

Integrating Climate Resilience into Sanitation Programming in Bangladesh

SUMMARY

Bangladesh is highly vulnerable to climate change and extreme climate events. The Global Climate Risk Index ranks Bangladesh as the seventh most affected country in the world from extreme weather events between 2000 and 2019. Depending on the region, Bangladesh experiences regular and long-lasting floods, cyclones, storm surges, droughts, sea level rise and other extreme climate events to which its coastal and riverine populations are especially vulnerable.

To reduce the impacts of climate change on sanitation services in the country, UNICEF Bangladesh mainstreamed climate change into its sanitation programming through three linked strategies: (1) creating demand for climate-resilient sanitation in the ongoing CATS/CLTS¹ programme; (2) promoting and expanding the supply and installation of climate-resilient sanitation designs and products through sanitation marketing; and (3) providing climate-resilient sanitation services with a focus on constructing flood-resilient latrines in vulnerable areas. In 2021, UNICEF Bangladesh supported 529,000 people with access to climate-resilient sanitation services using these three strategies.

The Accelerated Sanitation and Water for All (ASWA) II project supported the uptake of climate-resilient sanitation in Bangladesh through community awareness-raising, capacity-building and installation of climate-resilient sanitation facilities which have remained functional after climate events. Communities and other sector stakeholders are now constructing climate-resilient latrines in flood-prone areas, replicating and scaling up the climate-resilient sanitation programme within and outside of the ASWA II project areas, reaching almost all districts in Bangladesh.

In line with the organizational shift to climate-resilient WASH services, UNICEF Bangladesh is supporting the scaling up of climate-resilient sanitation programming by strengthening the sector's capacity for climate risk analyses to generate evidence for a stronger climate rationale and to improve the sustainability and design of climate-resilient sanitation solutions.

¹ CATS/CLTS: Community Approaches to Sanitation/Community-Led Total Sanitation.

Introduction

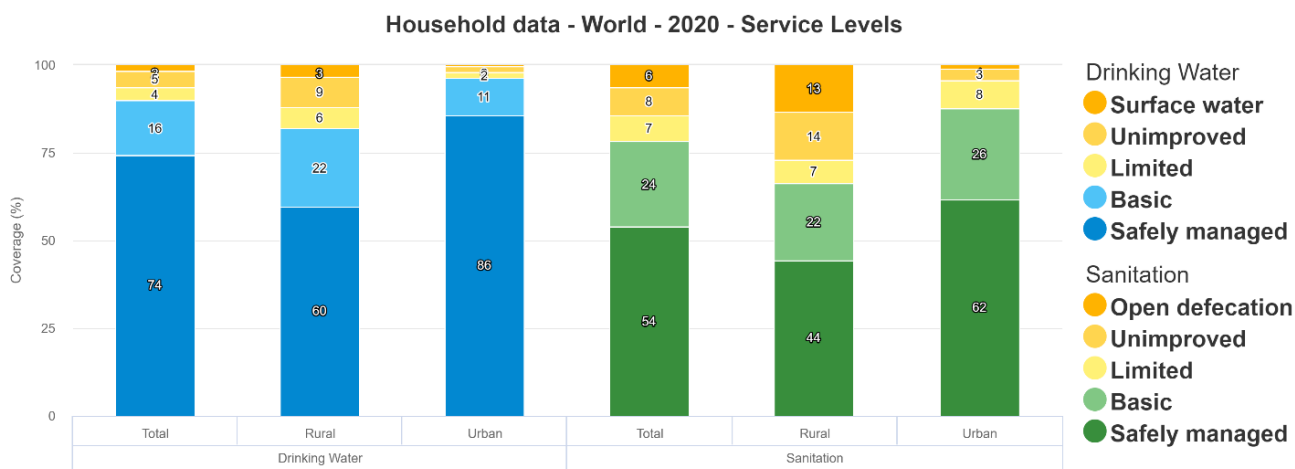
Bangladesh has one of the highest population densities in the world and 40 per cent of its population are children; the current total population is estimated at 165 million and is expected to reach 220 million by 2050.^{2,3,4} This population growth is expected to increase annual domestic water demand by 200 per cent compared with 2018 levels.⁵ Overall, 78 per cent and 90 per cent of households have access to at least basic sanitation and drinking water services, respectively; rural–urban disparities are shown in Figure 1.⁶ An estimated 56 per cent of schools (including pre-primary, primary and secondary schools) have access to at least basic sanitation and 82 per cent of these schools have access to drinking water services.⁷ An estimated 76 per cent

of health-care facilities have access to at least basic drinking water services with insufficient data regarding sanitation.⁸

