CDI2 WASH Program - Bangladesh

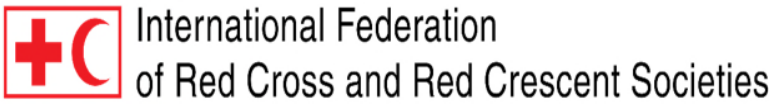
Program Endline Survey Final Report

June 30, 2018

Prepared for: Australian Red Cross & Bangladesh Red Crescent Society

Prepared by: Andrew Shantz (Consultant)

CDI- WASH is supported by the Australian Government and implemented by Bangladesh Red Crescent Society supported by Australian Red Cross and IFRC.



Acknowledgements

Many thanks to Jenni Lillingston (Senior Program Lead, ARC) for direction, support and feedback throughout the assignment, Biplob Kanti Mondal (Project Manager, IFRC) for overall coordination, support, and feedback, and Renae Davies (Bangladesh Country Manager, ARC) for review and comments. The field teams that coordinated and collected data for the endline, including the household surveys, school surveys, and focus group discussions are also recognized for their hard work and commitment, namely Mohammad Keramot Ali (Project Coordinator, BDRCS), Tanoy Dewan (Senior WASH Officer, IFRC), Ashik Sarder (Project Officer, IFRC), Talha Tasnim (BDRCS volunteer), BDRCS district staff from Rangpur and Gopelganj, BDRCS volunteers from both districts, and community-level facilitators.

Executive Summary

The Community Development Initiative - Water, Sanitation, and Hygiene Program (CDI WASH) was implemented by the Bangladesh Red Crescent Society (BDRCS) in Rangpur and Gopelganj districts in Bangladesh from May 2014 to June 2018 with support from the Australian Government Department of Foreign Affairs and Trade (DFAT). The program aimed to improve the health of families, communities and students from 4 villages in 2 communities. In total, 1,600 households (HH) and 29 schools (around 13,000 school children) were targeted directly. Investments were directed towards improving WASH conditions among poor households in both districts. The CDI WASH program demonstrated significant improvements to water supply access, drinking water quality (arsenic treatment), latrine access, HH hygiene practices, menstrual hygiene management (MHM), and WASH facility access and hygiene in schools. The program also improved WASH related knowledge and practices in the additional nearby communities (referred to as *school communities*) where the majority of students in the target schools came from. Government departments, public schools, student and community leaders, and commercial and finance service providers were all engaged in support of the program. The anticipated outcomes from the program included improved:

1. Performance of actors in the Bangladesh WASH enabling environment;
2. Gender equality;
3. WASH evidence and knowledge base;
4. Hygiene behaviour;
5. Use of equitable sanitation services; and
6. Use of improved and equitable water supply services.

An endline survey was administered from April to July 2018 to evaluate end of program results and generate recommendations for BDRCS. Program outcomes have been assessed through Key Performance Indicators (KPIs) and Key Performance Questions (KPQs). The endline assessed WASH conditions through the surveying of HHs in target and school communities, schools in the target area, and community members and Persons With Disabilities (PWDs) through a mix of structured HH questionnaires, focus group discussions, and key informant interviews. Results are summarised and presented below for each of the endline study objectives (in bold).

Assessment of the change in access to safe drinking water and improved sanitation facilities by the target population. Nearly all HHs relied on tube wells as their main drinking water source throughout the year. Accessibility to water supply was found to be very high for nearly all HHs - resulting in decreased workloads for fetching water. Greater gender equality has been realized through the reduction in time spent on water-related activities by women. Water accessibility service levels appear to be very high and water quantities were reportedly sufficient. Reliability was also found to be very high. Water treatment was more commonly practiced in target compared to school communities – but was moderately common overall. When considering the use of improved water sources, water treatment, and storage practices – approximately 80% of HHs demonstrated safe drinking water. Communities in Gopelganj – where groundwater arsenic was prevalent - reported having safer water due to the use of SONO filters for arsenic removal.

All target communities have now been declared Open Defecation Free by the government. OD was rarely reported (1% and 5% in target and school community groups, respectively) and slightly more common among children than adults. Nearly all HHs that used a toilet had one that was defined to be "improved" – with most being flush toilets to a pit latrine. Dry pit latrines with a slab were also common – but more so in school communities than in target communities. Latrine sharing was uncommon. In target communities, most latrines were constructed in the past 4 years and nearly half in target areas were supported by BDRCS. They were generally observed to be clean and providing privacy for the user. Most HHs reported that before using their current latrine, they used a different latrine, and this previous latrine was more likely to be 'unimproved'.

All schools reportedly served drinking water to students and most indicated that their facilities were sufficient to meet demand. A total of 29 water sources were constructed through the project representing nearly half of the cumulative infrastructure at the schools. Wells have been repaired or constructed depending on the needs at each individual school. Accessibility and reliability were reportedly very high. Nearly all schools reported having sufficient quantities of drinking water available for students. Water availability was continuous and consistent. Around one-quarter of school water supplies were contaminated by arsenic (all of which were in Gopelganj district). Two schools had all of their water sources contaminated with arsenic. SONO filters were present in nearly all schools and there were on average 5 functional water access points per school. However, students reported that drinking water was most commonly consumed directly from the wells. Tube wells were the predominant water source, and a small proportion were dysfunctional at the time of the survey (having been reported as requiring minor repairs which have now been completed).

All schools reported that OD was not being practiced by the students during school hours. Nearly all school latrines were observed to be defined as 'improved' and being in a clean state. Schools had an average of 6 latrines, most schools did not have dysfunctional latrines, and few were found to be shared by among both girls and boys. However, few schools demonstrated a ratio of less than 50 students per latrine. Most schools had at least one

latrine that could be accessed by someone in a wheelchair. All schools had at least one handwashing station and most had water and soap. Students generally reported that handwashing habits and understanding of WASH importance had been transformed through the program. Modern latrine facilities and handwashing sinks have greatly increased the levels of satisfaction among students. Student health and attendance were also noted as having been improved. WASH needs in schools have largely been met, however some remaining programmatic gaps include the further need for an additional water source point at a few schools and addressing water treatment needs (particularly at schools with no arsenic-safe water source) – as SONO filters were not always consistently used by students.

The program has also resulted in the improved health, decreased marginalization of PWDs, and indirect effects such as community cohesion and stronger linkages among local actors. While health indicators were not directly assessed as part of the endline, perceived changes to health were assessed through self-reports from respondents to the HH questionnaire and community and school respondents from the FGD/KIIs. Incidences of water-borne diseases among HH respondents were reportedly rare, and reportedly decreased from past years. Respondents consistently claimed that the health of the community and students had improved remarkably – including fewer incidences of diarrhoea, admissions to the doctor, and missed days at school due to sickness. Costs for health care and treatment reportedly decreased overall.

Measurement of changes in knowledge, perception, attitude and practice of the beneficiaries and surrounding communities in relation to hygiene and sanitation including menstrual hygiene management. Hygiene practices and conditions have reportedly been revolutionized in the program influenced communities - including improved handwashing, cleanliness, safe water storage, and use of soap. Respondents from target, school community, and school (CHAST teacher and student champion) populations consistently reported meaningful changes to their WASH related behaviours, attitudes, and practices as a result of the program. Handwashing after using a toilet was reportedly extremely common with soap also present at most HH handwashing stations. Multiple respondents noted that in some cases WASH-related knowledge was already known, but through the program this knowledge actually transferred into behaviour changes and new habits. When specifically asked, FGD respondents indicated that there were no particular groups excluded or marginalized by the program. Community habits and norms surrounding hygiene have reportedly changed remarkably over the 4-year program. Knowledge of the benefits of WASH, sanitation habits and practices, handwashing habits were all found to be very high. Nearly all HHs in target areas noted that they had received WASH messaging from BDRCS hygiene promotors. TV and other community committee members were also common sources of information.

The HH survey and FGD interviews both revealed that the level of discussion and openness to MHM issues had reportedly increased substantially. Women were reportedly more knowledgeable of MHM issues - including MHM products and options. Most respondents indicated that there had been an increase in awareness and discussion of menstrual hygiene issues with cloths and sanitary pads most commonly being used. Sanitary pads were the

preferred MHM solution but remained unaffordable for a large segment of the population. Most respondents indicated that their daughters were attending school when having their periods.

WASH practices and attitudes appear to have been significantly changed at target schools. The CHAST program appears to have been effective and the student champions an effective way of incentivizing and engaging with the student population. Most schools had a location for disposal of menstrual hygiene waste and female student confidence around MHM was generally high. Female students of menstrual age appeared to have mixed levels of comfort and satisfaction with the MHM situation at their schools. At some schools, student respondents were proud and extremely satisfied that they now had private facilities, pads, and comfort in discussing MH issues with their teachers and peers. At other schools, MH issues were still stigmatized – but to a lesser degree than prior to the program.

Review the effectiveness of community engagement in the design, implementation and monitoring of the project. The performance of WASH actors has reportedly been improved through formal trainings and practical experiences. Community change agents reported that their capacities had improved significantly and beneficiaries that worked with them were satisfied with their performance. Overall satisfaction with the programme was very high from the beneficiary's perspective. The program was clearly implemented in remote and socio-economically disadvantaged communities. Overall, PWDs noted that they felt more dignified as a result of the program, due to the fact that BDRCS recognized and encouraged their participation and they were able to participate and contribute in community activities.

Determination of the factors now in place to ensure that the improved service levels are sustainable and/or be replicated in other areas of Bangladesh. Water supply service levels that have been achieved appear likely to be sustained – as tube wells have been reportedly constructed to satisfactory levels of quality, community mobilization is in place to address future problems (such as breakdowns) if and when they occur, and repair expertise and spare parts are reportedly available locally. Some risks to facilities associated with flooding remains – but is largely unavoidable. Sanitation facilities are likely to remain operational, and OD is already a historical practice abandoned by most HHs for many years already. There may be continued demand to upgrade or construct flush toilets among pit latrine users, and to have more appealing and cleaner superstructures. There was some concern reported regarding the sustainability of the SONO filters. Many of the filters were purchased based on subsidies provided by the program. The lifespan of the filters is marketed as being 7 years. Community members were reportedly unsure whether replacement products will remain available in the marketplace at affordable prices after this time period. The SONO filters are reportedly highly valued in arsenic affected communities.

At schools, FGD respondents indicated that fees given to the schools by the enrolled students contribute towards general maintenance works, including those related to WASH. At some schools, students are also required to bring a bar of soap per year to contribute to the school's stock. These fees and contributions, combined with occasionally

reported budget lines allocated for general maintenance (which can also be used for WASH), are reportedly sufficient to sustain the need for consumables (handwashing soap and cleaning products), future repair works, and pit latrine emptying.

Document lessons from the CDI2 WASH interventions in the target communities that can inform future Red Cross/Red Crescent programming as well as the wider WASH sector. Water quality monitoring related to microbiological parameters should be considered in the future due to the prevalence of shallow tube wells and the concentration of faecal sludge in pit latrines in a high density. More holistic and sustainable arsenic treatment systems could also be explored for school settings. More in-depth engagement may be needed at schools that are reluctant to MHM messaging and changing of cultural norms. Meeting the needs of PWDs could also be enhanced through the availability of accessibility-related design features for WASH infrastructure.

The endline study for the 4-year CDI WASH program has revealed significant improvements to WASH behaviours and facility access in households, communities and schools across the program area – resulting in better health, school attendance, and stronger communities. These improvements have been effective through the community engagement approach and are also likely to be sustained into the future.

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List of Acronyms

BDRCS	Bangladesh Red Crescent Society
CAPI	Computer Assisted Personal Interviewing
CDI	Community Development Initiative
CPC	Community Program Committees
CS WASH	Civil Society Water, Sanitation, and Hygiene
CSP	Commercial Service Providers
DFAT	Department of Foreign Affairs and Trade
DPHE	Department of Health and Engineering
FGD	Focus Group Discussion
HH	Households
KII	Key Informant Interview
KPI	Key Performance Indicator
KPQ	Key Performance Question
PRT	Project Reporting Tool
WASH	Water, Sanitation, and Hygiene
UPWASH	Union Parishad WASH Committee

1 Introduction

The Community Development Initiative - Water, Sanitation, and Hygiene Program (CDI WASH) was implemented by the Bangladesh Red Crescent Society (BDRCS) and the non-governmental organization iDE in Rangpur and Gopelganj districts in Bangladesh. It ran from May 2014 to June 2018 and was supported through the Civil Society Water, Sanitation and Hygiene (CS WASH) Fund, of which the donor was the Australian Government Department of Foreign Affairs and Trade (DFAT).

The program aimed to improve the health of families, communities and of students from 29 schools in Bangladesh. Building on past successes in enhancing community resilience, this project supported vulnerable individuals, schools and communities in targeted areas to address their WASH related needs. WASH activities were developed to address localised issues relating to latrine construction, water supply provision and water resources management. Approaches included sanitation marketing, hygiene promotion (including participatory and child hygiene and sanitation training for communities and schools), regular follow-up including household visits and promotion of local technologies for providing safe water. The project worked closely with key government departments, as well as public schools, madrasahs, student and community leaders and commercial and finance service providers.

The program targeted investment for households from 4 villages in 2 communities in both districts reaching an estimated 10,000 people living in 1,600 households (HH) along with 29 schools, (reaching around 13,000 school children). It also provided support through building WASH related knowledge and practice in the remaining communities that students in the target schools came from. The four selected communities (target area) were chosen on the basis of vulnerability, susceptibility to floods, and arsenic[1] contaminated groundwater.

The implementation of the program centred around government and community change agents and their lead role in promoting WASH-related behaviour changes. The cross-cutting themes of climate change awareness and adaptation, gender and social inclusion, accessibility, and private sector support have also been integrated into the program design. WASH activities have been selected and implemented according to context-specific needs in each district and community. Activities have included water supply and sanitation provision at HHs and schools, sanitation marketing, hygiene promotion, water resource management, and water testing training. The

[1] A water contaminant commonly found in the groundwater of some parts of Bangladesh with natural origins and high toxicity if consumed for a prolonged length of time

program has strived to involve representatives of all stakeholder groups and beneficiaries in the planning and decision-making processes.

The overall aim of the CDI 2 WASH program was to enhance the health and quality of life of the poor and vulnerable through sustainable improvements to safe water, sanitation, and hygiene. The anticipated outcomes from the program include improved:

- Performance of actors in the Bangladesh WASH enabling environment;
- Gender equality;
- WASH evidence and knowledge base;
- Hygiene behaviour;
- Use of equitable sanitation services; and
- Use of improved and equitable water supply services.

