

Evolution of the Dhaka sanitation sector: institutional and regulatory reform

Contributed by Pritum Saha (WSUP), Sam Drabble (WSUP) and Dewi Rimayani Hanoum (UN Habitat)

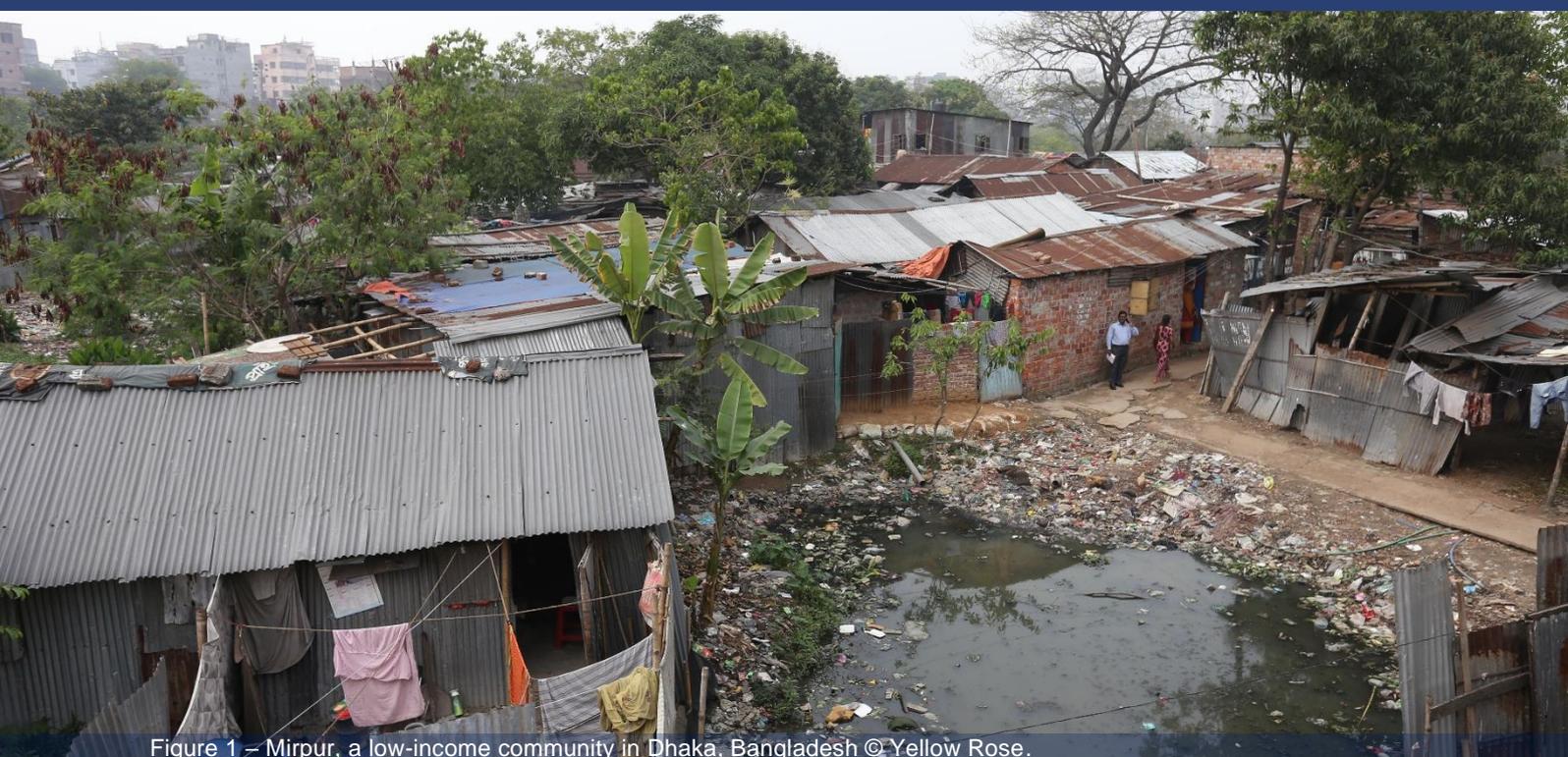


Figure 1 – Mirpur, a low-income community in Dhaka, Bangladesh © Yellow Rose.

Summary

Dhaka's population has multiplied 14 times in 50 years since 1971. The megacity is now the seventh most populous in the world with over 21 million residents.

