Terms of Reference

WASH Infrastructure Quality Monitoring
BGD1905
Bangladesh

29/08/2019
Version 4.0

REACH Informing more effective humanitarian action

1. Executive Summary

Country of intervention	Bangladesh					
Type of Emergency	□	Natural disaster	X	Conflict		
Type of Crisis	□	Sudden onset	□	Slow onset	X	Protracted
Mandating Body/ Agency	UNICEF					
Project Code	70DQP					
Overall Research Timeframe *(from research design to final outputs / M&E)*	Round one: April – June (Water) & June (Sanitation) Round two: September (Water & Sanitation)					
Research Timeframe	1.Start collect data: Round one: 9 April 2019 (Water) & beginning of July (Sanitation) Round two: 10 September 2019		5. Preliminary presentation: N/A			
	2. Data collected: Round one: 8 July 2019 Round two: 15 September 2019		6. Outputs sent for validation: Round one: 08 August 2019 Round two: 26 September 2019			
	3. Data analysed: Round one: 23 July 2019 Round two: 19 September 2019		7. Outputs published: Round one: 29 August 2019 Round two: 10 October 2019			
	4. Data sent for validation: Round one: 23 July 2019 Round two: 19 September 2019		8. Final presentation: N/A			
Number of assessments	X	Two rounds				
	□	Multi assessment (more than one cycle)				
Humanitarian milestones *Specify **what** will the assessment inform and **when*** *e.g. The shelter cluster will use this data to draft its Revised Flash Appeal;*	**Milestone**		**Deadline**			
	□	Donor plan/strategy	_ _/_ _/_ _ _ _			
	□	Inter-cluster plan/strategy	_ _/_ _/_ _ _ _			
	X	Cluster plan/strategy	WASH Sector JRP 2019 Review, JRP 2020			
	□	NGO platform plan/strategy	_ _/_ _/_ _ _ _			
	□	Other (Specify):	_ _/_ _/_ _ _ _			
	Audience type		**Dissemination**			

Audience Type & Dissemination *Specify **who** will the assessment inform and **how** you will disseminate to inform the audience*	X Strategic: WASH Sector strategy X Programmatic: partners programming, Water, Sanitation and HP Technial Working Group, Area Focal Agencies (AFAs), and WASH implementing partners □ Operational □ [Other, Specify]	□ General Product Mailing (e.g. mail to NGO consortium; HCT participants; Donors) X Cluster Mailing (WASH) and presentation of findings at Water and Sanitation TWiG meetings X Presentation of findings (e.g. at HCT meeting; Cluster meeting) X Website Dissemination (Relief Web & REACH Resource Centre) □ [Other, Specify]
Detailed dissemination plan required	□ Yes	X No
General Objective	Inform improved strategic analysis and decision-making by WASH sector partners concerning the monitoring, maintenance and development of key WASH infrastructure in Rohingya refugee camps in Cox's Bazar District, Bangladesh	
Specific Objective(s)	○ To provide timely information on the quality and functionality of water sources, latrines, and bathing facilities ○ To inform the infrastructure monitoring and gap analysis completed by the WASH Sector and Area Focal Agencies in line with agreed-upon standards and indicators ○ To inform the WASH Sector's input into the 2019 Joint Response Plan mid-term review	

Research Questions	For the first round of this research cycle, the research questions are the following:
	• What proportion of bathing cubicles are functional versus non-functional?
	  • What proportion of bathing cubicles have a functional versus non-functional structure (roof, walls and floor)?
	  • What proportion of bathing cubicles are private versus non-private?
	• What proportion of latrines are functional versus non-functional?
	  • What proportion of latrines have a functional versus non-functional roof?
	  • What proportion of latrines are private versus non-private?
	  • What proportion of latrines have a pan that are not full and not blocked?
	
	For the second round of this research cycle, the research questions are the following:
	• What proportion of bathing cubicles are functional versus non-functional?
	  • What proportion of bathing cubicles have a functional versus non-functional structure (roof, walls and floor)?
	  • What proportion of bathing cubicles are private versus non-private?
	  • What proportion of bathing cubicles have a functional versus non-functional drainage channel?
	• What proportion of latrines are functional versus non-functional?
	  • What proportion of latrines have a functional versus non-functional roof and slab?
	  • What proportion of latrines are private versus non-private?
	  • What proportion of latrines have a pan that are not full and not blocked?	

	• What proportion of latrines meet agreed-upon unified design standards?[1]
	  • What proportion of latrines has four concrete posts per cubicle?
	  • What proportion of latrines has a door or walls made out of CGI plain sheet?
	  • What proportion of latrines has a wooden or MS Angle frame that is used for walls, doors or roofing?
	  • What proportion of latrines has a hard plastic or metal sheet as roofing?
	  • What proportion of latrines has a complete concrete floor?
	  • What proportion of latrines is 4 by 5 feet?
	• What proportion of tubewells are functional versus non-functional?

Geographic Coverage	All ISCG-recognized camps in Ukhia and Teknaf upazilas with exception of Kutupalong RC due to ongoing security concerns and Choukhali which is yet to be established
Secondary data sources	• REACH infrastructure sweeps round 7, 8, and 9 (completed in June, August and October 2019) • REACH coding databases for tubewells, latrines and bathing facilities (being implemented between April and July 2019)

Population(s) *Select all that apply*				
	□	IDPs in camp	□	IDPs in informal sites
	□	IDPs in host communities	□	IDPs [Other, Specify]
	□	Refugees in camp	□	Refugees in informal sites
	□	Refugees in host communities	□	Refugees [Other, Specify]
	□	Host communities	X	Infrastructure in camps

Stratification *Select type(s) and enter number of strata*						
	□	Geographical #: _ _ _ Population size per strata is known? □ Yes □ No	□	Group #: _ _ _ Population size per strata is known? □ Yes □ No	□	*[Other Specify]* #: _ _ Population size per strata is known? □ Yes □ No

Data collection tool(s)				
	X	Structured (Quantitative)	□	Semi-structured (Qualitative)