These program outcomes have been assessed through the design of Key Performance Indicators (KPIs) and Key Performance Questions (KPQs) which have been monitored over time. KPIs (Annex A) are centred around quantifiable[2] parameters and attributes (typically obtained through HH or institutional surveys) while KPQs (Annex B) comprise of qualitative[3] measures (typically obtained through interviews with beneficiary target groups and key program stakeholders).

1.1 Monitoring and evaluation scope and program activities to-date

The implementation of the program and it's monitoring and evaluation through the KPIs and KPQs covers several populations of interest, as presented in Table 1.

Table 1 – Scope of study populations for the CDI2 WASH Program

N°	Study populations	Assessed by endline study	Population size	Survey Approach
1	HHs in the target area	Yes	1,603 HHs	Sample and survey
2	Schools in the target area	Yes	29 schools 12,728 students[4]	Select all and survey
3	HHs outside of the target area but whose children attend target area schools	Yes	8,541 HHs (estimated)	Sample and survey
4	Beneficiary-level stakeholders and target groups	Yes	-	Sample and interview
4a	Female adults in target villages	Yes	4,323	FGD
4b	Female and male adults in school communities (as #3 above) and who attended parent forums	Yes	30,000 (estimated)	FGD

[2] Results that can be counted, and summarized through percentages, means, and medians
[3] Results that cannot be counted in their original form, such as ideas, opinions, perceptions, or feelings
[4] Enrolled in 2018

4c	Persons with disabilities (PWDs) in target villages	Yes	51	FGD
4d	School students	Yes	29 schools, 12,728 students	FGD
4e	CHAST teachers and student champions	Yes	29 schools	KII
5	Management and mobilization level stakeholders and target groups	No	-	-
5a	Community Disaster Response Teams (CDRT)	No	-	-
5b	Community Project Committees (CPCs)	No	-	-
5c	UP-WASH Committees	No	-	-
5d	Commercial service providers (CSPs)	No	-	-
5e	Department of Health and Engineering (DPHE) staff	No	-	-

Population 1 resides within the target program area. For population 2, the schools themselves are within the target area, however the students themselves come from villages both within and outside the target area. In 2014, BDRCS led a baseline survey for the CDI 2 WASH program and this survey was administered to all HHs in Population 1 (Table 1) however it did not provide results that enable comparison with a number of the KPI requirements. Schools were targeted on the basis of a lack of suitable latrines and/or water supply. WASH facilities in schools had been monitored during subsequent construction activities by WASH Committees (CPC/UPWASH) and local government (Education/DPHE). Population 3 resides outside the target program area but was influenced by the program through their child's participation in target schools and their direct participation in parent-teacher forums. No baseline was conducted for Population 3. Interviews have been conducted with various stakeholders from the sub-groups comprising of Population 4 and 5 throughout the program, to inform routine performance monitoring against the KPQs. Annual reflection workshops have also been held with key change agents to review progress and challenges and to update progress against targets and KPQs.

The aforementioned program monitoring results have been compiled and reported against KPIs and KPQs in a Project Reporting Tool (PRT) in the form of an Excel spreadsheet. The PRT has been periodically submitted by ARC to DFAT's executing agency at the mid and end points of each fiscal year. KPIs covered by this external endline study are indicated in Annex A, while other KPIs were assessed and reported separately by IFRC and BDRCS. KPQs were assessed based on the perspectives and insights from beneficiary level stakeholder groups as indicated in Table 1. Other stakeholder groups have been assessed through separate studies by ARC,IFRC, BDRCS, and iDE.

1.2 Objectives and scope of the endline

This document represents the Final Report for the endline study[5] associated with the program. The aim of the study was to assess the level of achievement of the program towards the intended impacts and outcomes, as measured through those KPIs assigned to the external evaluation (Annex A), the KPQs (Annex B), across the assigned stakeholders (Table 1), and in accordance with the program monitoring design. The specific objectives of the study are presented in Table 2. The Terms of Reference (ToR) for the assignment is presented in Annex C.

Table 2 – Endline study objectives

N°	Objective
1	Assessment of the change in access to safe drinking water and improved sanitation facilities by the target population.
2	Measurement of changes in knowledge, perception, attitude and practice of the beneficiaries and surrounding communities in relation to hygiene and sanitation including menstrual hygiene management.
3	Review the effectiveness of community engagement in the design, implementation and monitoring of the project.
4	Determination of the factors now in place to ensure that the improved service level are sustainable and/or be replicated in other areas of Bangladesh.
5	Document lessons from the CDI2 WASH interventions in the target communities that can inform future Red Cross/Red Crescent programming as well as the wider WASH sector.

**taken from the Consultant's Terms of Reference*

2 Methodology

This chapter describes the methodology that has been implemented to execute the endline study and satisfy the objectives defined in Chapter 1. This chapter presents the study framework, data collection instruments, sampling strategy, methods for data collection and analysis, and protocols for quality control. An Inception Report was finalized with feedback provided by ARC and IFRC in April 2018.

2.1 Study framework and data collection instruments

The KPIs assigned to the consultant for the endline are discussed in the framework in Annex D. Endline data sources, retroactive baselines, and any issues with comparisons to the baselines are described therein. Study populations 1 and 3 (Table 1) were assessed using a structured HH questionnaire (Annex E) administered to randomly selected respondents in target and school communities. Study population 2 was assessed using a

[5] A study administered at the end of a project or program to assess its level of achievement against targets, performance, and/or sustainability - often through a comparison against previously collected monitoring data

structured school questionnaire (Annex F) including the questionnaire itself (F1) and the accompanying facility checklist (F2). The questionnaires were designed in English by the consultant, with feedback and inputs provided by ARC and IFRC, prior to translation into Bangla. Translations were double-checked by a 3rd party to identify any errors or to clarify any ambiguities. The observation portions of the questionnaires included the inspection of WASH facilities – such as latrines, water sources, and handwashing stations – conducted by the interviewer themselves, to avoid self-reporting which could be influenced by biases from the respondent. HH and school questionnaires were prepared in English on portable electronic devices using the digital data collection software called KOBO Toolbox[6]. The setup of the questionnaires on KOBO was led by the IFRC endline coordinator with verification and revisions provided by the consultant. Hard copy print-outs of the Bangla translations of the questionnaires were provided to enumerators separately. Skip-patterns and data fields were automatically coded and enforced in KOBO to minimize the likelihood of enumerator error.

Study population 4 was surveyed through Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs) as indicated in Table 1. Annex B presents the guiding interview questions for the target and school community beneficiaries (H1) and school beneficiaries (H2). Guiding questions were not translated into Bangla as interviews were led by the consultant and the translator provided by BDRCS. The consultant and the translator met in advance of the field interviews to review the questions and ensure understanding of their intentions and any related terminology. Interview notes were recorded by the consultant in English.

2.2 Sampling

For populations 1 and 3, listings of all HHs comprising each population were prepared by BDRCS. All HHs residing in target communities (population 1) and living in school community communities but having at least one child attending a target school (population 3) were compiled and digitized in an Excel spreadsheet. Required sample sizes were calculated separately for target and school community HHs[7] (as presented in Table 3) to ensure sufficient statistical power for comparison between target and school community groups and based on standard statistical tolerances of 95% confidence and a margin of error of 5%. The total required sample size for the household survey portion of the study was 651.

[6] A free and open-source data collection software designed for challenging environments: http://www.kobotoolbox.org

[7] Using the Krejcie & Morgan formula from their 1970 article entitled "Determining Sample Size for Research Activities" (Educational and Psychological Measurement, #30, pp. 607-610)

Table 3 – Sampling summary by group type

Parameter	Target group	School community group	Total
Target population (HHs)	1,603	8,541	10,144
Calculated required sample size (HHs)	283	368	651
Actual sample size (HHs)	286	364	650
Difference	+3	-4	-1

A total of 283 HHs were randomly selected from the listing of 1,603 households in target communities using simple random sampling[8] whereby each HH from the list had an equal chance of being selected. HHs were then randomly selected from community household lists using a random number generator. However, the population of school community households resided across 310 villages[9] and therefore, to concentrate the data collection logistics, a clustered sampling[10] approach was used[11]. Sample sizes (along with the actual number of HHs surveyed, discussed further in Chapter 3) are presented in

Rosters of selected HHs were printed and given to the enumerators, along with the corresponding names of the HH heads, which were used to locate and identify each HH. Additionally, a listing of randomly selected replacement HHs for each village was prepared, for cases when the randomly selected HH could not successfully be interviewed by the enumerator. An example enumerator and supervisor HH roster are presented in Annex G1 and G2, respectively. Separate enumerator and supervisor rosters were prepared for each of the 24 sample villages.

For the structured school surveys, questionnaires were administered at all 29 schools across the two districts. Any sampling of the 29 schools would have resulted in wide confidence intervals, beyond standard statistical tolerances.

[8] Random selection of each HH from a listing of all HHs (sample frame)
[9] Spelling inconsistencies of the village names were observed in the listing, meaning that the actual number of villages would be less than 310.
[10] Cluster units (in this case villages) were first randomly selected, following by the random selection of households inside the randomly selected village. Surveying activities were therefore more concentrated within a set number of villages.
[11] Only the school community villages with at least 50 eligible HHs were short-listed (resulting in 52 villages). A total of 20 random selections were made, with the probability of a selected village being proportional to its size. In four cases, a village was selected twice, and in such cases the sample size was doubled. Final sample sizes were allocated proportionally to the size of the villages (and the number of times they were randomly selected).

Table 4 and Table 5 by district and community type; and by village, respectively.

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For the structured school surveys, questionnaires were administered at all 29 schools across the two districts. Any sampling of the 29 schools would have resulted in wide confidence intervals, beyond standard statistical tolerances.

Table 4 – Sampling summary by region and type

Type	Number of villages	Calculated Sample Size	Actual sampling	Difference
Gopelganj	**13**	**302**	**303**	**+1**
School community	10	156	156	0
Target	3	146	147	+1
Rangpur	**11**	**349**	**347**	**-2**
School community	6	212	208	-4
Target	5	137	139	+2
Grand Total	**24**	**651**	**650**	**-1**

Table 5 – Sampling summary by village

District	Type	Village	Allocated Sample Size	Actual Sample Size	Difference
Gopelganj	School community	Banbari	19	19	0
Gopelganj	School community	Borfa	14	14	0
Gopelganj	School community	Dumdia	7	15	8
Gopelganj	School community	Dumria	56	48	-8
Gopelganj	School community	Joaria	12	13	1
Gopelganj	School community	Labutola	7	7	0
Gopelganj	School community	Manikhar	18	17	-1
Gopelganj	School community	Munshir Chor	6	5	-1
Gopelganj	School community	Paskohaniya	6	6	0
Gopelganj	School community	Pathorghata	11	11	0
Gopelganj	Target	Baladanga	35	34	-1
Gopelganj	Target	Dariarkul	27	27	0
Gopelganj	Target	Tebaria	84	86	2
Rangpur	School community	Durgapur	76	61	-15
Rangpur	School community	Fatepur	17	30	13
Rangpur	School community	Fridpur	7	9	2
Rangpur	School community	Maddhobpur	8	8	0
Rangpur	School community	Panbari	24	24	0
Rangpur	School community	Tetulia	80	77	-3
Rangpur	Target	Baramokim	23	25	2
Rangpur	Target	Biddiban	8	8	0
Rangpur	Target	Nagirdigor Sathgori	8	8	0
Rangpur	Target	Nazir Digor	50	52	2
Rangpur	Target	Paddo Pukur	48	46	-2

For the KIIs and FGDs associated with population 4, the number of interviews was determined based on the estimated size of the target population and time allocated for data collection activities, as presented in Table 6.

Table 6 – KII and FGD sampling

Population	Population Size	Planned # of KIIs	Planned # of FGDs	Sampling
Female adults in target villages (people)	4,323	-	1 per community	10 women from random HHs
Female and male adults in school communities (those that attended parent forums)	30,000 (est.)	-	1 per community	5 women and 5 men from 10 random HHs
PWDs	51	-	1 per district	3-5 persons with disabilities purposefully selected
School students	29	-	1 per community	Students of school
CHAST teachers and student champions	29	1 per community		
	Total:	4 KIIs	14 FGDs	

Target and school community FGD participants were randomly selected from village HH rosters. PWDs were selected purposefully from a list of PWDs in each community – based on proximity and accessibility to the meeting site. CHAST teacher and student champions were chosen by school administrators based on availability during the day and time of the visit.

2.3 Training and survey organization

The training of the HH questionnaire enumerators was led by IFRC/BDRCS – with support and guidance from the consultant - and was conducted on April 27 & 28, 2018. Training activities covered the use of portable handset devices, KOBO interface, HH questionnaire, HH sampling, eligibility, and replacement, and logistics. Data collection activities for the HH survey were supervised by IFRC staff with logistical support provided by regional BDRCS staff. The training of the school enumerators was led by the consultant and was conducted on April 29, 2018 for the Rangpur enumerator and May 3, 2018 for the Gopelganj enumerator. School surveying activities were supervised by the BDRCS endline coordinator. Data collection activities for the KIIs and FGDs were led by the consultant. An FGD and KII translator was responsible for supporting the consultant to administer the qualitative interviews. Figure 1 presents the management structure for the endline survey.

