 wards. In view of this, AIR sampled three wards each from the

⁴⁰ In this assessment, we anticipate that respondents may be unwilling to speak openly about open defecation habits, for example, since cultural norms indicate that such topics should not be discussed openly.

⁴¹The initial sampling criteria included wards selected in the BU evaluation that were also part of the ZSHP programme. Since no wards from Copperbelt province met these criteria, these wards were not included in the original sample of 34. Please note that Copperbelt and Southern Province wards were sampled and included in the final list of 40 wards.

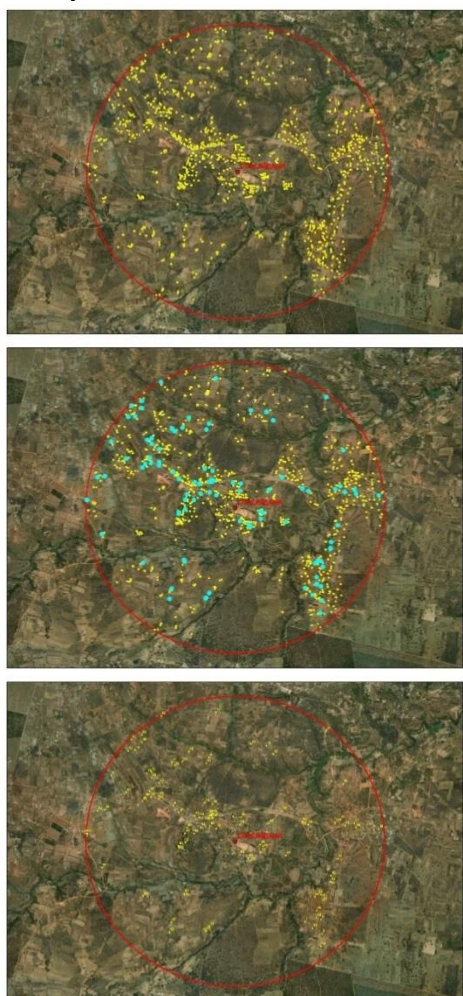
Copperbelt and Southern Provinces using the sampling frame of 37 chiefdoms declared ODF before 2016 (Table D.1).

Table D.1. List of Enumeration Areas

Province	District	Ward	EA ID
Central	Chibombo	Mungule	10101002091193
	Chibombo	Chikobo	10101003161022
	Kapiri Mposhi	Kashitu	10103006091031
	Chibombo	Chilochabalenje	10101002111061
	Kapiri Mposhi	Kapiri Mposhi	10103006081102
	Kapiri Mposhi	Kakwelesa	10103006131221
	Kapiri Mposhi	Mushimbili	10103006101011
	Kapiri Mposhi	Lwanchele	10103006031092
	Mkushi	Tembwe	10104007091032
	Mumbwa	Shichanzu	10105011131032
Eastern	Lundazi	Chimaliro	30304050161082
	Lundazi	Lunevwa	30304050181171
	Lundazi	Nkhanga	30304048071012
	Lundazi	Kajilime	30304048051142
	Mambwe	Kakumbi	30305051071012
Luapula	Chiengi	Mununga	40401065131043
	Chiengi	Kalungushi	40401065121042
	Nchelenge	Kabuta	40406066011042
	Nchelenge	Chilongo	40406066071036
Muchinga	Chinsali	Chilinda	60602083031031
	Chinsali	Chandaula	60602084141023
	Mpika	Lulingila	60605098051032
	Mpika	Mupamadzi	60605099221043
	Mpika	Nachikufu	60605100161022
Northern	Kaputa	Chubo	70702088091033
	Mbala	Mukololo	70705097091082
	Mpulungu	Isoko	70707096071082
	Mpulungu	Chibulula	70707096031111
	Mpulungu	Mumila	70707096091032
North-Western	Solwezi	Lumwana	80807112191033
	Solwezi	Musele	80807112211071

Province	District	Ward	EA ID
Southern	Choma	Namuswa	90901115271061
	Mazabuka	Chivuna	90907125101013
	Kazungula	Kanchele	90905121101053

Figure D.2. Household Sampling Example



D.3.1.1. Sample Size

It is vital to have a sample size sufficiently large to precisely measure key outcomes. For this reason, AIR conducted power calculations to determine the sample size necessary for the household survey. Our power calculations suggested that surveying 30 households in each of the 40 ODF-certified EAs would be sufficient to precisely measure key outcomes. On the basis of our sample of 1,200 households across 40 EAs, we were able to measure key outcomes such as household-level ODF status compliance with a 2.8 percentage point margin of error.

- The AIR evaluation team determined the sample size on the basis of several assumptions:
- We assumed the standard 80% power (the probability of correctly rejecting a hypothesis when it is false) at the 0.05 significance level (the probability of incorrectly rejecting a hypothesis when it is true).
- We assumed that 90% of the population was ODF-compliant because that was the level required for the ODF certification.
- We assumed a 90% survey participation rate. This rate was likely conservative, given the 96% response rate obtained in the ZSHP Impact Evaluation.
- We followed the Zambia Center for Applied Health Research and Development (ZCAHRD) evaluation and assumed a design effect of 1.7.⁴²

Note that for diarrhoea and other outcomes specific to children under age 5 years, it was possible that we would have a smaller effective sample size because not every household

⁴² The design effect is a parameter measuring survey design efficiency that needs to be accounted for in power calculations. In our two-stage sampling scheme, we selected villages first and *then* selected individual households from those villages. Households within the same village were likely somewhat similar. The design effect of 1.7 essentially means that the variability in our sample was 1.7 times larger than it would be with a simple random sample.

would have children under age 5. On the other hand, many households could have multiple children under age 5. According to the most recent available data from the Demographic Health Survey (DHS) (Demographic and health survey, 2014), 62% of households in Zambia had at least one child under age 5 living in the household. Of these, about 30% had one child under age 5, 24% had two, 6% had three, and just under 1% had four children under age 5. Therefore, the expected sample size for the main outcome in the ZCAHRD evaluation—the prevalence of diarrhoea among children under age 5—was about 600 children. This estimate suggested that the effective sample size for children under age 5 might be like our household sample size, although it was possible that we would end up with a different number of young children due to chance.

For the school survey, we visited two primary schools closest to each of the 40 EAs selected at the village sampling stage, for a total of 80 schools. Such a sample was representative of the schools in the selected villages and therefore of the schools in the entire population of interest.

D.3.2 Sampling Households

We used satellite maps to select a random sample of households for the household survey. For each EA in the sample, we obtained shape files and GPS coordinates from CSO to construct satellite maps. We used satellite imagery of the EA to identify household-like structures (Figure D.2). We then sequentially numbered all the identified household-like structures, randomly ordered them, and enrolled the first 30 randomly ordered household-like structures, as required by our sample size calculation.

We sampled more than 30 households to have backup households in case an enumerator found that a selected structure was empty, vacant, or non-residential; in that case, the enumerator went to the closest randomly sampled household.

D.3.3 Sampling Schools

In addition to the household survey, we conducted observations and interviews in schools. Our goal was to coordinate with UNICEF to identify two primary schools that received ZSHP components and that were closest to the sampled EA. UNICEF provided a list of schools that team supervisors used to select schools while in the field. We had an additional list of replacement schools in case enumerators could not locate one or both of the original schools. The list of schools is presented in Table D.2.

Table D.2 List of Sampled Schools

Kabinga	
1.	Kachiwezhi Primary School
2.	Sinde Primary
3.	Chitungu primary school
4.	Chabalanda (old name, Chulu chamba)
5.	Lubinga primary school
6.	Kapoko
7.	Simaubi Primary and Secondary

8. Mufubushi
9. Mpinda Primary School
10. Lumwana East primary school
11. Kakungu
12. Muchelenje
13. Kapoko primary school
14. Sikakwa community
15. Salamo
16. Kapilamikwa secondary school
17. Musende day secondary
18. Puma primary school
19. (Nearest school outside Namuswa ward)
20. Kalambwe community school
21. Kanakashi
22. Siamaluba Primary
23. Patasi Primary School
24. Isoko day secondary and primary school
25. St Clara primary school
26. Chifungo community school
27. Kasangala
28. Kasansu primary school
29. Mulilansolo primary school
30. Kabamba primary school
31. Chituta Primary School
32. New Kapela Primary school
33. Kantimba primary
34. Katele
35. Mushiwe primary school
36. Ngabo Primary
37. Inongwe Community
38. Machiya combined secondary
39. Mainza Primary
40. Emusa
41. Egichikeni
42. Nsunge Primary School

43. Chobana Community School
44. Fibawe Primary School
45. Renato primary school
46. Chizigizi
47. Elija
48. Kapiri Girls Technical
49. Fubera Primary School
50. Mununga Primary school
51. Shimbilo Primary
52. Nthakalavu
53. Mununga secondary school
54. Bowe
55. Nachiyaba Primary
56. Pharaza
57. Umi Primary
58. Namununga primary and secondary
59. Katole community
60. Yosefe
61. Lupani Primary School
62. Katuba Primary School
63. Mondake Primary School
64. Mulonda Primary School
65. Kaseke Primary School
66. Mfuwe primary
67. Kefulwa
68. Chiba Primary school
69. Kalala day secondary
70. Kabwale Primary School
71. Kabaka Primary School
72. Katuna Primary school
73. Mukupi primary
74. Chandwe Primary School
75. Malima Primary
76. Chipepo primary School
77. Andrew Peiles Primary school

78. Mwangule Primary School
79. Kaminer
80. Twikatene

D.4 Qualitative Sampling

D.4.1 Sampling Chiefdoms

AIR sampled from the same regions that were of interest in the quantitative study and used purposive sampling to select the chiefdoms for our qualitative research. Specifically, AIR collaborated with the office of the District Education Board Secretary and/or the office of the District Council to obtain a list of chiefdoms that had been exposed to the ZSHP program. From the list provided, we selected chiefdoms on the basis of convenience sampling (specifically, the availability of a guide to take us to a village and the availability of a community champion or a traditional leader, or headperson, in the village). See Table D.3 for a list of the chiefdoms sampled. We do not provide the name of specific villages within the sampled chiefdoms in order to preserve the anonymity of our respondents.