	Sampling method	**Data collection method**
Structured data collection tool # 1 *Select sampling and data collection method and specify target # interviews*	□ Purposive X Probability / Simple random □ Probability / Stratified simple random □ Probability / Cluster sampling □ Probability / Stratified cluster sampling □ [Other, Specify]	□ Key informant interview (Target #):_ _ _ _ _ □ Group discussion (Target #):_ _ _ _ _ □ Household interview (Target #):_ _ _ _ _ □ Individual interview (Target #):_ _ _ _ _ X Direct observations (Target #): 8,500 per round
Target level of precision if probability sampling	95% level of confidence	+/- 10% margin of error (aggregate)

Data management platform(s)				
	X	Kobo	X	Dropbox
	□	[Other, Specify]		

Expected ouput type(s)						
	□	Situation overview #: _ _	□	Report #: _ _	□	Profile #: _ _

[1] The WASH Sector in Cox's Bazar agreed on a set of unified designs for latrines, in an attempt to harmonize the different types and ensure quality of latrines installed in the camps. See the unified designs here: https://www.humanitarianresponse.info/en/operations/bangladesh/document/unified-standard-design-latrines-cxb-bws-0

	□	Presentation (Preliminary findings) #: _ _	X	Presentation (Final) #: 2 (one for sanitation, one for water)	X	Factsheet #: One set factsheet including water and sanitation infrastructure findings
	□	Interactive dashboard #:_	□	Webmap #: _ _	□	Map #: _ _
	X	Database with the raw data				
Access	X	Public (available on REACH resource center and other humanitarian platforms)				
	□	Restricted (bilateral dissemination only upon agreed dissemination list, no publication on REACH or other platforms)				
Visibility	UNICEF, WASH Sector Cox's Bazar, REACH					

2. Rationale & Overview

2.1. Rationale

Since August 2017 an estimated 870,000[2] Rohingya refugees have arrived from Myanmar to Cox's Bazar district in Bangladesh, bringing the total number to approximately 910,000. The early stages of the crisis were characterized by a rush in humanitarian actors to provide life-saving services in the camps, including construction of emergency WASH infrastructure – much of it inadequate quality and temporary in nature.[3] Under the leadership of the Bangladeshi Government's Department of Public Health Engineering (DPHE) and co-chaired by UNICEF and Action Against Hunger (ACF), the Cox's Bazar WASH Sector is tasked with the coordination, oversight, monitoring and strategic planning for all WASH-related aspects of the humanitarian response. Since mid-2018, with the response stabilizing the Cox's Bazar WASH Sector has shifted strategy from quantity to quality of WASH infrastructure and service delivery.

Since the influx the WASH Sector has faced significant challenges in monitoring the status and quality of WASH infrastructure to inform strategic planning and reporting due to the large number of facilities (around 20,000 waterpoints, 40,000 latrines and 20,000 bathing facilities) managed by over 50 implementing partners. To assist in filling this information gap, REACH will complete two rounds of independent water and sanitation infrastructure quality monitoring in 2019. The data will be used to inform the WASH Sector's input into the 2019 Joint Response Plan (JRP) mid-term review as well as WASH Sector and Area Focal Agency (AFA)[4]-level strategic planning.

2.2. Overview

The WASH infrastructure quality monitoring consists of two rounds and will include water points, latrines and bathing cubicles. In the first round, water and sanitation facilities will be assessed in two separate assessments.
Round one for tubewells is included in the REACH tubewell coding (research cycle 1903a)[5]. The roll-out of this project is currently ongoing. This assessment includes a SPHERE standard sanitary survey for each tubewell, and is therefore considered providing sufficient information to serve as round one of infrastructure monitoring with regards to water facilities. For sanitation, the first round will be carried out in June and will be focused on latrines and bathing facilities. This assessment

[2] According to RRRC-UNHCR Family Counting, see ISCG Situation Report April 2019.
[3] For more information on challenges arising from poorly-constructed infrastructure at the beginning of the response, see Cox's Bazar WASH Sector 2018 Strategy: https://www.humanitarianresponse.info/en/operations/bangladesh/document/wash-sector-cxb-2018-strategy
[4] The three AFAs include UNICEF, IOM and UNHCR and are responsible for coordinating between eight and fourteen camps each. See AFA Terms of Reference here: https://www.humanitarianresponse.info/en/operations/bangladesh/document/tor-wash-sector-area-focal-point
[5] During the REACH tubewell coding (1903a) roll-out, a yellow label with a barcode will be physically attached to each tubewell in the field. The barcode serves as a unique identifier, and by labelling the tubewells is ensured that the same wells can be accurately and consistently identified over time. In this full sweep, data on each tubewell is collected during the tagging.

will consist of a small sample of latrines and bathing cubicles representative at overall response level in order to provide data for the JRP 2019 Midterm Review.

In the second round of infrastructure monitoring, carried out in september, sanitation and water will be monitored simultaneously. Round two follows a sample-based approach, producing statistically-representative data at overall response level for the WASH Sector to report on JRP indicators and inform WASH Sector and Area Focal Agency-level strategic planning. An overview of each infrastructure quality monitoring assessment can be found Table 1 below.

Table 1: Overview - WASH infrastructure quality monitoring assessments

Assessment	Objective	When	Facilities[6]	Method
Round one: Water infrastructure quality monitoring	Inform WASH Sector input into JRP mid-term review Inform WASH Sector and AFA-level strategic planning	April – June 2019	Tubewells	Census (incorporated into tubewells coding implementation)
Round one: Sanitation infrastructure quality monitoring	Inform WASH Sector input into JRP mid-term review Inform WASH Sector strategic planning	June 2019	Latrines Bathing facilities	Stand-alone assessment (sample-based, stratified at overall response level with a 95% confidence level and 10% margin of error, using OpenStreetMaps shelter footprint to determine sample points)
Round two: Water infrastructure quality monitoring	Inform WASH Sector and AFA-level strategic planning and reporting	September 2019	Tubewells	Stand-alone assessment (sample-based, stratified at overall response level with a 95% confidence level and 10% margin of error, using OpenStreetMaps shelter footprint to determine sample points)
Round two: Sanitation infrastructure quality monitoring	Inform WASH Sector and AFA-level strategic planning and reporting	September 2019	Latrines Bathing facilities	Stand-alone assessment (sample-based, stratified at overall response level with a 95% confidence level and 10% margin of error, using OpenStreetMaps shelter footprint to determine sample points)

[6] Due to the nature of the assessments for water facilities, the types of infrastructures differs between round one and two, resulting in the limitation that data of these rounds is not comparable. This however should not limit the conclusions drawn in these assessment as the objectives of both rounds are different.

