



FROM VISION TO ACTION

**UP'S JOURNEY TOWARDS FAECAL SLUDGE
AND SEPTAGE MANAGEMENT**





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AND SEPTAGE MANAGEMENT**

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Maps in this report are indicative and not to scale.

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ABBREVIATION

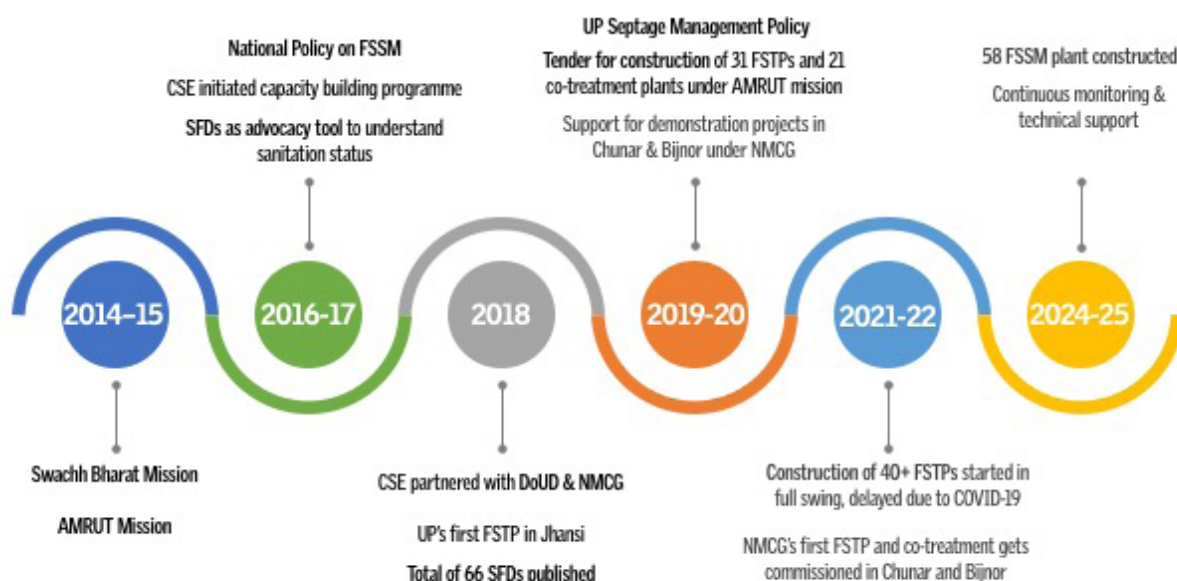
AMRUT	Atal Mission for Rejuvenation and Urban Transformation
BOD	Biochemical Oxygen Demand
CSE	Centre for Science and Environment
CWIS	Citywide Inclusive Sanitation
COD	Chemical Oxygen Demand
CPCB	Central Pollution Control Board
FSSM	Faecal Sludge and Septage Management
FSTP	Faecal Sludge Treatment Plant
KLD	Kilo Liters per Day
MoHUA	Ministry of Housing and Urban Affairs
NMCG	National Mission for Clean Ganga
O&M	Operation and Maintenance
OSS	On-site Sanitation System
SFD	Shit Flow Diagram
SBM	Swachh Bharat Mission
SHG	Self-Help Group
STP	Sewage Treatment Plant
SMCG	State Mission for Clean Ganga
UP	Uttar Pradesh
ULB	Urban Local Body
UPJN	Uttar Pradesh Jal Nigam

1. Executive Summary

Uttar Pradesh, India's most populous state, continues to face major challenges in providing safe and sustainable sanitation for its fast-growing urban population. **More than 62 per cent of urban households depend on on-site sanitation systems (OSS)**, while less than ten per cent of cities have partial sewer networks. As a result, untreated faecal sludge poses serious public health and environmental risks.

The launch of the Swachh Bharat Mission (SBM) in 2014 gave a big push to the construction of individual household toilets, helping India declare all its urban areas Open Defecation Free (ODF) by 2019, with Uttar Pradesh accounting for the highest share of toilets built. But achieving ODF status also highlighted the **second challenge—ensuring the safe collection, treatment, and disposal of faecal sludge and septage from on-site sanitation systems**. To address this, the Government of Uttar Pradesh (GoUP), with support from the Centre for Science and Environment (CSE), the Bill & Melinda Gates Foundation (BMGF), adopted faecal sludge and septage management (FSSM) approach as a statewide strategy. This move marked a major shift from focusing mainly on toilet construction towards a citywide inclusive sanitation and sustainable service delivery.