Table D.3. Qualitative Sampling, by Chiefdom

Province	District	Ward	Chiefdom
Central	Mkushi	Mkushi North	Mulumbwe
Copperbelt	Lufwanyama	Kasonka	Shimukunami
Luapula	Nchelenge	Kabuta	Mununga
Northern	Mbala	Mukololo	Nsokolo
North-Western	Solwezi/Kalumbila	Musele	Musele
Southern	Choma	Namuswa	Singani
Eastern	Mambwe	Kakumbi	Kakumbi

D.4.2 Key Informant Interviews

AIR's sampling approach for KIIs was purposive, and we sampled key informants on the basis of their knowledge of different components of the ZSHP and its implementation processes. We conducted KIIs with WASH officials in Lusaka, including UNICEF staff and national government officials, to understand how ZSHP aligned with official government policies and priorities, and we conducted KIIs with community champions, school personnel, and chiefs (or their representatives) in local villages to gain an in-depth perspective on various aspects of the ZSHP implementation and the programme's perceived impact and sustainability.⁴³ The KIIs with macro-level respondents (n = 18), such as government officials, cooperating partners (CPs), and UNICEF Zambia staff, focused on themes pertaining to every aspect of the evaluation. KIIs with meso-level respondents (n = 20), such as district- and village-level

⁴³ We conducted 10 KIIs in addition to the previously proposed 35 KIIs because findings during fieldwork indicated that there were some district-level officials with extensive knowledge on ZSHP programme implementation who should be included in our evaluation sample. After consulting with UNICEF, AIR removed private-sector actors (in the meso-level category of respondents) from our original sample because of their limited knowledge of programme processes.

officials, school personnel, and NGO partners, focused on themes pertaining to effectiveness, sustainability, equity/gender, timeliness, and adequacy. Finally, KIIs with micro-level respondents (n = 7), such as community champions and sanitation action group (SAG) members, focused mostly on sustainability and impact. The KIIs were distributed as shown in Table D.4 and D.5.

Table D.4. Distribution of Macro-Level KIIs

Respondent type	Respondent
Government officials	Ministry of Local Government official
	Ministry of General Education official
	Ministry of Chiefs and Traditional Affairs official
	Ministry of Water Development, Sanitation, and Environmental Protection official
	CLTS coach
UNICEF officials	WASH specialist
	WASH officer
	CLTS specialist
Implementing partners	DFID
	Akros
	WaterAid
	Red Cross
	ZAMCOM
	SNV Netherlands Development Organisation
	People's Action Forum

Table D.5. Distribution of Meso- and Micro-Level KIIs

Region	Community champions	SAG	District govt official	Village leader	School admin	Environmental health tech	WASH officials	Total
North-Western, Copperbelt	1	1	2	1	1	1	n/a	7
Central, Northern, Luapula	2	1	3	2	1	1	n/a	10
Eastern, Southern	1	1	4	1	1	2	n/a	10
Lusaka	n/a	n/a	n/a	n/a	n/a	n/a	18	18
Total	4	3	7	4	3	4	18	45

SAG = sanitation action group.

D.4.3 Focus Group Discussions

To identify FGD participants, we adopted the same purposive sampling approach used for the KIIs (see Table D.6). In total, AIR conducted 15 FGDs with beneficiary households, child beneficiaries, and WASH-sector workers in order to learn about their perceptions and gained capacities with regard to the ZSHP.⁴⁴ These qualitative data supplemented the quantitative data collected on the perceived impact of the programme. FGDs helped to understand providers' and beneficiaries' perceptions of the programme and the community-level norms that influenced the implementation of ZSHP interventions. The breakdown of FGDs is as follows:

- **Households ($n = 96$).** In each region, we conducted three FGDs with households (for a total of nine FGDs). Households were recruited from survey respondents using purposive sampling, and each focus group included between eight and 12 participants. AIR also adopted quota sampling to ensure that women were adequately represented in the focus groups.
- **WASH-sector workers ($n = 10$).** In each region, AIR conducted one FGD with WASH-sector workers in each region (for a total of three FGDs). We investigated challenges, financial incentives, perceived changing norms, and support related to the ZSHP.
- **Child beneficiaries ($n = 24$).** AIR conducted a total of three FGDs with school-going children from beneficiary schools to understand perceived impacts and the sustainability of SLTS. Quota sampling was employed to ensure that an equal number of boys and girls participated in the focus groups.

Table D.6. Distribution of FGDs

Region	Households	Child beneficiaries	WASH-sector workers	Total
North-Western, Copperbelt	3	1	1	5
Central, Northern, Luapula	3	1	1	5
Eastern, Southern	3	1	1	5
Total	9	3	3	15

D.4.4 Direct Field Observations

The evaluation team conducted qualitative observations at schools to inform AIR's broader understanding of the programme's effectiveness, efficiency, sustainability, equity/gender, coherence, adequacy, and impact. Observations focused on three specific themes: (1) the current state of sanitation facilities and management/hygiene systems in the selected school, (2) the practises of school administrators tasked with maintaining these facilities and systems, and (3) the overall user experience. We conducted one observation per region, for a total of three field observations at schools. Field observations were conducted in schools that had upgraded sanitation facilities through the ZSHP. In the field, AIR worked with the

⁴⁴ Fifteen FGDs were conducted instead of the 16 FGDs initially proposed because a proposed FGD with WASH-sector workers only had one participant and was therefore counted as a KII.

office of the District Education Board Secretary to purposively select eligible schools in the region. We then randomly selected a school from the list to conduct field observations. Evaluators recorded observations using a simple protocol. They were also trained in nonparticipant observation techniques to minimise the effect of their presence in the evaluation settings.

D.4.5 Social Mapping

Social mapping is a participatory tool in which community members or other key stakeholders are asked to map the landscape of actors and/or agencies that shape a particular issue area. The purpose of the social mapping in the evaluation was to get more information on households' experience with or knowledge about CLTS and the key community actors involved in CLTS, and to understand community members' sanitation and hygiene practises. After each household FGD, we conducted a social-mapping exercise (one exercise was performed per district, for a total of seven). Quota sampling was used to select the respondents to ensure a fair representation of men and women in the FGD.

D.5 Data Collection Process

D.5.1 Quantitative Data Collection Process

D.5.1.1 Enumerator Training

Enumerators were short-listed from a database of AIR's quantitative and qualitative consultants. This database contains names of people who have successfully and competently completed enumerator assignments on previous AIR projects. These short-listed candidates were then interviewed specifically for ZSHP data collection. The final selection of enumerators to conduct fieldwork for the project occurred after evaluation of their performance during piloting.

We conducted enumerator training from February 18 to 21, 2019. In the training, enumerators were introduced to the scope of the evaluation and research ethics, including IRB approvals and quality assurance procedures (see Appendix G for more detail). AIR invited a nutritionist from the National Food and Nutrition Commission of Zambia to train enumerators in the use of anthropometric equipment to ensure that they would collect good-quality anthropometric data. The enumerators were also trained in the use of mapping tools by a geographic information specialist from the CSO in order to correctly identify sampled households in the field.

D.5.1.2 Piloting and Pretesting Survey Instruments

Enumerators pretested the survey tools in the Chikupi and Kabwezi area of the Kafue district. This pilot allowed the team to test the tools and adapt the survey in cases in which questions were unclear or led to inconsistent responses. While the area and the respondents were similar to those included in our sample, they were selected from a district that was not part of our sample.

The pilot was also important because it allowed the enumerators to become familiar with the survey and survey techniques. The field team noted areas of difficulty for respondents or enumerators in order to clarify appropriate procedures before data collection officially

started. After the pilot exercise, AIR debriefed the enumerators and made adjustments to the survey questionnaire.

D.5.1.3 Field Operations

The enumerators used tablets to conduct the data collection using SurveyCTO, an electronic data collection platform. The SurveyCTO software runs on the Open Data Kit (ODK) platform, which enables users to collect data on a phone or tablet, send data to a server, aggregate the collected data, and export the data to standard formats for analysis. Electronic data collection minimises errors in the field because evaluators can automate skipping patterns and built-in checks to help ensure the quality of the data.

A total of 24 enumerators, split into four teams comprising one supervisor and five enumerators, conducted the data collection. We planned for each team to visit and conduct 30 household interviews and two school interviews in 2 days. Team supervisors first visited the District Education Board Secretary's office in the district to explain the purpose of the evaluation and obtain permission to collect the necessary data from schools and households in the sampled EA. While at the office, team supervisors asked for directions to the sampled EA. After securing permission from the office, the data collection teams visited the schools. At each school, the team members introduced themselves and the evaluation to the administrator before proceeding to conduct an interview with the administrator. At each household, enumerators first introduced themselves, explained the purpose of the evaluation, and asked for consent. If the head of house was not available, the interview was conducted with the person available who could speak on behalf of the head of house.