3. Methodology

3.1. Methodology overview

Reflecting the strategic rather than operational focus of this assessment, this infrastructure quality monitoring assessment will be carried out using a sample-based approach instead of a census[7] - with the exception of the first round of water infrastructure quality monitoring. Refer to Table 1 for an overview of the methodology that will be employed for each round.

Kobo tools and an analysis plan will be developed by REACH in consultation with the Cox's Bazar WASH Sector – in particular the Water and Sanitation Technical Working Groups (TWiGs) – aimed at producing data that can be aggregated to report on JRP and WASH Sector indicators.

During data collection one field coordinator, one field assistant and four teams each consisting of one team leader and eight enumerators will be deployed to the field. Where possible target facilities will be identified using randomly selected GPS points from census databases of infrastructure being compiled by REACH as part of the coding system. Where this is not possible, sample points will be randomly drawn from a list of "likely" latrines compiled from REACH infrastructure footprints for each camp.[8] Data will be cleaned throughout the data collection process, and checked to monitor consistency and enumerator performance. Data analysis will be conducted in Microsoft Excel based on an analysis plan. Data will be released as raw data and factsheets, shared via SendInBlue, the REACH resource centre and HDX, and presented to the WASH Sector coordination team and Water and Sanitation TWiGs as well as AFAs.

3.2 Population of interest

In this assessment data will be collected on infrastructure rather than households or individuals and as such, no personal identifiable information will be collected. The infrastructure quality monitoring will focus on water sources, bathing cubicles and latrines that are located within 33 out of the 35 ISCG-recognized camps. The assessment currently excludes Kutupalong Registered Camp (RC), which REACH enumerators cannot assess due to ongoing security concerns. The newly-designated Choukhali camp is currently under development and is not yet populated, and will therefore not be included in both research cycles.

3.3 Secondary data

Last year, REACH conducted nine rounds of WASH infrastructure sweeps. The dataset from round nine will be used to randomly select bathing cubicles and latrines to be assessed in the first part of the infrastructure quality monitoring.
In addition to that and as outlined in Part 2.2, the Cox's Bazar WASH Sector and REACH are implementing the WASH infrastructure coding system between April and July 2019. As the coding database will include the most accurate and up-to-date WASH infrastructure, the sampling frame for the second round of tubewells quality monitoring will be developed by using this data. The Garmin-based GPS points within the coding database will be used to navigate to the selected infrastructure. The sample for the second round of sanitation will be drawn from round 9 of last year's infrastructure sweeps, identical as in the first round.

3.4 Primary Data Collection

Before primary data collection starts, samples will be generated by selecting random tubewells, latrines and bathing facilities. Based on REACH's last rounds of infrastructure monitoring completed in June, August and October 2018, the sample size for each different type of infrastructure will be around 200 facilities in both rounds.

[7] In 2017-2018 REACH completed nine censuses of WASH infrastructure across all camps, involving enumerators visiting all waterpoints, latrines, and bathing facilities to assess basic functionality, security and sanitary aspects of each facility. Raw datasets as well as analysed data and factsheets were published for each round. Round 9 products available here: https://bit.ly/2JK8Q3E.
[8] REACH and its partner UNOSAT have digitised the structure footprints for all 34 camps based on January 2019 drone imagery from the International Organisation for Migration's Needs and Population Monitoring Unit. The full set of shapefiles is available here: https://data.humdata.org/dataset/bangladesh-refugee-camp-infrastructure-foot-print-january-2019

Tools

REACH will work with the WASH Sector including the Water TWiG to develop a Kobo tool for waterpoints and the Sanitation TWiG to develop Kobo tools for latrines and bathing facilities. REACH will request WASH partners to provide photos of different types of water and sanitation facilities for inclusion in the Kobo form as a reference for enumerators, to minimise the risk of miscategorization. Once finalized, a data analysis plan will be developed and sent to REACH HQ for validation along with research tools. The English version of the tool will be translated into Bangla language by Translators Without Borders in Cox's Bazar. Kobo forms will be tested in an enumerator training as well as a pilot, with the final version incorporating changes based on advice from the field teams.

Training and pilot

Before data collection commences, the enumerators will receive a one-day training on how to use the form, to avoid confusion in the field and increase data accuracy. When the tool is finalized and the enumerators are trained, there will be a pilot day of data collection. After this first day of data collection, the results will be checked, in order to spot for inconsistencies and errors. If issues are detected in the form, or enumerators misinterpret questions in the form, the form will be adjusted before data collection commences. Pilot data will not be incorporated into the main dataset that will be used for data analysis.

3.5. Data Processing & Analysis

After each day of data collection, team leaders submit all collected forms to the REACH Kobo server. The GIS and Data Unit will download the data after all forms are uploaded. Checks on these incoming results will be performed to minimize irregularities or errors and to ensure highest data quality possible. These checks and initial data cleaning take place after each day of data cleaning to avoid backlogging and delays in delivering final outputs. An automated script in R will flag irregularities and unexpected values. The checks and corrections in case errors are flagged that are required will be outlined in the data cleaning SOP. Outputs for this assessment are outlined in Table 3.