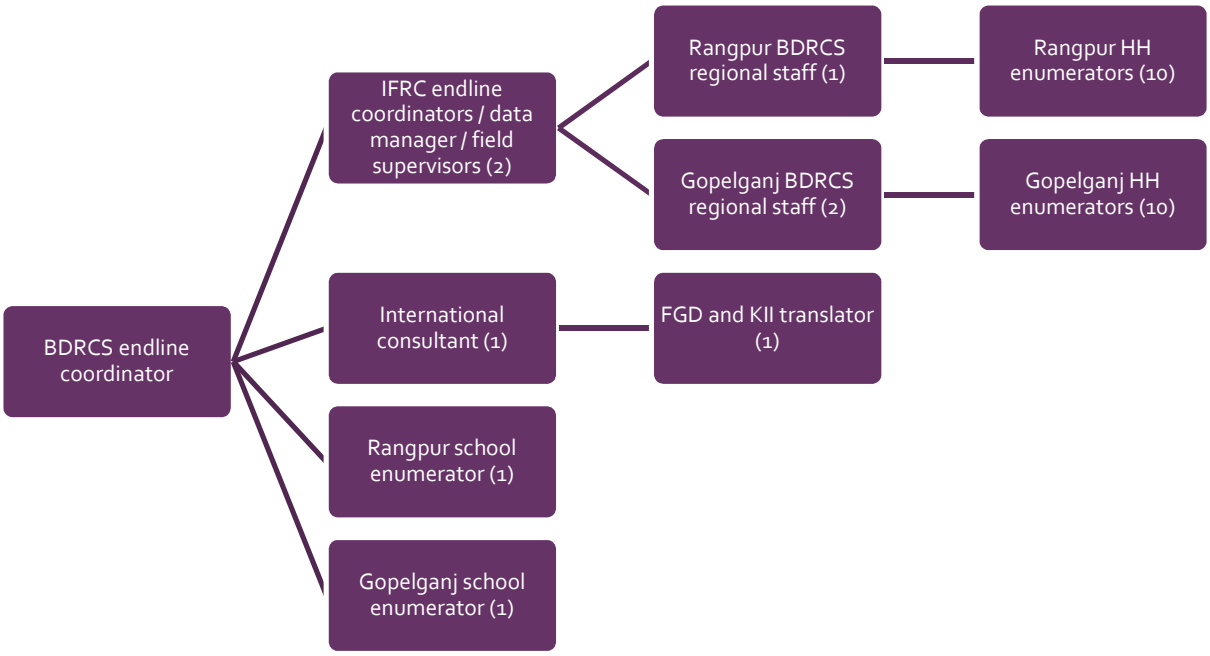

Figure 1 – Management structure for the endline survey

Enumerator teams from each district were drawn from experienced BDRCS volunteers. IFRC field supervisors were responsible for oversight, logistics, and quality of the HH survey data collection activities – including providing replacement HHs to enumerators in cases where respondents could not be recruited. The BDRCS endline coordinator provided supervision to the school survey enumerators. Scheduling, planning, and logistics for the FGD and KII interviews were supported by the BDRCS endline coordinator with support from local focal points in the target communities.

2.4 Data collection and analysis

For the structured HH and school questionnaires, each enumerator was provided with their own portable handset device and a roster of candidate HHs (or schools) that they were responsible for surveying. For the HH survey, if HH members did not meet eligibility requirements (adult aged 18 years or older) or if they were not available for the interview (after visiting twice), then the enumerator's respective field supervisor was contacted to provide the name and location of a replacement HH. If HH members were busy at the time of the visit, then the enumerator discussed time availabilities for re-scheduling when it was convenient.

Once an eligible and available respondent was identified, the enumerator read to them the pre-prepared informed consent statement and verbally requested their acknowledgement and participation. The informed consent statement was part of the ethical principles of conducting data collection, and informed the potential

respondent that: 1) they did not have to participate if they did not want to; 2) that they could refuse to answer any questions or could stop the interview at any time; 3) that there was no benefit to participating; 4) how long the survey would take and what was expected of them; 5) that their data would be disconnected from their name and not used outside of the study; and 6) the contact details for the endline coordinator should they have had any subsequent questions. If the candidate respondent refused, then the HH was considered ineligible, and a replacement was made by contacting the supervisor. Supervisors provided random replacement HHs from a pre-prepared list for each village. Data that was entered into the questionnaire in KOBO was uploaded to the central data server at the completion of each survey (if mobile network internet was available) or at the end of the day (when a wifi connection was established).

2.5 Data analysis and reporting

Several quality control protocols were implemented at the data management stage to improve the accuracy and precision of the data collection. Data was analysed by the consultant after the first two days of data collection in Rangpur, and once again after data collection commenced in Gopelganj - to check for potential irregularities and issues with the questionnaire administration and to address any training gaps. Field supervisors also shadowed the enumerators as possible during the initial stages of the data collection activities, providing additional instruction and correction as needed. The consultant also conducted some re-visits of surveyed HHs to cross-check the consistency and correctness of the original results.

Upon completion of the data collection activities in both districts, the HH and school datasets were exported from KOBO, imported into STATA, and each variable inspected for correctness and completion through the observation of cross-tabulations. For the HH survey, the number of records in each sub-group were checked against the calculated sample sizes. A spot check of the names of the HH heads against the list of randomly selected HHs from the sample frame was also performed. Some adjustments to the data were made where mis-calculations (school checklists) or irrational findings were observed – with data converted to 'missing data' in cases where any uncertainty existed in the actual results.

Copies of the final datasets were prepared and sent to BDRCS and ARC. HH data was tabulated across the target and school community sub-groups. School and qualitative data were not disaggregated (other than the target and school community FGDs which are already separated).

Data analysis was performed using STATA while tables and figures were prepared using Microsoft Excel. Chi-squared tests were performed in some cases to determine whether differences in results for the target and

school community groups were statistically significant. P-values[12] are reported where significant differences were found.

3 Results and discussion

This section presents the results and discussion for the endline study, split into three sections – HH survey results, school survey results, and FGD/KII results and discussion (with overall synthesis from the HH and school surveys). The endline survey has been executed according to the implementation schedule presented in Annex I.

3.1 Household survey results in target and school community communities

The HH survey was administered in Rangpur from April 28 to May 1 and in Gopelganj from May 3-6, 2018. In total, 650 HH surveys were successfully administered with eligible respondents and uploaded into KOBO. A full tabulation of all HH survey results disaggregated by target and school community groups is presented in Annex J. The overall response rate was 92%. Most of the randomly selected HHs that could not be recruited did not have an eligible respondent at home at the time of the visit and after following-up one additional time (87%) while few (13%) refused to participate. Among all of the randomly selected school community HHs, 4% were ineligible because no child family members were found to be attending target schools (likely because former students had graduated).

The final listing of successfully surveyed HHs did not exactly match the calculated required sample sizes (Table 3,

Rosters of selected HHs were printed and given to the enumerators, along with the corresponding names of the HH heads, which were used to locate and identify each HH. Additionally, a listing of randomly selected replacement HHs for each village was prepared, for cases when the randomly selected HH could not successfully be interviewed by the enumerator. An example enumerator and supervisor HH roster are presented in Annex G1 and G2, respectively. Separate enumerator and supervisor rosters were prepared for each of the 24 sample villages.

[12] Probability of the observed difference being due to chance. Probabilities <0.05 are typically regarded as representing likely true differences between two populations.

For the structured school surveys, questionnaires were administered at all 29 schools across the two districts. Any sampling of the 29 schools would have resulted in wide confidence intervals, beyond standard statistical tolerances.

Table 4, Table 5), likely due to the enumerator mistakenly selecting the wrong village in KOBO, or confusion in cases where the respondent's HH resided near the border between two villages and the HH listing or the village name reported by the respondent did not align to the roster. In some cases, it appears that simply too many (potentially additional HHs from the replacement list) or too few HHs were surveyed – perhaps due to mistakes with the tracking of completed surveys. Overall however, these issues appear to be minor and are very unlikely to significantly affect the statistical power and representability of the results.

3.1.1 Demographics and HH information

Respondents were overwhelmingly female (87% and 86% in target and school community groups, respectively). The average HH size was 5.2 and 5.5 in target and school community groups, respectively. Most HHs did not have any children <5 years old (74% and 81% in target and school community groups, respectively) nor any differently-abled[13] HH members (93% and 95% in target and school community groups, respectively). The occupation of the HH head was typically related to farming (47% and 49% in target and school community groups, respectively). Most respondents lived in a kacha-type[14] household (71% for both target and school community groups).

Most respondents reported that no HH members had experienced the symptoms or diagnosis associated with any water-borne diseases over the past 1-month (87% and 89% in target and school community groups, respectively). Diarrhoea (5% for both in target and school community groups) and dysentery (6% and 4% in target and school community groups, respectively) were the most commonly reported water-borne diseases. No notable trends were observed between disease incidence and age groups or gender.

3.1.2 Drinking water and water supply

Nearly all households relied on a tube well as their main drinking water source throughout the year (97% and 98% in target and school community groups, respectively). This main drinking water source was almost always situated inside the house or property (80% and 74% in target and school community groups, respectively), as opposed to outside the property. Roughly half of all main drinking water sources were shared among at least two HHs (50% and 41% in target and school community groups, respectively). Figure 2 presents the range of the number of HHs using the main drinking water source.

[13] Having any type of physical or mental disability

[14] Houses that are made with mud, bamboo, wood and straw (using local materials) – as opposed to brick, sand and cement

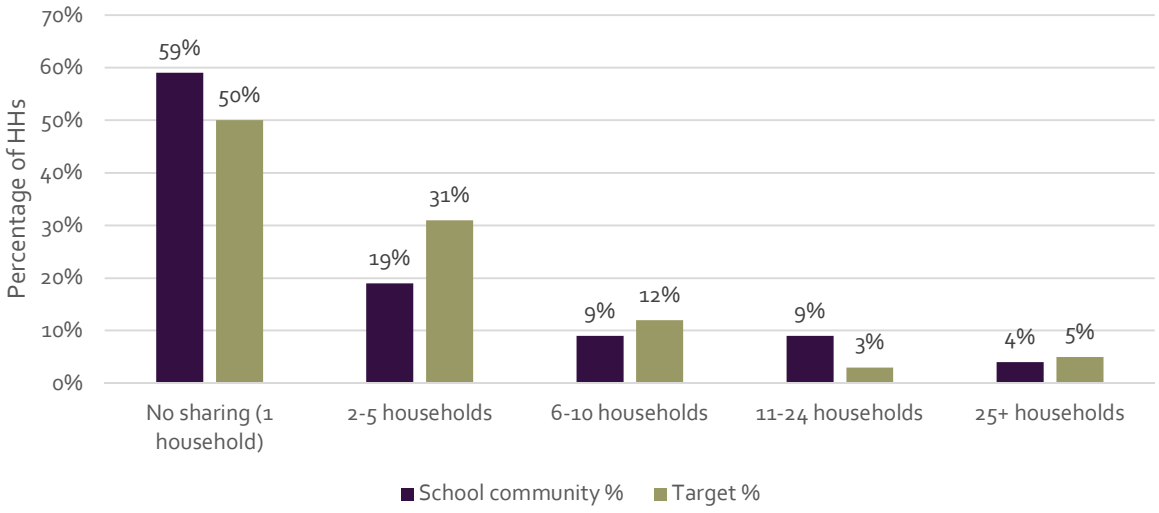

Figure 2 – Number of HHs using the main drinking water source

Survey respondents indicated that most of the shared drinking water sources were shared by a small number of HHs (2-5) – however there was a small number of drinking water sources shared by more than 10 HHs (8%). This appears to underreport the number of communal systems established by government and NGO/BDRCS including the 82 constructed by this project which are reportedly shared by around 8-12 households.

The total time spent fetching water from the main source and returning home was almost always less than 30 minutes (97% and 98% in target and school community groups, respectively) and on average 5.5 and 5.6 minutes in target and school community groups, respectively – indicating high levels of accessibility overall. The HH member most often responsible for fetching water was the adult female (97% and 98% in target and school community groups, respectively). HHs in target communities were significantly more likely to do something to their drinking water to improve its quality or to make it more likely to be safe, than those in school community communities (38% and 14% in target and school community groups, respectively, $p<0.01$). Drinking water treatment practices for those HHs that do something to their water to improve its quality are presented in Figure 3.

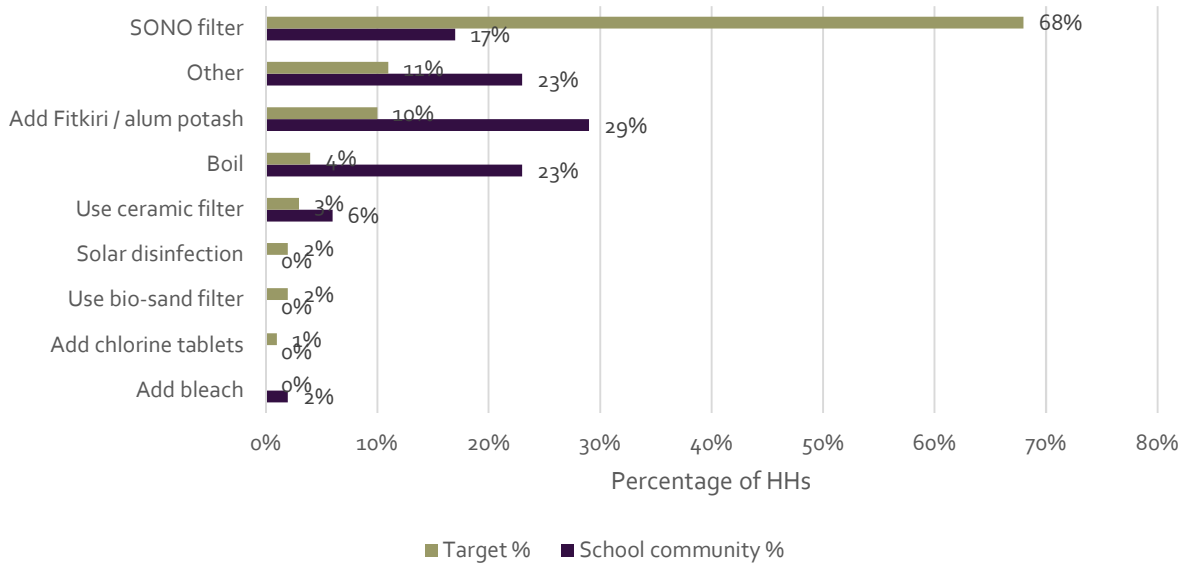

Figure 3 – HH drinking water treatment practices

Not all water treatment methods are intended to produce safe water. From those reported in the study, alum flocculants (under the common Bangla name of Fitkiri) are likely to improve water quality, but not necessarily produce water that is safe for human consumption. Considering only appropriate water treatment methods[15], approximately 34% and 10% of HHs were reportedly drinking safely treated water in target and school community groups, respectively. SONO filters were actively promoted in the communities of Gopelganj district – where groundwater arsenic levels are elevated and present a public health concern. Of those HHs that treated their water, most had last done so on the day of the survey (64% and 78% in target and school community groups, respectively) and nearly all within the past 2-days (96% and 97% in target and school community groups, respectively).