Bangladesh, formed as a large delta with an average elevation of only 9 m above sea level, is highly vulnerable to climate change and extreme climate events due to its low elevation, often non-resilient infrastructure and high population density, especially in coastal and riverine areas.^{9,10}

The Global Climate Risk Index ranks Bangladesh as the seventh most affected country in the world from extreme weather events between 2000 and 2019.¹¹

Figure 1: Drinking water and sanitation service access for households, 2020



Source: WHO/UNICEF Joint Monitoring Programme

² 'Data – Population, total – Bangladesh', World Bank, 2020. [Link](#).

³ 'Children in Bangladesh', UNICEF, 2022. [Link](#).

⁴ 'Population trends, Bangladesh', UNFPA, 2022. [Link](#).

⁵ 'Climate Change Profile: Bangladesh', Ministry of Foreign Affairs of the Netherlands, 2019. [Link](#).

⁶ 'Households WASH Data: Bangladesh', WHO/UNICEF JMP, 2020. [Link](#).

⁷ 'Schools WASH Data: Bangladesh', WHO/UNICEF JMP, 2019. [Link](#).

⁸ 'Health Care Facilities WASH Data: Bangladesh', WHO/UNICEF JMP, 2019. [Link](#).

⁹ 'Bangladesh', World Population Review, 2022. [Link](#).

¹⁰ 'How Climate Change Deepens Bangladesh's Fragility', United States Institute of Peace, 2021. [Link](#).

¹¹ Ibid.

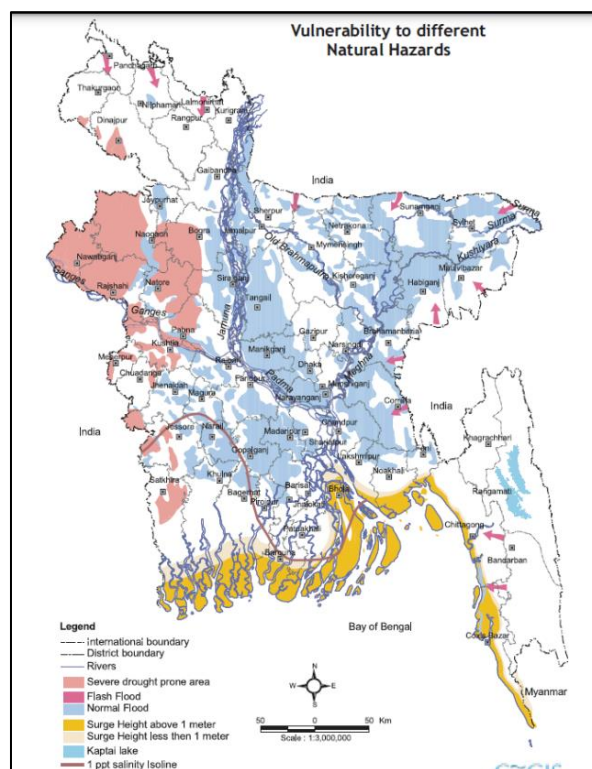
Average annual losses attributable to climate disasters are estimated at 1–2 per cent of Bangladesh's GDP.¹² Bangladesh is further vulnerable to climate change due to its high dependence on agriculture (47 per cent of Bangladesh's workforce depends on agriculture).¹³ Internal migration and a rapidly growing urban population are largely the result of climatic stresses and shocks and put pressure on urban food, water and other resources.¹⁴

As shown in Figure 2, climate risks, especially cyclones, floods, storm surges and drought, vary across the country, with the most vulnerable areas being the central and western coastal areas, the north-west highlands and along the main rivers.¹⁵ Since 1990, Bangladesh has observed more erratic rainfall patterns (shorter and heavier rainy seasons which increase flooding, landslides, riverbed sedimentation and waterlogging), more frequent cyclones, more regions susceptible to drought, sea level rise further increasing soil salinization, glacial melt exacerbating frequent flooding and higher average temperatures.¹⁶ UNDP has ranked Bangladesh first globally in terms of vulnerability to tropical cyclones; the country is hit by a severe cyclone on average every three years.¹⁷

Bangladesh also suffers severe floods every three to five years during which over 60 per cent of the country is inundated. Landslides, riverbank erosion, sedimentation and salinization of coastal lands leading to reduced crop productivity, harvest and agricultural land losses, and increased waterborne illnesses, are only some of the devastating results of frequent floods experienced in Bangladesh.^{18,19}