Table 3. Outputs – infrastructure quality monitoring

Round of Infrastructure quality monitoring	Outputs
Water and sanitation infrastructure quality monitoring round one	• Key findings presentation • 1 x dataset with response-level water and sanitation infrastructure findings (based on JRP indicators) • 1 x response-level presentation displaying key findings in line with JRP indicators
Water and sanitation infrastructure quality monitoring round two	• Key findings presentation • 1 x dataset with response-level water and sanitation infrastructure findings (based on JRP indicators) • 1 x response-level factsheet displaying key findings in line with JRP indicators and WASH Sector standards and indicators

4. Roles and responsibilities

Table 4. Roles and responsibilities – infrastructure quality monitoring

Task Description	*Responsible*	*Accountable*	*Consulted*	*Informed*
Research design	Junior GIS Officer	Assessment Officer, Country Focal Point	IMPACT HQ	WASH Sector, UNICEF, GWC, IMPACT HQ
Supervising data collection	Junior GIS Officer Field Coordinator	Assessment Officer, Country Focal Point	Senior GIS Officer	Country Focal Point
Data processing (checking, cleaning)	Junior GIS Officer	Assessment Officer, Country Focal Point	Senior GIS Officer, Country Focal Point	IMPACT HQ
Data analysis	Junior GIS Officer	Assessment Officer, Country Focal Point	Senior GIS Officer, Country Focal Point	WASH Sector, GWC
Output production	Junior GIS Officer, Assessment Officer	Assessment Officer, Country Focal Point	IMPACT HQ, Country Focal Point	WASH Sector, UNICEF, GWC, IMPACT HQ
Dissemination	Junior GIS Officer	Country Focal Point	IMPACT HQ Country Focal Point	WASH Sector, UNICEF, GWC, IMPACT HQ
Monitoring & Evaluation	Junior GIS Officer	Assessment Officer, Country Focal Point	Country Focal Point IMPACT HQ Country Focal Point	WASH Sector, UNICEF, GWC, IMPACT HQ
Lessons learned	Junior GIS Officer, Assessment Officer	Assessment Officer, Country Focal Point	Field Coordinator, Country Focal Point	IMPACT HQ

Responsible: *the person(s) who executes the task*

Accountable: *the person who validates the completion of the task and is accountable of the final output or milestone*

Consulted: *the person(s) who must be consulted when the task is implemented*

Informed: *the person(s) who need to be informed when the task is completed*

5. Data Analysis Plan

DAP 1905a (Bathing cubicles)

Research questions	Indicator #	Data collection method	Indicator group / sector	Indicator type/list	San TWG Indicator	REACH BGD1905 Indicator	Questionnaire Question	Questionnaire Responses	Calculation instructions	Subset	Stratification	Operation
What proportion of bathing cubicles has a functional versus non-functional structure (roof and walls)? What proportion of bathing cubicles is functional versus non-functional?	1A	Infrastructure assessment (Kobo survey)	% of functional bathing cubicles	JRP Midterm 2019	% of bathing cubicles with functional structure (roof and walls)	% of bathing cubicles with a roof	Does the bathing cubicle have a roof?	Yes No	bc_roof_yes / bc_roof	No subset	Overall response level	Calculate percentage of bathing cubicles with a roof from total assessed bathing cubicles
What proportion of bathing cubicles has a functional versus non-functional structure (roof and walls)? What proportion of bathing cubicles is functional versus non-functional?	1B	Infrastructure assessment (Kobo survey)	% of functional bathing cubicles	JRP Midterm 2019	% of bathing cubicles with functional structure (roof and walls)	% of bathing cubicles with four walls	How many walls does the bathing cubicle have?	None 1 2 3 4	bc_walls_4 / bc_walls	No subset	Overall response level	Calculate percentage of bathing cubicles with three walls from total assessed bathing cubicles
What proportion of bathing cubicles is private versus non-private? What proportion of bathing cubicles is functional versus non-functional?	1C	Infrastructure assessment (Kobo survey)	% of functional bathing cubicles	JRP Midterm 2019	% private bathing cubicles	% of bathing cubicles that has a lockable door	Can the door of the bathing cubicle be locked from the inside?	Yes No	door_lock_yes / bc_door_yes	Automatically subsetted because question is only asked if bc_door = yes	Overall response level	Calculate percentage of bathing cubicles with a door with lock from total bathing cubicles with door
									door_lock_yes / bc_door_yes_no	Bathing cubicles with functional door		Calculate percentage of bathing cubicles

												with a door with lock from total bathing cubicles assessed

DAP 1905a (Latrines)

Research questions	Indicator #	Data collection method	Indicator group / sector	Indicator type/list	San TWG Indicator	REACH BGD1905 Indicator	Questionnaire Question	Questionnaire Responses	Calculation instructions	Subset	Stratification	Operation
What proportion of latrines has a functional versus non-functional roof? What proportion of latrines is functional versus non-functional?	1A	Infrastructure assessment (Kobo survey)	% of functional latrines	JRP Midterm 2019	% of latrines with functional roof	% of latrines with a roof	Does the latrine have a roof?	Yes No	lat_roof_yes / lat_roof	No subset	Overall response level	Calculate percentage of latrines with a roof from total assessed latrines
What proportion of latrines is private versus non-private? What proportion of latrines is functional versus non-functional?	1B	Infrastructure assessment (Kobo survey)	% of functional latrines	JRP Midterm 2019	% private latrines	% of latrines with four walls	How many walls does the latrine have?	None 1 2 3 4	lat_walls_4 / lat_walls	No subset	Overall response level	Calculate percentage of latrines with four walls from total assessed latrines
What proportion of latrines is private versus non-private? What proportion of latrines is functional versus non-functional?	1C	Infrastructure assessment (Kobo survey)	% of functional latrines	JRP Midterm 2019	% private latrines	% of latrines that has a lockable door	Can the door of the latrine be locked from the inside?	Yes No	door_lock_yes / door_functional_yes	Automatically subsetted because question is only asked if door_functional = yes	Overall response level	Calculate percentage of latrines with a door with lock from total latrines with functional door

									door_lock_yes / door_lock_yes_no_ NA	No subset		Calculate percentage of latrines with a door with lock from total latrines assessed
									door_lock_yes / lat_door_yes	Latrines with functional door		Calculate percentage of latrines with a door with lock from total latrines with door
What proportion of latrines have a pan that is not full and not blocked? What proportion of latrines is functional versus non-functional?	1D	Infrastructure assessment (Kobo survey)	% of functional latrines	JRP Midterm 2019	% of latrines where pan is not full and not blocked	% of latrines where pan is not full and not blocked	Is the pan blocked or full?	Yes No	pan_full_no / pan_full	Automatically subsetted because question is only asked if lat_pan = yes	Overall response level	Calculate percentage of latrines with full pan from total latrines with pan
									pan_full_no / pan_full_yes_no_N A	No subset		
What proportion of latrines is labelled female-only?	2A	Infrastructure assessment (Kobo survey)	% of female-only latrines	JRP Midterm 2019	% of female-only latrines	% of female-only latrines	For which gender is this latrine?	Male Female Not specified	lat_gen_female / lat_gen_male_fema le_not_specified	No subset	Overall response level	Calculate percentage of latrines that is labelled as female-only from total assessed latrines