Team supervisors used maps and identifiers (e.g., names of schools and clinics) generated by the CSO to locate sampled EAs. Once an EA was located, the team used the Avenza Maps®, installed on the data collection tablets, to locate households. As described in the section on sampling, for each EA, AIR created a satellite map with randomly sampled household-like structures. The team supervisor shared the map with the team members before beginning data collection. The enumerators first visited the 30 priority map points representing a random sample of structures in the EA. If a priority map point was not a household or the respondent refused to consent, the team supervisor selected a replacement, which was the randomly sampled map point closest to the point being replaced. The supervisor recorded all replacements made and the reason for replacement.

In four districts (Kaputa, Mpulungu, Mpika, and Mpongwe), the sampled EA or parts of it were inaccessible because of flooding and/or bad terrain. In these cases, team supervisors conducted a listing of households closest to the inaccessible EA. A sample of households to be interviewed was then drawn from this listing by AIR staff and relayed to the team supervisor. AIR staff conducted daily data quality checks during data collection. Team supervisors also submitted a daily report highlighting the number of households visited, the number of interviews completed, and any challenges for each school. AIR staff maintained close communication with the team supervisors to troubleshoot any technical or logistical challenges encountered during fieldwork.

D.5.2 Qualitative Data Collection Process

We conducted the qualitative data in several stages. We started with a desk review of relevant programmatic and policy documents to understand the policy and institutional

framework shaping WASH programming in Zambia. We then conducted KIIs with WASH stakeholders to provide details about changes in WASH related to the ZSHP. Then we conducted FGDs and social mapping exercises to understand the way households, children, and WASH actors experienced the ZSHP.

D.5.2.1 Enumerator Training

From February 18 to 25, 2019, AIR conducted a 5-day qualitative data collection training that covered the objectives of the ZSHP project evaluation, data collection and management procedures, and research ethics. The evaluation tools were also reviewed and translated into the various local languages common in the sampled districts of the ZSHP project evaluation.

D.5.2.2 Piloting Qualitative Instruments

Immediately following the qualitative data collection training, on February 21, 2019, AIR piloted the FGD, observation, and KII protocols (to determine their overall effectiveness for achieving key evaluation aims) in the Chikupi area of the Kafue district. During the pilot, the qualitative team conducted one KII with a school administrator, two FGDs with learners, one direct school observation, and one FGD with community members. After the pilot, the qualitative team regrouped to debrief the team on the effectiveness of the protocols and what needed to be modified prior to commencing data collection.

D.5.2.3 Field Operations

Qualitative researchers began fieldwork on March 10, 2019. The qualitative team was composed of three groups (with two qualitative researchers per group). The first group covered North-Western and Copperbelt Provinces; the second group covered Eastern and Southern Provinces; and the third group covered Central, Luapula, and Northern Provinces. Each group coordinated with the District Council office, the District Education Board Secretary's office, and/or the District Health office in the selected districts to arrange fieldwork logistics. The district offices provided information about the various chiefdoms that was then used to select evaluation sites (including the locations of the chiefdoms and the presence of community champions). The district offices in some cases provided guides to facilitate access to villages and qualitative data collection. All the data collection conducted at the chiefdom level was completed by March 21, 2019, but interviews with national-level WASH-sector actors did not conclude until April 25, 2019.

D.5.2.4 Desk Review

AIR conducted a desk review of government planning documents, ZSHP programme implementation documents; DFID planning documents, such as the DFID business case and country strategy; DFID annual progress reports; extractions from the MWDSEP's management information system; the Boston University impact evaluation; and UNICEF's country programme documents, programme cooperation agreements, progress reports, sustainability checks, and the draft programme completion review. We reviewed the documents to assess the relevance and alignment of ZSHP with UNICEF policies and programmes in Zambia and the GRZ's national plans and strategies, including Vision 2030 (Republic of Zambia, 2006), the 7th National Development Plans, and the National Rural Water Supply and Sanitation Programme.

D.5.2.5 Key Informant Interviews

AIR conducted 45 KIIs, 27 that targeted community champions, district government officials, traditional leaders, school administrators, and private-sector and NGO partners and 18 that targeted central governmental officials, hygiene/handwashing media strategies, and key development partners, such as DFID, Akros, the People's Action Forum, the Red Cross, WaterAid, ZAMCOM, and SNV Netherlands Development Organization. We used purposive sampling of relevant stakeholders, in consultation with UNICEF and local Zambian staff, to select each key informant. These interviews provided system-wide perspectives on the ZSHP, including details about programme effectiveness and sustainability. See Tables D.4 and D.5 for a list of key informant interview respondents.

D.5.2.6 Focus Group Discussions and Social Mapping

AIR conducted 15 FGDs with child beneficiaries, household beneficiaries, and WASH-sector employees. For the child and household FGDs, we used both purposive and quota sampling to select three chiefdoms per geographic zone. We conducted one FGD in each chiefdom, and in three chiefdoms (one per region) we also conducted the social-mapping exercise. We used purposive sampling to select WASH-sector employees, as well, again conducting one FGD in each geographic area. The FGDs helped us understand beneficiary perceptions and gained capacities under the ZSHP, in addition to discussing problems and challenges encountered at the local level. We conducted the social-mapping exercises immediately after the household FGDs, using the same respondents as participants.

D.6 Data Analysis

D.6.1 Quantitative Data Analysis

To be consistent with baseline and midline reports on the ZSHP, AIR produced descriptive statistics (mean values) related to WASH knowledge, behaviour, and infrastructure at the household and school levels. We present information from baseline, midline, and end line to show changes over time.

D.6.2 Qualitative Data Analysis

AIR evaluators led the qualitative data analysis. All interviews were conducted in either English or a local dialect, audio-recorded, and then transcribed into English. All data from KIIs, FGDs, and observations (structured notes, FGD transcripts, and observation protocols) were coded and analysed using NVivo qualitative data analysis software. Researchers first created a preliminary coding outline and structure based on the conceptual framework, evaluation questions, interview protocols, and memos of themes that emerged during data collection. We used this outline as a tool to organise and analyse the information gathered in interviews and focus groups. We continuously modified the outline as new themes and findings emerged during data analysis. In addition to the outline, we created a list of definitions for codes, to ensure that all coders categorised data using the same standards. After inputting the raw data from the notes template into NVivo, coders selected a sample of interviews to double-code, to ensure interrater reliability. During this process of data reduction, researchers characterised the prevalence of responses, examined differences among groups, and identified key findings that addressed evaluation questions. AIR relied on the expertise of its Zambia-based staff to ensure that our interpretation of data was consistent with their knowledge of the country and their experience during fieldwork.

D.6.3 Triangulation of Quantitative and Qualitative Findings

Throughout data collection and analysis, qualitative and quantitative researchers maintained regular communication to discuss emerging findings, generate hypotheses from the data, and discuss ways in which qualitative and quantitative findings could help explain questions or interesting outliers. This triangulation process allowed AIR to complement the findings from the survey with more in-depth qualitative data on ZSHP beneficiary experiences and perceptions.

D.7 Limitations

The evaluation team designed and implemented a study that could address the research questions with rigor and validity so that the results can be used to make policy decisions. This evaluation encountered a few challenges, which the team mitigated accordingly. For example, the baseline and midline did not collect a number of parameters that are important for the evaluation and theory of change. This evaluation has included various indicators outlined in this report to strengthen analysis of the theory of change. Similarly, the three rounds of data collection included different households at each wave, so this evaluation does not have panel data (data on the same households over time). Similarly, the lack of a control group means that we cannot account for what would have happened in the absence of the program, for which the evaluation teams is careful about making causal claims about impacts.

Our qualitative study is limited in that previous rounds of data collection done for the baseline and midline did not include qualitative focus group discussions or key informant interviews so we cannot discuss qualitative changes over time.

Appendix E. Description of Evaluation Sample

In this section we describe non-programme-related characteristics of the end line sample to better understand the types of households included in the evaluation. While we expect ZSHP programming to change WASH-related knowledge and practises, the programme should not affect the characteristics presented below, like household size, respondent education level, or child age. The sample description serves two primary purposes: (1) to understand the sample population and determine if it matches the targeting approach we used, which aimed to examine the sustainability of ZSHP programming and maximise comparability with the previous baseline and midline evaluations, and (2) to understand the way the sample measures compare with national-level indicators.

E.1 Individual-Level Characteristics

E.1.1 Gender and Martial Status

Married respondents make up over two thirds (72%) of the sample, which means most of the households likely have two adult caregivers (Table E.1). Fifty-six percent of the sample was female, and 44% was male. This gender mix is slightly different from that of the baseline and midline evaluations, which targeted female caregivers of children aged 0 to 59 months (Table E.2). At end line, enumerators spoke to the head of the household of all randomly

identified households to understand WASH practises in households with and without young children. Table E.1 presents characteristics of end line respondents. F

E.1.2 Education

Almost two thirds (59%) of respondents completed at least some primary education. The portion of the sample with some primary education is therefore slightly lower than the primary education level at baseline and midline (67.8% and 65.8%, respectively). Even with the differences in primary education, all three samples closely match national education levels in Zambia according to the most recent Demographic Health Survey from Zambia, in 2014, in which 56% of household heads in rural areas reported completing at least some primary school (Demographic and Health Surveys Program [DHS], 2014).