Figure 1: UP FSSM journey



Source: CSE

From Vision to Action

Uttar Pradesh's FSSM journey evolved through a phased, incremental approach, combining policy reforms, infrastructure development, capacity building, and multi-stakeholder engagement. The initial phase laid the foundation for the state's FSSM strategy. During this period, **pilot projects were launched in Chunar and Bijnor**, where faecal sludge treatment plants (FSTPs) and co-treatment facilities were established to demonstrate feasible, context-specific, nature-based solutions for managing faecal sludge in small and medium towns. To have better understanding of sanitation gaps at the state level, CSE developed Shit Flow Diagrams (SFDs) for 66 cities. The findings highlighted that **only 27 per cent of faecal waste generated in urban UP was being safely managed**, highlighting the scale of the problem.

Building on these early learnings, the second phase focused on expanding the reach of FSSM infrastructure across the state. With funding support from the Atal Mission for Rejuvenation and Urban Transformation (AMRUT), the National Mission for Clean Ganga (NMCG), and the urban local Bodies (ULBs), a total of 59 treatment plants were established across 56 ULBs, including 39 FSTPs and 20 co-treatment facilities.

October 2019 marked a turning point in UP's FSSM journey when the **state government adopted the Uttar Pradesh State Septage Management Policy**, formally making FSSM a key part of the state's urban sanitation agenda. To take this forward, the state with support from CSE, developed model FSSM bye-laws to establish a regulatory framework at the city level. The State also issued multiple guidelines, advisories, and technical documents to streamline the FSSM services. The AMRUT Mitra initiative of Government of India was piloted, engaging 16 women from self-help groups across four ULBs to manage and operate FSTPs, demonstrating the potential of community-led management. At the same time, large-scale IEC campaigns, exposure visits, workshops, and training programmes were organised to strengthen the capacity of ULBs and promote citizen engagement. These combined efforts enabled around 40 per cent of treatment plants to operate at more than 40 per cent of their designed capacity. However, the journey was not without challenges, which also provided critical lessons for the path ahead.

Key challenges faced so far

- 1. Institutional and policy gaps:** The ULBs lack clear accountability for sanitation services. Delays in adopting and enforcing city-level FSSM bye-laws and limited technical and managerial capacity, make it difficult to manage FSSM services effectively.

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2. **Planning and design issues:** Many treatment plants were designed with a one-size-fits-all approach, leading to underuse. Oversized treatment facilities, little consideration of local climate conditions for technology selection, and minimal ULB involvement in planning and implementation have resulted in low ownership and weak operational efficiency.
 3. **Operational gaps after plant construction:** The plants were handed over without detailed project reports, O&M manuals and warranty papers, causing delays and challenges in plant operations. Nearly 40 per cent of the plants still operate at less than 30 per cent of their designed capacity, mainly due to irregular desludging, incomplete registration of private desludging operators, and low public awareness about safe containment and regular desludging.
 4. **Treatment and quality concerns:** The treated water usually meets basic parameters like BOD and COD standards, but bio-solids remain unsafe for direct agricultural use because of high pathogen and heavy metal content.
 5. **Capacity and community-level gaps:** The frequent staff transfers and limited technical expertise affect smooth plant operations. Low public awareness about regular desludging and safe waste disposal further reduces overall efficiency.

Key learnings

1. **Start small, scale gradually:** The pilots in Jhansi, Chunar, and Bijnor provided useful learnings on technology, governance, and community engagement before scaling-up FSSM across the state.
2. **Context-specific planning is essential:** Rightsizing plants according to population, desludging frequency, and local conditions improves sustainability. Also, locating treatment plants closer to the city reduces desludging costs and increases use.
3. **Continuous capacity building for sustainability:** Training of ULB officials, SHGs, desludging operators, and plant operators improves overall efficiency. SOPs and checklists help maintain consistent plant performance.
4. **Engage and empower ULBs:** Involving urban local bodies early in planning, design, and operational processes enhanced ownership, improved decision-making, and streamlined plant management.

Way forward

Uttar Pradesh's FSSM journey represents a significant transformation in India's sanitation landscape—moving beyond toilet construction, and towards safely managed sanitation systems. The state has made remarkable progress through policy reforms, institutional strengthening, and infrastructure development, yet challenges remain in plant utilisation, service quality, community participation, and resource management.