DAP 1905b (Bathing cubicles)

Research questions	Indicator #	Data collection method	Indicator group / sector	Indicator type/list	San TWG Indicator	REACH BGD1905 Indicator	Questionnaire Question	Questionnaire Responses	Calculation instructions	Subset	Operation
	X1					% of bathing cubicles part of a block	Is the bathing cubicle part of a block?	Yes No	bc_block_yes / bc_block	No subset	Calculate percentage of bathing cubicles part of a block from total assessed bathing cubicles
What proportion of bathing cubicles has a functional versus non-functional structure (roof, walls and floor)? What proportion of bathing cubicles is functional versus non-functional?	1A	Infrastructure assessment (Kobo survey)	% of functional bathing cubicles	JRP 2019	% of bathing cubicles with functional structure (roof, walls and floor)	% of bathing cubicles with a roof	Does the bathing cubicle have a roof?	Yes No	bc_roof_yes / bc_roof	No subset	Calculate percentage of bathing cubicles with a roof from total assessed bathing cubicles
What proportion of bathing cubicles has a functional versus non-functional structure (roof, walls and floor)? What proportion of bathing cubicles is functional versus non-functional?	1B	Infrastructure assessment (Kobo survey)	% of functional bathing cubicles	JRP 2019	% of bathing cubicles with functional structure (roof, walls and floor)	% of bathing cubicles that has no hole in the roof that can fit both hands through	Is there a hole in the roof of the bathing cubicle where you would be able to fit two hands through?	Yes No	roof_hole_no / roof_hole	No subset	Calculate percentage of bathing cubicles with no holes in the roof from total assessed bathing cubicles
What proportion of bathing cubicles has a functional versus non-functional structure (roof, walls and floor)? What proportion of bathing cubicles is functional versus non-functional?	1C	Infrastructure assessment (Kobo survey)	% of functional bathing cubicles	JRP 2019	% of bathing cubicles with functional structure (roof, walls and floor)	% of bathing cubicles with different types of flooring	What material is the slab primarly made of?	Concrete Iron Plastic Wood Dirt/sand Other	lat_floor_mat_Concrete / lat_floor_mat lat_floor_mat_Iron / lat_floor_mat lat_floor_mat_Plastic / lat_floor_mat lat_floor_mat_Wood / lat_floor_mat lat_floor_mat_Dirt/sand / lat_floor_mat lat_floor_mat_Other / lat_floor_mat	No subset	Calculate percentage bathing cubicles with certain type of flooring from total assessed bathing cubicles
What proportion of bathing cubicles has a functional versus non-functional structure (roof, walls and floor)? What proportion of bathing	1C	Infrastructure assessment (Kobo survey)	% of functional bathing cubicles	JRP2020	% of bathing cubicles with functional structure	% of bathing cubicles with different types of flooring	Specify other			No subset	Analyse and classify 'other', and calculate percentages from total assessed bathing cubicles

cubicles is functional versus non-functional?					(roof, walls and floor)						
What proportion of bathing cubicles has a functional versus non-functional structure (roof, walls and floor)? What proportion of bathing cubicles is functional versus non-functional?	1D	Infrastructure assessment (Kobo survey)	% of functional bathing cubicles	JRP 2019	% of bathing cubicles with functional structure (roof, walls and floor)	% of bathing cubicles with floor that is not broken or damaged	Is the slab damaged or cracked?	Yes No	floor_damage_no / floor_damage	No subset	Calculate percentage of bathing cubicles with floor that is not broken or damaged from total assessed bathing cubicles
What proportion of bathing cubicles is private versus non-private? What proportion of bathing cubicles is functional versus non-functional?	2A	Infrastructure assessment (Kobo survey)	% of functional bathing cubicles	JRP 2019	% private bathing cubicles	% of bathing cubicles with four walls	How many walls does the bathing cubicle have?	None 1 2 3 4	bc_walls_4 / bc_walls	No subset	Calculate percentage of bathing cubicles with three walls from total assessed bathing cubicles
What proportion of bathing cubicles is private versus non-private? What proportion of bathing cubicles is functional versus non-functional?	2B	Infrastructure assessment (Kobo survey)	% of functional bathing cubicles	JRP 2019	% private bathing cubicles	% of bathing cubicles with a functional door	Does the bathing cubicle have a functional door?	Yes No	bc_door_yes / bc_door	No subset	Calculate percentage of bathing cubicles with functional door from total assessed bathing cubicles
What proportion of bathing cubicles is private versus non-private? What proportion of bathing cubicles is functional versus non-functional?	2C	Infrastructure assessment (Kobo survey)	% of functional bathing cubicles	JRP 2019	% private bathing cubicles	% of bathing cubicles that has no holes in the wall or between walls where you can look through	When the door is closed, can you see inside the bathing cubicle?	Yes No	see_inside_no / see_inside_yes_no	Automatically subsetted because question is only asked if bc_door = yes and bc_walls = 4	Calculate percentage of bathing cubicles where you cannot see inside from total assessed bathing cubicles
									see_inside_no / see_inside_yes_no_NA	No subset	Calculate percentage of bathing cubicles where you cannot see inside from total assessed bathing cubicles