Table E.1. Characteristics of End Line Respondents^a

Variables	Mean (N = 1,199)
Respondent age (years)	40.67
Female respondent	0.56
Highest level of education (proportion of households)	
No education	0.11
Primary education	0.59
Secondary education	0.29
Tertiary education	0.02
Marital status (proportion of households)	
Single/not married	0.10
Married	0.72
Separated/divorced	0.06
Widowed	0.10

^a Education variable indicates average number of respondents who have taken at least one grade at each level. They may not have completed all grades at each level.

Table E.2. Sociodemographic Characteristics of Respondents at Baseline, Midline, and End Line^a

Variables (proportion of households)	Baseline mean (n = 1,204)	Midline mean (n = 1,170)	End line mean (n = 1,198)
Age (baseline n = 1,173; midline n = 1,134)			
Younger than 20 years old	0.099	0.091	0.063
20–35 years old	0.716	0.679	0.367
Older than 35 years old	0.185	0.230	0.569

Variables (proportion of households)	Baseline mean (<i>n</i> = 1,204)	Midline mean (<i>n</i> = 1,170)	End line mean (<i>n</i> = 1,198)
Highest level of education			
No education	0.102	0.108	0.105
Primary education	0.674	0.658	0.585
Secondary education	0.218	0.228	0.287
Tertiary education	0.005	0.006	0.018
Marital status			
Single/not married	0.091	0.078	0.098
Married	0.820	0.817	0.724
Separated/divorced	0.064	0.067	0.064
Widowed	0.026	0.038	0.102
Ethnic group/tribal affiliation (baseline <i>n</i> = 1,192; midline <i>n</i> = 1,167)			
Bemba	0.271	0.259	0.265
Tonga	0.174	0.167	0.199
Tumbuka	0.068	0.068	0.084
Lozi	0.042	0.060	0.012
Other ethnicity	0.445	0.446	0.441

^a Education variables show the proportion of respondents who have completed at least some schooling in each category. Other ethnicities include Chewa, Nsenga, Ngoni, Soli, Lenje, Kaonde, Lunde, Luvale, and Other (unspecified).

E.1.3 Child Characteristics

End line data collection included information from 875 children under the age of 5 and 1,804 children between the ages of 5 and 12. We use these age categories at end line to follow the same protocol set in the baseline and midline surveys. Females represent roughly half the sample in both age ranges (51% and 48%, respectively). The average age of children under 5 in our sample is 2.18 years, whereas the average ages for children under 5 in the baseline and midline reports are 2.25 and 2.28 years, respectively. Since the difference in ages is less than 1 month, we do not think it will matter for programme implementation. On the other hand, our sample of children between ages 5 and 12 is almost a year older, on average, than the baseline and midline samples (Table E.4). Children with an extra year of exposure to WASH programming in schools might have more WASH-related knowledge or better attitudes and WASH practises. Since we did not collect WASH behaviour at the child level, we cannot see these differences. However, because WASH behaviour affects the prevalence of diarrhoea and acute respiratory infection (ARI), unobserved differences in WASH habits may account for decreases in the prevalence of diarrhoea or ARI.

More than 70% of children under the age of 5 received all appropriate vaccinations (Table E.3). We present childhood vaccination rates, as they are important indicators of general health and health-seeking behaviours. In order to reduce preventable child deaths, the

WHO produced the Global Vaccination Action Plan (GVAP) 2012–2020, which has the goal of vaccinating 90% of children in every country by 2020, including at least 80% in each district (WHO, 2012). End line vaccination rates are important because, as Table E.3 indicates, many households with children are not engaging in behaviours known to improve child health (between a third and a fifth in the case of vaccinations), and these families may also find it more difficult to incorporate recommended sanitation and hygiene practises into their lives.

Table E.3. Characteristics of Children Under Age 5 at End Line^a

Variables	Mean
Children under 5 (n = 875)	
Age in years	2.18
Female (proportion of children)	0.51
Received vitamin A supplementation in last 12 months (proportion of children).	0.70
Received BCG (tuberculosis) vaccination (proportion of children).	0.79
Received all appropriate polio vaccinations (proportion of children).	0.74
Received all appropriate vaccinations for diphtheria, tetanus, pertussis, hepatitis (proportion of children).	0.79
Received measles vaccination (proportion of children).	0.68
Received rotavirus vaccination (proportion of children).	0.73
Children 5–12 (n = 1,804)	
Age in years	8.51
Female (proportion of children)	0.48

^aThe WHO recommends children receive polio and DPT vaccinations at 6 weeks, 10 weeks, and 14 weeks. If children are above this age and have not received the appropriate vaccination doses, they are not counted as having received all vaccinations.

Table E.4. Characteristics of Under-5s at Baseline, Midline, and End Line

Variables	Baseline mean (n = 1641)	Midline mean (n = 1671)	End line mean (n = 875)
Mean age in months	26.7	27.4	26.181
Age group (baseline n = 1143; midline n = 1664)			
0–11 months	0.264	0.228	0.189
12–23 months	0.182	0.207	0.175
24–59 months	0.554	0.565	0.637
Sex			
Female	0.521	0.512	0.486
Male	0.488	0.488	0.514

Table E.5. Characteristics of 5- to 12-Year-Old Children at Baseline, Midline, and End Line

Variables (proportion of households)	Baseline mean (n = 1042)	Midline mean (n = 1491)	End line mean (n = 1654)
Mean age in years	7.6	7.9	8.8
Age group			
5–7 years	0.552	0.470	0.320
8–9 years	0.278	0.266	0.279
10–12 years	0.170	0.264	0.401
Sex			
Female	0.544	0.521	0.518
Male	0.456	0.479	0.482

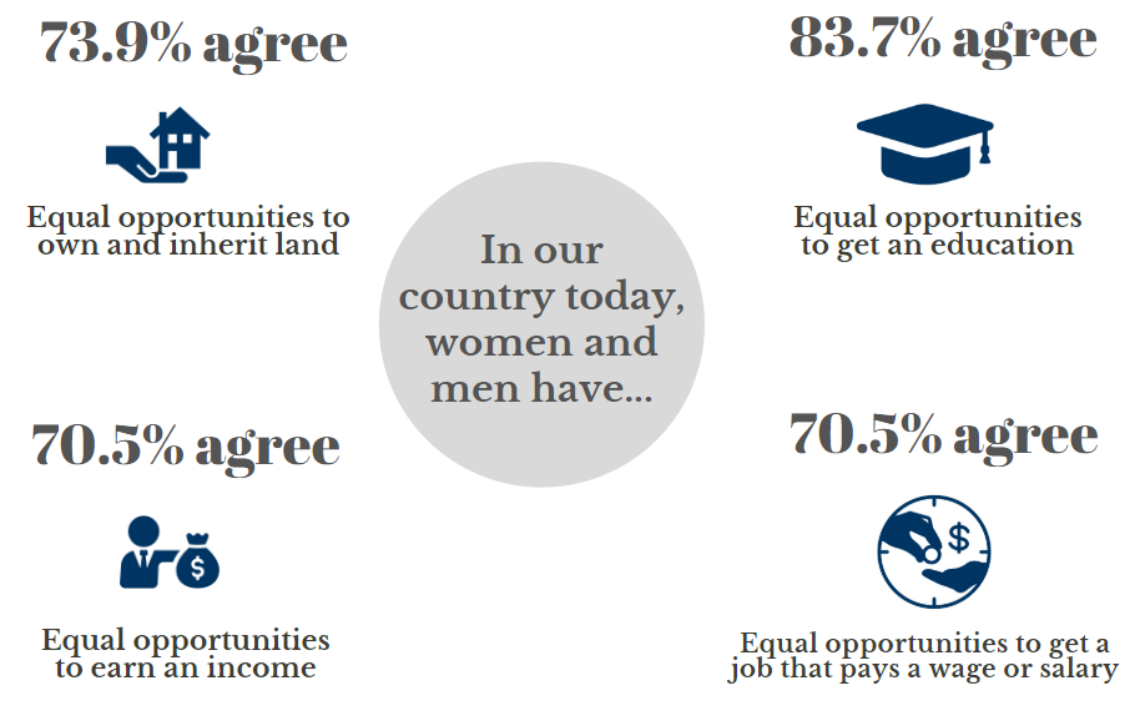
E.1.4 Views on Gender Equity

The ZSHP aims to be an inclusive programme with specific components targeting girls. This is because WASH infrastructure is particularly important for women and girls, who are vulnerable to harassment or violence when sharing toilets or defecating in the open (WaterAid, 2015). A lack of toilet facilities can also discourage female students from attending school, especially during their menstrual periods, because they have no way to take care of their menstrual needs (WaterAid). Improving WASH facilities can decrease the number of school days that girls miss. However, some families may not value these gendered components of the ZSHP. Below, we present information on views about gender equity in education and income to help us understand views about gender equity within households and the way these views may affect interaction with and implementation of the ZSHP.

The majority of our respondents believe that men and women can and should have equal opportunities to receive an education, earn an income, and inherit land (Figure E.1). We asked respondents the same series of questions about educational and income-earning opportunities for men and women asked in Afrobarometer surveys, to compare against previous national surveys in Zambia and other surveys conducted in Sub-Saharan Africa. Our respondents answered in similar ways to the national sample surveyed as part of the Afrobarometer survey in Zambia in 2017⁴⁵. With the exception of views about women’s having the same opportunity as men to inherit land, our data show that a lower proportion of respondents in Zambia think that women and men have equal opportunities for education and jobs today. Zambian respondents are slightly less likely to say that they think men should have more right to a job when jobs are scarce.