Drinking water was commonly stored in containers kept at the HH (87% and 88% in target and school community groups, respectively) with nearly all of the remaining HHs going directly to their water source whenever water was needed (no storage). Most HHs that stored water in a container kept it completely covered (81% and 78% in target and school community groups, respectively). Overall, 83% and 81% of target and school community HHs had their water safely stored[16]. Considering both safe drinking water treatment and safe storage combined – 30% and 9% of target and school community HHs demonstrated both characteristics, respectively

[15] All except for Fitkiri / alum
[16] Completely covered if stored in containers, stored in roof tanks/cisterns, or taken directly from the source if not stored at all

(KPI 6.2). Approximately 83% and 81% of target and school community HHs had safe drinking water as per ARC's definition[17].

Respondents were asked to prepare a glass/cup of water for drinking as they normally would if they were thirsty. Based on observations performed by the enumerator, most respondents stored the glass in a sanitary environment[18] (85% and 89% in target and school community groups, respectively). Most respondents did not allow their hands to come into contact with the water when the glass/cup was being filled (81% and 78% in target and school community groups, respectively).

Groundwater contaminated with naturally-occurring arsenic is a public health issue in some parts of Bangladesh. HHs in target areas were much more likely to report that their main drinking water source had ever been tested for arsenic than those in school community areas (73% vs. 37%, respectively, $p<0.01$). Among those that reported that their water source had been tested for arsenic, most reported that the test had been performed within the past 3-years (85% and 74% in target and school community groups, respectively). In most cases, the latest test results revealed that the water from the source had safe levels of arsenic (69% and 78% in target and school community groups, respectively). The survey retroactively assessed when surface water[19] was last used for drinking by the HH, the results of which are presented in Figure 4.

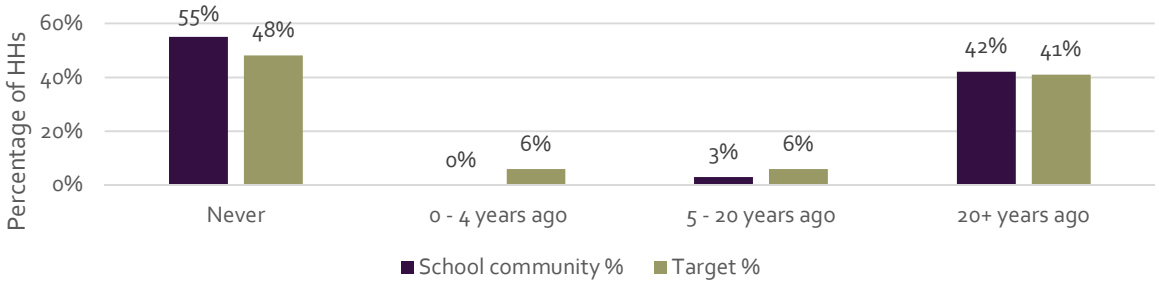

Figure 4 – Number of years ago that surface water was used for consumption

Most HHs in both target and school community groups reported that they had not consumed surface water since at least 5 years ago and before the project began (94% and 100% in target and school community groups, respectively) – the majority of which have not done so ever or did so more than 20 years ago (88% and 93% in target and school community groups, respectively). These results demonstrate that improved drinking water sources have been predominant in the communities for many years. The project team advised that whilst there was a history of use of tube wells in these communities, in reality a number of these systems had not been properly constructed, repaired or replaced and therefore actual usage was much lower than that reported in the

[17] An improved water source with safe storage, or an unimproved water source with sufficient treatment and safe storage.
[18] Covered or protected from flies and dust
[19] Reportedly the most common unimproved drinking water source type last to be used

endline survey results. The team noted that at the start of the project a number of households were actually using unimproved water sources or where possible sharing tube wells across a number of households, which was leading to disputes and tensions over access. Additionally, a reoccurring issue was that the plinth of the functional tube wells was open and not raised, leading to greater potential for bacterial contamination. During the frequent floods, those tube wells were also under water. As such, the project focused on the installation of new water points (funded through both project and government) and rehabilitation of existing tube wells.

3.1.3 Sanitation

Open defecation (OD) was rarely reported to be the typical sanitation practice (1% and 5% in target and school community groups, respectively) but was found to be statistically more common in school community vs. target areas ($p<0.05$)[20]. All target communities had been officially declared as being Open Defecation Free. Current OD practices and frequency reported among adult HH members are presented in Figure 5.

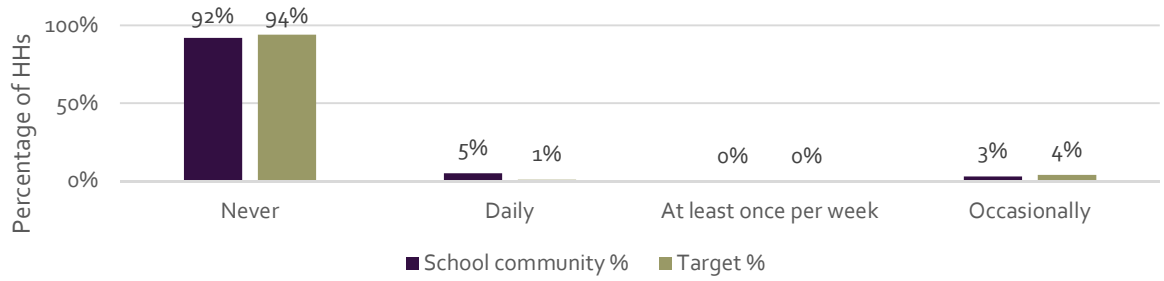

Figure 5 – Current OD practices and frequency among adult members

Most HHs never practice OD (94% and 92% in target and school community groups, respectively) with very few practicing OD only occasionally (4% and 3% in target and school community groups, respectively). As expected, those HHs that do not use a toilet practice OD daily (1% and 5% in target and school community groups, respectively). OD practices among children are more common than for adults however. Among only those HHs with children <5 years old, 19% and 22% reported that their children practiced OD daily, in target and school community HHs respectively. The estimated time since OD was last practiced are presented in Figure 6.

[20] Some caution needs to be applied when interpreting self-reporting of OD figures, as some HHs (particularly those sharing a latrine) may have misreported their status – potentially with the thinking that claiming to practice OD to the enumerator might result in a future latrine subsidy.

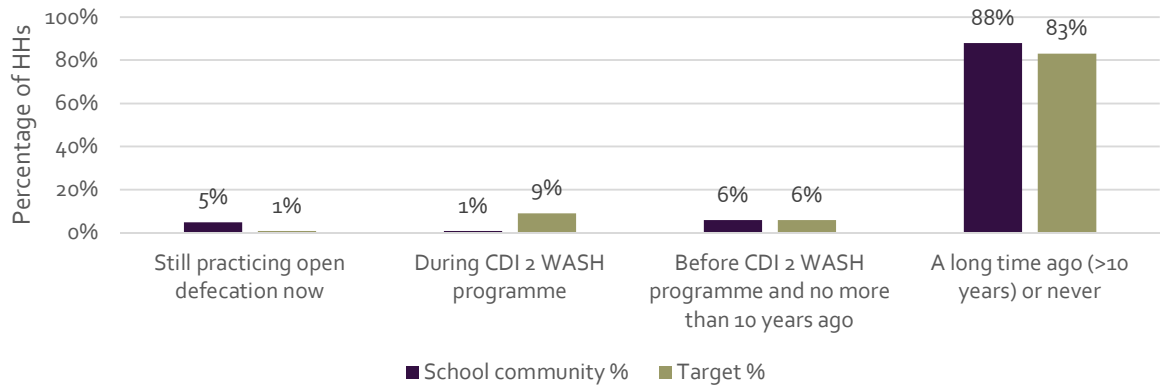

Figure 6 – Estimated time since OD was last practiced

Most HHs reportedly had not practiced OD for a very long time (88% and 83% in target and school community groups, respectively)[21]. Some had stopped practicing OD during the time that the CDI2 WASH program was implemented (9% and 1% in target and school community groups, respectively). Nearly all HHs that used a toilet used an improved one that had a slab (99% in both target and school community groups). The types of toilets used in the surveyed area are presented in Figure 7.

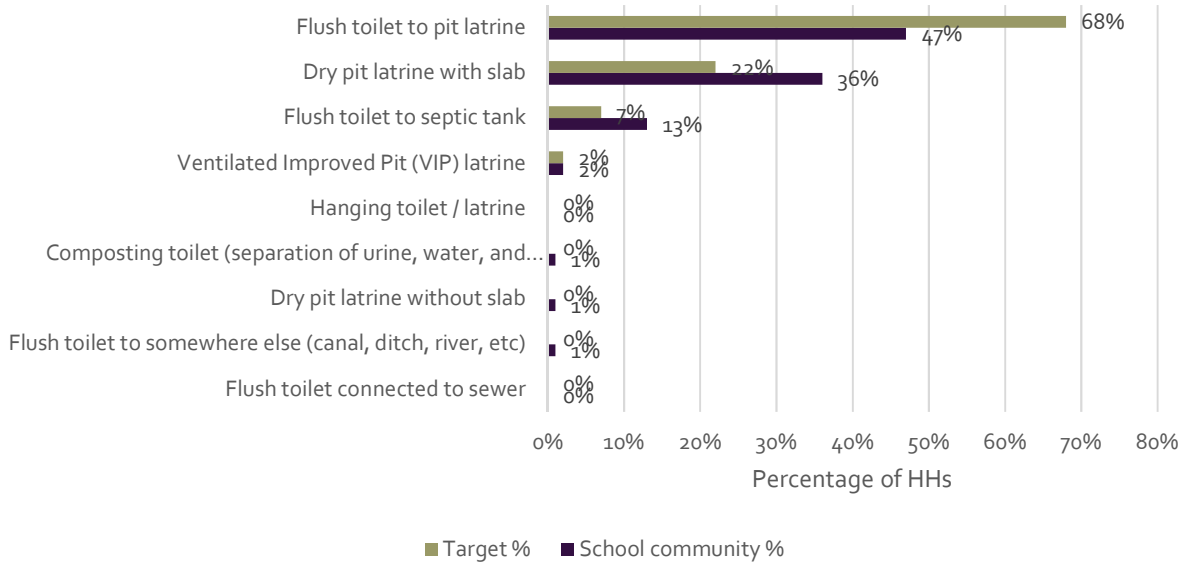

Figure 7 – Types of latrines used

Most households in the target community have access to an improved latrine (99%) and in the school community (98%). Flush toilets to pit latrines and dry pit latrines with slabs were the most common types of

[21] The project team have advised that at the start of the project the entry roadways to the target villages were often covered in feces and this was one of the key motivators for communities to engage in the project.

latrines in the surveyed area. Flush toilets to pit latrines were statistically more common in target vs. school community villages ($p<0.01$) while dry pit latrines with slabs were statistically more common in school community vs. target villages ($p<0.01$). Most HHs reported that all HH members used the latrine (97% and 94% in target and school community groups, respectively). Most HHs that had at least one differently-abled HH member reported that the disabled HH member(s) were able to use the latrine (94% and 100% in target and school community groups, respectively). All HHs reported that adults and elderly were able to use the latrine, while nearly all HHs reported that children were able to do so (98% for in both target and school community groups). Few latrines had reportedly been modified or upgraded to improve accessibility (13% and 18% in target and school community groups, respectively). The sharing of latrines with at least one other HH was reportedly uncommon (8% and 11% in target and school community groups, respectively). Most latrines were constructed in the past 4 years (82% and 65% in target and school community groups, respectively). Figure 8 presents the main entity responsible for paying for the latrine.

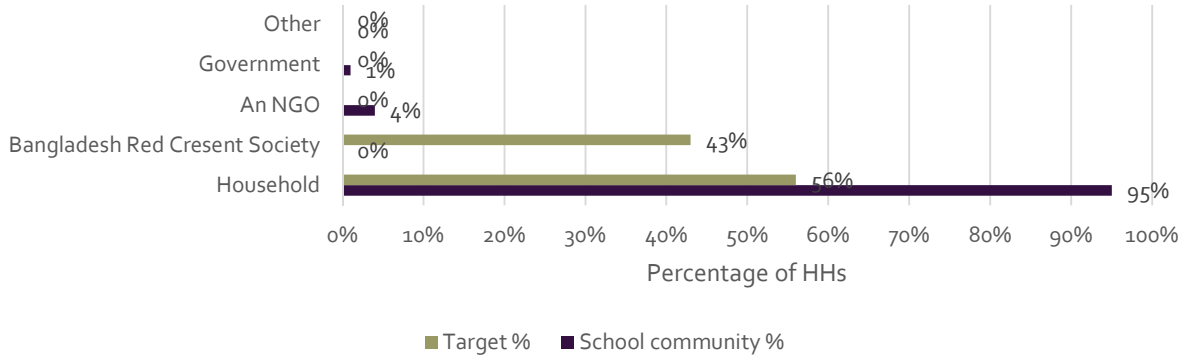

Figure 8 – Main entity responsible for paying for latrine

Nearly all HHs in school community areas paid for their latrines themselves (95%) while nearly half of HHs in target areas had their latrine at least mostly funded by BDRCS (43%). Latrines were visually inspected by the enumerator and most were observed to be clean (72% and 69% in target and school community groups, respectively) and providing sufficient privacy (90% and 86% in target and school community groups, respectively). Most HHs reported that their septic pit had not yet become full (23% and 40% in target and school community groups, respectively). Among only those HHs that had experienced a full pit, the pit reportedly became full an average of 7.8 and 10.0 months ago in target and school community HHs, respectively. Most such HHs discarded the pit contents underground in a new hole/pit that was then covered (81% and 89% in target and school community groups, respectively) while few discarded the contents above ground without being covered (10% and 8% in target and school community groups, respectively). Overall, most HHs experiencing a full pit reportedly disposed of it underground and covered (90% and 92% in target and school community groups, respectively). Most HHs reportedly used a latrine facility prior to the latrine that was currently in use at the time of the interview

(62% and 59% in target and school community groups, respectively). The type of previous latrine is presented in Figure 9.