What proportion of bathing cubicles is private versus non-private? What proportion of bathing cubicles is functional versus non-functional?	2D	Infrastructure assessment (Kobo survey)	% of functional bathing cubicles	JRP 2019	% private bathing cubicles	% of bathing cubicles that has a lockable door	Can the door of the bathing cubicle be locked from the inside?	Yes No	door_lock_yes / bc_door_yes	Automatically subsetted because question is only asked if bc_door = yes	Calculate percentage of bathing cubicles with a door with lock from total bathing cubicles with door
									door_lock_yes / bc_door_yes_no	Bathing cubicles with functional door	Calculate percentage of bathing cubicles with a door with lock from total bathing cubicles assessed
What proportion of bathing cubicles have a functional versus non-functional drainage channel? What proportion of bathing cubicles is functional versus non-functional?	3A	Infrastructure assessment (Kobo survey)	% of functional bathing cubicles	JRP 2019	% of bathing cubicles with functional drainage channel	% of bathing cubicles with drainage channel	Does the bathing cubicle have a drainage channel?	Yes No	bc_drainage_yes / bc_drainage	No subset	Calculate percentage of bathing cubicles from percentage of total bathing cubicles assessed
What proportion of bathing cubicles have a functional versus non-functional drainage channel? What proportion of bathing cubicles is functional versus non-functional?	3B	Infrastructure assessment (Kobo survey)	% of functional bathing cubicles	JRP 2019	% of bathing cubicles with functional drainage channel	% of bathing cubicles with functional drainage channel	Are there problems with the drainage channel?	Yes, drainage channel permits ponding Yes, drainage channel is blocked or needs cleaning Yes, drainage channel is cracked or broken No	drainage_problem_no / bc_drainage_yes	Automatically subsetted because question is only asked if bc_drainage = yes	Calculate percentage of bathing cubicles that has no drainage problems from all bathing cubicles with drainage channel
									drainage_problem_no / bc_drainage_yes_no	No subset	Calculate percentage of bathing cubicles that has no drainage problems from all bathing cubicles assessed

DAP 1905b (Latrines)

Research questions	Indicator #	Data collection method	Indicator group / sector	Indicator type/list	San TWG Indicator	REACH BGD1905 Indicator	Questionnaire Question	Questionnaire Responses	Calculation instructions	Subset	Stratification	Operation
	X1					% of latrines part of a block	Is the latrine part of a block?	Yes No	lat_block_yes / lat_block	No subset	Overall response level	Calculate percentage of latrines part of a block from total assessed latrines
What proportion of latrines has a functional versus non-functional roof and slab? What proportion of latrines is functional versus non-functional?	1A	Infrastructure assessment (Kobo survey)	% of functional latrines	JRP 2019	% of latrines with functional roof and slab	% of latrines with a roof	Does the latrine have a roof?	Yes No	lat_roof_yes / lat_roof	No subset	Overall response level	Calculate percentage of latrines with a roof from total assessed latrines
What proportion of latrines has a functional versus non-functional roof and slab? What proportion of latrines is functional versus non-functional?	1B	Infrastructure assessment (Kobo survey)	% of functional latrines	JRP 2019	% of latrines with functional roof and slab	% of latrines that has no hole in the roof that can fit both hands through	Is there a hole in the roof of the latrine where you would be able to fit two hands through?	Yes No	roof_hole_no / roof_hole	No subset	Overall response level	Calculate percentage of latrines with no holes in the roof from total assessed latrines
What proportion of latrines has a functional versus non-functional roof and slab? What proportion of latrines is functional versus non-functional?	1C	Infrastructure assessment (Kobo survey)	% of functional latrines	JRP 2019	% of latrines with functional roof and slab	% of latrines with different types of flooring	What material is the slab primarly made of?	Concrete Iron Plastic Stone Porcelain Wood Dirt/sand Other	lat_floor_mat_Concrete / lat_floor_mat lat_floor_mat_Iron / lat_floor_mat lat_floor_mat_Plastic / lat_floor_mat lat_floor_mat_Stone / lat_floor_mat lat_floor_mat_Porcelain / lat_floor_mat lat_floor_mat_Wood / lat_floor_mat lat_floor_mat_Dirt	No subset	Overall response level	Calculate percentage latrines with certain type of flooring from total assessed latrines

									/sand / lat_floor_mat lat_floor_mat_Other / lat_floor_mat			
What proportion of latrines has a functional versus non-functional roof and slab? What proportion of latrines is functional versus non-functional?	1C	Infrastructure assessment (Kobo survey)	% of functional latrines	JRP 2019	% of latrines with functional roof and slab	% of latrines with different types of flooring	Specify other			No subset	Overall response level	Analyse and classify 'other', and calculate percentages from total assessed latrines
What proportion of latrines has a functional versus non-functional roof and slab? What proportion of latrines is functional versus non-functional?	1D	Infrastructure assessment (Kobo survey)	% of functional latrines	JRP 2019	% of latrines with functional roof and slab	% of latrines with floor that is not broken or damaged	Is the slab damaged or cracked?	Yes No	floor_damage_no / floor_damage	No subset	Overall response level	Calculate percentage of latrines with floor that is not broken or damaged from total assessed latrines
What proportion of latrines is private versus non-private? What proportion of latrines is functional versus non-functional?	2A	Infrastructure assessment (Kobo survey)	% of functional latrines	JRP 2019	% private latrines	% of latrines with four walls (excluding the wall with the door)	How many walls does the latrine have?	None 1 2 3 4	lat_walls_4 / lat_walls	No subset	Overall response level	Calculate percentage of latrines with three walls from total assessed latrines
What proportion of latrines is private versus non-private? What proportion of latrines is functional versus non-functional?	2B	Infrastructure assessment (Kobo survey)	% of functional latrines	JRP 2019	% private latrines	% of latrines with a functional door	Does the latrine have a door?	Yes No	lat_door_yes / lat_door	No subset	Overall response level	Calculate percentage of latrines with door from total

												assessed latrines
What proportion of latrines is private versus non-private? What proportion of latrines is functional versus non-functional?	2B	Infrastructure assessment (Kobo survey)	% of functional latrines	JRP 2019	% private latrines	% of latrines with a functional door	Is the door functional?	Yes No	door_functional_yes / lat_door	Automatically subsetted because question is only asked if lat_door = yes	Overall response level	Calculate percentage of latrines with functional door from total assessed latrines
									door_functional_yes / lat_door_yes_no	No subset	Overall response level	Calculate percentage of latrines with functional door from total latrines with door
What proportion of latrines is private versus non-private? What proportion of latrines is functional versus non-functional?	2C	Infrastructure assessment (Kobo survey)	% of functional latrines	JRP 2019	% private latrines	% of latrines that has no holes in the wall or between walls where you can look through	When the door is closed, can you see inside the latrine?	Yes No	see_inside_no / see_inside_yes_no	Automatically subsetted because question is only asked if lat_door = yes and lat_walls = 3	Overall response level	Calculate percentage of latrines where you cannot see inside from total assessed latrines
									see_inside_no / see_inside_yes_no_NA	No subset		