Responsibility for sewered sanitation in the city resides with the utility, Dhaka Water Supply & Sewerage Authority (DWASA), under the Water Supply and Sewerage Authority Act 1996. DWASA has been active in providing such services since 1963. Responsibility for on-site sanitation, in areas within their jurisdiction, resides with Dhaka's two city corporations: Dhaka North (DNCC) and Dhaka South (DSCC). City Corporation responsibility for on-site sanitation can be traced back to the City Corporation Act 2009.

This case study explores the recent evolution of Dhaka's sanitation sector, including planned investments and recent reforms to the institutional and regulatory framework, which provide a basis for strengthening accountability and tackling the entrenched practice of discharging wastewater directly to open surface drains.

Overview

Geographical information

Country: Bangladesh

City: Dhaka

City population: 22,478,116



Problem

- Urban sanitation provision in Dhaka has split mandates among different institutions.
- The city is surrounded by rivers, wetlands and canals. Due to urbanization, a significant amount of wetland has been lost, rivers encroached on and canals increasingly polluted. Disposal of solid and faecal waste to these waterbodies has become commonplace, with toilets often connected directly to canals and open surface drains.
- Until recently, no institution held responsibility for faecal sludge management.

Solution

- The Institutional and Regulatory Framework for Faecal Sludge Management (IRF-FSM) has been developed and was approved by the Government of Bangladesh in 2017. It clarifies responsibilities for the management of wastewater and faecal sludge generated from onsite sanitation facilities in different contexts.
- A separate IRF-FSM was developed for Dhaka, recognizing its specific contextual characteristics as a megacity.
- The IRF-FSM for Dhaka clearly places responsibility for canal maintenance, enforcement against toilet connection to open surface drains and wider onsite sanitation with the city corporations.
- Creation of key partnerships with the private sector, target communities, local small businesses, research and developmental organizations (including academia) and funders.

Problem

Dhaka is located in central Bangladesh along the Buriganga River. Dhaka is the capital and most populated city in Bangladesh, and one of the most populated cities in the world. Only 20% of Dhaka residents are connected to a piped sewer network Table 1, with the remaining 80% using on-site sanitation. Dhaka Water Supply & Sewerage Authority (DWASA), under the Water Supply and Sewerage Authority Act 1996, has been active in providing such services for water and sanitation since 1963. However, the Act does not explicitly refer to 'faecal sludge' but rather to accumulated 'refuse', and it does not reference wastewater. Until recently, no authority was responsible for the management of faecal sludge, including enforcement of containment standards for onsite systems, stopping the direct connection of containment structures to surface drains, emptying and transportation of faecal sludge, and treatment and disposal or reuse of faecal sludge.

City corporations (CCs) hold responsibility for solid waste management in Dhaka, which they delegate to the private sector; and have recently adopted responsibility for drainage — an enormous challenge in Dhaka, where it is common practice for households to connect pour-flush toilets directly to drains.

Table 1: Summary of key data and Water and Sanitation Services for Dhaka city

Demographics	Population in Dhaka city	22,478,116
	Population density	23,234/KM ²
	Low-income area population	12,385,441
Water and sanitation services	Water network coverage (%)	100
	Sewerage coverage (%)	20
	Dependent on onsite sanitation (%)	80
	Access to improved containment (%)	54
	Dependent on shared facilities (%)	49.6
	Wastewater treated (%)	9.6
	Sludge treated (%)	0
	Water network coverage (%)	100
Sewerage coverage (%)	20	

Source: DWASA, and Dhaka SFD.

Solution

A significant step forward was the development of the Institutional and Regulatory Framework for Faecal Sludge Management (IRF-FSM), approved by the Government of Bangladesh in 2017 Figure 2.