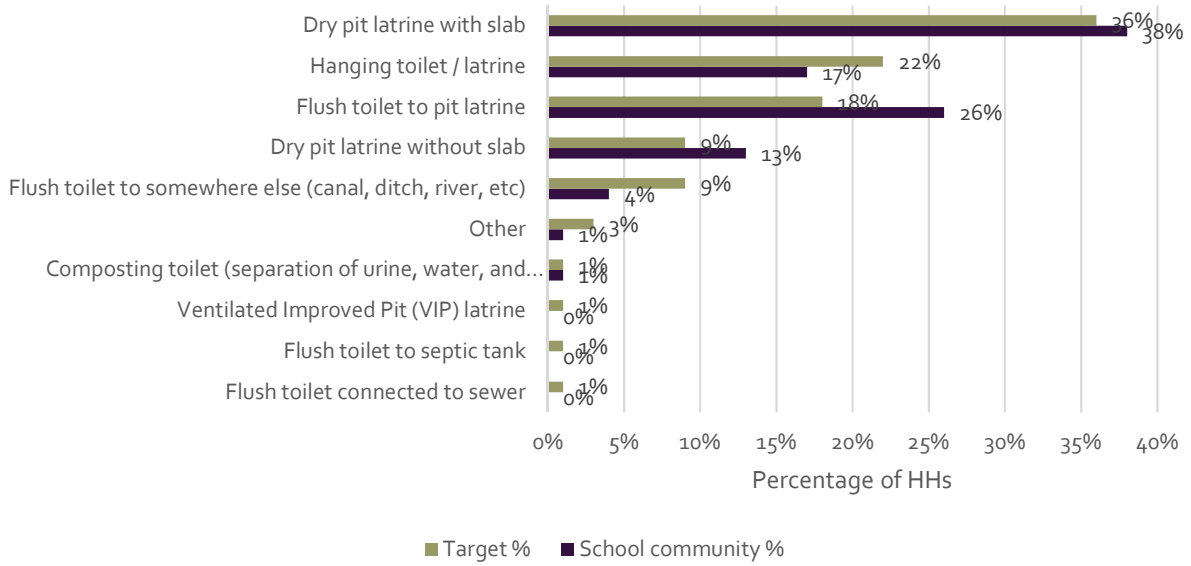

Figure 9 – Type of previous latrine facility

Most previous latrines were dry pit latrines with slabs in both target and school community areas. Latrine subsidies were allocated based on socio-economic status, the absence of a latrine, or the presence of a broken or unimproved latrine. Unimproved sanitation facilities – such as hanging toilets / latrines, flush toilets to somewhere else, and dry pit latrines without slabs were more common than those used currently.

3.1.4 Handwashing

Most respondents reported that they typically practiced handwashing after using their toilet (99% and 95% in target and school community groups, respectively) and stated that they currently did so every time they used the latrine (96% and 95% in target and school community groups, respectively). Enumerators visually observed the typical location where handwashing reportedly occurred after using the latrine and found that most had a dedicated location (93% and 94% in target and school community groups, respectively), with water present (89% and 91% in target and school community groups, respectively), and with soap present (83% and 81% in target and school community groups, respectively).

3.1.5 WASH messaging

Most respondents reported having heard WASH messages from any source (97% and 91% in target and school community groups, respectively). The source(s) of these messages are presented in Figure 10.

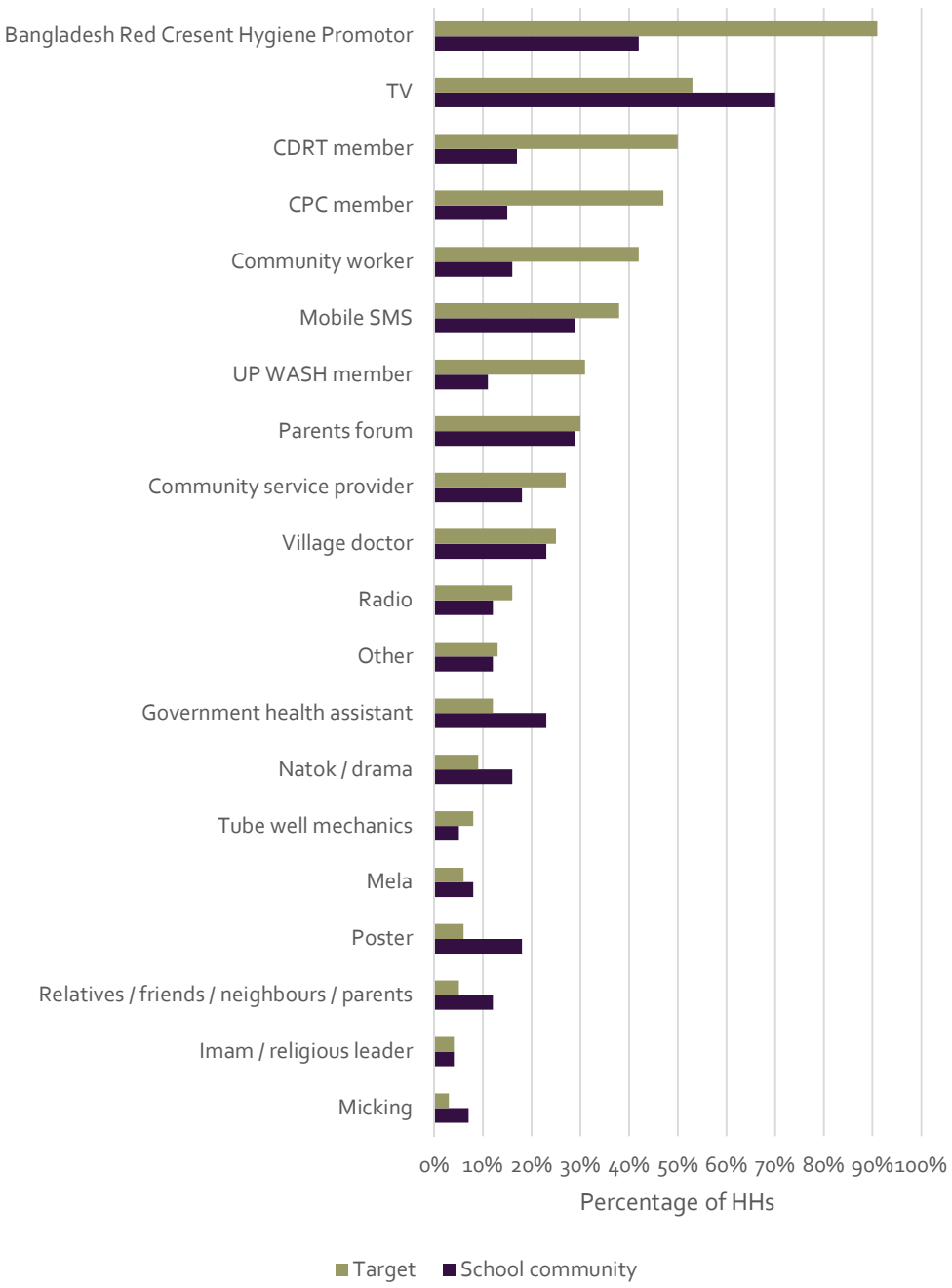

Figure 10 – Sources of WASH messaging

Nearly all respondents were able to name at least one source of WASH messaging (99.8%). Across both target and school community groups, various sources of WASH messaging were reported. Within target communities, the most commonly reported sources were BDRCS promotors (91%), TV (53%), CDRT members (50%), and CPC members (47%). Within the school community group, the top reported sources were TV (70%),

BDRCS promotors (42%), parent forums (29%), and SMS[22] (29%). Statistically significant differences were observed between the proportion of the target and school community HHs reporting that WASH messages originating from BDRCS promotors (p<0.01), TV (p<0.01), CDRT members (p<0.01), CPC members (p<0.01), community workers (p<0.01), SMS (p<0.01) and UP WASH members (p<0.01). Most respondents from school community HHs reported that they (or another member of the HH) had attended parent forums (89%).

Respondents were asked to name the benefits associated with drinking safe water, and answers for which are presented in Figure 11.

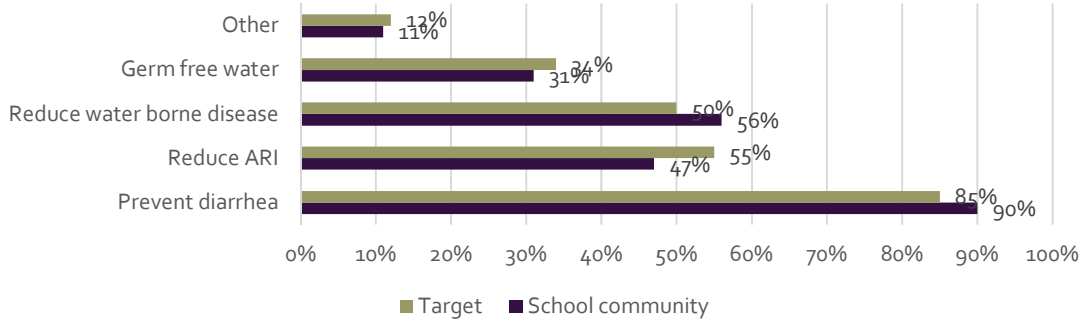

Figure 11 – Knowledge of the benefits of drinking safe water

Nearly all respondents were able to name at least one benefit associated with drinking safe water (98.8%). Diarrhoea prevention was the most common perceived benefit to drinking safe water, and statistically significant differences were not observed between target and school community groups. Respondents were also asked to name proper sanitation practices and habits (Figure 12).

[22] Organised through the program to reach both target and school communities

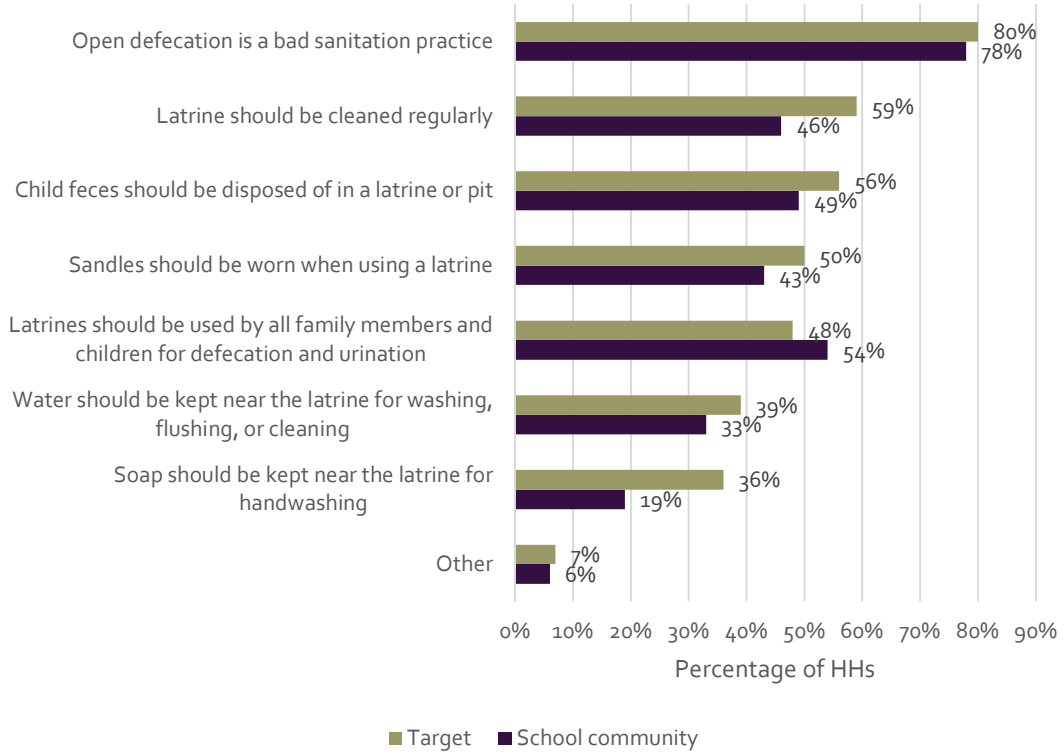

Figure 12 – Knowledge of proper sanitation habits and practices

Nearly all respondents were able to name at least one proper sanitation habit or practice (98.6%). Most (79%) of respondents noted that open defecation is a bad practice – while roughly half noted that latrines should be cleaned regularly, child faeces should be disposed in a latrine or underground, sandals should be worn when using a latrine, and latrines should be used by all family members and children. There were few statistically significant differences in the knowledge of proper sanitation habits and practices between target and school community groups[23]. Statistically significant differences were observed only for the regular cleaning of latrines ($p<0.05$) and soap should be kept near the latrine ($p<0.01$) – which were both higher in target vs. school community HHs. Respondents were asked to name proper handwashing practices, the results of which are presented in Figure 13.

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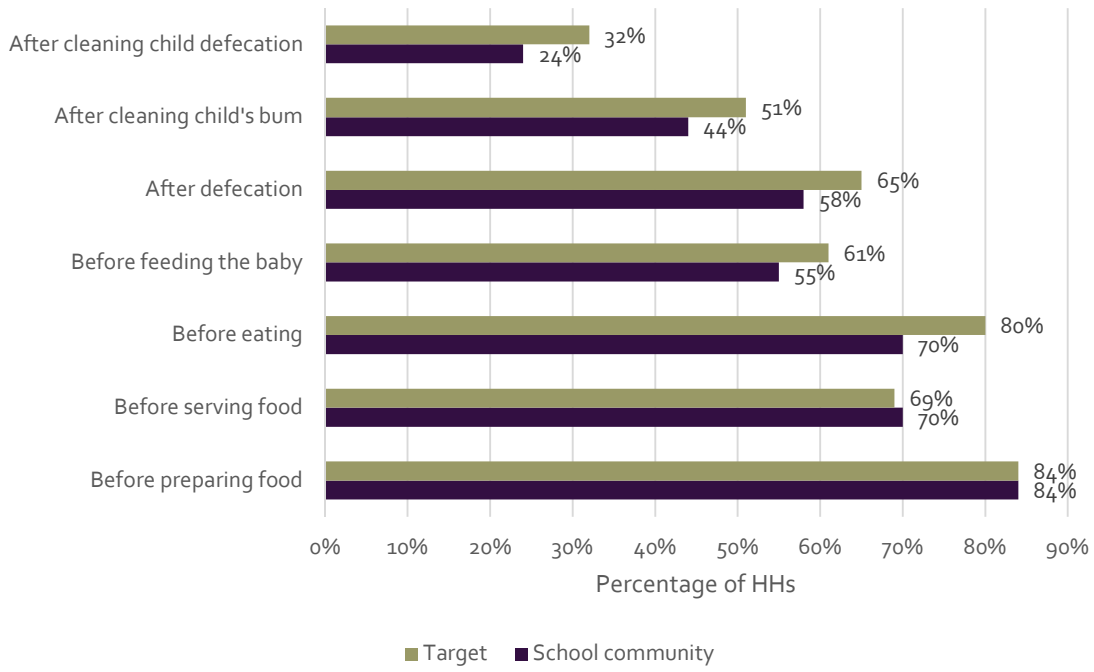

Figure 13 – Knowledge of proper handwashing practices

Nearly all respondents were able to name at least one appropriate time for handwashing (99.2%). Most respondents highlighted that handwashing was necessary before food preparation, before serving food, and before eating. Fewer respondents named instances related to babies and children (potentially because they didn't have children in the HH themselves). Statistically significant differences between target and school community groups were only observed for handwashing before eating ($p<0.01$) and cleaning a child's faeces ($p<0.05$). The majority (roughly 80-90%) of respondents specifically mentioned using soap when describing such handwashing practices and times. Respondents were also asked about the benefits of handwashing, the results of which are presented in Figure 14.