What proportion of latrines is private versus non-private? What proportion of latrines is functional versus non-functional?	2D	Infrastructure assessment (Kobo survey)	% of functional latrines	JRP 2019	% private latrines	% of latrines that has a lockable door	Can the door of the latrine be locked from the inside?	Yes No	door_lock_yes / lat_door_yes	Automatically subsetted because question is only asked if door_functional = yes	Overall response level	Calculate percentage of latrines with a door with lock from total latrines with door
									door_lock_yes / door_lock_yes_no_NA	No subset		Calculate percentage of latrines with a door with lock from total latrines with functional door
What proportion of latrines have a pan that is not full and not blocked? What proportion of latrines is functional versus non-functional?	3A	Infrastructure assessment (Kobo survey)	% of functional latrines	JRP 2019	% of latrines where pan is not full and not blocked	% of latrines with a pan	Does the latrine have a pan?	Yes No	lat_pan_yes / lat_pan	No subset	Overall response level	Calculate percentage of latrines with pan from total assessed latrines
What proportion of latrines have a pan that is not full and not blocked? What proportion of latrines is functional versus non-functional?	3B	Infrastructure assessment (Kobo survey)	% of functional latrines	JRP 2019	% of latrines where pan is not full and not blocked	% of latrines where pan is not full and not blocked	Is the pan blocked or full?	Yes No	pan_full_no / pan_full	Automatically subsetted because question is only asked if lat_pan = yes	Overall response level	Calculate percentage of latrines with full pan from total latrines with pan
									pan_full_no / pan_full_yes_no_NA	No subset		

What proportion of latrines have a pan that is not full and not blocked? What proportion of latrines is functional versus non-functional?	3C	Infrastructure assessment (Kobo survey)	% of functional latrines	JRP 2019	% of latrines with functional pan that is not full or blocked	% of latrines with pan flap or water seal	Can you see the pan flap or water seal in the bottom of the pan?	Yes No	pan_flap_yes / pan_flap	Automatically subsetted because question is only asked if lat_pan = yes and pan_full = no	Overall response level	Calculate percentage of latrines with pan from total assessed latrines
									pan_flap_yes / pan_flap_yes_no_NA			
What proportion of latrines has four concrete posts per cubicle? What proportion of latrines meet agreed-upon design standards?	4A	Infrastructure assessment (Kobo survey)	% of latrines of agreed standards	JRP 2019	% of latrines that meet agreed-upon unified design standards	% of latrines with four concrete posts	Are there exactly four concrete posts on each corner of the cubicle?	Yes No	concrete_post_yes / concrete_post		Overall response level	Calculate percentage of latrines with four concrete posts from total assessed latrines
What proportion of latrines has a door or walls made out of CGI plain sheet? What proportion of latrines meet agreed-upon design standards?	4B	Infrastructure assessment (Kobo survey)	% of latrines of agreed standards	JRP 2019	% of latrines that meet agreed-upon unified design standards	% of latrines with walls made of CGI plain sheet	Are the walls made of the plain iron plates that you can see in the picture?	Yes No	cgi_walls_yes / cgi_walls	Automatically subsetted because question is only asked if lat_walls is NOT "None"	Overall response level	Calculate percentage latrines with CGI plain sheets used for the walls of all latrines that have at least 1 wall
									cgi_walls_yes / lat_walls_4	Latrines with three walls	Overall response level	Calculate percentage of latrines with CGI plain sheets used for

												walls from total latrines with three walls
									cgi_walls_yes / cgi_walls_no_NA	No subset		
What proportion of latrines has a door or walls made out of CGI plain sheet? What proportion of latrines meet agreed-upon design standards?	4C	Infrastructure assessment (Kobo survey)	% of latrines of agreed standards	JRP 2019	% of latrines that meet agreed-upon unified design standards	% of latrines with a door made of CGI plain sheet	Is the door made of plain iron plates that you can see in the picture?	Yes No	cgi_door_yes / lat_door_yes	Automatically subsetted because question is only asked if lat_door = yes	Overall response level	Calculate percentage of latrines with CGI plain sheets used for the door from total latrines that have a door
									cgi_door_yes / door_functional_yes	Latrines with functional door	Overall response level	Calculate percentage of latrines with CGI plain sheets used for the door from total latrines that have a functional door
									cgi_door_yes / cgi_door_yes_no_NA			
What proportion of latrines has a wooden or MS Angle frame that is used for walls, door and roofing? What proportion of latrines meet agreed-upon design standards?	4D	Infrastructure assessment (Kobo survey)	% of latrines of agreed standards	JRP 2019	% of latrines that meet agreed-upon unified design standards	% of latrines with wooden or MS Angle frame used for the walls	Is a wooden or steel frame as shown in the picture used for the walls, roof or door?	Yes, the walls Yes, the roof Yes, the door No	frame_yes_walls / frame	No subset	Overall response level	Calculate percentage of latrines with wooden/MS angle frame used for the walls from

												total latrines assessed
									frame_yes_walls_ / lat_walls_4	Latrines with three walls	Overall response level	Calculate percentage of latrines with wooden/MS angle frame used for the walls from total latrines with walls
What proportion of latrines has a wooden or MS Angle frame that is used for walls, door and roofing? What proportion of latrines meet agreed-upon design standards?	4E	Infrastructure assessment (Kobo survey)	% of latrines of agreed standards	JRP 2019	% of latrines that meet agreed-upon unified design standards	% of latrines with wooden or MS Angle frame used for the roofing	Is a wooden or steel frame as shown in the picture used for the walls, roof or door?	Yes, the walls Yes, the roof Yes, the door No	frame_yes_roof / frame	No subset	Overall response level	Calculate percentage of latrines with wooden/MS angle frame used for roofing from total latrines assessed
									frame_yes_roof / lat_roof_yes	Latrines with roof	Overall response level	Calculate percentage of latrines with wooden/MS angle frame used for roofing from total latrines assessed with roof