The next phase must focus on stronger regulation, their implementation, and active citizen involvement to achieve the goal of universal access to safe, sustainable, and inclusive sanitation. The focus now should shift from creating infrastructure to ensuring effective service delivery. A statewide digital monitoring system, regular desludging practices, and GPS-enabled tracking of private desludging operators will enhance transparency and improve plant utilisation. Promoting the co-composting of biosolids and reuse of treated water can encourage a circular economy at the local level by transforming waste into valuable resources. Finally, empowering ULBs, engaging women SHGs, and strengthening community participation will be key to making Uttar Pradesh's sanitation systems resilient, sustainable, and future-ready.

2. Background

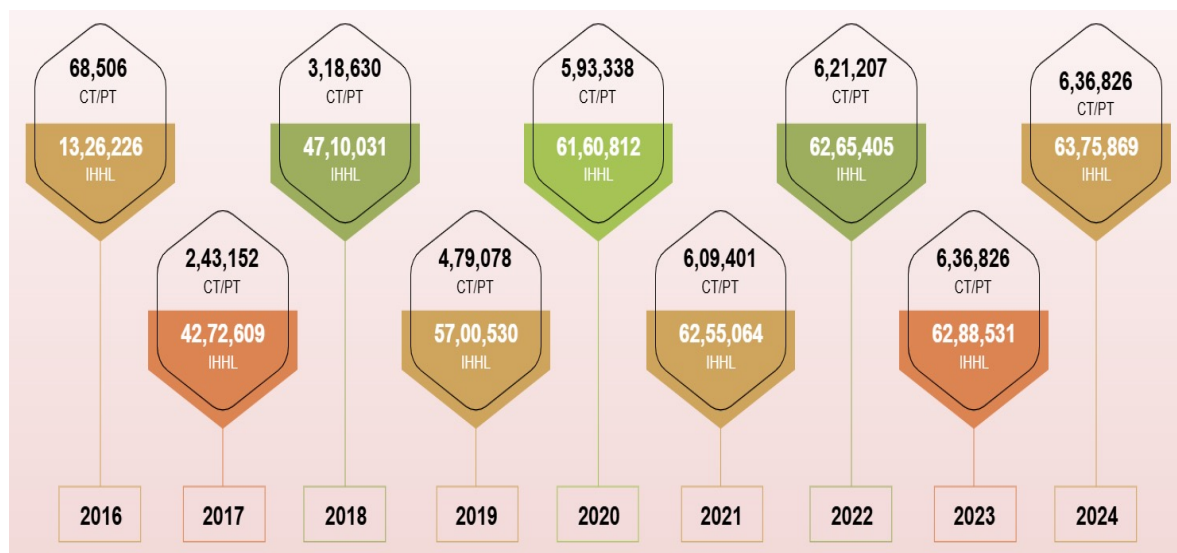
2.1 India's sanitation landscape

Over the past decade, the Government of India has made a remarkable progress in improving access to sanitation primarily facilitated through Swachh Bharat Mission (SBM), a flagship sanitation improvement programme launched in 2014 by the Government of India. Led by such initiatives, urban India became Open Defecation Free (ODF) in 2019. The success of the programme was driven by incentives to the beneficiaries, widespread awareness efforts, continuous capacity building initiatives, and strong coordination among multiple stakeholders.

After becoming ODF in 2019, the next challenge was to sustain the ODF status and move beyond toilet construction. The increase in access to sanitation brought an evident need to address the emerging liquid waste management challenges. As per the Census 2011, the piped sewer system that transfers wastewater/used water from households to treatment facilities was available to only 32.7 per cent urban households in India. The remaining households relied on onsite sanitation systems (OSS) like septic tanks or single pit or defecated in open areas.

Indiscriminate disposal of untreated faecal sludge and septage, generated from onsite sanitation systems, is one of the major causes of surface and groundwater

Figure 2: Year-on-year increase in toilets constructed under SBM Urban in India



Source: SBM Urban Portal

pollution in India— posing threat to health, hygiene, and environmental outcomes. In India, majority of the households depend on onsite sanitation systems, wherein safe containment of human excreta, emptying, transportation, treatment and disposal is of utmost importance to make our cities healthy and livable.

