



FECAL SLUDGE MANAGEMENT

A WAY FORWARD TO OVERCOME URBAN SANITATION CHALLENGES IN BANGLADESH

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Bangladesh, a country of 160 million people, has achieved commendable sanitation success during the 15 year Millennium Development Goals (MDG) period. The laudable achievement was possible through a remarkable growth in on-site sanitation (OSS) facilities of which about 98% of the people in the country depend upon. However, the management of OSS remains neglected with a large quantity of fecal sludge generated in these facilities inaptly managed leading to significant environmental, health and economic challenges. Bangladesh has recognized the importance of an 'Institutional and Regulatory Framework' (IRF) for Fecal Sludge Management in order to ensure that the achieved sanitation successes are sustained. This brief provides background and the way forward for policy makers.



Adequate treatment of fecal sludge is extremely important.

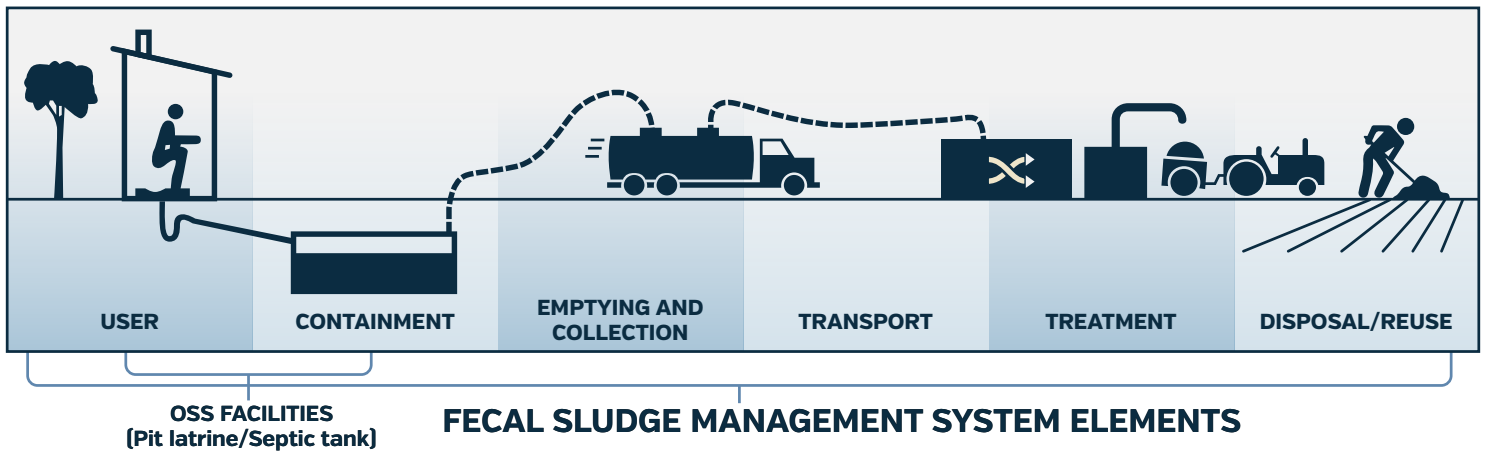
WHAT IS FSM?

Fecal Sludge Management (FSM) refers to a systems approach that includes technologies and mechanisms for containment, emptying, collection, transportation, treatment, disposal and/or reuse of sludge produced in onsite sanitation systems such as septic tanks and pit/pour-flush latrines. Conventional sewerage is not included in a FSM system.

POLICY MESSAGES

A strong institutional and regulatory framework for FSM, involving all relevant stakeholders, is important to ensure sanitation challenges are met. The framework should:

- Involve and coordinate all the diverse institutions, including the private sector, in the entire FSM service chain of collection, transportation, treatment and enduse or disposal.
- Clarify roles and responsibilities of concerned institutions.
- Facilitate environmental, economic and social sustainability.



*The elements of the entire FSM service chain are equally important and must be properly addressed.
[Image adapted from Global Health Hub, 2012].*

FSM SYSTEM ELEMENTS SHOULD BE CONSIDERED HOLISTICALLY:

User: Raise awareness of the pros and cons of the entire service chain and ensure participation in all stages of planning, design, implementation, operation and maintenance of FSM services. Users are a critical stakeholder in the system.

Containment: Proper design for effective containment of fecal matter.

Emptying: Sufficient access for mechanical desludging, particularly in slums and low income areas.

Collection: Align collection vehicle size with available access to OSS facilities.

Transport: Include transfer stations for cost-effective transport of fecal sludge up to treatment plants.

Treatment: Ensure availability of land for establishment of fecal sludge treatment plants.

Disposal/Reuse: Implement quality assurance of treatment and of treated FS for end use.

ON-SITE SANITATION

On-site sanitation (OSS) is a system that generally stores, treats and disposes fecal wastes within the premises of a household or a small community. In the urban context, septic tanks (with or without soakage pits) and different types of pit/pour-flush latrines are common OSS systems. However, the sludge generated within these OSS systems needs to be emptied at certain intervals and must be treated off-site.

FECAL SLUDGE

Sludge is accumulated in all kinds of OSS systems such as septic tanks, aqua privies, pit latrines, and community multiple pit systems. Fecal sludge (FS) that accumulates in septic tanks, including scum and liquid effluent is termed as 'septage'. The terms 'fecal sludge' and 'septage' are often used interchangeably.