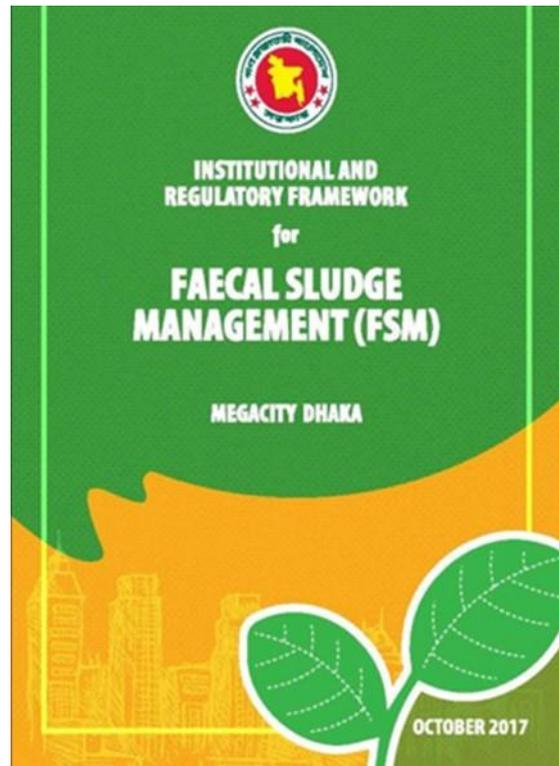


Figure 2 – IRF - FSM for Dhaka.

The national-level IRF-FSM clarified responsibilities on paper for the management of wastewater and faecal sludge generated from on-site sanitation facilities in different contexts. A separate IRF was developed for Dhaka, recognizing its unique status in Bangladesh as a megacity with specific contextual characteristics.

The IRF-FSM for Dhaka is still to be executed, with the CCs slowly adapting to their enhanced roles in faecal sludge management. No significant steps have been taken to execute the CC mandates to provide faecal sludge treatment. Currently, Dhaka has one functional sewerage treatment plant and one faecal sludge treatment (mobile) unit, both operated under DWASA. Significantly, two major new Sewerage / Wastewater Treatment Plants are now under construction in Dhaka (Rayerbazar and Mirpur).

The Water Supply and Sewerage Authority Act, 1996 provides the foundation for wastewater management in Dhaka and the other metropolitan cities in the country. Through the Act, DWASA became the sole economic regulatory authority for water and wastewater management in Dhaka. As the mandated service authority, this amounts to a model of self-regulation. The Act stipulates: i) no other government or private entity can supply water and sewerage facilities inside the Water and Sanitation Authority (WASA) area (in effect the whole city of Dhaka, as the water supply network extends across Dhaka, although the sewerage network is contained only to a small part); ii) the WASA can charge all property owners inside their operational area, even if owners do not take services from WASA; and (iii) the WASA can appoint (external) service providers under certain conditions to support their operations.

As the sole economic regulatory authority, DWASA has autonomy in setting tariffs for wastewater services. DWASA is currently charging BDT 15.18/m³ (USD \$0.14) for water supply and another BDT 15.18/m³ for wastewater management. DWASA has no mechanism to count the amount of wastewater discharged but estimates the amount to be ‘the same as the amount of water used’ by the customer. The same tariff is charged to DWASA customers which are not connected to the DWASA sewerage system as for those with sewer connections.

The Department of Environment (DoE) sets standards for wastewater disposal into the environment, including rivers and canals. The DoE has overall responsibility for enforcing the Environment Conservation Rules 1997, which it delegates to CCs. Within their areas of jurisdiction, CCs are the principle regulatory authorities for on-site sanitation, accountable for the management (including containment) of wastewater in on-site areas. However, in a case of overlapping mandates, the Dhaka Urban Planning Department (RAJUK) is the regulator and approval authority for building design, with responsibility for approving the design of containment structures. The CCs are empowered to take legal action against households or businesses found to be polluting surface water through discharge of untreated faecal sludge but are yet to develop the capacity to proactively monitor and enforce regulations in this area, only acting where complaints are filed. While CCs are more active in regulating wastewater and sanitation in public domains, they have limited capacity to reach individual polluters.

A particular feature of the Dhaka context is the predominance of canals carrying rainwater alongside surface drains. Most holdings without sewerage or onsite sanitation connect their toilets to the canals, which until 2021 came under DWASA jurisdiction, with CCs unable to act. However, in a potentially significant development, the CCs took responsibility for canal maintenance from DWASA in 2021. Responsibilities for sanitation service provision in Dhaka, as reflected in the IRF-FSM, are illustrated in Figure 3.



Figure 3 – Responsibilities for sewered and onsite sanitation service provision in Dhaka.