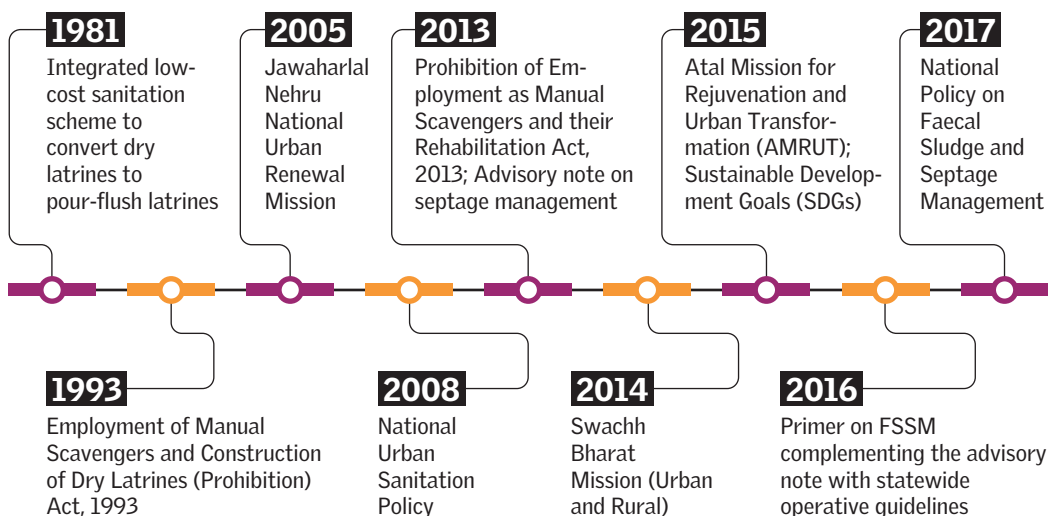
Historically, sanitation programmes in India were largely focused on toilet construction or centralised wastewater management. However, with the launch of National Urban Sanitation Policy (NUSP) in 2008, septage management started getting due attention. FSSM, in particular, gained further recognition in 2013 with an advisory note issued by the erstwhile Ministry of Urban Development (MoUD).

Recognising the evident need to address the septage management challenges, the Government of India launched initiatives such as the Atal Mission for Rejuvenation and Urban Transformation (AMRUT) in 2015, with dedicated funding for interventions related to septage management, among others. Going beyond the conventional focus on sewerage systems, AMRUT marked a significant shift by promoting faecal sludge and septage management (FSSM) as a complementary approach in areas without sewer networks. This inclusive strategy proved to be a game changer, enabling effective and citywide management of septage across urban areas.

Following this, MoUD issued a primer on FSSM in 2016 to supplement the 2013 advisory note. The primer emphasised on the need to develop statewide operative guidelines, city-level toolkits, operational manuals, operating plans and allocate finances for state-level FSSM implementation.

As FSSM gained importance, the central government started partnering with various national and international agencies to support both policy development and on-ground implementation. A key milestone in this journey was the formation of the National Faecal Sludge and Septage Management Alliance (NFSSM Alliance) in 2016, a multi-stakeholder platform established to build consensus and drive coordinated action on Citywide Inclusive Sanitation (CWIS) and safe septage management. The alliance worked closely with the Ministry of Housing and Urban Affairs (MoHUA) and played a critical role in shaping and supporting the launch of the National Policy on FSSM in 2017.

Figure 3: Sanitation and FSSM milestones in India



Source: CSE

2.2 Paradigm shift in UP's approach to septage management

Uttar Pradesh is the most populous state of India. Under the SBM-U, maximum number of toilets were constructed in UP—approximately nine lakhs in urban areas till June 2025, as per the SBM Urban portal. As per Census 2011, around 62 per cent of urban households in UP relied on on-site containment systems like septic tanks and pits. Following the implementation of SBM, there has been a significant likelihood that the dependence on septic tanks has increased, particularly considering that only less than ten per cent of cities in UP have a partial sewerage network system. The Central Pollution Control Board (CPCB) report¹ in 2021, highlighted that there was a huge gap of 70 per cent between wastewater generation and actual treatment in UP.

With the growth of population, the load on existing sewerage system will also substantially increase. But setting up big infrastructure like STPs and sewerage network demands time and resources. The mismatch in population growth rate and infrastructure development will further damage the environment and pose risk to public health.