Simultaneously, the north of Bangladesh experiences drought.²⁰ Higher temperatures cause higher rates of evaporation and lead to higher water demands for irrigation, and these are projected to increase by 10–20 per cent by 2030.²¹ Dependence on groundwater for household consumption increases with surface water contamination during extreme climate events and when drought depletes surface water supplies. In many regions in Bangladesh, groundwater levels are falling at rates up to 10 cm per year and many traditional sources are being contaminated due to salinization.²²

Figure 2: Climate risks across Bangladesh



Source: Reliefweb.int

¹² 'Climate Knowledge Portal Country Profile: Bangladesh', World Bank, 2021. [Link](#).

¹³ 'Climate Change Profile: Bangladesh', Ministry of Foreign Affairs of the Netherlands, 2019. [Link](#).

¹⁴ 'How Climate Change Deepens Bangladesh's Fragility', United States Institute of Peace, 2021. [Link](#).

¹⁵ 'Climate Change Profile: Bangladesh', Ministry of Foreign Affairs of the Netherlands, 2019. [Link](#).

¹⁶ Ibid.

¹⁷ Ibid.

¹⁸ 'Climate Knowledge Portal Country Profile: Bangladesh', World Bank, 2021. [Link](#).

¹⁹ 'Climate Change Profile: Bangladesh', Ministry of Foreign Affairs of the Netherlands, 2019. [Link](#).

²⁰ 'Climate Change Profile: Bangladesh', Ministry of Foreign Affairs of the Netherlands, 2019. [Link](#).

²¹ Ibid.

²² 'Climate Knowledge Portal Country Profile: Bangladesh', World Bank, 2021. [Link](#).

Climate change and extreme climate events are projected to worsen across Bangladesh. The north-west is projected to experience greater temperature increases and more frequent, expansive and severe drought; the middle and north-east are projected to experience increased frequency and intensity of floods; and the coastal area and islands are projected to experience increased cyclone frequency and intensity, sea level rise and salinization.²³ Mean annual temperature increases in Bangladesh are expected to surpass 2°C by 2100 under the moderate SSP2-4.5 scenario.²⁴ The number of people exposed to an extreme river flood is expected to grow by 6–12 million by the 2040s.²⁵ By 2050, about 27 million people in Bangladesh will be at risk due to sea level rise and its consequences.²⁶ In Bangladesh, sea level rise and cyclones have combined effects: cyclone-induced storm surges are projected to inundate an additional 15 per cent of the coastal area by 2050 to that which is projected to be affected by sea level rise.²⁷ Climatic change is projected to further threaten food security, water availability, infrastructure, services (including water and sanitation services), health, livelihoods, migration and poverty.²⁸

Bangladesh's multiple climate impacts may damage or destroy the materials and structures of non-resilient sanitation facilities and their functionality and access during and after disasters. Recurrent costs are incurred for repairs after each disaster. More frequent and severe climate events can cause more frequent and severe damage to non-resilient sanitation infrastructure of any service level. Also, access to sanitation services can be suspended if the infrastructure is inaccessible or unsafe to use during or after a climate event. These impacts are

²³ 'Climate Change Profile: Bangladesh', Ministry of Foreign Affairs of the Netherlands, 2019. [Link](#).

²⁴ 'Climate Knowledge Portal Country Profile: Bangladesh', World Bank, 2021. [Link](#).

²⁵ Ibid.

²⁶ 'Climate Change Profile: Bangladesh', Ministry of Foreign Affairs of the Netherlands, 2019. [Link](#).

²⁷ 'Economics of Adaptation to Climate Change: Bangladesh', World Bank, 2010. [Link](#).

especially dangerous for women and girls; when climate events destroy sanitation facilities, they are forced to seek privacy, often at a distance from their household, putting them in danger.