The overall management of wastewater in Dhaka involves investment in sewerage networks, in sewage treatment plants, and for overall O&M. All these investment areas are overseen by DWASA and guided by three masterplans for water, sewerage and drainage respectively. The Sewerage Masterplan of DWASA is prepared with a vision to serve 100% of the Dhaka population with sewered systems, with an estimated required investment of USD 2.2 Billion by 2035. As of 2022, DWASA had completed 98% of works for the Dasherbandi Sewerage

Treatment Plant, and 83% of works for Uttara Sewerage Treatment Plant. DWASA is also conducting feasibility assessments for two new sewerage treatment plants in Rayerbazar and Mirpur. DWASA, the utility, has instituted significant reforms over the past 10 years, and financial performance appears to be on a positive trajectory overall. According to DWASA sources, DWASA is now a profit-making organization which made profit of around USD 150 Million in the year 2020. That has been made possible by reducing water losses from non-revenue water from above 40% to below 5% in the last 12 years of the utility's internal 'Turn Around Program.' Among other measures, the project involved rehabilitating the network with high-density polyethylene pipes; installing water meters in the homes of all consumers; continuous supply of water to all households through a pressurized system; replacing illegal connections with official DWASA connections; and improved billings and revenue collection.

DWASA is actively reinvesting around USD \$90 Million each year to its development initiatives and is also taking initiatives to include customers from low-income communities, although this engagement is limited to water supply and not wastewater management.

In on-site sanitation, the Citywide Inclusive Sanitation Services Faecal Sludge Management (CWIS-FSM) support cell under Department of Public Health Engineering (DPHE) and International Training Network-Bangladesh University of Engineering and Technology (ITN-BUET) are helping the city corporations to develop the investment plans required to implement their enhanced responsibilities assigned by the IRF. The clarification of responsibilities for on-site sanitation under the IRF are significant, better positioning CCs to mobilize resources, seek investments and structure institutional arrangements for management of FSM across the value chain.

The CCs are still unpacking their enhanced mandates for on-site sanitation with the help of technical partners and reviewing the shit-flow situation of Dhaka city. The Mayor of Dhaka North City Corporation (DNCC) has acknowledged the existing data gap, including toilet connection to open drains and rates of faecal contamination. CC officials are hopeful of minimizing the data-gap in the near future, citing aspirations to develop decentralized faecal sludge treatment solutions, for which an accurate database will be required to track demand. Similarly, DNCC is supportive of public-private partnerships for FSM but view stronger data on demand as essential to that activity, as private entities will be only ready to invest once the demand is visible.

The 2017 approval of the IRF-FSM was a pivotal decision for wastewater management of Dhaka in both policy and practice. Among other key clauses, the IRF stipulates CCs should carry out inspections and make sure that domestic wastewater is not connected to storm sewers and open drains, an activity treated as a punishable offence according to the provisions of the City Corporation Act 2009.

In 2021, DNCC started unpacking enhanced responsibilities under the IRF-FSM, with technical support from a range of partners. As a result, the Mayor of DNCC has started campaigning against the problem of connecting toilets directly to surface drains.

Disposal of solid and faecal waste to these waterbodies had become commonplace, with toilets often connected directly to canals and open surface drains. A recent study of sanitation options in low-income communities in Dhaka found this practice to be highly prevalent, with 71% of toilets in the study areas discharging directly to drains (Foster et al, 2021).

The IRF addressed this gap by clearly placing responsibility for canal maintenance and enforcement against toilet connection to open surface drains with CCs, representing a significant step forward for wastewater management in Dhaka. Since the formal handover of responsibility in December 2020, CCs have begun to clear the canals filled with solid waste, serve legal notice to those illegally using the canals, and to create awareness among property owners of the need to stop direct toilet connections to canals and open surface drains. Figure 4 represents the scale of the challenge, showing a canal congested with solid waste in a Dhaka LIC.



Figure 4 – Canal in low-income community of Dhaka © Yellow Rose.

The issue of direct discharge to open drains is considerable and will require sustained effort from the CCs over an extended period. The fact that the issue is now being addressed, after four decades of stasis, is significant, with improvements in solid waste disposal already observable in some LICs.

Lessons learned

Dhaka is an example of split mandates for urban sanitation service delivery, with the utility DWASA responsible for sewerage services, and also the sole economic regulatory authority for water and wastewater management in Dhaka. The development of the IRF-FSM for Dhaka has been significant in clarifying responsibilities for the management of wastewater and faecal sludge generated from on-site sanitation facilities, clearly placing this responsibility with the CCs.