To address these emerging challenges, Government of Uttar Pradesh took a shift from conventional path and started its journey towards faecal sludge and septage

management, to provide safe and healthy environment to its residents. The Centre for Science and Environment (CSE), New Delhi, which has been a strong advocate of FSSM at the national level, partnered with the State and played a critical role in shaping UP's septage management efforts. This technical support was made possible with financial assistance from the Bill and Melinda Gates Foundation.

2.3 Purpose of the report

The report serves two main purposes. First, it aims to comprehensively document Uttar Pradesh's journey of experimenting, learning, adopting, and scaling up efforts to establish and strengthen faecal sludge and septage management systems. Second, it aims to share the key learnings, and challenges faced along the way with other cities, both within India and globally, that are initiating or scaling up their FSSM efforts. Thereby, the report seeks to strengthen policy, actions, and support evidence-based decision making for sustainable urban sanitation.

2.4 What is FSSM?

Before exploring Uttar Pradesh's journey, it is important to understand the broader vision of Citywide Inclusive Sanitation (CWIS). CWIS is a public service approach to advance equitable, safe, and sustainable outcomes, by strengthening core public system functions of responsibility, accountability, and resource planning, and management.

Within this vision, faecal sludge and septage management (FSSM) plays a critical role. The FSSM is an end-to-end management of faecal sludge and septage collected from septic tanks or other on-site sanitation systems, particularly in areas where a sewer network is not available. It ensures the safe containment or collection, emptying, transportation, treatment, and disposal or reuse of waste, thereby protecting public health and the environment.

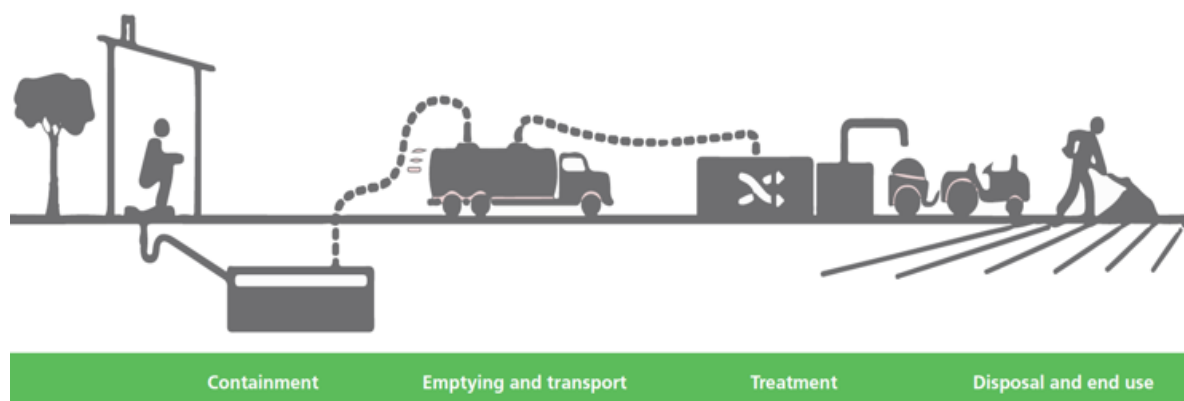
Figure 4 below depicts how waste travels across the sanitation service chain. The faecal waste is collected in septic tanks (containment system) through user interface, commonly called as toilets. The waste is then kept into the septic tank over a period of three to five years for stabilisation. Once stabilised, the faecal sludge or septage will be emptied through mechanical desludging vehicles. The effluent from septic tank flows into the soak pit; however, on-ground, most of the households do not have the soak pit and the liquid flows into open or closed drains.

The collected faecal sludge and septage is safely transported to either a faecal sludge treatment plant (FSTP) or a sewage-septage co-treatment facility located within a sewage treatment plant (STP) for proper treatment. FSTPs are stand-

alone facilities designed specifically to treat faecal sludge and septage. In cities with underutilised STPs, co-treatment facilities are established within the STP premises. These co-treatment facilities dewater the septage by separating solid and liquid fractions. The liquid is directed to the STP's inlet for further treatment, while the solids are sent to the solid stream of the STP.