Climate change impacts in Bangladesh disproportionately affect vulnerable communities, especially women and girls, and people living in areas with high levels of poverty, such as the 'haor' depressions in the north-east and river and coastal districts, as well as those dependent on agriculture and fishery for livelihoods. Destruction of these communities' livelihoods, infrastructure and access to services, limits already strained capacities to recover from climate disasters.²⁹

One of the factors increasing the vulnerability of women and girls in Bangladesh to climate change and climate events is related to their limited access to resources and decision-making processes.³⁰ Death rates for women associated with cyclones and floods are five times higher than for men in Bangladesh, as women are often unable to access information distributed in public spaces, may not be able to leave their homes and may not swim.³¹ In Bangladesh, women are also more vulnerable than men because their responsibilities are often resource-dependent; seeking water becomes increasingly difficult due to salinization and drought, and women's agricultural resources, such as livestock, are sold off first in times of scarcity, further increasing women's vulnerability by limiting their assets.³² Especially in Bangladesh's most climate-vulnerable areas, women often face natural disasters and other climate impacts alone because men are more likely to have migrated for alternative livelihoods.³³

²⁸ 'Climate Change Profile: Bangladesh', Ministry of Foreign Affairs of the Netherlands, 2019. [Link](#).

²⁹ 'Climate Change Profile: Bangladesh', Ministry of Foreign Affairs of the Netherlands, 2019. [Link](#).

³⁰ Ibid.

³¹ Ibid.

³² Ibid.

³³ Ibid.

Programme description

In response to demonstrated local needs following floods, cyclones and other climate events and to ensure alignment with UNICEF's global drive to 'shift' towards climate-resilient services, the UNICEF water, sanitation and hygiene (WASH) programme in Bangladesh integrated climate resiliency into its sanitation programme starting in 2020. Climate-resilient sanitation was introduced as a cross-cutting issue into both the regular development programme as well as the emergency response programme. The climate-resilient sanitation programme has also been incorporated into the UNICEF Bangladesh 2022–2026 Country Programme.

The UNICEF WASH team in Bangladesh commenced the process of integrating climate resilience into their sanitation programming through training of an internal team on the concepts of climate-resilient sanitation. This was followed by conducting a baseline study of sanitation services to assess their climate resilience in Accelerated Sanitation and Water for All (ASWA) II project districts.³⁴ The outcome of the baseline was used to develop the country's climate-resilient sanitation programme with the following key objectives:

- to reduce climate impacts on the functionality, durability and sustainability of sanitation facilities; and
- to reduce recurrent costs after climate disasters through community education, capacity-building and encouraging communities to use climate-resilient sanitation facilities.

According to these objectives, the framework of UNICEF's climate-resilient sanitation programme in Bangladesh has the following three linked strategies: to (1) create demand for, (2) ensure the supply of and (3) implement, climate-resilient

sanitation. The approaches supporting each of the three strategies, respectively, are: (1) CATS/CLTS, (2) sanitation marketing and (3) infrastructure construction. Provision of flood-resilient latrines in vulnerable areas is the focus of UNICEF's climate-resilient sanitation programme in Bangladesh.

These three linked strategies were jointly developed by the Department of Public Health Engineering (DPHE) and the UNICEF BCO based on the potential to increase positive and sustainable sanitation results with minimal additional costs.

UNICEF's climate-resilient sanitation programme in Bangladesh has been greatly influenced by DPHE's experience in provision of flood-resilient latrines, feedback and guidance from ASWA II project annual review meetings and technical support, guidance and capacity development from the UNICEF Bangladesh Climate Change Focal Point.

The demand creation strategy for climate-resilient sanitation interventions using the CATS/CLTS approach was incorporated and implemented as part of the ASWA II project with the overall objective of eliminating open defecation through promotion and use of at least basic climate-resilient sanitation facilities in the project districts. The lessons and outputs from the project implementation, such as climate-resilient latrine designs, hand-washing device designs and private sector engagement, were disseminated across the sector for replication and scaling up outside the project areas.

Description of intervention

The climate-resilient sanitation programme was implemented in ASWA II project areas: 52 unions (from 15 Upazilas) in 14 districts across 6

³⁴ 14 districts in 6 divisions in Bangladesh: Barishal, Mymensingh, Sylhet, Khulna, Rangpur and Chattogram.

divisions in Bangladesh (Barishal, Mymensingh, Sylhet, Khulna, Rangpur and Chattogram).

A. Demand solution: CATS/CLTS

Climate-resilient sanitation was incorporated into the CATS/CLTS approach in 2020 based on the ongoing efforts of scaling up the approach and its potential to create awareness and to trigger demand for climate-resilient latrines.

The first step of the climate-resilient intervention within the ongoing CATS/CLTS approach was to demonstrate that a functional, safe and sustainable toilet could improve access to sanitation, health, safety and menstrual hygiene, especially for women, girls and persons with disabilities, if the toilet is protected against flooding. To further demonstrate the benefits, use and design of climate-resilient sanitation to the communities, climate-resilient sanitation facilities were constructed in schools and health-care facilities.