What proportion of latrines has a wooden or MS Angle frame that is used for walls, door and roofing? What proportion of latrines meet agreed-upon design standards?	4F	Infrastructure assessment (Kobo survey)	% of latrines of agreed standards	JRP 2019	% of latrines that meet agreed-upon unified design standards	% of latrines with wooden or MS Angle frame used for the door	Is a wooden or steel frame as shown in the picture used for the walls, roof or door?	Yes, the walls Yes, the roof Yes, the door No	frame_yes_door / lat_door_yes	Automatically subsetted because response option only possible if lat_door = yes	Overall response level	Calculate percentage of latrines with wooden/MS angle frame used for the door from total latrines assessed
									frame_yes_door / door_functional_yes	Latrines with functional door	Overall response level	Calculate percentage of latrines with wooden/MS angle frame used for the door from total latrines with functional door
									frame_yes_door / frame_yes_walls_yes_roof_yes_door_no_NA	No subset		
What proportion of latrines has a hard plastic sheet as roofing? What proportion of latrines meet agreed-upon design standards?	4G	Infrastructure assessment (Kobo survey)	% of latrines of agreed standards	JRP 2019	% of latrines that meet agreed-upon unified design standards	% of latrines with plastic roofing	Is the roof made of a plastic sheet?	Yes No	roof_plastic_yes / roof_plastic	Automatically subsetted because question is only asked if lat_roof = yes	Overall response level	Calculate percentage of latrines with hard plastic sheet used for roofing from total latrines with roof
									roof_plastic_yes / roof_plastic_yes_no_NA	No subset		

What proportion of latrines has a complete concrete floor? What proportion of latrines meet agreed-upon design standards?	4H	Infrastructure assessment (Kobo survey)	% of latrines of agreed standards	JRP 2019	% of latrines that meet agreed-upon unified design standards	% of latrines with complete concrete floor	What material(s) is the floor inside the latrine made of?	Concrete Iron Plastic Stone Porcelain Wood Dirt/sand Other	lat_floor_mat_Concrete / lat_floor_mat	No subset	Overall response level	Calculate percentage of latrines that has concrete as only option selected as materials on the floor from total latrines assessed
What proportions of latrines is 4 by 5 feet? What proportion of latrines meet agreed-upon design standards?	4I	Infrastructure assessment (Kobo survey)	% of latrines of agreed standards	JRP 2019	% of latrines that meet agreed-upon unified design standards	% of latrines that are 4 by 5 feet	Measure the width of the latrine in inches Measure the length of the latrine in inches		Exclude values that < 47" or > 60" (lat_width_47-60 AND lat_length_47-60) / total latrines	No subset	Overall response level	If lat_width < 47" or > 60", it is outside margin of error and not considered to comply with the agreed standards.

DAP 1905b (Tubewells)

Research questions	Indicator #	Data collection method	Indicator group / sector	Indicatortype/list	REACH BGD1905 Indicator	Questionnaire Question	Questionnaire Responses	Calculation instructions	Subset	Stratification	Operation
What proportion of tubewells is functional?	A1	Infrastructure assessment (Kobo survey)	% of functional tubewells	WASH Sector JRP 2019	% of functional tubewells	Can you draw water from the tubewell?	Yes No	functional_yes / functional	No subset	Overall response level	Calculate percentage of tubewells that is functional

6. Monitoring & Evaluation Plan

IMPACT Objective	External M&E Indicator	Internal M&E Indicator	Focal point	Tool	Will indicator be tracked?
Humanitarian stakeholders are accessing IMPACT products	Number of humanitarian organisations accessing IMPACT services/products Number of individuals accessing IMPACT services/products	# of downloads of infrastructure quality monitoring dataset from Resource Center	Country request to HQ	User_log	X Yes
		# of downloads of infrastructure quality monitoring dataset from Relief Web	Country request to HQ		□ Yes
		# of downloads of infrastructure quality monitoring dataset from Country level platforms	Country team		X Yes
		# of page clicks on infrastructure quality monitoring dataset from REACH global newsletter	Country request to HQ		X Yes
		# of page clicks on infrastructure quality monitoring dataset from country newsletter, sendingBlue, bit.ly	Country team		X Yes
		# of visits to x webmap/x dashboard	Country request to HQ		□ Yes
IMPACT activities contribute to better program implementation and coordination of the humanitarian response	Number of humanitarian organisations utilizing IMPACT services/products	# references in HPC documents (HNO, SRP, Flash appeals, Cluster/sector strategies)	Country team	Reference_log	JRP 2019 Bangladesh Midterm Review JRP 2019 Bangladesh End term Review
		# references in single agency documents			WASH AFA strategies AFA Gap analysis
Humanitarian stakeholders are using IMPACT products	Humanitarian actors use IMPACT evidence/products as a basis for decision making, aid planning and delivery Number of humanitarian documents (HNO, HRP, cluster/agency strategic plans, etc.) directly informed by	Perceived relevance of IMPACT country-programs	Country team	Usage_Feedback *and* Usage_Survey template	
		Perceived usefulness and influence of IMPACT outputs			
		Recommendations to strengthen IMPACT programs			
		Perceived capacity of IMPACT staff			
		Perceived quality of outputs/programs			
		Recommendations to strengthen IMPACT programs			

	IMPACT products				
Humanitarian stakeholders are engaged in IMPACT programs throughout the research cycle	Number and/or percentage of humanitarian organizations directly contributing to IMPACT programs *(providing resources, participating to presentations, etc.)*	# of organisations providing resources (i.e.staff, vehicles, meeting space, budget, etc.) for activity implementation	Country team	Engagement_log	X Yes
		# of organisations/clusters inputting in research design and joint analysis			X Yes
		# of organisations/clusters attending briefings on findings;			X Yes