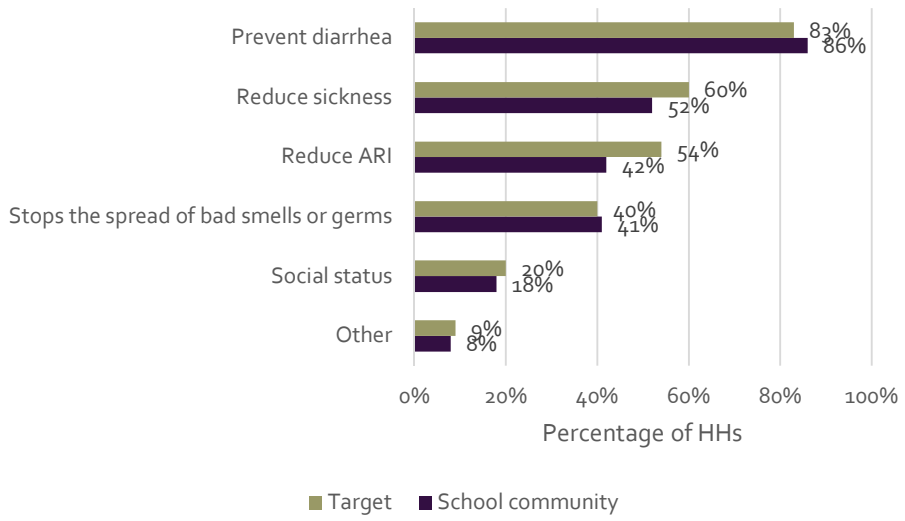

Figure 14 – Knowledge of the benefits of handwashing

Nearly all respondents were able to name at least one benefit of handwashing (99.5%). Most respondents highlighted that handwashing can prevent diarrhoea (83% and 86% in target and school community groups, respectively) while roughly half mentioned that it can reduce general sicknesses and specifically acute respiratory infections (ARI). Statistically significant differences were observed for reducing ARI ($p<0.01$) and reducing general sickness ($p<0.05$) between target and school community groups – with respondents in target areas more likely to provide these responses.

3.1.6 Menstrual hygiene

Most respondents agreed to answer questions related to menstrual hygiene (MH) when specifically asked (78% and 82% in target and school community groups, respectively) – and most of which stated that there had been a recent increase in discussion and awareness of MH issues (87% and 75% in target and school community groups, respectively). MH products reportedly used during menstruation are described in Figure 15.

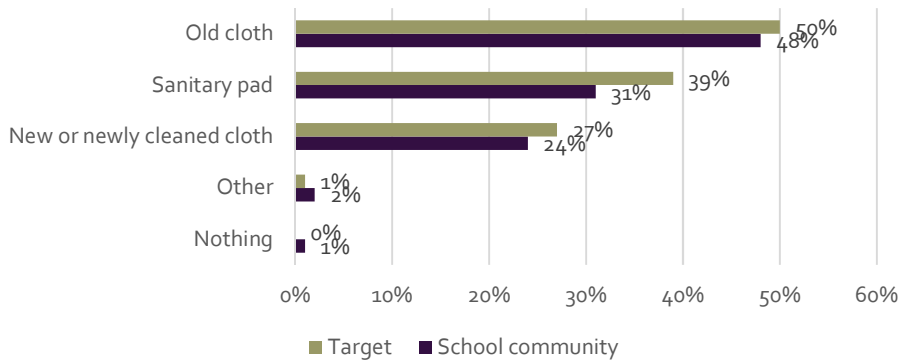

Figure 15 – Menstrual hygiene products and practices

Most respondents indicated that female HH members used cloth (all types combined) at the time of their menstruation (77% and 72% in target and school community groups, respectively). Approximately half reportedly used old cloths specifically (50% and 48% in target and school community groups, respectively). Sanitary pads (39% and 31% in target and school community groups, respectively) and new or newly cleaned cloths (27% and 24% in target and school community groups, respectively) were also commonly used. Women in target HHs may be slightly more likely to use sanitary pads than women in school community groups (p=0.05). Menstruating female HH members that reportedly did not use sanitary pads were asked about the reasons why sanitary pads were not used, as presented in Figure 16.

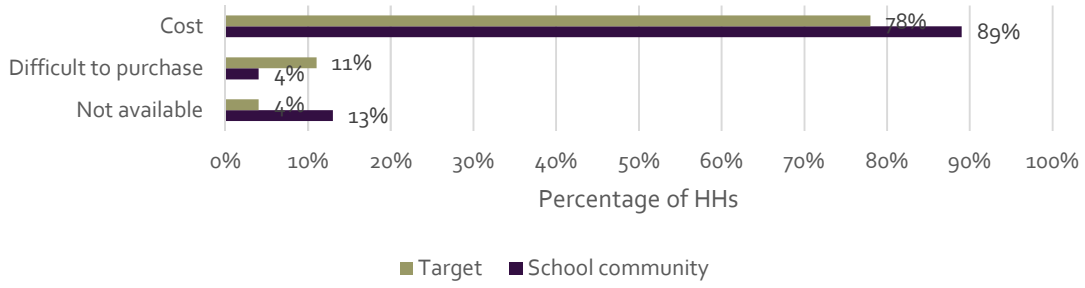

Figure 16 – Reasons why sanitary pads were not used by women HH members

Affordability was the overwhelming reason why women did not use sanitary pads while menstruating (78% and 89% in target and school community groups, respectively). Statistically significant differences were observed between target and school community groups for all three responses (p<0.05), with cost and unavailability being a more commonly reported barrier in school community HHs and difficulty to purchase being more common amongst target HHs. Among those HHs with daughters attending school and of menstrual age, most reported that they attended school when having their period (84% for both target and school community groups).

3.2 School survey results in target communities

The school survey was conducted in Rangpur from April 28 to May 1 and in Gopelganj from May 3-5, 2018. In total, all 29 target schools were successfully surveyed with the results uploaded into KOBO. A full tabulation of all school survey results is presented in Annex K. No schools refused to participate in the survey. The number of students enrolled at the schools ranged significantly from 152 to 1000 (average 439). More students were female than male, with the average ratio being 1.2. All schools had at least one student with a disability (average 4.8 per school)[24].

3.2.1 Drinking water and water supply

All schools reportedly supplied drinking water to students while 93% indicated that there was typically enough drinking water to meet demand. Nearly all schools (97%) indicated that drinking water had been continuously available to the students throughout the past 1-year and nearly all (97%) used a form of water treatment to improve the quality and/or safety of at least some of the drinking water supplied to the students. The only type of treatment reportedly employed by the schools was the SONO filter.

Schools had an average of 5 functional drinking water access points available to the students. The breakdown of the ratio of the number of students per functional drinking water access point is presented in Figure 17.

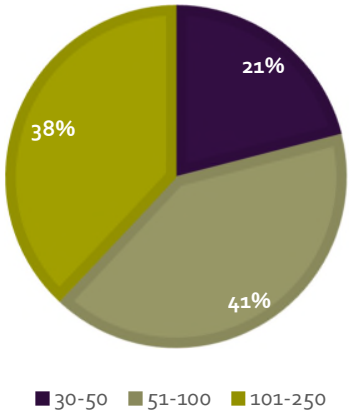

Figure 17 – Ratio of number of students per functional drinking water access point

At most schools (62%) there was at least one drinking water access point per maximum 100 students. All schools (100%) had all their drinking water access points visually observed by the enumerator and found to be protected from external contamination[25]. Nearly all schools (93%) had all of their drinking water access points observed to be clean. All schools (100%) had universal access to improved water. Most schools (86%) had at least one drinking water access point that could be accessed by someone using a wheelchair. At the remaining 4 schools (14%) the project had installed electric water pumps connected to tube well which was then piped to taps that were also accessible to all students.

Most schools (55%) had two functional drinking water sources (overall average of 1.9). Tube wells were the predominant water source at the schools – with 97% of schools having at least one well. Pressurized piped water accessed from a tap was reported at some schools (31%). In total, there were 67 water sources amongst the 29 schools, of which 11 (16%) were dysfunctional at the time of

[24] There are no longer PWDs using wheelchairs in target schools in Gopelganj as the government has established a special school for disabled students in 2016
[25] Covered, sealed, and or self-contained

visit. A total of 29 water sources were constructed by the project over the past 3-years, representing 43% of all the functional and dysfunctional water sources existing at the schools. A total of 3 water sources that were constructed over the past 3-years were found to be dysfunctional at the time of the survey (a dysfunctionality rate of 10% among all sources constructed over the past 3-years), however these water sources have subsequently been repaired by SMCs[26].

Nearly all schools had at least one water source tested for arsenic (97%). In total, 50 water sources had been reportedly tested for arsenic (75% of all functional and dysfunctional water sources) of which 12 (24%) were determined to contain unsafe concentrations. A total of 28% of the schools had at least one water source found to have unsafe levels of arsenic – all of which were in Gopelganj district. Two schools currently had all of their water sources contaminated with unsafe levels of arsenic and whilst these schools have been provided with SONO filters through the project, feedback through the FGDs indicated not all teachers and students are using water that has been treated through filters.

3.2.2 Sanitation

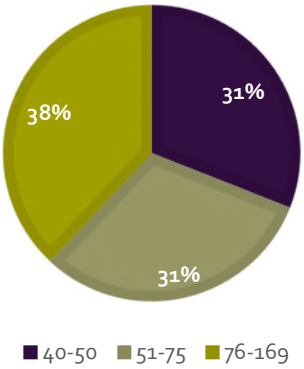

Figure 18 – Ratio of number of students per functional latrine

All schools (100%) reported that none of their students practiced open defecation during school hours and that students do not need to leave the school facility in order to defecate or find a private space for menstrual hygiene. All schools had at least three functional latrines (average of 5.9). Most schools (86%) did not have any dysfunctional latrines. Few schools (31%) had a latrine per student ratio of 50 or less – the average of which was 77 students per toilet – and the breakdown for which is presented in Figure 18.

[26] Minor problems were observed – such as issues with the well plunger/bucket

Most schools (83%) had at least one toilet built in the past 3-years – none of which had since become dysfunctional. The breakdown of gender allocated toilets at the 29 schools is presented in Figure 19[27]. The majority of toilets were allocated for girls only (49%). Few toilets were shared between both boys and girls (14%) – and these were likely to be the accessibility toilets. A total of 14% of all toilets could reportedly accessed by a student in a wheelchair. Most schools (83%) had at least one latrine that could be accessible to someone in a wheelchair.

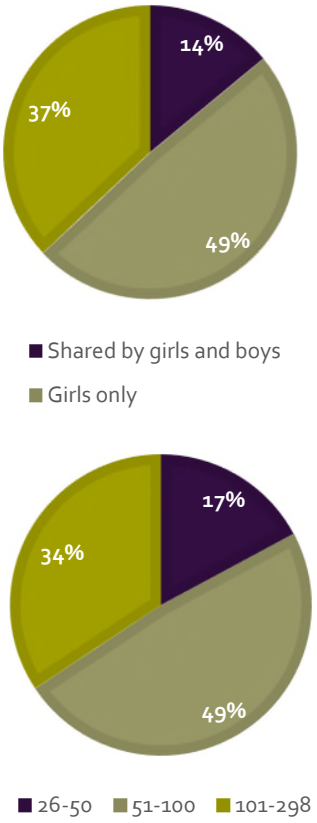

Figure 20 - *Ratio of number of students per handwashing station*

The functional latrines were individually inspected by the enumerator. Nearly all were found to be clean (96%), having a slab (99%), discharging to an underground pit or tank (99%), and improved (99%). On average, the first latrines were built at the schools 15 years ago (with a minimum of 5 years ago and maximum of 30 years ago).

3.2.3 Handwashing and menstrual hygiene

All schools had at least one handwashing station – with the average number of handwashing stations at each school being 5.8. On average, there was 98 students per handwashing station – the breakdown of which is presented in Figure *20*.

Few schools (17%) demonstrated a handwashing station per student ratio of less than 50. Most schools (90%) demonstrated that all handwashing stations had water at the time of inspection. The worst performing school had water at 60% of handwashing locations. Most schools (72%) also demonstrated the presence of soap at all handwashing stations. All schools had soap in at least 50% of handwashing stations. At 8 schools, soap and water was not available at all handwashing stations (coverage of such ranging from 50% to 90%). Most schools (86%) also had a location established for the private disposal of menstrual hygiene materials.

3.3 FGD / KII results and KPQs

FGDs and KIIs were conducted from April 28 to May 1 in Rangpur and May 3-5 in Gopelganj, according to the field work schedule presented in Annex L. Results from these interviews are presented against KPQs and grouped into three sub-chapters: 1) Impact and outcomes; 2) Effectiveness and reach; and 3) Sustainability. Discussion of HH and school survey results has also been added to compliment the responses to the KPQs. The results are limited to the reflections and perspectives of those stakeholder groups included in the interviews (Table 1).

[27] Gender access figures could not be reported at 7 schools due to inconsistences in the data collected

3.3.1 Impact and outcomes

The impact and outcomes of the program have been described through five KPQs covering capacity building of program implementors, WASH outcomes (behaviours, attitudes, and practices), health impacts, and school-specific impacts.

3.3.1.1 Whose performance has improved (institutional and community change agents), and what is the nature of the improvement?

This KPQ was not fully assessed as institutional and community change agents were not directly interviewed through the endline surveying activities. However, some findings were obtained from informal conversations with local focal points and from beneficiaries in target communities. Community change agents reported that their capacities had improved significantly as a result of their engagement in the program – particularly related to leadership and management (organizing and leading community meetings and events) and communication (collecting and reporting information, working collaboratively with colleagues to implement activities, and speaking publicly). Their level of confidence was particularly reported to be much higher after having completed their engagement in the program. These capacities were strengthened through the many formal training activities that they participated in along with the practical experiences of implementing their activities. The experience of resolving challenges experienced during implementation was noted as being particularly important. Community change agents[28] reported that the trainings that they participated in were well organized and delivered and highlighted that their performance could be improved further through additional training on specific technical issues – such as novel water source options (rainwater harvesting) and treatment technologies (SONO filter). Beneficiaries from target areas consistently noted that they were satisfied with the performance of local implementers – stating specifically that they engaged with the community respectfully and appropriately. The quality of the community events and meetings were also reported to be strong.