Additionally, training manuals and modules on CLTS, Basic Hygiene Promotion, Operation and Maintenance (O&M) Guidelines for WASH in Healthcare Facilities and UNICEF's Three-Star Approach were revised to include climate-resilient sanitation in February 2020 and were distributed to NGO implementing partners and other sector stakeholders. Each manual is available in Bengali and English and highlights that climate resilience is necessary for sustainable access to sanitation.³⁵

The manuals were shared across the sector to increase demand for climate-resilient sanitation within and outside of the ASWA II project area. Within the project area, the target audiences of the manuals were also encouraged to adopt climate-resilient sanitation through marketing, education and trend-setting strategies to further increase awareness of the advantages of climate-resilient sanitation designs and products, as well

³⁵ Manuals available [here](#).

³⁶ Manual available in Bengali and English and shared with sector stakeholders within and outside of programme area.

as by following up with user feedback on the manuals and from users of climate-resilient sanitation facilities. For example, the manuals were distributed during community Key Hygiene Behaviour training sessions, and climate risks and climate-resilient sanitation were discussed during these sessions to create awareness and demand for the topic.

B. Supply solution: sanitation marketing

The WASH programme used sanitation marketing, the process of promoting improved sanitation to communities through the engagement of the private sector, to offer climate-resilient latrine products and installation services to increase demand for climate-resilient sanitation. Under the sanitation marketing approach, the WASH programme:

- Conducted field-based rapid assessments of sanitation services to evaluate the extent of climate resilience and communicated observations to local communities and sector stakeholders;
- Partnered with private companies, public agencies and other development organizations in the sector to create awareness of, and to promote, climate-resilient sanitation in existing WASH programming using Social and Behaviour Change Communication (SBCC) strategies;
- Developed and distributed climate-resilient sanitation training packages, including a manual³⁶ for latrine producers to determine heights and designs for climate-resilient sanitation, during workshops³⁷ with latrine producers, thereby introducing alternative and improved methods for climate-resilient sanitation to the sector;

³⁷ For example, 132 latrine producers attended a 2020 workshop coordinated by DPHE, IDE and the WASH programme.

- Introduced latrine producers to communities to expand the market and supply of climate-resilient sanitation products and qualified installation services;
- Advocated for sector stakeholders to allocate financing to increase access to climate-resilient sanitation for vulnerable communities;
- Ensured that the human-centred design approach was used in the programming and communication of climate-resilient sanitation; and
- Established a robust mobile- and web-based monitoring and reporting system accessible by all sector stakeholders at the national and subnational level, including open defecation status, project quality and constraints, staff efficiency, progress against targets, use of allocated resources, timelines, etc.

While the CATS/CLTS approach motivated demand for climate-resilient solutions within communities using demonstrations and educational materials, this sanitation marketing approach increased awareness of the value of climate-resilient sanitation across all sector stakeholders and increased access to climate-resilient solutions and services.

Since the implementation of the sanitation marketing approach, latrine producers have been observed to continue promoting climate-resilient sanitation options to communities, such as the stacked pre-cast concrete rings to elevate latrine pits shown in Figure 3.

Figure 3: Demonstration of stacked pre-cast concrete rings to elevate latrine pit by latrine producers, Bangladesh, 2020



C. Implementation solution: climate-resilient infrastructure

Across Bangladesh, stacked 0.3-m-high pre-cast concrete rings are used to construct pit latrines, connected to at-grade squatting pans, and enclosed with bamboo- or wood-framed commodes. Commodes typically have bamboo-thatched roofs and walls are fabric or plastic tarp curtains. When the pit latrine is not sited directly underneath the commode, a PVC pipe is used to connect the toilet to the pit latrine, with additional PVC pipes used as vents. These latrine systems are often unsealed and vulnerable to damage by rain and wind, causing odours and faecal contamination, as shown in Figure 4.

