

# Maharashtra's journey to move towards ODF+/ ODF++ through faecal sludge and septage management

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Figure 1 – Faecal Sludge Treatment Plant in Satara. Source: CWAS, CEPT University.

## Summary

Maharashtra is the second most urbanized state in India with a population of 64 million living in 412 cities regulated by their respective Urban Local Governments. The state was awarded the status of Open Defecation Free (ODF) in October 2017 and has continually focused on improving the entire sanitation service chain. Since 300+ cities in Maharashtra depend completely on onsite sanitation, a considerable focus on Faecal Sludge and Septage Management (FSSM) is needed to achieve safe sanitation. Therefore, the Government of Maharashtra's has developed a robust strategy to strengthen the Faecal Sludge and Septage Management system in order to remodel as ODF+ and ODF++. With 214 functioning Faecal Sludge Treatment Plant (FSTPs) and another 22 under construction out of a proposed 311

FSTPs, Maharashtra has performed remarkably in its ongoing journey from ODF to ODF+ /ODF++1. For efficient result, under the flagship Swachh Maharashtra Mission for Urban Areas (SMMUA) 1.0, a Technical Support Unit (TSU) had been established under the Urban Development Department (UDD). Our organization, the Center for Water and Sanitation (CWAS), CEPT University, acts as a TSU and extensively supports the Government of Maharashtra in implementing urban sanitation improvement measures in urban areas of Maharashtra with a determined focus on FSSM. Furthermore, in the next phase of SMMU, CWAS has signed MOU with the UDD Maharashtra, with the commitment to extend their support for further improvement with a focus on the parameters of Citywide Inclusive Sanitation in small and medium cities that are dependent on onsite sanitation.

In this story we will bring to light Maharashtra's journey of urban sanitation in an incisive manner so that it can be used as a knowledge product to inspire other states, government officials and practitioners. For good measure, the best practices from Maharashtra can be replicated in any other states in India fostering cross learning among them.

## Overview

### Geographical information

**Country:** India

**State:** Maharashtra

**City population:** 120 million (approx. according to Unique Identification Authority of India).



### Problem

- Despite universal toilet access, a large part of wastewater and faecal sludge and septage generated is disposed untreated in open waterbodies and open land.

### Solution

- The highly urbanized state of Maharashtra has continually focused on the entire sanitation service chain. Since 300+ cities in Maharashtra depend completely on onsite sanitation, it specifically focuses on Faecal Sludge and Septage Management (FSSM) to achieve safe sanitation in cities.

## Problem

The practice of open defecation is quite unbridled in developing countries like India and considered to be a serious concern for the environment. As per Census 2011, nearly one in three urban households in Maharashtra did not have a toilet facility within the premises (CWAS, CEPT University). At the onset of Swachh Bharat Mission phase 1, the Government of India had embarked on an ambitious programme and aimed to make India Open Defecation Free (ODF) by 2019. By declaring all the urban areas ODF by the end of 2017, Maharashtra became one of the pioneer states to manifest the vision of the Swachh Bharat Mission. Swachh Maharashtra Mission for Urban Areas (SMMUA) adopted a demand-based model to eradicate open defecation wherein the demand for construction and use of toilets was generated.

Assessments have been conducted which shows that non-functionality and inadequate upkeep of community toilets are the prime reason encouraging people to defecate openly (CWAS, CEPT University). The Government of Maharashtra had introduced a Government Resolution in 2015 by integrating the fund of 14th Finance Commission which mandated all the Urban Local Bodies

(ULBs) to use at least half of the fund for activities linked to sanitation. Households in some Maharashtra cities, including Wai, Sinnar, Pathri, Ballarpur and Jalna, have chosen to borrow money for sanitary improvements from a variety of lenders, prioritizing toilets before other amenities. In smaller cities, such as Wai, Mahad, Sinnar, Vadagaon, Vita and a few others, the approach of group toilets, shared septic tanks has been rolled out where space was a constraint for providing individual toilets.

Despite Maharashtra's excellent implementation of sanitation infrastructure, it is apparent that the state has won only half the battle. In Maharashtra, more than 300 cities still entirely rely on onsite sanitation with no proper sewage treatment facilities (PAS Project 2016–2017, CEPT University). Even though Maharashtra has made great strides in ensuring that everyone has access to urban sanitation, the faecal matter generated from households is not treated properly, resulting in environmental degradation. Hence it is also important to ensure that the ODF status is sustained over time, and that faecal sludge and wastewater are properly collected, conveyed, treated and reused.