⁴⁵ Data presented in Figure E.1 come from survey of ZSHP beneficiaries. Comparable Afrobarometer states are as follows: (1) equal opportunities to own and inherit land—72.1%, (2) equal opportunities to get an education—85.9%, (3) equal opportunities to earn an income—76.7%, and (4) equal opportunities to get a job that pays a wage or salary—73.9% (Afrobarometer, 2017).

Figure E.1. Gender Equality in ZSHP Sample

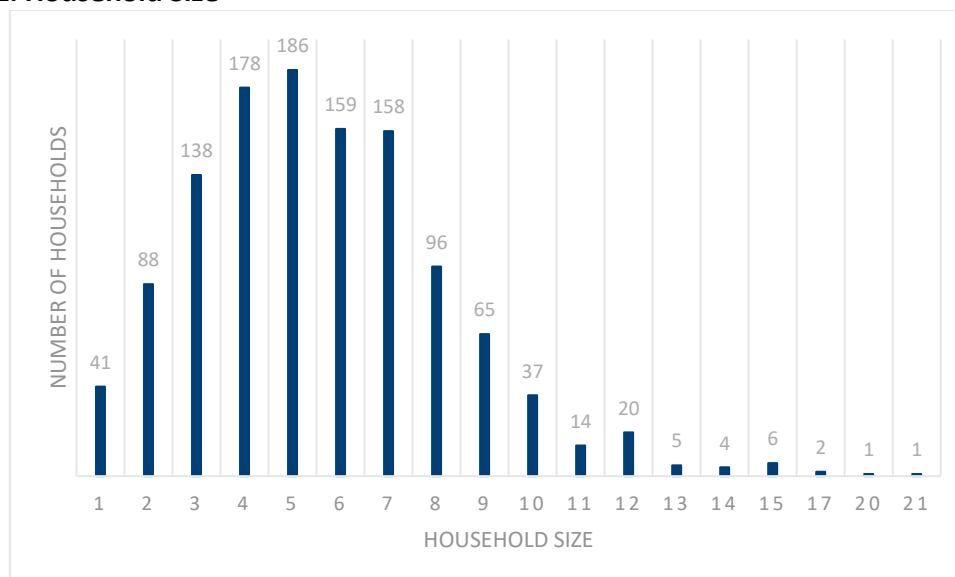


E.2 Household-Level Characteristics

E.2.1 Household Size

At end line, enumerators spoke with respondents from 1,199 households (of the targeted 1,200) of varying size (Figure E.2), with a median household size of 5 people.

Figure E.2. Household Size



E.2.2 Housing and Household Assets

Most of the households in the end line sample use nonelectric energy for both cooking and lighting and natural housing material, like wood or mud, for their floors (76%) and their walls (69%) (Table E.6). The evaluation teams did not report this kind of information at baseline or midline, so we cannot know if housing materials changed across samples.⁴⁶ The DHS data indicate that about 34.6% of rural Zambian households have walls made of natural materials (DHS, 2014). Part of the difference between our sample and the DHS sample may be due to the fact that our survey includes wood in a category for finished walls, while the DHS includes wood in the natural category. In addition, 78% of rural Zambian households in 2014 had earth or sand floors, similar to the proportion in our sample (76%).

Families with lower socioeconomic status are more likely to use natural materials for their housing, as these materials are more readily available (UNICEF Zambia, 2018). Households with mud floors are unlikely to spend money constructing a flushing toilet, for example. These housing materials affect a family's ability to incorporate new WASH practises into their daily life even if they have knowledge about appropriate hygiene.

About half of the sample own standard housing items like bicycles, beds, chairs, and tables (Table E.6). These ownership rates are comparable to the DHS national data from 2014, in which 53% of the households surveyed owned a bicycle, 60% owned beds, and 14.5% owned sofas (DHS, 2014). Moreover, DHS data from 2014 indicate that 48% of households surveyed owned a radio, and assets like clocks (8%) and televisions (16%) were also slightly more prevalent in the DHS data than in our sample. Less than half (41%) of respondents in our sample owned a radio and 15% owned a television. Some information-sharing elements of the ZSHP occurred through media programmes on the radio or on television, but most sampled households probably did not hear or see programme elements on the radio or TV, although other districts in Zambia might hear or see this information often.

⁴⁶ Baseline and midline evaluations did not report data on any of the subsequent household measures for income, either.

Table E.6. Housing Characteristics at End Line

Variables	Mean (N = 1,199)
Roof material proportion of households)	
Tiles or sheets	0.51
Grass, wood, or thatched roof	0.49
Concrete roof	0.00
Floor material proportion of households)	
Earth/sand floor	0.76
Wood, palm, or bamboo floor	0.01
Finished floor	0.23
Wall material proportion of households)	
Finished walls (bricks, wood tiles, concrete, vinyl, wood planks, cement)	0.27
Natural walls (mud, cane, palm, trunks)	0.69
Rudimentary walls (stone or bamboo with mud)	0.04
Light energy source (proportion of households)	
Electricity for lighting	0.04
Nonelectric sources of lighting	0.95
No source of lighting	0.01
Cooking energy source proportion of households)	
Electricity for cooking	0.01
Nonelectric sources of energy for cooking	0.99
Ownership of household items proportion of households)	
Owens clock.	0.06
Owens radio.	0.41
Owens pressing iron.	0.24
Owens television.	0.15
Owens bicycle.	0.55
Owens bed.	0.59
Owens mattress.	0.70
Owens sofa or lounge suite.	0.25
Owens chair.	0.54
Owens table.	0.48

^aTile roof category includes asbestos sheets, asbestos tiles, nonasbestos tiles, and iron sheets. Nonelectric forms of lighting include kerosene, solar panels, candles, diesel, open fires, and torches. Nonelectric forms of cooking fuel include firewood, charcoal, coal, kerosene, gas, solar, and crop/livestock residues.

E.2.3 Poverty and Food Security

Sample households report experiencing poor and/or worsening economic conditions in the past year (Table E.7). Half self-identified as “very poor,” and just under half said that they were worse off than 12 months ago (45%). According to the nationally representative Living Conditions and Monitoring Survey (LCMS) done in Zambia in 2015, about 40% of respondents identify as “very poor” (LCMS, 2015). Rates vary by province, but only in North-Western Province were more than half of the respondents “very poor” in 2015. The Zambian government implemented an economic recovery programme in October 2016 in response to challenges like tight liquidity related to the global economic slowdown in 2015 (World Bank, 2016). Since then, the economy has continued to grow, but slowly (World Bank, 2017). Our data contain more “very poor” households compared to national data, by 10 percentage points. Despite these self-assessments, less than a quarter of the sample received any sort of external assistance from government poverty alleviation programmes, like cash transfer programmes, or from NGOs in the past 12 months (Table E.7).

Food security may play an important role in the poverty self-assessment, as the average family had less than three meals a day and had consumed animal products only three times in the past 4 weeks (Table E.7). We use questions from the Household Food Insecurity Access Scale (HFIAS) developed by the Food and Nutrition Technical Assistance (FANTA III) teams at USAID to examine access-related concerns about food security (Coates, Swindale, & Bilinsky, 2007). Table E.7 presents indicators in order of increasing severity. Most of the families in this sample experienced at least one of the access-related concerns listed in the table. For example, 72% of families worried about not having enough food in the past 4 weeks. According to USAID guidelines, we categorised 11% of households as food secure because they only worried about accessing but did not experience any other changes in food intake in the past 4 weeks (Coates et al., 2007). However, according to their responses, 51% of households are severely food insecure because they experience one of these three conditions—no food in house, went to sleep hungry, or had no meal for 24 hours—or they experienced some of the less extreme conditions often (Coates et al., 2007.). Since one hypothesised outcome of improved WASH access and knowledge is a lower prevalence of stunting, wasting, and undernutrition among young children, it is important to understand that almost half of our sample experiences some food insecurity at the household level.

Table E.7. Household Self-Assessed Poverty and Food Security

Variables	Mean (N = 1,199)
Self-assessed poverty status (proportion of households)	
Very poor	0.50
Moderately poor	0.44
Not poor	0.07
Household status relative to 12 months ago (proportion of households)	
Worse off	0.45
The same	0.34
Better off	0.21

Variables	Mean (N = 1,199)
Household food security	
Average number of meals per day	2.37
Average number of times household consumed fish, poultry, or animal products in past 4 weeks	3.10
Average number of times household consumed vegetables in past week	5.72
Food security (proportion of households)	
FANTA conditions^a	
Worried that household would not have enough food in the last 4 weeks.	0.72
Household members did not eat preferred food because of lack of resources in previous 4 weeks.	0.83
Household members ate a limited variety of food because of lack of resources in previous 4 weeks.	0.73
Household members ate food they did not really want to eat because of lack of resources in previous 4 weeks.	0.82
Household members had to eat smaller meals than they needed because of lack of food in previous 4 weeks.	0.71
Household members ate fewer meals in a day due to lack of resources in previous 4 weeks.	0.69
No food of any kind in household due to lack of resources in previous 4 weeks.	0.41
Household members went to sleep hungry because there was not enough food in previous 4 weeks.	0.29
Household members went a whole day and night without eating because of lack of food in previous 4 weeks.	0.21
FANTA food insecurity access prevalence^b (proportion of households)	
Food secure	0.11
Mildly food insecure	0.09
Moderately food insecure	0.30
Severely food insecure	0.51
External support (proportion of households)	
Received money or goods from Farmer Input Support Programme in last 12 months.	0.17
Received money or goods from public welfare assistance scheme in last 12 months.	0.01
Received money or goods from Cash Transfer Programme in last 12 months.	0.10
Received money or goods from other programmes in last 12 months.	0.02
Received money or goods from NGO or church in last 12 months.	0.02
Received money or goods from an individual not part of the household in the last 12 months.	0.05

^a Averages indicate the presence of households that responded affirmatively to each question regardless of the frequency of the experience (*never, rarely, sometimes, or often*).