Figure 4: Flooded latrine, Rangpur District, 2019



Under the climate-resilient sanitation programme, modifications made to increase the resilience of this design include:

- Adding at least two pre-cast concrete rings above the ground level to increase the elevation of the pit latrines by at least 60 cm (typically, five rings are used as the base buried construction prior to adding elevation), representing historical one-in-five-year return period flood levels in most areas;³⁸
- Ensuring pre-cast concrete rings are sealed with concrete mortar joints to prevent contamination during flooding and to reduce the risk of damage to the latrine during storm surges and cyclones;
- Adding 5 cm reinforced concrete slabs on the pre-cast concrete rings and the commode foundation, backfilled with earth, stabilizing and adding elevation to the latrine structures to reduce potential damage during heavy wind and rain (commodes are elevated at least 0.3 m above ground level if not located above the pit latrine);
- Replacing handrails and other exterior piping with galvanized iron to prevent rusting;
- Ensuring that the wood framing and corrugated iron sheets are designed to withstand moderate wind and rain (corrugated iron sheets are secured using metal angle frames, hook joints and cross-angle bars on top of the roof sheet; wood frame pillar corners are tied with rope and buried in soil);
- Considering wind direction when orienting the latrine structures; and
- Considering feasibility of construction in extremely humid conditions by using pre-cast

concrete materials with no ambient drying required.

These design modifications were developed by DPHE engineers in consultation with the sector partners, including the UNICEF Bangladesh WASH team, as well as communities. Modifications were developed to increase resilience with minimal additional costs and using latrine systems familiar to, and accepted by, communities. Communities were consulted by DPHE in the design development process; community feedback was incorporated into the design, and designs were endorsed, implemented and monitored by communities.

Latrines that are installed by household typically serve five persons. Under average operation and maintenance conditions of the super- and sub-structures, including desludging every one to three years, the life expectancy of these latrines is approximately 20–30 years. An example of a climate-resilient latrine built under this WASH programme is shown in Figure 5.

Figure 5: Elevated latrine, Satkhira, 2021



³⁸ Historical flood levels were determined based on community records, site visits of flooding marks and elevations of existing

elevated structures. DPHE and NGO implementing partners supported communities in determining latrine elevation.

Since 2020, these climate-resilient design modifications have been implemented across Bangladesh by DPHE with support from UNICEF and NGO implementing partners in response to extreme flooding events, including in the flood-prone plainlands of north-west and north-east Bangladesh (such as in response to devastating floods in the districts of the Teesta and Brahmaputra rivers in 2019 and 2020), and in the cyclone-prone south-west coastal areas, which experience storm surges of up to 3 m (such as in response to cyclone Amphan in 2020).

After the flood or cyclone, household surveys were conducted by NGO partners to determine sanitation service access, and DPHE used beneficiary selection criteria based on storm damage, service need, poverty level, household status,³⁹ access to other aid and having minimum space for latrine installation, to determine which subdistricts and families would receive support to implement climate-resilient sanitation and to determine where the programme would be scaled up.

Families were encouraged to purchase the additional pre-cast concrete rings themselves, made desirable and accessible through the CATS/CLTS and sanitation marketing approaches, respectively. Families were mobilized to make the additional investment using triggering and post-triggering processes,⁴⁰ household consultations, courtyard and community sessions, and demonstrations within the community of different climate-resilient latrine design options and prices.

The additional cost per household latrine to include the listed climate-resilient design elements was approximately US\$55 (around 20 per cent of the US\$220–250 base cost of a complete latrine installation). NGO subsidies and construction support were available in some areas, such as through the Central Emergency Response Fund

³⁹ Women-headed households were prioritized.

⁴⁰ Triggering process: participatory sanitation status analysis and solution development; post-triggering process: community

(CERF). Annual monitoring and review of the project were conducted as part of the ASWA II project implementation and in 2021, this was done through the Foreign, Commonwealth and Development Office (FCDO) third party Internal Monitoring Verification (IMV) exercise.

Additional climate-resilient design elements were tested in two pilot latrine installations in the haors of the Sunamganj District in north-east Bangladesh by International Development Enterprises (iDE) Bangladesh in 2020, with UNICEF's support. The additional climate-resilient modifications for these installations included:

- Adding an additional 1.2 m in stacked pre-cast concrete rings to further increase elevation to flood levels experienced approximately every four years;
- Installing three reinforced concrete poles to further stabilize the latrine pit;
- Securing the commode to the house; and
- Using bamboo- instead of wood-framing for the commode to be more resilient against humidity.

As of 2022, both pilot latrines have remained functional and without damage, including after two severe floods. However, the total additional cost of this design (approximately US\$150) compared with standard latrine designs was considered to be unaffordable for the average family. Therefore, the UNICEF WASH programme, together with DPHE and iDE, are considering options to make these additional design elements more affordable.

Outcomes

The ASWA II project supported the uptake of climate-resilient sanitation in Bangladesh through community awareness-raising (demonstrations and community sessions, etc.), capacity-building

preparation of action plan to improve sanitation status with follow-up to ensure retention of latrine use.

and the installation of climate-resilient sanitation facilities.