3.3.1.2 How has the improved WASH service delivery resulted in better outcomes for poor/remote communities and poor/vulnerable households? How has the project contributed to this?

The four communities that participated in the program were selected due to their low socio-economic status and vulnerable circumstances (groundwater arsenic contamination and disaster susceptibility) – as reported by IFRC and BDRCS. School community FGD participants generally noted that the selected target communities (not their own, but residing nearby) did experience socio-economic deprivation and poorer hygiene practices prior to the program. The geographical locations of the target communities were also observed to be very remote – often at or near the ends of the village road networks that extended off of the main highways (consultant's observation). Community representatives noted that groundwater arsenic was present in some communities in Gopelganj and flooding affected some areas in both districts. Overall, the program appears to have been

[28] Hygiene promotors and disaster committee members

implemented in remote settings comprised of a greater proportion of poor/vulnerable households than that of nearby communities and the district overall.

FGD respondents identified many improved outcomes from the program, namely: 1) decreased workload for fetching water because wells were now closer to home; 2) safer water in arsenic-affected communities of Gopelganj for the HHs that used the SONO filter; 3) improved hygiene practices (handwashing, cleanliness, safe water storage, use of soap); 4) improved and more convenient use of latrines; 5) decreased prevalence of disease; and 6) community being more open to discussing and addressing MH. It is clear that the majority of HHs utilise an improved water source and store in covered containers. Nearly all now use a toilet and soap is widely observable in the HHs and in the local marketplace. Exposures to unsafe levels of arsenic in HH drinking water are also likely to be significantly reduced in Gopelganj, where SONO arsenic removal filters have been promoted and subsidised. Within the target communities, the poorest of the poor were identified through a wealth indexing study and selected for eligibility to receive latrine and SONO filter subsidies. The FGDs with target community members revealed that uptake of these subsidies was very high and the selection for eligibility was led by the community and performed transparently. The HH survey results also demonstrated that use of the SONO filter in target communities was significantly higher than in school communities (where the subsidies were not present) and 43% of the HHs in the target area used a latrine funded by BDRCS (as opposed to 0% in school communities). Overall, the program appears to have contributed to better outcomes for poorest and most vulnerable HHs and for all HHs residing in the communities.

3.3.1.3 What evidence is there of changes in targeted areas of WASH related behaviours, attitudes and practices and whose behaviour has been influenced?

Respondents from target, school community, and school (CHAST teacher and student champion) populations consistently reported meaningful changes to their WASH related behaviours, attitudes, and practices as a result of the program. Multiple respondents noted that in some cases WASH-related knowledge was already known, but through the program this knowledge actually transferred into behaviour changes and new habits. When asked to describe the differences between conditions and behaviours before and after the program at HH/community level, common responses included: 1) more frequently washing hands and using soap (behaviour/practice); 2) improved use of latrines due to greater accessibility (behaviour/practice); 3) keeping their surrounding environments cleaner (behaviour/practice); 4) increased value towards safe and clean water (attitude); 5) usage of SONO filters (behaviour/practice); and 6) improved comfort and security discussing MH issues and solutions (attitude) . At schools, the changes noted through the FGDs and KIIs included: 1) more frequently washing hands and using soap (behaviour/practice); 2) more frequent use of latrine facilities due to improved cleanliness and lower student-to-latrine ratios; 3) improved comfort and security discussing MH issues and solutions (attitude). Overall, there is significant evidence of changes to behaviours, attitudes, and practices across several WASH areas. The program has influenced such behaviours and practices among all stakeholders

(schools, target communities, school communities). When specifically asked, FGD respondents indicated that there were no particular groups excluded or marginalized by the program.

3.3.1.4 What impact has the project had on the health status of the target population?

While health indicators were not directly assessed as part of the endline, perceived changes to health were assessed through self-reports from respondents to the HH questionnaire and community and school respondents from the FGD/KIIs. Results from the HH survey indicated that incidences of diarrheal diseases were low. Respondents also consistently claimed that the health of the community and students had improved remarkably – including fewer incidences of diarrhoea, belly-aches, admissions to the doctor, and missed days at school due to sickness. Costs for health care and treatment reportedly decreased overall. Attendance at schools was also reported to have increased. Some respondents noted that water-borne diseases had been completely eliminated, and that occasional cases of diarrhoea were caused by contaminated food. One respondent noted that if the program hadn't occurred, then diseases would continue to be chronically experienced in the community, as they were before. Another respondent also noted that prior to the WASH program, outbreaks would result in entire families and even neighbouring HHs becoming ill, but this no longer occurs. These observations were self-reported, and no epidemiological study has been made to determine whether there were actual improvements to health and, if so, what caused them.

3.3.1.5 Did the project have an impact on education (e.g. school attendance, children retention and absenteeism) in the project area due to increased access to WASH facilities in the schools?

School FGD/KII participants noted that school attendance had increased, students were more focused and productive during classroom hours, and the students' health had noticeably improved since the time before the program was implemented. It was also reported that girls were more likely to attend schools and were more likely to remain in school when experiencing their periods. More girls than boys appear to be attending schools, as the female to male ratio of students was greater than one. Anecdotal observations on education-related impacts were self-reported, and no formal study has been made to determine whether there were actual improvements, if so, what caused them.

3.3.2 Effectiveness and reach

Effectiveness and reach of the program have been described through eight KPQs covering beneficiary satisfaction, participation, transfer of information, water supply service levels, addressing the needs of women and those with disabilities, addressing climate change and disaster related risks, and innovations.

3.3.2.1 To what extent are citizens in target areas satisfied, relative to expectations, with the delivery of WASH services?

Overall, satisfaction with the program was clearly very high among surveyed stakeholders at all levels. Stakeholders did not have any particular expectations associated with the program at its onset, and generally

stated that they would be appreciative for any changes or benefits that could be received. Expectations were therefore neither high nor low – but rather unknown and open-ended. Community respondents were extremely appreciative for how their communities had been transformed by the program. Besides WASH related benefits, community cohesion and strengthened relationships were reportedly cultivated. Knowledge on hygiene, handwashing, and the importance of water and sanitation and related good practices were reportedly well established in the communities. Citizens reportedly made significant changes to their HH practices – including keeping their surrounding environment clean, protecting drinking water, using soap for handwashing, and wearing sandals while using the latrines. Wells were more common, more functional, and easier to access since the time prior to the program. In communities where iron and arsenic were present in groundwaters, technologies and products were in place (and made available to the poor through subsidies) to address these challenges. Flush toilets were more prevalent, convenient to use, and less commonly shared. OD was rarely practiced.

WASH needs at schools have reportedly largely been met. Wells have been repaired or constructed depending on the needs at each individual school. At schools where functional water supplies were not available prior to the program, students typically brought water to school from home. However, such practices reportedly do not occur any longer. Some schools reported the continued need for an additional water point to reduce wait times and most schools require additional SONO filters to make them viable. Arsenic testing appears to have been broadly conducted at target schools, but the results (whether the well produces water of safe or unsafe arsenic levels) may not be entirely clear amongst the school leadership and teachers[29]. Students at two schools appear to be continuing to consume arsenic contaminated water due to the lack of arsenic-safe drinking water sources and the fact that SONO filters are only able to meet a portion of the schools' drinking water needs. Modern standard latrine facilities have now been constructed that are much more comfortable for the students to use, more functional, and easier to keep clean. Latrine facilities also offer greater separation and privacy by gender and latrine to student ratios have improved significantly. Toilets are now reportedly kept cleaner than before, and the students enjoy using them compared to the old facilities. All of these factors have combined to improve the livelihood and dignity of the communities.

Satisfaction with the delivery of the program has also been reported to be very high. Respondents were reportedly very satisfied with how the community committees, community change agents, and activities were organized and delivered. Committees were representative of the community at-large and subsidies and benefits were reportedly fairly allocated. Respondents were also satisfied with the engagement of CSPs (latrine producers and well drillers) in the program – including the quality of their work and how they engaged with the

[29] At one school that was visited, there was confusion as to whether the primary school well had unsafe levels of arsenic or was safe to drink. It was concluded by a higher official that indeed the well had unsafe levels of arsenic, but there was not yet any other alternative.

communities. Schools reported that the delivery of CHAST training to teachers was very strong. CHAST sessions delivered to students were also good but reportedly could have been improved by borrowing some of the methods and materials used in the CHAST ToT sessions.

3.3.2.2 *How and to what extent have beneficiaries participated in decision-making processes informing project design, implementation and exit strategies? And what impacts has this participation/lack of participation had?*

Community-level beneficiaries have participated directly in decision-making processes through the committees that were established and remained functional and active throughout the program. Respondents reported that these committees were comprised of members that were representative of their communities. The committees made decisions related to the prioritization of community needs, connecting these needs to activities and infrastructure development funded by the program, site selections for well construction, and reaching agreement on the selection of HHs for subsidies. When asked whether there were any observed cases where benefits were delivered, or special treatment was given, to privileged HHs or those that did not actually meet eligibility requirements – all respondents stated that this had never occurred.

At schools, decision-making (such as the type and location of facility infrastructure installations, upgrades, and design) was reportedly performed by school leadership/administrators and BDRCS program staff. School administrators were reportedly given opportunities to voice their needs and opinions during the design phase of the program.

For both the target communities and target schools, inputs from beneficiaries appear to have been provided during the design and implementation phases. No specific inputs were reported towards the program's exit strategy, but that certainly doesn't mean that this didn't occur[30]. Community change agents who may have been most likely to engage in exit strategy planning were not explicitly surveyed during the endline and the respondents that attended FGDs were only a sampling of the community. Overall, the program appears to have been implemented with a strong community engagement component – and this has allowed the community to have a decision-making role and active participation in the program. The impacts of this participation were difficult to assess, but were likely to have resulted in program adaptations based on local contexts and needs (well construction sites where the benefits would be highest, SONO filter promotion in arsenic affected areas, latrine subsidies reaching the poorest HHs) and therefore higher performance overall. However, some contextual gaps have been observed – particularly relating to water sources and drinking water quality at a small number of schools which could be have been better addressed through the combination of program flexibility and

[30] All change agent groups participated in a MERP workshop in Dhaka in September 2017 to discuss sustainabilty prospects additional actions required in the final year of the project as part of exit strategy planning

identification of these issues by school leadership. However, overall efforts to engage beneficiaries appear to have resulted in a stronger performing program.

3.3.2.3 *Have any mechanisms been effective in transferring information and knowledge between community members?*

Various mechanisms were reported to have been effective in transferring information and knowledge between community members – some of which were formal and informal. These reported mechanisms are summarized in Table 7.

Table 7 – Formal and informal mechanisms for transfer of information and knowledge between community members

Formal	Informal
Participation in parent forums	Discussion among family members when bad habits were observed
Participation in community meetings (courtyard sessions, CPC, CDRT meetings)	School students discussing WASH behaviours among friends, family, relatives, and neighbours
Discussion with committee members during monitoring and door-to-door follow-up visits	CHAST teachers and student champions answering questions and leading discussions due to their status and recognition among their social networks
CHAST sessions at schools	Women discussing WASH and MH issues while they work together or take breaks during their work days in the communities
	Discussions with friends, family or relatives in non-target communities

A variety of mechanisms have reportedly provided opportunities for the sharing of information, and likely many more also occurred but were not reported during the interviews. From the HH survey, nearly all respondents indicated exposure to WASH messaging through the BDRCS hygiene promotors and some also via SMS (both mechanisms used by the program). Other mechanisms not related to the program may also have also played (and might continue to play) a role in the transfer of knowledge and information, including TV, local doctors, and radio (Figure 10).

3.3.2.4 *How has access to water improved for users in terms of: reliability of supply; accessibility; equity of access; and water quantity and quality?*

Nearly all HHs use a tube well as their primary drinking water source (HH survey) – and are very likely to use this same source for domestic water needs as well. These wells are typically located within the HH premises – as only 20-25% of HHs report having to leave the premises to fetch water. The time spent fetching water is on average only 5.5 minutes. As a result, water accessibility service levels appear to be very high. FGD respondents noted that water quantities were sufficient (no reports were made of wells becoming dry) and reliability was also very high (with hand pump breakdowns reported as only occurring infrequently). Well repair training conducted via the program may have further improved water supply reliability.

Water quality was not directly measured (i.e. through chemical and microbiological testing and comparison to national drinking water standards). However, tube wells are considered by global definitions to be an *improved* water source - meaning that they are more likely to deliver water of higher quality. Recent global-level studies have confirmed that many improved water sources are in fact unsafe – and therefore in the absence of routine water testing, household water treatment is required to ensure consistently safe drinking water at the point-of-consumption. Water treatment was not commonly practiced – but significantly more so in target vs. school communities. With the concentrating of human excrement in pit latrines, their high density in the target villages, and combined with the presence of shallow aquifers and tube wells - water quality conditions remain poorly understood, and will remain so until water testing is performed (particularly relating to microbial water quality). Naturally-occurring arsenic contamination was reportedly prevalent in some communities in Gopelganj. In these settings, no safe alternative water sources are reportedly present. However, SONO filters have been promoted in such communities to address arsenic removal and safe water production. The prevalence of SONO filters specifically in arsenic affected communities has not been assessed (only in the entire target area as a whole). Groundwater salinity is also a water quality issue in some communities. In cases where salinity levels are elevated, users must either tolerate these conditions (typically if salinity levels are lower and no alternative water sources are present) or find alternative sources (often shallow wells, which are more prone to arsenic contamination in some areas).

Equity of access to water supply was not directly assessed, however access to tube wells (a type of improved water source) is nearly uniform (97-98%) and therefore is likely to be largely inclusive of socially or socio-economically disadvantaged groups. However, it was not the objective of the study (and its design) to assess equity in water service levels (accessibility, reliability, quality).

