



Septage Management Report by CSE

Introduction

Despite constructing 18 crore toilets with containment systems under **Swachh Bharat Mission**, which will be ready by 2019, India struggles with problem of managing treatment of waste generated. Thus, we treatment of sewage and septage needs to be tackled to ensure not just an **open defecation-free (ODF) India**, but pollution-free water bodies, cities and towns as well.

- As per **2011 Census**, 81.4% households in urban India have a toilet facility, but only 40% households with a toilet facility are connected to a piped sewer network.
- Septage management in cities would also help achieve the aims of **SDG-6**, which includes improving water quality by reducing pollution, eliminating dumping, and minimizing the release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing global recycling and safe end use by 2030.
- **National Urban Sanitation Policy (NUSP), 2008**, emphasizes the need for proper collection, treatment and disposal of septage from onsite installations.
- **Faecal sludge and septage management** is not only affordable and sustainable as compared to centralized sewerage system but can also be implemented quickly to make cities clean and healthy.

Key points from Excreta Matters: Seventh State of India's Environment Report

- Pollution from one city distorts water supply plans of those downstream.
- Costs of building centralized wastewater treatment system is high.
- Cities can build sewerage system for few not all.
- Cities spend to treat waste of some, which eventually gets mixed with untreated waste of the majority.
- The result is pollution; and cities drowning in their own excreta.

What is septage management?

- Sanitation often focuses only on the provisioning of physical infrastructure — toilets or latrines — in order to increase the 'coverage of toilets', or to look at the epitome of sanitation: Open Defecation Free (ODF) cities.
- But there is a need to focus on the entire 'sanitation chain. It is an outline for understanding how faecal waste flows through each system.
- It sets out interlinked steps vital to manage septage and effluent from generation to disposal or end use, thereby summarizing the city-level outcomes and current status of the same.

Septage

Septage or septic tank waste refers to the partially treated matter stored in and pumped out of a septic tank. It is generally pumped out of a septic tank or onsite sanitation system using a vacuum tanker. It is a host of many disease-causing organisms along with significant level of grease, grit, hair and debris.

Septage has three main components:

- **Scum:** The layer of solids formed by wastewater constituents that floats to the surface of a tank or reactor (such as oil, grease, hair or any other light material).
- **Effluent:** The liquid fraction collected in between scum and sludge in a septic tank is known as effluent, sometimes also referred to as a supernatant.
- **Sludge:** Solids which collect at the bottom of the tank

Why manage septage?

- **Insufficient infrastructure**
 - Only 40 per cent of Indian population having toilets is connected to sewerage networks, while another 48 per cent are connected to On-site Septage Systems (OSS).
 - It poses challenge in the form of lack of sewerage network lines and in emptying of OSS and treatment of effluent let out by them.
 - In the absence of designated disposal sites, private operators often discharge collected septage into drains, waterways, open land and agricultural fields, which in turn poses a larger threat to the environment and health.
- **Health and environment implications**
 - Septage contains elements that may produce bad odor, risk public health and create serious environmental hazards.
 - As septage is highly concentrated, discharging it into a water body may cause immediate depletion of dissolved oxygen.
 - Increased nutrients levels in the water, leads to eutrophication and increase in the number of pathogens, thus creating risk of health hazards.
- **Loopholes in Regulation**
 - Public health and sanitation is a part of the '**constitutional responsibility**' of the municipalities **under the 12th schedule of the Constitution (74th Amendment, 1992)**.
 - Municipal acts and regulations normally refer to management of solid and liquid waste, but **do not provide detailed rules for septage management**.
 - Inadequacy in the implementation and enforcement of regulations worsens the problem.

Current Practice

- Septage management is primarily in the hands of **private operators**. The operators charge for emptying services provided to different stakeholders. Emptying points can be individual households, residential colonies, commercial establishments, institutions, toilet complexes, offices etc.
- Due to absence of dedicated disposal sites, private emptiers practice illegal dumping of septage into water bodies, utterly disregarding the threat posed to health and environment.
- They run their business without paying any fees to government authorities which means that despite high charges collected from the customers, no revenue is generated by government authorities from the emptying business. Farmers in whose fields the collected septage or faecal sludge is disposed of also pay the private operators.