## Solution

After gaining ODF status in 2017, the Government of Maharashtra issued a 7-point sustainability charter that included focus on ODF-Sustainability and ensuring effective collection and treatment of human faecal waste in all cities. Maharashtra has adopted a systematic approach to move towards ODF++ through a state-wide strategy for FSSM. It was the first state in India to concentrate on attaining SDG 6.2 by making sure that human faeces were effectively collected and treated in all cities. Maharashtra has received technical and research-oriented assistance from CEPT University in putting its plan into practice.

### 1. A two-pronged approach for scaling up FSSM

The government had made the decision to support a two-pronged approach to carry out the coverage of statewide FSSM efforts. Strategies for the effective implementation of FSSM throughout the state were drafted by the Government with assistance from CEPT University. With a clear determination of using the excess capacity of existing sewage treatment plants, a co-treatment strategy (Figure 2) had been taken up by Government of Maharashtra which suggests that all the cities which do not have any treatment facilities and are located within a radius of 20 km from any nearby sewage treatment plant with surplus capacity can co-treat their faecal waste there. The remaining cities which have no sewage treatment facilities and are fully dependent on onsite sanitation are required to construct their own Faecal Sludge Treatment Plant (FSTP). With the help of CWAS, the Urban Development Department at the State

Government prepared a plan for the design and implementation of nature-based treatment FSTPs with the goal of offering a cost-effective and nature-based solution.

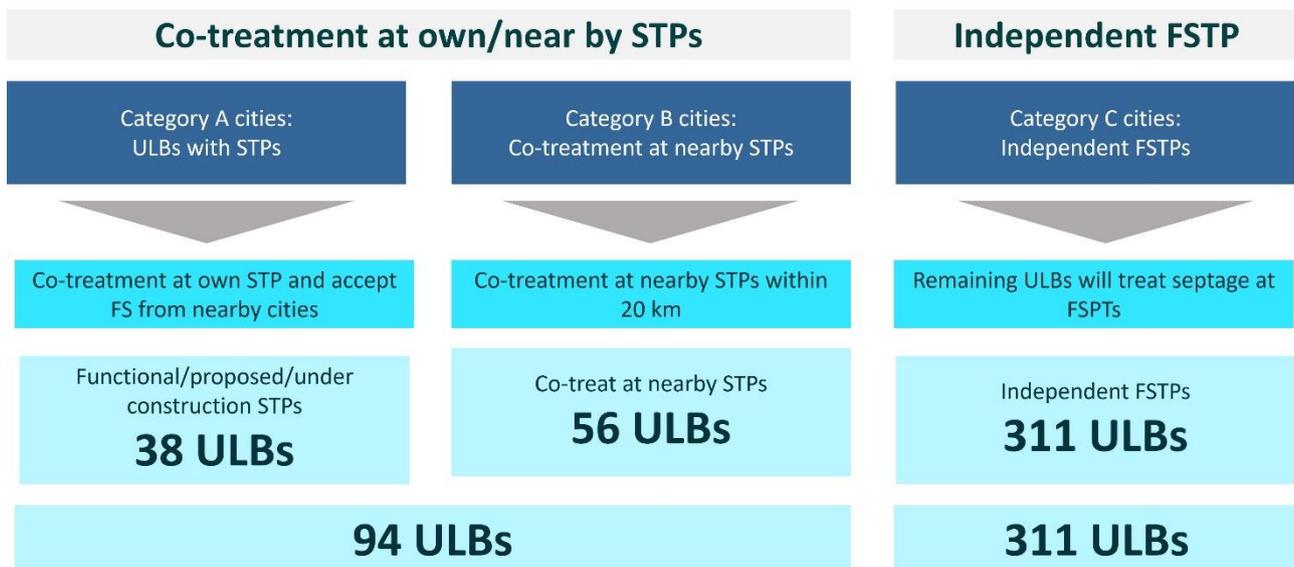


Figure 2 – Proposed STP, FSTP, and co-treatment facilities in Maharashtra. Source: CWAS, CEPT University.