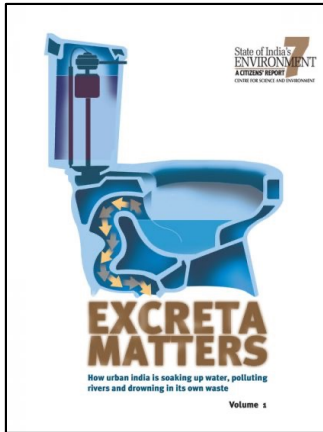
Thus, faecal sludge and septage from septic tanks are effectively treated in FSTPs or co-treatment facilities, and the resulting end products, such as treated water and biosolids, can be either be reused or safely disposed. FSSM was promoted as an alternative solution for efficient liquid waste management in small and medium towns and areas, where setting up sewer networks seemed unviable due to several reasons, such as high cost, longer and complex construction phase, and less density of population, etc.

Figure 4: Sanitation service chain



Source: CSE

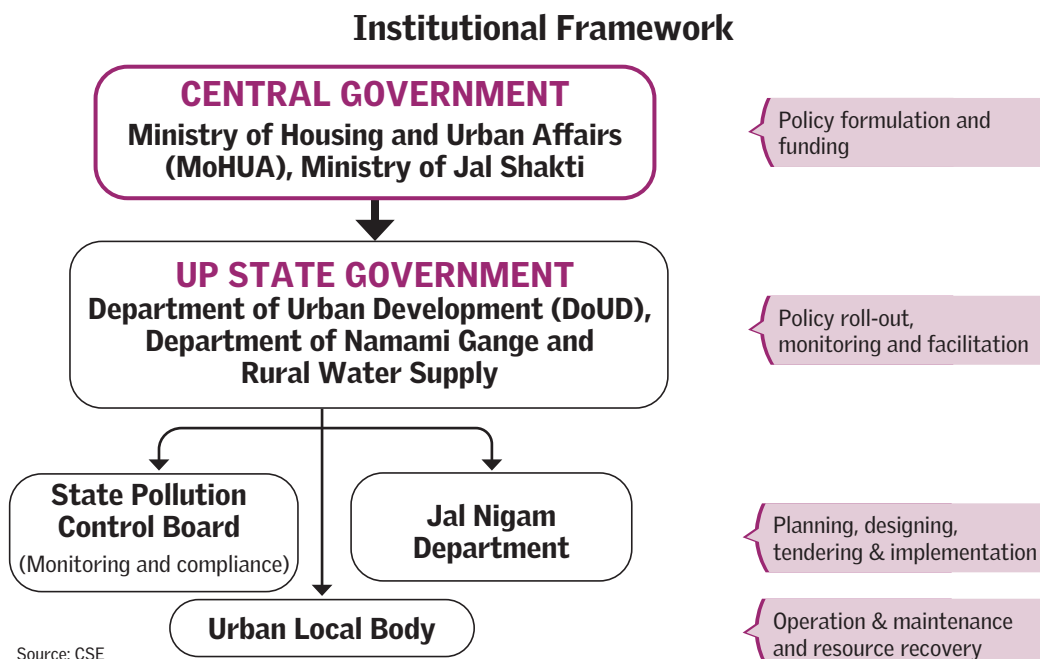
3. Setting the agenda for FSSM



CSE's work on water and wastewater issues has been a key part of its broader work on environmental sustainability. Its focused work on excreta management began in 2011 with the publication of *Excreta Matters*, a landmark report that helped bring national attention to the urgent need for better urban sanitation planning.

At the national level, CSE has been working closely with the government to bring faecal sludge and septage management into focus. With support from the Ministry of Housing and Urban Affairs and the Ministry of Jal Shakti, Government of India, CSE has been working on an initiative aimed at building capacity of urban local bodies and other stakeholders to help achieve convergence of national programmes, namely National Mission for Clean Ganga (NMCG), Atal Mission for Rejuvenation and Urban Transformation (AMRUT) and Swachh Bharat Mission (SBM) by promoting citywide sanitation planning.

Figure 5: Engagement with multi-level government stakeholders to driving positive change



Within this broader national initiative, Uttar Pradesh emerged as a key partner, particularly with funding support from the Bill and Melinda Gates Foundation (BMGF). With its vast geographical spread, large population, and significant number of river towns, UP presented a unique opportunity to link policy, practice, and innovation in FSSM.