At schools, accessibility and reliability were reportedly very high. Nearly all schools reported having sufficient quantities of drinking water available for students. A small number of water supplies were broken at the time of inspection, however results from the FGDs revealed that such wells may be more likely to be contaminated (by arsenic or salinity) and therefore potentially not worthy of further investment of limited school funds to repair them. Water quality at the source is a potential concern – as students reported that they typically drink water directly from the water sources (SONO filters are reportedly not commonly used by the students themselves). However, the presence of water treatment products and options (exclusively SONO filters) was reportedly very common – but in practical terms were limited to only a few drinking water collection points per school and were observed to be located in areas avoided or prohibited to the students (isolated school storage rooms, teacher rooms). Water was typically observed in the filters, indicating that they were likely used frequently, but students reportedly most commonly drank water directly from the water sources themselves (i.e. pumping and drinking from the tube well). At two schools, arsenic contaminated tube wells were the only water source available, and students were reportedly consuming this contaminated water. When queried on the use of

the SONO filters in schools, administrators and teachers stated that the filters would be abused or broken if placed in locations that were readily accessible to the students.

3.3.2.5 What changes have occurred in WASH services responding to women's needs (e.g. workload, reproductive health issues etc.)? How did the project contribute to this?

Female FGD respondents indicated that their workloads had decreased due to tube wells now being closer to their HH. Washing, bathing, cleaning, and drinking were all reported to be occurring more commonly at or near the HH. However, adult women continue to be the main HH member responsible for water related activities.

The HH survey and FGD interviews both revealed that the level of discussion and openness to MH issues had reportedly increased substantially. Women were also reportedly more knowledgeable of MH issues - including MHM products and options. Sanitary pads were the preferred MHM solution but remained unaffordable for a large segment of the population. Female students of menstrual age appeared to have mixed levels of comfort and satisfaction with the MHM situation at their schools. At some schools, student respondents were proud and extremely satisfied that they now had private facilities, pads, and comfort in discussing MH issues with their teachers and peers. At other schools, MH issues were still stigmatized – but to a lesser degree than prior to the program. In such cases, students typically return home if their period starts at school, pads were not readily available at the school, and freedom and comfort around discussing MH did not yet exist. It is possible that such variability in the results and conditions across the program schools was the result of varying degrees of acceptance and support to such messages from school leadership and implementors.

3.3.2.6 To what extent have communities adapted WASH practices in response to identified climate-related risks/hazards? Has the project reduced the environment and disaster risks and climate change adaptation in water facilities, if so provide examples

WASH facilities and practices were not individually assessed for climate and disaster related risk and susceptibility. Instead, general perceptions were gathered from the community and school beneficiaries towards the general flood and disaster conditions. Some cases of tube wells and latrine block construction in elevated locations or on raised platforms were reported – and BDRCS reported that all designs took into consideration the highest flood levels reported in the last 10 years. In other cases, respondents noted that such infrastructure would be susceptible during major flood events. Tube wells were reportedly designed to be drilled and screened to specific depths based on hydrogeological records available at local government offices. Such efforts may maximize the functionality of these water sources over their lifetime. Disaster response committees have been established by BDRCS and were engaged in the program.

3.3.2.7 How well has the project addressed barriers to inclusion and opportunities for participation for people with disability/reduced mobility? How was this achieved?

PWDs reportedly were specifically targeted to participate in community committees, attend local meetings, and engage in decision-making processes. However, no meetings or activities were reported to be *specifically* for PWDs – except for disability accessible toilets constructed in schools. PWDs noted their appreciation that information was delivered in such ways that were accessible to them (meetings, and person-to-person discussions) – whereas in many cases they reported that they may be excluded from typical communication tools (i.e. television, radio). Levels of satisfaction with the program among PWDs were generally high. Some PWDs (specifically several with mobility issues and vision problems) noted that customized infrastructure/facility features and having flexibility in terms of design would have been appreciated – such as ramps (rather than stairs) and hand-rails to make access easier and lighting to make it easier for those with impaired vision. Household toilet facilities and community wells were not constructed specifically for, nor with customizable options for the needs of PWDs. While the project did train CSPs on design modification for PWD and this has been implemented for a number of HHs such customizations may have required micro-management by program planners and implementors to meet the specific needs of each PWD, which would have further improved satisfaction levels. Some PWD respondents indicated that they had made accessibility enhancements to their facilities on their own (i.e. making stair step intervals shorter to enter a latrine). Overall, PWDs noted that they felt more dignified as a result of the program, due to the fact that BDRCS recognized and encouraged their participation and they were able to participate and contribute in community activities.

At schools, accessibility conditions for WASH facilities was high – with most schools having at least one drinking water and latrine facility that could be accessed by someone using a wheelchair. Newly constructed latrine facilities were typically fitted with a wheelchair ramp when situated on the ground floor. Most schools had on average around 5 PWDs enrolled, but these were not always students with mobility issues.

3.3.2.8 What innovative approaches has the project applied to WASH delivery?

Beneficiaries and community change agents regarded rainwater harvesting and SONO filters to be innovative approaches to water supply and treatment, respectively. Rainwater harvesting has not been a traditional and cultural practice in the target areas. The pilot rainwater systems established in the target communities served to inspire ideas for potential future uptake in the community. Water treatment was rarely performed in the past, and knowledge on the use and maintenance of treatment products was low. SONO filters were initiated into the private marketplace in the target and school communities in order to address underlying arsenic issues. As a result, the prevalence of HH water treatment increased substantially in target communities versus school communities.

3.3.3 Sustainability

The sustainability of the program has been described through three KPQs covering factors for continuing and expanding on achievements to-date, collaboration between stakeholders, and processes for knowledge and learning among implementors.

3.3.3.1 What factors are in place to ensure that the improved performance of WASH actors, gender outcomes, sanitation practices and hygiene behavioural changes, and improved water supply service levels can be endured and replicated?

The sustainability of hygiene behaviour changes and water supply service levels depends on the continued functionality of related facilities (wells, latrines, filters), affordability and availability of maintenance and consumables (spare parts, maintenance labour, replacement filters, soap, MH pads), and the continuation of the habits and hygiene culture established through the program (regular handwashing, disgust associated with OD, unhygienic environmental conditions, unsafe water, etc.).

Water supply service levels that have been achieved appear likely to be sustained – as tube wells have been reportedly constructed to satisfactory levels of quality, community mobilization is in place to address future problems (such as breakdowns) if and when they occur, and repair expertise and spare parts are reportedly available locally. Some risks to facilities associated with flooding remains – but is largely unavoidable. Sanitation facilities are likely to remain operational, and OD is already a historical practice abandoned by most HHs for many years already. There may be continued demand to upgrade or construct flush toilets among pit latrine users, and to have more appealing and cleaner superstructures. Pits will reportedly be emptied by locally available "sweepers" and disposed of in below-ground covered pits.

There was some concern reported regarding the sustainability of the SONO filters. Many of the filters were purchased based on subsidies provided by the program. The lifespan of the filters is marketed as being 7 years. Community members were reportedly unsure whether replacement products will remain available in the marketplace at affordable prices after this time period. The SONO filters are reportedly highly valued in arsenic affected communities. Arsenic testing services are reportedly well institutionalized, with testing services available regionally upon request and at the initiation and motivation of individual HHs. However, it is not clear whether such district-level services are actually being utilized, as travel distances are moderate and not all HHs may be aware of the existence of this service.

At schools, FGD respondents indicated that fees given to the schools by the enrolled students contribute towards general maintenance works, including those related to WASH. At some schools, students are also required to bring a bar of soap per year to contribute to the school's stock. These fees and contributions, combined with occasionally reported budget lines allocated for general maintenance (which can also be used for WASH), are reportedly sufficient to sustain the need for consumables (handwashing soap and cleaning products), future repair works, and pit latrine emptying.

At community level, development funds are also reportedly available for disbursement towards future WASH-related needs. These funds are reportedly available across all communities, with individual HHs making periodic small contributions. Such funds can reportedly be used to support maintenance or infrastructure investments for poorer HHs.

The frequency and intensity of school CHAST sessions and community meetings reportedly will not be able to be sustained, but such high intensity programming may no longer be cost-effective given the activities that have already taken place. Some schools indicated that they would try to continue the CHAST student champion program – which appeared to be effective. Also, parent forums are also likely to continue as there is already a mechanism for parent-school networking, to which hygiene messaging can be added. A number of factors related to local governance (involving CPCs, UP WASH committees, etc) will reportedly contribute to the endurance and replicability of services, and while were not within the scope of the endline, they have been documented separately.

3.3.3.2 To what extent has the collaboration between stakeholders at local level built the sustainability of services that will continue to support the improved hygiene results?

It was not possible to fully assess this KPQ as beneficiary level insights were limited. However, it was widely reported that community cohesion has significantly increased through the broad participation in the events associated with the program, and collaborative achievements in the communities. This culture change may indirectly support the sustainability of program outcomes and service levels. Collaboration between institutionalized committees, local and regional government, CSPs, and stakeholders responsible for support/monitoring were not assessed.

3.3.3.3 *How effective are the processes in sharing knowledge and learning, within project team and with partners, and has that contributed to better WASH delivery?*

It was not intended to assess this KPQ at beneficiary level however insights were sought from relevant participants. Community change agents participated in training sessions with their colleagues from other villages and communities. Such events served to facilitate the horizontal sharing of lessons learned through the program. School headmasters reported that discussion and information sharing were occurring between target and non-target schools. Non-target schools were reportedly curious about the program and some were interested to learn more about the methods and the interventions.

3.4 Limitations

The HH survey was representative of the program area as a whole, but the design did not allow for disaggregated statistics by district (Gopelganj vs. Rangpur) nor by socio-economic status (poor vs. non-poor). Such additional disaggregations could have facilitated further insights towards conditions in arsenic vs. non-arsenic affect areas and across different levels of poverty. Some improvements could have been made to the implementation of the HH survey to improve quality and accuracy. The training could have been extended to a third day to allow for field piloting of the questionnaire and field practice for the enumerators. The questionnaire could have also been input in Bengali onto the KOBO handset (rather than English). Also, paid enumerators could have been engaged - rather than BDRCS volunteers who had limited time and potentially less incentive to ensure quality and to tolerate challenging field conditions. And finally, a dedicated data manager could have been mobilized to monitor and assess data daily for any irregularities and issues with particular enumerators.

Various proxies for behaviours and practices have been utilized in the endline in line with the PRT KPI definitions. Proxies may not always be valid and should be interpreted with caution. For example, improved water supplies may not always yield safe drinking water and the presence of water and soap at a handwashing station may not imply that handwashing is consistently and correctly practiced by all family members.

KII/FGD interviews were limited to beneficiary level stakeholders, while many of the KPQs are designed to incorporate additional perspectives from implementer level. Therefore, the level of depth of the assessment of some KPQs was shallow, but is intended to be supplemented and enhanced with data focused on change agents collected during endline monitoring activities administered by ARC in March 2018. KII/FGD interviews were also conducted with a limited number of stakeholders, and while attempts were made to draw participants randomly from the selected communities, those with a stronger voice may have biased some of the responses. Efforts were made by the facilitators to engage and gather insights from all participants.

4 Conclusions and recommendations

The 4-year CDI 2 WASH program demonstrated significant improvements to water supply access, drinking water quality (arsenic treatment), latrine access, HH hygiene practices, MHM, and WASH facility access and hygiene in schools. The endline study has assessed program results at beneficiary level through various data collection mechanisms, and across IFRC/BDRCS reporting requirements. The performance of WASH actors has reportedly been improved through formal trainings and practical experiences. Greater gender equality has been realized through the reduction in time spent on water-related activities by women. Hygiene behaviours have reportedly been drastically changed in school and community settings. Sustainable sanitation and water supply services appear to now be in place. These program outcomes appear to have also resulted in improved health conditions, higher attendance at school, less marginalization of PWDs, and indirect effects such as community cohesion and stronger linkages among local actors.

Some WASH programming gaps appear to remain. Drinking water quality conditions remain poorly characterized due to the lack of water quality testing – particularly related to microbiological contamination. Low cost testing products (such as H_2S presence-absence tests) may be available in Bangladesh to support community-led testing. The safety of shallow tube well water may be compromised by the concentration of human waste in pit latrines, the relatively high population density in the village clusters, and close proximity between pits and wells. Water treatment practices remain uncommon, and therefore few HHs have a secondary barrier to exposure to pathogens should their well water become compromised.

SONO filters reportedly have become highly valued by their users at HH level. Efforts should be taken to ensure the continued availability of the filters and their spare parts in the local marketplace to ensure that arsenic treatment options are available in those communities where safe wells are not accessible. Continued efforts should also be taken to ensure that the SONO filters are consistently delivering arsenic treatment to safe levels as marketed. The promotion of SONO filters in schools has not been fully effective as most students continue to drink water directly from wells. This is a major concern at schools with no arsenic-safe water sources. Further study may be needed to explore safe water treatment options that are viable for school settings. Teachers were reportedly reluctant to provide individual filters to each classroom (if they were ever made available at such quantities) due to concerns related to damage and abuse. Centralized gravity-fed water filter systems may be viable – particularly for schools with no arsenic-safe sources.

Usage of improved latrines appears to be the norm, and pit emptying services are locally available and reportedly affordable. It is highly unlikely that HHs would revert back to OD in the future. Further exploration of typical pit emptying practices may be needed – particularly to ensure safe handling among the so-called 'sweepers'. Social class and exploitative issues around the sweepers could also be further explored to ensure dignity.

Hygiene practices and conditions have reportedly been revolutionized in the communities. WASH practices and attitudes also appear to have been significantly changed at target schools. The CHAST program appears to have been effective and the student champions an effective way of incentivizing and engaging with the student population. Modern latrine facilities and handwashing sinks have greatly increased the levels of satisfaction among students. Some remaining programmatic gaps at schools include the further need for an additional water source point at a few schools, addressing water treatment needs (particularly at schools with no arsenic-safe water source), and further sensitizing school administration and leadership to MH issues.

However, the use of self-reporting and proxies in the endline is associated with lower levels of confidence in the estimations of adherence and frequency of such practices. Further in-depth methods (observational studies) could be explored to validate the conclusions in this study. Further research could also be performed to assess what elements of the program have resulted in such significant transformations in behaviour over a relatively short period of time.

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5 Annexes

Annex A – Key Performance Indicators (KPIs)
Annex B – Key Performance Questions (KPQs)
Annex C – Terms of Reference
Annex D – Endline study KPI framework
Annex E – Household questionnaire
Annex F – School questionnaire and facility checklist
Annex G – Community and school FGD / KII guiding questions
Annex H – Example household roster forms
Annex I – Endline implementation schedule
Annex J – Household survey cross-tabulations
Annex K – School survey cross-tabulations
Annex L – FGD-KII field schedule