## 2. Speeding up the FSTP construction process

For scaling up FSSM activity in Maharashtra, a single window approach has been enabled to avoid a complicated system of city-to-city administration and allowed for a one-stop and fast-track sanctioning system (in terms of approvals on FSTP designs, processes, etc.). The Government of Maharashtra received assistance from CEPT University and a national technical organization in choosing four cost-effective technologies to build FSTPs. Five possible sizes of FSTPs for the chosen technologies have been developed based on the populations of the relevant ULBs in Maharashtra, with technical approval from Maharashtra Jeevan Pradhikaran. Figure 3 shows a typical FSTP technology adopted in Maharashtra. The 14th Financial Commission fund was made available for use by the ULBs. A small number of ULBs levied sanitary taxes to partially offset the costs of operation and maintenance for the Faecal Sludge Management service.

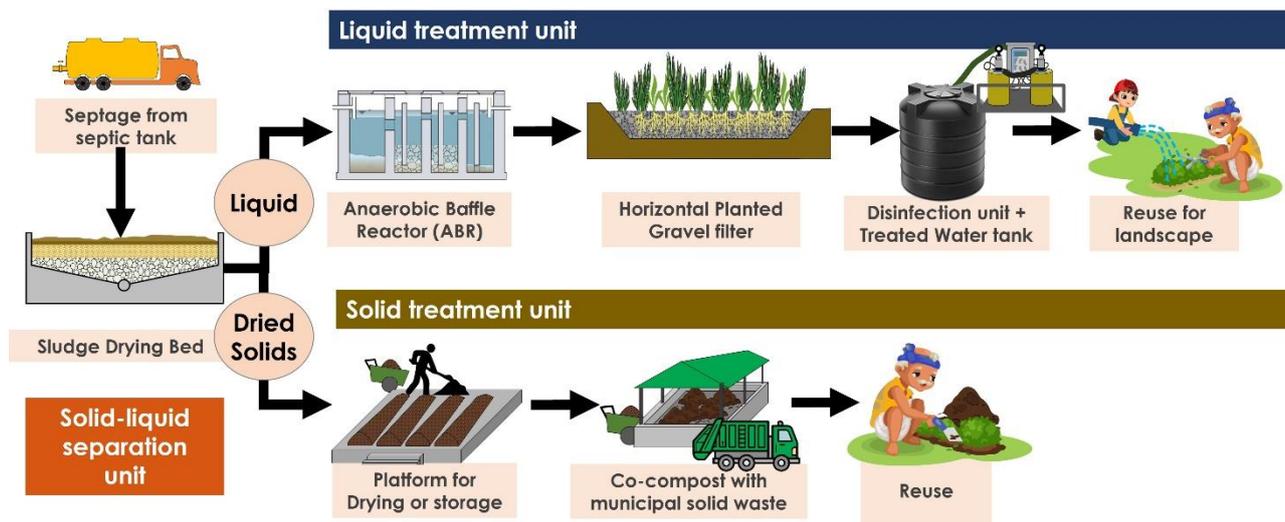


Figure 3 – Process flow diagram of the typical FSTP technology adapted in Maharashtra. Source: CWAS, CEPT University.

### 3. Sustained Faecal Sludge Management service provision at scale

- a) **Supporting the ULBs during construction of FSTPs:** Six workshops were held to appraise all the ULBs about FSTP construction in Maharashtra. ULBs and private contractors had been trained further regarding the construction technology of FSTPs and implementation of the Faecal Sludge Management plan. Figure 4 shows various operational FSTPs across Maharashtra’s small and medium cities.



Figure 4 – Photos of various operational FSTPs across Maharashtra’s small and medium towns. Source: CWAS, CEPT University.

Handholding support was provided by the CWAS team, along with Swachh Maharashtra Mission Urban (SMMU) team for technical support, to the ULBs in order to make any necessary changes or expedite the process. Field visits were conducted to monitor the actual construction of FSTPs as well as support the ULBs if any challenges were faced. A call centre was set up for ULBs and contractors to address queries around FSTP construction. The Mission Director of Swachh Maharashtra Mission for Urban Areas (SMMUA) attended weekly meetings to track the implementation of ongoing FSSM-

related activities, and in addition a quality assurance framework was established. Cities such as Khopoli and Vita which were performing well were classified as model cities, as they had built the FSTPs well in the earlier stages. There were model cities identified across each division who took peer learning sessions in the workshops.