In 2021, the WASH programme supported over 529,000 beneficiaries, approximately half of which reside in riverine districts, with a climate-resilient sanitation service through all three programme approaches (CLTS/CATS, sanitation marketing and latrine improvements).^{41,42} Isolating only beneficiaries of the latrine improvement programme approach, approximately 40,000 household latrine systems have been modified to increase their climate resilience across six regions in Bangladesh, benefitting around 180,000 people, since 2020.

In addition, 996 communities have achieved open defecation free (ODF) status using climate-resilient sanitation facilities. These climate-resilient improvements to latrine systems have allowed communities to sustain access to sanitation during and after climate events, and reduced waterborne illness previously resulting from faecal contamination from damaged latrine pits, as documented anecdotally during the annual FCDO third party IMV exercise. Reducing interruptions to sanitation access was essential to reduce the risk of slippage to open defecation.

The outcomes of these interventions have been documented during the annual FCDO third party IMV post-construction visits in 2020 and 2021, and supplementary site visits after extreme climate events. Communities attaining ODF status through the climate-resilient sanitation programme underwent similar monitoring site visits one year after the designation. In all site visits, the resilience of the infrastructure was evaluated, with feedback and anecdotes collected. In general, anecdotes confirmed that families liked the elevated latrine designs constructed with locally available materials, were able to continue using the latrines during and after floods and had

⁴¹ Beneficiaries by region: Barisal: 59,000 (11 per cent); Sylhet: 80,000 (15 per cent); Rangpur: 135,000 (26 per cent); Chattogram: 74,000 (14 per cent); Khulna: 92,000 (17 per cent); and Mymensingh: 89,000 (17 per cent).

experienced reduced waterborne illness since the latrine systems were improved.

Additionally, the enclosure of the commodes with more resilient superstructures have provided more privacy, particularly for women and girls. These improvements to health, safety and well-being through climate-resilient sanitation were motivated in the CATS/CLTS approach, persuading families to invest in reducing their climate risks. Communities and other agencies are now constructing climate-resilient latrines in flood-prone areas, replicating and scaling up climate-resilient sanitation, including outside of the ASWA II project areas.

During site visits, it was also observed that private sector interest remained at the community level, through the sanitation marketing campaign, improving the supply chain of climate-resilient latrine materials and services. The promotion of climate-resilient sanitation technologies and behaviours by sector stakeholders through the sanitation marketing approach expanded outside the project area, reaching almost all 64 districts under eight divisions in Bangladesh. Sector stakeholders are disseminating climate-resilient sanitation information to communities through training, campaigns and prototype demonstrations.

These results are scalable by expanding demand for climate-resilient sanitation, increasing sales and marketing of sustainable climate-resilient sanitation products and latrine design options, and by offering different credit options through local microfinance institutions (MFIs) to ensure affordability of climate-resilient sanitation.

Challenges

Community remoteness, repeat and long-lasting climate events, difficult ground conditions

⁴² Of these beneficiaries, 266,510 (~50 per cent) were reached by ASWA II project, 184,000 (~35 per cent) were reached by the Swedish International Development Cooperation Agency (SIDA) Project and 78,490 (~15 per cent) were reached by the Chittagong Hill Tracts (CHT) Special Project.

(especially in riverine areas), poor communication (such as no or unreliable cellular networks for communities to communicate with suppliers, installers and repair services) and limited resources (such as limited finances for households to afford latrine installation) challenged the implementation and scaling up of climate-resilient sanitation. Some communities are so remote, or inaccessible during long inundation periods, that implementation of climate-resilient sanitation can become more costly in time and resources. Resource limitations, and/or a lack of budget planning, also constrain the ability of caretakers to adequately maintain infrastructure.

Gaps in policies and in inter-ministerial and intersectoral coordination, limited prioritization of the sector, and limited sector capacities and funding further constrain the scaling up of climate-resilient sanitation across Bangladesh. Similarly, limited options for climate-resilient sanitation technologies and designs, and the prevailing low quality of sanitation products, limit the demand creation for climate-resilient sanitation. Additionally, an uncoordinated environment for sanitation service delivery, limited financing opportunities, limited coordination at the local level and limited incentives stall the engagement of local service providers to market climate-resilient sanitation and to facilitate uptake at the local level.