This transition is only just beginning, and it will take time for the CCs to absorb the requirements of these expanded responsibilities and achieve a state of readiness for implementation. Nonetheless, the clarification in mandate places the CCs in a better position to mobilize resources, seek investments and structure institutional arrangements for management of FSM across the value chain.

It is notable that the Dhaka IRF makes CCs responsible for the management of wastewater produced from the slums or low-income communities, which fall under on-site areas. Within the Dhaka context, safe and equitable sanitation and wastewater management in these areas requires the CCs to expand their efforts to tackle the widespread practice of discharging septic tanks directly to open drains.

Useful links

<https://sfd.susana.org/about/worldwide-projects/city/4-dhaka#>

[2023-04-18-08-42-4f13d316f798b9e5fd3a4c61eae4bfef.pdf \(portal.gov.bd\)](https://portal.gov.bd/2023-04-18-08-42-4f13d316f798b9e5fd3a4c61eae4bfef.pdf)

[Global Report on Sanitation and Wastewater Management in Cities and Human Settlements | UN-Habitat \(unhabitat.org\)](#)

<https://www.daily-sun.com/post/623459/Pagla-Sewage-Treatment-Plant-found-to-be-effective-in-removing-SARSCoV2>

Further reading and references

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About the author

Pritum Saha is an Urban WASH Professional with over 10 years' experience in result measurement, evaluation, learning, knowledge and research management, research coordination and qualitative and quantitative assessment. He is currently Monitoring, Evaluation, Research and Learning (MERL) Manager with Water & Sanitation for the Urban Poor (WSUP), working across WSUP's seven country programmes. Prior to this, Pritum led country-level M&E and research-into-policy for WSUP's Bangladesh programme.

Sam Drabble is an urban WASH professional with over 10 years' experience in urban WASH research, technical publications, programme evaluation and peer-to-peer learning. He currently holds organization-wide responsibility for the Evaluation, Research and Learning function at Water & Sanitation for the Urban Poor (WSUP). While at WSUP Sam has supported the rollout of research programmes across WSUP's seven programme countries, authored or edited over 60 WSUP technical publications, and delivered research for wide-ranging institutional clients including World Bank, ESAWAS and WHO.

Dewi Hanoum is currently working at UN Habitat, Urban Basic Services Section covering the areas of WASH. She has decades of working experience in the field of sanitation, wastewater management and environmental management. She has a civil and sanitary engineering background and previously worked in academia and as a consultant.

The case study in this story is a further detailed of the case study presented at the [Global report for Sanitation and Wastewater Management in Cities and Human Settlements](#).

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HS Number: HS/036/23E

ISBN Number: 978-92-1-132900-1

About the institution / organisation

Water & Sanitation for the Urban Poor (WSUP) is a non-for-profit company that helps transform cities to benefit the millions who lack access to water and sanitation. WSUP was created in 2004 as a response to the urban explosion that has left many cities unable to provide basic services, such as access to a toilet or drinking water, to low-income communities. <https://www.wsup.com/>



UN-Habitat is a United Nations agency that works for a better urban future based in over 90 countries and promotes the development of socially and environmentally sustainable cities, town and communities. UN-Habitat strives for adequate shelter with better living standards for all, and advocates for urbanization as a positive transformative force for people and communities, reducing inequality, discrimination and poverty. <https://unhabitat.org/>



About the IWA Inclusive Urban Sanitation Initiative

IWA's Inclusive Urban Sanitation initiative responds to a huge and growing public need - safe sanitation in combination with access to safe drinking water and hygiene underpins good health. The aim of this initiative is reshaping the global urban sanitation agenda by focusing on inclusive sanitation service goals--and the service systems required to achieve them - rather than the traditional singular focus on expanding sewer networks and treatment works. This forms part of IWA's larger agenda to promote inclusive, resilient, water-wise, and sanitation-secure cities.

About the Inclusive Urban Sanitation Stories

The Inclusive Urban Sanitation stories are documenting some of the policies, practices, and approaches that demonstrate how stakeholders especially those in urban areas (e.g., public sector, operators, academics, regulators, and other key actors) are taking part or contributing to Sustainable Development Goal 6 which require water and sanitation concepts and norms to look beyond technology and the usual focus on building infrastructure. Increased focus is on safety, inclusion, environment, public health, and multiple technology solutions tailored to different geographies and socio-economic contexts for building climate-resilient cities. The stories aim to inspire urban stakeholders to discuss ways for advancing inclusive urban sanitation, especially in low- and middle-income countries.