- b) **Maintaining and sustaining the quality of FSTPs after construction:** In the following stage, SMMU guided the ULBs for Operation & Maintenance of FSTPs by preparing a manual and sharing it with them. For third party evaluation (Quality Assurance and Quality Control), the team gave supported by providing a list of laboratories/engineering colleges near the city. The inlet and outlet quality of septage and effluent are tested, and quality checks of construction are conducted.
- c) **Monitoring system set up:** Regular follow-up meetings are conducted to monitor the operations of the FSTPs (to see if the FSTPs are operated appropriately or if any alteration is needed). State-wide monitoring and dashboard have been developed to track the implementation of the FSSM plan.
- d) **Move towards regular desludging of septic tanks:** To sustain safe sanitation practices in Maharashtra, small and medium cities like Wai and Sinnar have successfully shifted to regular desludging from demand-based desludging. Wai is one of the first Indian cities that have successfully completed the first three-year cycle of citywide scheduled desludging. This has not only improved the performance quality of septic tanks but also the quality of drain, river and ground water. A study by Jaiswal et al. (2022) in Wai city has shown that with the desludging, the quality of supernatants has improved, and this has led to improvement in the quality of drain water. In desludged areas 50–60% decrease in the value of Total Suspended Solids (TSS) and Biochemical Oxygen Demand (BOD) load was observed while inspecting the open drain samples. With lessons learnt from Wai and Sinnar, many cities have started taking steps towards implementing scheduled desludging.

#### 4. Institutionalizing FSSM service delivery

Capacity building programmes and regular review meetings are conducted to keep tabs on the progress of FSSM activities across all ULBs in Maharashtra. A state level dashboard is prepared to help the state government officials to track the implementation of FSSM plan, Figure 5 highlights the status of operational treatment plants across the state (56 operational, 38 sewage treatment plants and 214 faecal sludge treatment plants).