THE ABSENCE OF AN EFFECTIVE SYSTEM CREATES SERIOUS CHALLENGES

OSS facilities have become major sources of groundwater and surface water pollution, with significant environmental, public health, and economic impacts. Most OSS facilities including septic tanks are built without following any engineering design principle and therefore perform poorly, as was evident from a case study conducted by K-Hub, ITN-BUET [2015]. In the absence of effective fecal sludge management (FSM) services, a huge quantity of FS generated in septic tanks and pits/pour-flush latrines are being discharged in low-lying areas, storm water drains, in lakes, canals and rivers leading to serious environmental degradation, particularly in urban areas, endangering public health.



Household latrine directly connected to open drain.

People living in high-density urban slums and low-income communities depend entirely on OSS facilities shared by multiple families. As a result, the pits (or septic tanks) are filled up quickly with fecal matter and without desludging services, the toilets become unusable. Thus, in absence of effective 'emptying', a part of the FSM system, sanitation in these communities is becoming unsustainable and people are being compelled to go back to open defecation. It is worth noting that while open defecation has been brought down to 1% on a national level [according to 2015 JMP report], in many slums open defecation is practiced by as much as 20% of the slum population [Oxfam and ITN-BUET, 2014].

The alarming situation is similar in all major urban areas comprising of 11 City Corporations (CCs) and 325 Paurashavas [Municipalities] as well as across socio-economic strata within towns and cities.

A root cause for lack of FSM services in these cities and towns is that there is no clear assignment of responsibilities with regard to fecal sludge management among the utility service providers (e.g., water supply and sewerage authorities, WASAs), City Corporations and Paurashavas/Municipalities, and City Development Authorities in major cities e.g., Dhaka, Khulna, Chittagong, Rajshahi, Cox's Bazar [SNV and DevCon, 2014]. There is also lack of awareness among these institutions and organizations regarding FSM. As a result, there is a lack of concerted effort by all concerned to address this serious issue.

SHIFTING TO FSM IS COST-EFFECTIVE

Since the traditional sewerage system (network sanitation) with flush toilets are too expensive to build and maintain, and the benefits of network sanitation are not readily apparent, policy makers often do not prioritize sewerage projects over other services.

FSM could be a cost-effective and sustainable solution for urban sanitation in Bangladesh. Preliminary estimates show it can be five times less expensive than a sewerage system providing immediate environmental, health and economic gains. A clear benefit is that it does not require huge capital expenditures to be arranged, as do sewer-based solutions.



Fecal sludge being discharged into open environment.

CURRENT FSM PRACTICE IN BANGLADESH

- FSM has recently been initiated as an urban sanitation option in some areas of Bangladesh.
- Some 16 Paurashavas [Municipal] towns have initiated FSM services, on a limited scale, with treatment plants built with assistance from the Department of Public Health Engineering (DPHE) and NGOs, and employing 'vacutug' for emptying, collection and transportation of fecal sludge to treatment plants.
- In large cities including the mega-city Dhaka, limited emptying and collection services are available through NGOs/private organizations, but the subsequent disposal of fecal sludge into sewers/low lands without treatment needs addressing.
- In all urban areas, unhygienic manual emptying systems predominate over the mechanical emptying system using 'vacutug' because of its limited availability and lack of public awareness.

SANITATION ACHIEVEMENTS IN BANGLADESH

- Open defecation practice has come down to a mere 1% in 2015 from 34% in 1990.
- Improved access to sanitation has almost doubled at 61% since 1990.
- Urban sanitation has witnessed a complete elimination of open defecation during this period.



Mechanical emptying of septic tanks/pits using 'vacutugs' needs to be encouraged.

WHAT MORE NEEDS TO HAPPEN?

- Raise awareness among stakeholders including policymakers, local authorities, and urban dwellers, on the benefits of FSM.
- Use the institutional and regulatory framework to regulate and coordinate FSM services.
- Improve the performance of technologies with increased monitoring and enforcement by relevant authorities.
- Train personnel to plan, design, construct, and operate FSM infrastructure.
- Secure financial resources for establishing FSM infrastructure and services in urban local authorities.
- Recognize the potential of fecal sludge treatment products for productive use in the agriculture and energy sectors.

NEXT STEPS FOR BANGLADESH

Bangladesh has recognized the importance of an 'Institutional and Regulatory Framework' [IRF] for FSM aimed at advancing our commendable achievement in the sanitation sector one step further. Formulated through a participatory approach involving all stakeholders, the IRF is expected to lead to a more systematic and sustainable FSM development in urban Bangladesh.

The next important steps include development of 'Implementation Guidelines' for FSM, related service standards, and more importantly facilitate capacity building of the local institutions in planning, design, implementation, operation and maintenance, and performance monitoring of FSM in all urban areas of Bangladesh.

Further Reading:

Rahman, M. M., Ali, M. A., Choudhury, M. R., Rahman, M. A., Redwan, A. M., Noor, N. F., and Sohan, A. I., "Fecal Sludge Management [FSM] Scenario in Urban Areas of Bangladesh" - A Case Study by **South Asia Urban Knowledge Hub [K-Hub]**, ITN-BUET, Bangladesh National Center, Dhaka, May 2015.



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