Furthermore, increasingly intense and frequent climate events, like cyclones and floods, damage WASH infrastructure and interrupt the implementation of climate-resilient sanitation programming because efforts become diverted to emergency response in non-focus programme areas. When latrines are not built or retrofitted with sufficient climate resiliency, they are flooded and become non-functional, forcing users to revert to open defecation and discouraging repeat investments in sanitation.

⁴³ SIWI: Stockholm International Water Institute.

Lessons learned

The WASH programme learned that communities vulnerable to climate events are interested and willing to pay for climate-resilient sanitation infrastructure and its operation and maintenance if it allows sustainable access to sanitation facilities during and after climate events, and if it reduces interruptions to sanitation access and recurrent repair costs after climate events.

Where resources allowed, communities modified the DPHE and UNICEF WASH programme climate-resilient latrine design to include circular fencing and circular roofing to reduce wind load damage, and to include concrete stabilization within the plinth to withstand erosion caused by flooding and storm surges and to maintain a safe slope that reduces stormwater forces.

An interest in improving sanitation infrastructure, a willingness to pay for the improvements, and modifications to optimise the latrine design facilitated adoption, remained a driving force in the replication and scaling up of climate-resilient sanitation in Bangladesh.

Next steps

The following next steps can enhance climate-resilient sanitation in Bangladesh:

- Shift focus from 'low cost' to 'cost-effective' programming and create an understanding across the sector that climate-resilient sanitation is a worthwhile longer term investment to be accessible to all households.
- Use climate risk assessments (currently in development with SIWI⁴³), other climate science and UNICEF's climate-resilient sanitation criteria to inform infrastructure improvements to be designed to future climate projections, to develop the climate

rationale and to promote stakeholder understanding of climate risks.

- Connect communities and sector stakeholders with MFIs and financing opportunities to scale up implementation of climate-resilient sanitation.
- Develop manuals that integrate disaster response and encourage adequate operation and maintenance of climate-resilient sanitation infrastructure in the long term, especially during and after climate events.
- Strengthen local capacities for adoption of climate-resilient and risk-reducing options to reduce reliance on external personnel.
- Develop climate disaster emergency contingency plans for district-level use.
- Identify strategies and options to make climate-resilient infrastructure modifications more affordable.

Continue skills development training for the latrine producers on diversified and innovative climate-resilient latrine production, for latrine sales agents on marketing climate-resilient

- sanitation and for sweepers on occupational health safety issues and desludging methods to improve the proper maintenance of latrines and ensure their sustainability.
- Continue monitoring existing programme sites to collect feedback on the demand and sales of adapted designs and the efficacy of the designs of the infrastructure against a range of climate risks and identify any further modifications, and provide support where needed.
- Strengthen the monitoring capacity after extreme events to highlight the impact of extreme events on sanitation services, and on those who depend on these services.

Photo Credits

Photos included in this Field Note are courtesy of UNICEF Bangladesh.

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About the Series

UNICEF's water, sanitation and hygiene (WASH) country teams work inclusively with governments, civil society partners and donors, to improve WASH services for children and adolescents, and the families and caregivers who support them. UNICEF works in over 100 countries worldwide to improve water and sanitation services, as well as basic hygiene practices. This publication is part of the UNICEF WASH Learning Series, designed to contribute to knowledge of good practice across UNICEF's WASH programming. In this series:

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Guidelines describe a specific methodology for WASH programming, research or evaluation, drawing on substantive evidence, and based on UNICEF's and partners' experiences in the field.

Reference Guides present systematic reviews on topics with a developed evidence base or they compile different case studies to indicate the range of experience associated with a specific topic.

Technical Papers present the result of more in-depth research and evaluations, advancing WASH knowledge and theory of change on a key topic.

WASH Diaries explore the personal dimensions of users of WASH services, and remind us why a good standard of water, sanitation and hygiene is important for all to enjoy. Through personal reflections, this series also offers an opportunity for tapping into the rich reservoir of tacit knowledge of UNICEF's WASH staff in bringing results for children.

WASH Results show with solid evidence how UNICEF is achieving the goals outlined in Country Programme Documents, Regional Organizational Management Plans, and the Global Strategic Plan or WASH Strategy, and contributes to our understanding of the WASH theory of change or theory of action.

COVID-19 WASH Responses compile lessons learned on UNICEF's COVID-19 response and how to ensure continuity of WASH services and supplies during and after the pandemic.

Readers are encouraged to quote from this publication but UNICEF requests due acknowledgement. You can learn more about UNICEF's work on WASH here: <https://www.unicef.org/wash/>

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