Key provisions in different laws and regulations that deal with septage management

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National Faecal Sludge and Septage Management Policy, 2017

Issued by Ministry of Urban Development in early 2017.

Aim: Facilitate nationwide implementation of FSSM services in all ULBs and to set priorities, and direction for safe and sustainable sanitation in every household in India.

Key features of the policy are as follows:

- **State-level guidelines**, framework, objectives, timelines and implementation plans to address septage management.
- Formulating strategy at the **Central level** to initiate capacity-building for training on FSSM.
- Creating a **sanitation benchmark framework** which can be used by ULBs to develop a database and registry of certified onsite sanitation system, and a robust reporting format.
- Funding for facilitation of FSSM projects and encouragement to increase public private partnerships (PPP).
- Achieving integrated citywide sanitation along with safe disposal.

Stages of Septage Management

- **Containment:** Containment system helps in restricting the human interaction with excreta either through off-site sanitation system like underground drainage network or through onsite sanitation system like septic tank.

- **Bio-digester (anaerobic):**

- Bio-digesters advocated by the SBM are widely used to provide 80 per cent treatment of black water from individual and cluster households, or institutional buildings where there is

no sewerage network.

- The technology has been **developed by DRDO**.
- **Specifications:** It has two key components: **(i) Anaerobic microbial consortium** which has been created by acclimatization, enrichment and bio-augmentation of cold active bacteria collected from Antarctica and other low-temperature areas. **(ii) Specially designed fermentation tank.**
- **Bio-toilet (aerobic):** Bio-toilets make use of aerobic digestion involving multiple strains of bacteria that break down waste matter through oxidization
- **Emptying:** The process of extracting faecal sludge/septage from onsite sanitation systems is known as emptying. It is done both **mechanically and manually**.

(The Prohibition of Employment of Manual Scavengers and their Rehabilitation Act, 2013 however prohibits employment or engagement of manual scavengers).

- Mechanized methods include use of vacuum trucks or tractor-mounted vacuum tankers.
- **Transportation**
 - Faecal sludge/septage and waste water/sewage both need to be transported to the treatment/disposal site. Sewage is conveyed using underground drainage network also called sewerage network.
- **Treatment and Disposal**
 - **Wastewater, faecal sludge and supernatant**, all three should be properly treated and/or safely disposed for improved sanitation.
 - **Sewage and supernatant** with or without treatment end up into lakes and rivers of the State.
- **Resource recovery**
 - Faecal sludge contains nutrients such as nitrogen and phosphorus and, varying amounts of micro-nutrients such as boron, copper, iron, manganese, molybdenum and zinc.
 - These nutrients reduce reliance on chemical fertilizers and in combination they can meet the requirements of nutrients for crop production.
 - Septage has also been used to generate energy through **biogas systems** and **bio-methanization process**. The methane thus produced can be used as fuel for cooking or for generation of electricity.

Way Forward

- **Containment**
 - It is essential to ensure that the OSS constructed is best suited to the local condition of the target area.
 - Municipal bye-laws for construction of containment systems should be enforced for new constructions.
 - The relevant agencies must provide sufficient time and support to retrofit OSS with faulty design.
- **Emptying**
 - Charges to empty septage vary widely across the country, which should be regularized.
 - Regulating and licensing of private emptiers.
 - Proper PPE usage should be made mandatory.
 - ULBs should ensure that containment systems are desludged as per schedule
 - Awareness about the need to empty containments regularly is very essential which can be taken up by social media platforms, through various ministries initiative, NGOs too can be consulted.
 - Most private operators in this business are not aware about adverse impacts of unsafe disposal of the septage. They should be trained on correct transportation and disposal method.
- **Transport**
 - Most private operators illegally discharge septage at the nearest point. Routes to be taken should be fixed to reduce the cost of transportation as well as minimizing the effects on health and environment.

- Vehicles transporting septage should be able to ply on the roads only during select hours of the day.

- **Treatment and disposal**

- Septage characterization should be undertaken as it helps in selecting the appropriate technological option that suits the local and regional conditions.
- Septage decanting stations can be constructed at strategic locations for convenient disposal, cutting down the distance to be travelled by desludging lorries.

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