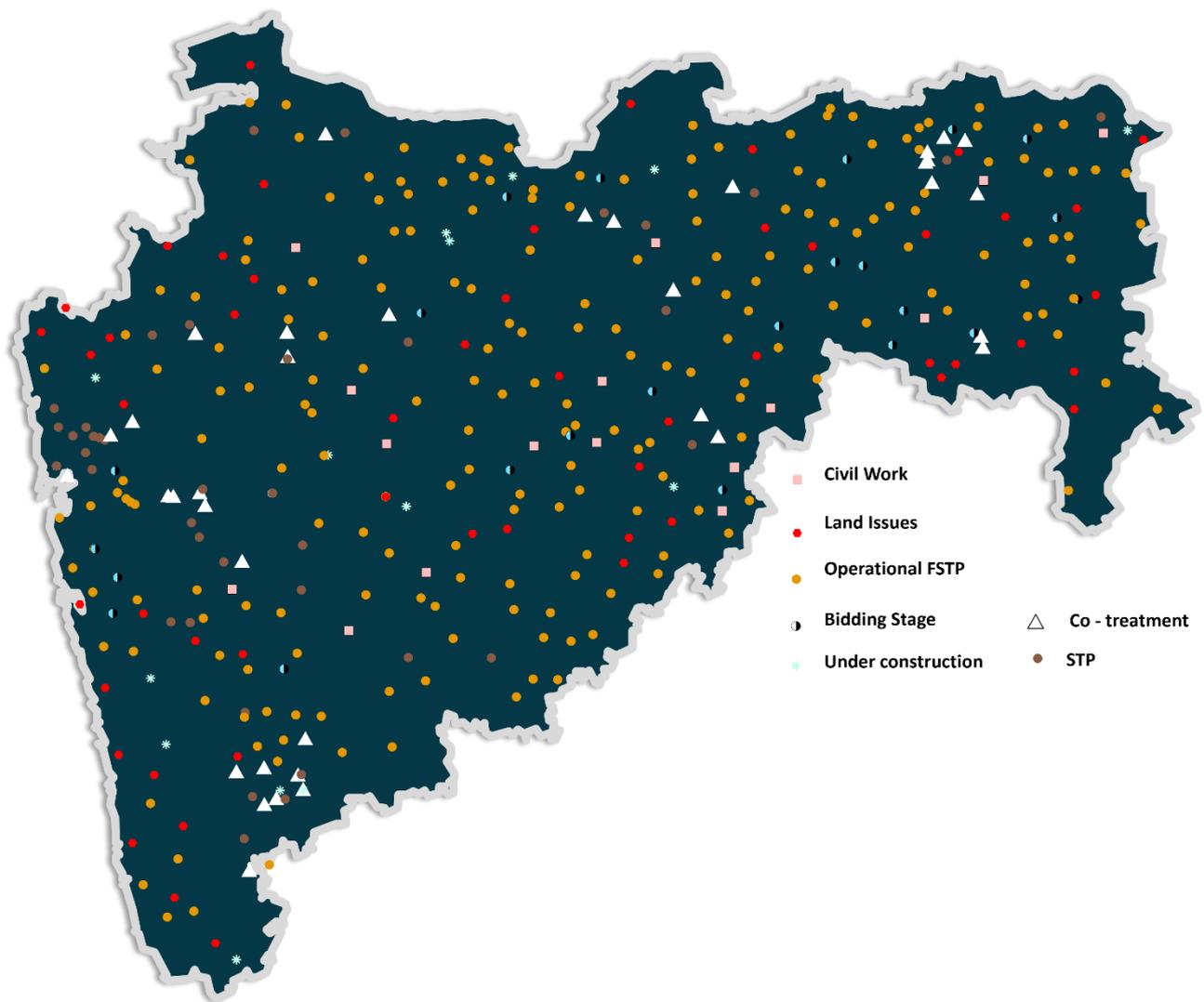


Figure 5 – Status of operational treatment plants across the state. Source: CWAS, CEPT University.

## 5. Achievement and way forward

Due to the remarkable performance in the paradigm of urban sanitation, Maharashtra has acquired the status of being one of the top three states in India under Swachh Survekshan over the last 4 years. Having said that, now the state is moving further to not only becoming ODF++ but also a Water+ state with the aim of attaining SDG 6.2.

Maharashtra is developing a strategy on convergence of National Urban Livelihoods Mission (NULM) and SBM for improved sanitation service delivery with participation of Self-Help Groups in operation and maintenance activities of the Faecal Sludge Treatment Plants.

In terms of resource recovery and reuse of faecal waste, the state Government Resolution for FSTP also captures the significance of reuse and has asked the cities to reuse of treated faecal sludge and treated wastewater. Cities are now exploring various reuse practices.

## Lessons learned

A single truck of toilet waste emptied without treatment, into the open, potentially can have an impact equal to 3,000 people defecating in the open (Chary, 2017). With the construction of FSTPs, sewage treatment plant and co-treatment plants, the state has eliminated the practice of open dumping of untreated faecal waste and septage. This further reduced contamination and pollution of water and land resources in Maharashtra. The health hazards affecting people, especially the marginalized communities who reside near these areas and are dependent on the polluted water bodies, are thus reduced.

For cities moving towards ODF++ and Water +, it is important that the implementation and approval processes become easier. The single-window approval system adopted in Maharashtra which curtailed the complex and lengthy technical and administrative sanction processes supported in fast tracking the entire implementation process of FSTPs. Constant handholding technical support during construction of FSTPs as well as developing operational guidelines to sustain the FSTP performance has helped to keep the FSTPs operational.

The Government of Maharashtra has also passed a Government Resolution for all the cities to implement scheduled desludging of septic tanks. This has also guided the ULBs to take up regular desludging of septic tanks. Along with this approach, the use of desludging trucks for regular desludging and Personal Protection Equipment have minimized human-contact with the untreated waste at collection points which leads towards a sense of social inclusion.

## Further reading and references

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## About the author

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## About the institution / organisation

The **Center for Water and Sanitation (CWAS)** is a part of CEPT Research and Development Foundation (CRDF) at CEPT University. CWAS undertakes action-research, implementation support, capacity building and advocacy in the field of urban water and sanitation. Acting as a thought catalyst and facilitator, CWAS works closely with all levels of governments – national, state and local to support them in delivering water and sanitation services in an efficient, effective and equitable manner. <https://cwas.org.in/>



### 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.