^b Households are categorised as increasingly food insecure as they respond affirmatively to more severe conditions and/or experience these conditions more frequently (see Coates et al., 2007, for more details about specific calculations).

E.2.4 Agriculture and Livestock

Despite living in rural areas and with a median household owning 1.6 hectares of land, less than a quarter of households own large agricultural tools that would enable them to produce large amounts food on their own land (Table E.8). For example, 22% of households own a plough, and only 1% of families own a treadle pump (a suction pump used for irrigation). According to the DHS, only 16% of rural households in Zambia own a plough, an indication that the prevalence of rural families is higher in our sample, in which 22% of households own a plough (DHS, 2014). Most sampled families own both axes (94%) and hoes (98%), so it is clear that sampled households engage in some agricultural activities. Families working in agriculture during the day are unlikely to have access to a toilet facility and may therefore continue to engage in open defecation. Such habits will be difficult to change even if households and schools gain access to improved toilet facilities.

Most families (61%) own chickens, but less than a third own livestock that require larger investments up front, like cattle. In other words, these households do not have large, valuable assets and are unlikely to have available cash to make big purchases. Such families may not have the resources to install a toilet or handwashing facility. Because these families have limited resources, external financial support for the construction of toilets and handwashing facilities may be important to consider in future WASH projects.

Table E.8. Household Agricultural Resources at End Line

Variables	Mean (N = 1,199)
Ownership of agricultural tools (proportion of households)	
Ox cart	0.13
Plough	0.22
Ox-drawn harrow	0.05
Hammer mill	0.02
Treadle pump	0.01
Canoe or boat	0.03
Fishing net	0.07
Axe	0.94
Hoe	0.98
Land ownership	
Agricultural and owned by household (hectares)	62.21
Livestock ownership (proportion of households)^a	
Cattle	0.27

Variables	Mean (N = 1,199)
Horse, donkey, or mule	0.00
Goats	0.32
Sheep	0.01
Poultry	0.61
Other livestock	0.06

^a Livestock ownership proportions are calculated using the number of families who reported owning at least one of any given type of livestock.

The data presented in Table E.8 show that our sample is very similar to the baseline and midline samples. In addition, the ZSHP targeted rural areas of Zambia, and our sample is similar to the data collected in rural areas by DHS in 2014 with regard to household assets and poverty status. As we have collected data from rural districts across the country, however, lessons learnt in our report (see Section 3.2 on programme impact/effectiveness) are likely to be relevant to other rural areas in Zambia and Sub-Saharan Africa.

E.3 School-Level Characteristics

E.3.1 School Characteristics of End Line Sample

Most (89%) of the schools in our sample are government schools with predominantly female teachers. Table E.9 also shows that sampled schools have high pupil-to-teacher ratios, as the average school has 10 teachers and 540 pupils. The average pupil-to-teacher ratio is 63.67, which is higher than the 42.3 ratio reported for Zambia in their most recently available data from 2016 (MoGE, 2017). Although the midline report did not include statistics about teachers, schools in the baseline sample have more than 600 students on average.

Table E.9. School Characteristics at End Line

Variables	Mean (N = 81)
School ownership (proportion of schools)	
Government school	0.89
Teacher statistics	
Average number of female teachers	4.89
Average number of male teachers	0.48
Student statistics	
Average number of male pupils	270.15
Average number of female pupils	270.20
Average number of male pupils absent in past 7 days	62.07
Average number of female pupils absent in past 7 days	75.72

Table E.10. School Characteristics at Baseline, Midline, and End Line

Variables (proportion of households)	Baseline mean (n = 44)	Midline mean (n = 47)	End line mean (n = 81)
School ownership			
Government school	0.955	0.936	0.889
Student characteristics			
Number of male pupils	331	281	270.148
Number of female pupils	297	264	270.198
Number of male pupils absent in last 7 days	42	35	62.074
Number of female pupils absent in last 7 days	29	27	75.716

Appendix F. UNICEF Evaluation Questions

Evaluation questions	Desk review	KIs	FGDs	Surveys	Secondary admin data	Direct observation
Relevance						
a. To what extent were the objectives and approach of the programme responsive to the needs and priorities of rural population and to their sociocultural and economic situation?	●	●	●			●
b. To what extent was the programme implemented in line with UNICEF and national policies, strategies, and plans?	●	●				
c. What aspects of the programme were more appreciated by the target population?			●	●		
d. To what extent did the interventions target the most vulnerable and marginalised groups?		●	●	●	●	●
e. To what extent was the programme aligned with UNICEF policies and programming in Zambia?	●	●				
Effectiveness						
a. To what extent did the programme achieve its expected results—in particular, in terms of behaviour change and the consistent use of improved sanitation facilities? Were the assumptions underlying the programme intervention strategy correct? Which factors, internal and external to the programme, explain the extent to which results have been achieved?	●	●	●	●	●	●
b. What were the facilitating and constraining factors?		●	●	●		●
c. To what extent has the rollout of community-led total sanitation (CLTS) been effective in achieving ODF (open defecation-free) status in the villages? To what extent did the monitoring of the ODF certification processes contribute to effective project implementation?		●	●		●	●
d. To what extent did school sanitation improvements and school-based hygiene promotion meet the specific needs of children, especially girls, in terms of privacy, cleanliness, security or comfort, including menstrual hygiene?		●	●	●		●
e. How effective was the sanitation-marketing output in moving people up the sanitation ladder?	●	●	●	●		
Efficiency						
f. Did the programme use resources in the most economical manner to achieve expected equity-focused results?		●			●	

Evaluation questions	Desk review	KIs	FGDs	Surveys	Secondary admin data	Direct observation
g. Would it have been possible to achieve the same results at lower costs?		●			●	
h. How well did the programme coordinate with other similar interventions (if any) for synergy and to avoid overlaps?		●	●		●	
i. Were the activities under different interventions completed in a timely manner?		●			●	
j. Were expected results (outputs) delivered within budget? How does the cost-effectiveness of the different outputs compare?	●	●			●	
k. What were the most important cost drivers in the programme, and how were costs contained without compromising results?		●			●	
Sustainability						
l. To what extent will the outcomes be maintained after development support is withdrawn?		●	●	●	●	●
m. Was behaviour change related to sanitation and hygiene sustained after initial intervention? Were latrines cleaned and maintained after initial intervention (for both school and household)?		●	●	●	●	●
n. What factors explain the observed sustainability of behaviour?		●	●	●		●
o. To what extent has Government capacity, including information management systems, for the delivery of sanitation and hygiene been strengthened as a result of this programme? Specifically, and for the real-time monitoring (RTM)/District Health Information Software 2 (DHIS2) platform, to what extent has the RTM/DHIS2 platform used for decision-making? What factors contributed to the successful rollout of the RTM/DHIS2 platform in the 68 districts? What are the likely factors that could undermine the continued use of RTM/DHIS2?		●	●			
p. How were local authorities at the provincial and district levels involved in the programme? Has there been an increase in budget allocations for sanitation and hygiene?	●	●	●			
q. To what extent has sanitation marketing contributed to enhanced and sustained private-sector capacity and interest?		●	●			
r. To what extent has the programme contributed to strengthened governance of community structures directly or indirectly involved in sanitation and hygiene?		●	●			
s. Were there any mechanisms in place for warranting continuous operation and maintenance of sanitation facilities and continuous promotion of hygiene awareness? Were they functioning?		●	●			●

Evaluation questions	Desk review	KIs	FGDs	Surveys	Secondary admin data	Direct observation
Equity and Gender						
t. To what extent is the programme equity sensible: How well did the programme integrate equity in its design, implementation, and monitoring? Were the needs of marginalised groups and individuals, including the poor, hard-to-reach communities, adequately considered?	●	●	●			●
u. To what extent were women and girls involved in community processes (such as CLTS) and related economic opportunities (for example, sanitation and hygiene marketing?)		●	●			
v. Did the programme contribute to equitable participation and benefits to various groups (men, women, young people, children, and differently able people)?		●	●	●		●
w. How well did the programme integrate gender approach in its design, implementation, monitoring, and reporting?	●	●	●			●
Timeliness						
x. How long did it take for donors to approve programme adjustments to reflect the (cholera) emergency/humanitarian situation from date of request?		●	●			
y. How long did it take to adjust agreements and start implementing (cholera) emergency humanitarian actions in the programme area?		●	●		●	
z. What decisions informed adjustment of the programme to incorporate cholera emergency response? What would have been the impact on the programme if no action had been taken?		●				
Coherence						
aa. To which extent was the programme adjustment in line with national and subnational humanitarian priorities and actions?	●	●				
bb. How did the programme adjustments contribute to addressing the humanitarian situation?		●	●			
Adequacy						
cc. To what extent were all communities in the programme area covered by emergency-related response?		●	●		●	
dd. How adequate was the justification provided for adjusting the programme to address the humanitarian situation?	●	●				
ee. How adequate were the programme resources to address cholera outbreak?		●	●		●	

Evaluation questions	Desk review	KIIs	FGDs	Surveys	Secondary admin data	Direct observation
Impact						
ff. What changes have occurred in the incidences of diarrhoeal disease and other sanitation-related diseases among children under age 5 over the course of the programme?		●	●	●	●	
gg. What other significant differences has the programme made in terms of the well-being of beneficiaries, especially women and girls—in particular, in terms of life skills, dignity, self-confidence, school attendance, and economic opportunity?		●	●	●		●
hh. To what extent has the programme contributed to the reduction in water- and sanitation-related diseases among children under age 5 years? Which factors explain this contribution?	●	●	●	●	●	
ii. To what extent has the programme contributed to the participation of children in school, especially girls? Which factors explain this contribution?		●	●			●
jj. To what extent has this programme contributed to establishing the conditions to sustain the observed behaviour change and use of sanitation facilities—in particular, in terms of governance and capacity of public- and private-sector actors as well as community structures?		●	●			●
kk. To what extent has the programme impacted the local environment, and to what extent have environmental factors affected the performance of the programme?		●				●
ll. What other factors contributed to the observed impact? What are the implications of the interaction between the programme and these factors for the future replication and scale-up of a similar combination of sanitation and hygiene strategies?		●	●			

Note. KIIs = key informant interviews. FGDs = focus group discussions. UNICEF = United Nations Children’s Fund.

Appendix G. Ethical Approval and Data Management

G.1 Ethical Approvals

All AIR staff, subcontractors, and consultants involved in the collection of data from human evaluation participants adhere strictly to the requirements of AIR's Institutional Review Board (IRB). AIR's IRB (IRB00000436) is registered with the Office of Human Research Protection as a research institution (IORG0000260) and conducts research under its own Federalwide Assurance (FWA00003952). The IRB must preapprove all research activities and protocols involving human subjects, as well as an information security plan to protect the confidentiality of data from research participants.

We conducted this evaluation in careful alignment with UNICEF's ethical principles, including (1) respect for dignity and diversity, (2) fair representation, (3) compliance with codes of ethics for vulnerable groups, (4) redress of possible grievances, (5) confidentiality, and (6) avoidance of harm. AIR also strictly adheres to the Ethical Guidelines set forth by the United Nations Evaluation Group (UNEG), as well as the UNEG Code of Conduct, which requires both a conflict- and gender-sensitive approach to research, adherence to the do-no-harm principle, and transparency, confidentiality, accuracy, accountability, and reliability, among other key principles (UNEG, 2008). Regarding protection of vulnerable individuals and communities, AIR respects and adheres to the United Nations Declaration of Human Rights, the United Nations Refugee Convention, the Convention on the Rights of the Child, and the Convention on the Elimination of All Forms of Discrimination Against Women, as well as other human rights conventions and national legal codes that respect local customs and cultural traditions, religious beliefs and practises, personal interaction, gender roles, disability, age, and ethnicity (UNEG, 2008).

Before we collected data, AIR's IRB approved a comprehensive plan to protect the privacy and confidentiality of participants during data collection, transmission, analysis, and storage. Upon being hired, AIR staff are required to complete a comprehensive course in the ethical conduct of research. All individuals and organisations that collect data on behalf of AIR are required to sign our IRB's Participant Protection Assurance to certify that they are aware of and will comply with the requirements for the protection of human subjects in research.

To ensure that field staff are adequately trained in ethical research, we reviewed research ethics at length during enumerator training and required fieldworkers to complete an online research ethics course (e.g., FHI 360, 2011). Further, all researchers signed a participant protection assurance form.

AIR also takes seriously the need for adequate safeguards for any children participating in evaluation activities. No one on the evaluation team will ever be permitted to be alone with a child outside the sight or hearing of caregivers.

G.1.1. Enumerator Selection

We trained more enumerators than we needed for the field teams and selected enumerators for the data collection on the basis of their performance during the training, their observed practises during pilot activities, and their demonstrated performance and understanding of research ethics.

G.1.2. Consent

We inform participants that the information they share is confidential. We also inform them that their participation is voluntary and that they can end their participation at any time or skip any

questions they do not wish to answer. During the qualitative research, we obtain informed verbal consent from each participant after reading the consent form aloud.

G.2. QC approach

G.2.1. Data Security and Management

AIR handles all data in accordance with the procedures and protocols approved by AIR's IRB. Standard practises include digital recording, transcription, and translation where necessary, complete anonymisation of data, and protection of confidentiality.

The evaluation protected confidentiality by several methods. We did not identify any individual household or member by name in any report or publication about this evaluation; we did not share specific information about a household with anyone outside the evaluation team; and we developed data-handling procedures to safeguard completed forms.

AIR analyses data collectively and uses anonymised datasets so that information from any one participant remains anonymous. Data are anonymised at the data-cleaning stage to ensure that all analysis is conducted without names. We include a randomly generated house ID code that can be matched with names, using a cross-walk dataset maintained only by the principal investigator and project director. We also ensure that evaluation staff members are trained to understand ethical research.

For this evaluation, AIR obtained clearance from electronic records and electronic signatures (ERES), as well as the National Health Research Authority (NHRA).

G.2.2. QC process

In an evaluation such as this one, several levels of quality assurance (QA) are incorporated into the project design. Claude Kasonka, the team leader, was responsible for overall project QA planning and execution. Mr. Kasonka has more than 13 years of experience designing and managing large-scale, policy-relevant, qualitative and quantitative studies examining the effectiveness of programmes and interventions that include WASH. The QA team also includes Juan Bonilla, PhD, who will ensure the quality and rigor of the evaluation design and analysis. Dr. Bonilla has extensive experience designing impact evaluations. In addition to internal organisational QA processes, Mr. Kasonka and the evaluation team worked closely with the UNICEF WASH specialist and the Programme Management Unit. We made presentations to both parties, and they approved our inception report.

Appendix H. Gender Analysis

Table H.1. Handwashing Knowledge and Reported Practises, by Gender of Household Head

	Male		Female		Mean
	Mean	N1	Mean	N2	Difference
WASH and disease risk (proportion of households)					
Knows treating and properly storing water associated with lower risk of disease.	0.97	898	0.97	229	0.00
Knows washing hands with soap and water associated with lower risk of disease.	0.98	898	0.98	229	0.00
Knows using clean latrine associated with lower risk of disease.	0.98	898	0.97	229	-0.01
Know open defecation associated with higher risk of disease.	0.98	898	0.97	229	-0.01
Knowledge of causes of diarrhoea (proportion of households)					
Dirty water	0.71	898	0.66	229	-0.05
Dirty food	0.73	898	0.77	229	0.03
Uncleanliness/bad hygiene	0.50	898	0.52	229	0.03
Dirty environment	0.30	898	0.29	229	-0.01
Flies	0.31	898	0.30	229	-0.01
Knowledge of causes of acute respiratory infections (proportion of households)					
Dirty water	0.18	898	0.17	229	-0.01
Dirty food	0.13	898	0.13	229	0.00
Uncleanliness/bad hygiene	0.44	898	0.48	229	0.05
Dirty environment	0.49	898	0.50	229	0.01
Flies	0.08	898	0.07	229	-0.01
Household handwashing facilities (proportion of households)					
Have a functional handwashing facility	0.09	898	0.13	229	0.04
Household handwashing habits (proportion of households)					
Before food preparation	0.56	898	0.65	229	0.09*
Before eating	0.89	898	0.93	229	0.04
Before feeding children	0.35	898	0.28	229	-0.07*
After defecation	0.95	898	0.95	229	0.00
After cleaning baby's bottom	0.22	898	0.18	229	-0.04
Handwashing at 5 critical times	0.17	898	0.14	229	-0.04

^a Washing agents include bar, liquid, or powder soap or detergent, ash, mud, or sand.

*Mean difference is significant at 95% confidence level.

Table H.2. Sanitation Facilities and Practises, by Gender of the Household Head

	Male		Female		Mean
	Mean	N1	Mean	N2	Difference
Household toilet facilities (proportion of households)					
Not-shared toilet facility	0.57	898	0.62	229	0.05
Pit latrine with slab	0.61	898	0.58	229	-0.03
Ventilated improved pit latrine	0.00	898	0.00	229	0.00
Flush/pour toilet	0.00	898	0.01	229	0.01
No facility	0.24	898	0.20	229	-0.04
Communal toilet	0.02	898	0.01	229	-0.01
Observed toilet conditions (proportion of households)					
Toilet inside, connected, or within 10m of main living quarters ^a	0.05	680	0.07	183	0.02
Toilet clean	0.60	680	0.62	183	0.03
Reported satisfaction with current toilet facilities (proportion of households)					
Satisfied or very satisfied with current toilet type	0.44	898	0.48	229	0.04
Neither satisfied nor unsatisfied with current toilet type	0.03	898	0.03	229	0.01
Unsatisfied or very unsatisfied with current toilet type	0.36	898	0.31	229	-0.05
Reasons for dissatisfaction with current toilet facilities (proportion of households)					
Not hygienic/clean	0.19	441	0.25	103	0.06
Not comfortable, not private, or unsafe at night	0.44	441	0.47	103	0.03
Other reason for dissatisfaction ^b	0.70	441	0.67	103	-0.03
Toilet construction (proportion of households)					
Household provided funding, resources, materials, for toilet construction.	0.96	680	0.96	183	0.00
Government provided funding, resources, materials, for toilet construction.	0.01	680	0.02	183	0.01
Other entity provided funding, resources, materials, for toilet construction.	0.03	680	0.02	183	-0.01
Very easy or easy to access building materials for toilet	0.48	652	0.41	176	-0.07
Average monthly maintenance cost of toilet facility	2.30	545	4.38	148	2.08
Cleans toilet at least once a day.	0.71	680	0.69	183	-0.02

^a Enumerators observed toilet facilities and marked them as inside, connected, or within 10m of the main living quarters.

^b Other reasons for dissatisfaction with toilets included other households have nicer toilets, the toilet is almost full, the toilet is also used as a shower, or unsure.

*Mean difference is significant at 95% confidence level.

Table H.3. ODF Practises and Status, by Gender of the Household Head

	Male		Female		Mean
	Mean	N1	Mean	N2	Difference
Household garbage disposal practises (proportion of households)					
Buries or put trash in pit.	0.73	898	0.75	229	0.02
Burns trash.	0.04	898	0.10	229	0.05*
Puts trash in latrine or disposes of it in another way.	0.23	898	0.16	229	-0.07*
Night-time toilet use (proportion of households)					
Uses same toilet night and day.	0.77	898	0.77	229	0.00
Waits to use toilet until morning.	0.05	898	0.04	229	-0.01
Uses chamber pot, bucket, or plastic bag.	0.29	898	0.26	229	-0.03
Other night-time toilet practises	0.25	898	0.20	229	-0.05
Household disposal of child faeces (proportion of households)					
Disposes of child stool in toilet or latrine.	0.75	518	0.69	81	-0.06
Buries child faeces.	0.16	518	0.23	81	0.08
Leaves child faeces in open.	0.00	518	0.01	81	0.01
Puts child faeces in ditch, garbage, or disposes of it in other way.	0.09	518	0.06	81	-0.03
Household open defecation habits (proportion of households)					
Members of household above 5 years defecate in open daily.	0.13	898	0.07	229	-0.06*
Members of household above 5 years defecate in open occasionally.	0.11	898	0.05	229	-0.06*
Members of household above 5 years never defecate in open.	0.74	898	0.88	229	0.13*
ODF certification (proportion of households)					
Knows what ODF is.	0.44	898	0.45	229	0.01
Knows ODF certification process.	0.21	393	0.15	103	-0.06
Knows if own village is ODF certified.	0.19	393	0.13	103	-0.06
Thinks ODF certification is important.	0.99	393	0.97	103	-0.02
Someone talked to beneficiary about ODF, latrines, or handwashing in past 6 months.	0.51	898	0.52	229	0.01
Sensitised about ODF once in past year.	0.26	898	0.27	229	0.01
Sensitised to ODF more than twice in past year.	0.25	898	0.24	229	0.00

*Mean difference is significant at 95% confidence level.

Table H.4. Water Access and Water Treatment Practises, by Gender of the Household Head

	Male		Female		Mean
	Mean	N1	Mean	N2	Difference
Household water source (proportion of households)					
River, lake, stream, or dam	0.23	898	0.14	229	-0.09*
Unprotected well	0.22	898	0.22	229	0.00
Protected well	0.19	898	0.23	229	0.04
Borehole	0.33	898	0.38	229	0.04
Other water source ^a	0.03	898	0.03	229	0.00
Fetching water (proportion of households)					
Time to get water and return (minutes)	109.51	898	109.15	229	-0.36
Adult women responsible for fetching water	0.93	896	0.95	229	0.02
Adult men responsible for fetching water	0.30	896	0.24	229	-0.07*
Female children under age 15 responsible for fetching water	0.27	896	0.30	229	0.03
Changes in water source (proportion of households)					
Household water source changed in last 2 years.	0.15	898	0.20	229	0.05
New water source closer than old water source.	0.45	134	0.56	45	0.11
New water source same distance from house as old water source.	0.29	134	0.22	45	-0.07
New water source farther than old water source.	0.26	134	0.22	45	-0.04
Changes in water quality (proportion of households)					
Household water quality changed.	0.20	898	0.17	229	-0.03
Water quality better than 2 years ago.	0.53	178	0.62	39	0.08
Water quality the same as 2 years ago.	0.09	178	0.08	39	-0.01
Water quality worse than 2 years ago.	0.38	178	0.31	39	-0.07
Water quality improved because household constructed new borehole.	0.40	95	0.63	24	0.22*
Water quality improved because household now treats water.	0.22	95	0.04	24	-0.18*
Water quality improved for a different reason.	0.38	95	0.33	24	-0.05
Household water treatment practises (proportion of households)					
Household treats drinking water.	0.34	898	0.34	229	0.01
Boils water to treat it.	0.36	304	0.32	79	-0.04
Adds bleach or chlorine to treat water.	0.63	304	0.67	79	0.04
Treats water by letting it stand and settle or in other way.	0.01	304	0.01	79	0.00
Started treating water in last 6 months.	0.19	304	0.11	79	-0.08
Started treating water in last 2 years.	0.21	304	0.30	79	0.10

	Male		Female		Mean
	Mean	N1	Mean	N2	Difference
Started treating water more than 2 years ago.	0.48	304	0.51	79	0.02
Don't know/cannot remember when household started treating water.	0.12	304	0.08	79	-0.04

^a Other water sources include rainwater, protected and unprotected spring water, public or private taps, and water kiosks.

*Mean difference is significant at 95% confidence level.

Table H.5. Sources of WASH Information, by Gender of the Household Head

	Male		Female		Mean
	Mean	N1	Mean	N2	Difference
Reported source of WASH information (proportion of households)					
Health workers	0.57	898	0.54	229	-0.04
Community health workers	0.11	898	0.14	229	0.03
CLTS or ZSHP volunteers	0.05	898	0.06	229	0.01
Radio	0.17	898	0.15	229	-0.02
TV	0.03	898	0.02	229	-0.01
WASH information from other source ^a	0.27	898	0.30	229	0.02
CLTS initiation (proportion of households)					
Has heard of CLTS.	0.30	897	0.31	229	0.01
CLTS active in village.	0.71	266	0.67	70	-0.04
CLTS not active in village.	0.22	266	0.26	70	0.04
Doesn't know if CLTS is active in village.	0.07	266	0.07	70	0.00
CLTS initiated in village.	0.74	266	0.69	70	-0.05
CLTS not initiated in village.	0.12	266	0.20	70	0.08
Doesn't know if CLTS has ever been initiated in village.	0.14	266	0.11	70	-0.02
CLTS initiated more than 12 months ago.	0.72	197	0.77	48	0.05
CLTS initiated within last 12 months.	0.10	197	0.17	48	0.07
CLTS not yet initiated or respondent does not know if it has been initiated.	0.09	197	0.02	48	-0.07
Government initiated CLTS.	0.40	197	0.44	48	0.04
ZSHP (CLTS) project initiated CLTS.	0.25	197	0.33	48	0.08
Community initiated CLTS.	0.28	197	0.40	48	0.11
Other NGO not related to ZSHP or other entity initiated CLTS.	0.34	197	0.21	48	-0.13
Community hygiene, water, and sanitation meetings (proportion of households)					
Had meetings/were sensitised on hygiene and water and sanitation	0.50	898	0.51	229	0.00
Meeting leader					
Meeting led by local health staff or district WASH member	0.69	453	0.74	116	0.05

	Male		Female		Mean
	Mean	N1	Mean	N2	Difference
Meeting led by CLTS volunteer or community health workers	0.31	453	0.30	116	-0.01
Meeting led by other NGO or other entity	0.29	453	0.22	116	-0.07
Meeting Frequency					
Sensitization meetings held more than 12 months ago	0.40	453	0.42	116	0.02
Sensitization meetings held within last 12 months	0.55	453	0.53	116	-0.03
No sensitization meetings held, or respondent unsure	0.05	453	0.05	116	0.01
Number of meetings attended by respondent	3.62	453	2.77	116	-0.86

^a Other sources of WASH info include posters/billboards, drama groups, newspapers, and others.

Table H.6. Health and Nutrition Outcomes for Children, by Gender, of the Household Head

	Male		Female		Mean
	Mean	N1	Mean	N2	Difference
Children under 5 years (proportion of children)					
Diarrhoea prevalence					
Had diarrhoea in last 2 weeks.	0.11	748	0.12	127	0.00
Sought treatment for diarrhoea.	0.34	165	0.31	32	-0.03
Went to public clinic for diarrhoea treatment.	1.00	56	0.90	10	-0.10*
Prevalence of acute respiratory infections					
Had cough or trouble breathing in last 2 weeks.	0.28	748	0.33	127	0.05
Sought treatment for cough.	0.82	212	0.86	42	0.04
Went to public clinic for cough treatment.	0.77	212	0.76	42	-0.01
Malnutrition indicators^a					
Stunted	0.32	585	0.36	104	0.04
Severely stunted	0.10	585	0.11	104	0.00
Wasted	0.05	601	0.10	111	0.05
Children 5 to 12 Years (proportion of children)					
Diarrhoea prevalence					
Had diarrhoea in last 2 weeks	0.05	1,469	0.05	335	0.00
Sought treatment for diarrhoea	1.00	51	1.00	12	0.00
Went to public clinic for diarrhoea treatment	0.86	51	0.92	12	0.05
Prevalence of acute respiratory infections					
Had cough or difficulty breathing in last 2 weeks	0.19	1,469	0.18	335	-0.01
Sought treatment for cough	0.77	284	0.85	61	0.08
Went to public clinic for cough treatment	0.73	284	0.77	61	0.04

^a Stunting defined as having a height- or length-for-age WHO z score is less than -2; severe stunting is defined as having a height- or length-for-age WHO z score less than -3; Wasting is defined as having a weight-for-height or length WHO z score less than -2.

*Mean difference is significant at 95% confidence level.

Appendix I. Terms of Reference

Please note that only the final PDF version of this report contains the TOR. The TOR can be found on the page in the PDF.