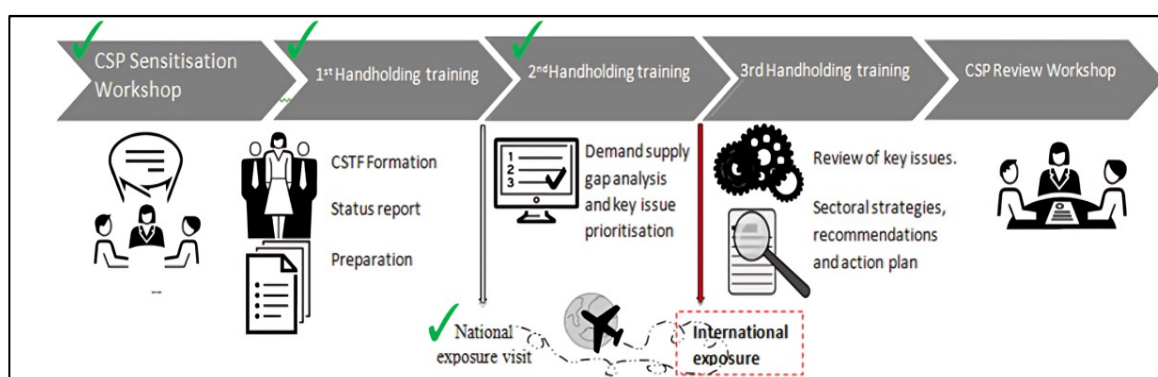
In the early phase of engagement, CSE's focus in UP was on understanding on-ground realities, building consensus, and engaging a wide range of stakeholders. Additionally, CSE's prior experience in providing capacity-building support to state and city officials on water and sanitation helped build a strong foundation of trust and continuity in the partnership.

3.1 Support for CSP preparation

In May 2016, CSE initiated its state-level engagement in Uttar Pradesh, focusing on pollution abatement in Ganga basin cities. This initiative was undertaken in partnership with the Ministry of Housing and Urban Affairs (MoHUA), formerly known as the Ministry of Urban Development (MoUD). As part of this collaboration, CSE was given a responsibility to support 22 cities across India, including four in Uttar Pradesh—namely Chunar, Ramnagar, Gangaghat, and Bijnor.

In these four cities, CSE's support was focused on capacity-building for septage management and enabling cities to prepare City Sanitation Plans (CSPs) by building awareness, strengthening local capacity and providing technical assistance. To kick-start the initiative, CSE organised a sensitisation workshop in July 2016 with officials from the state and selected ULBs in New Delhi. During this workshop, CSE introduced the concept of the Shit Flow Diagram (SFD) as a tool to understand and visualise the sanitation situation across the service chain. The SFD provides a clear, graphical representation of excreta flow, from the point of

Figure 6: Hand-holding process of CSP preparation



Source: CSE

generation to final disposal, helping identify service gaps and opportunities for targeted interventions.

3.2 Piloting FSSM in Chunar and Bijnor

Following this, CSE began a comprehensive training programme on the 'Preparation of City Sanitation Plans' for four selected cities, which began in September 2016. The trainings were delivered in three phases, aimed to enable cities to develop their CSPs focusing on effective and implementable septage management to reduce pollution load in the Ganga basin. The training covered various aspects of CSP preparation like preparation of status assessment report, carrying out demand supply analysis, formation of City Sanitation Task Force (CSTF), identification of city specific key issues, formulation of sectoral strategies, and preparation of action plan.

While working in the State, CSE simultaneously continued its national level engagement. As a result of CSE's advocacy and research efforts, NMCG showed interest in financially supporting two ULBs to pilot septage management solutions. This marked the beginning of Uttar Pradesh's journey in septage management. At the state level, this support was provided through State Mission for Clean Ganga (SMCG), Uttar Pradesh. Based on the city-level assessments and discussions, Chunar and Bijnor were selected as pilot cities for setting up a FSTP and a co-treatment facility, respectively. Moving forward, CSE started engaging closely with Chunar and Bijnor to support for the planning, implementation, and streamlining FSSM at the city level.

To build further capacity and enable peer learning, national-level exposure visits were organised in Bangalore, Chennai, and Pondicherry for officials from ULBs

In 2017, CSE developed India's first Practitioner's Guide on Septage Management, which was officially launched by the Joint Secretary of the Swachh Bharat Mission (SBM)



International field exposure visit to Malaysia

and Uttar Pradesh Jal Nigam (UPJN)—the technical arm of the Department of Urban Development (DoUD). Recognising the need for more advanced skill development, develop master trainers, and to strengthen institutional support from the state, an international exposure visit to Malaysia, Philippines, and Indonesia was organised in 2017–18, under “Multi-Country Twinning Programme: FSSM Knowledge Exchange”. Officials from NMCG, state government and UPJN participated in the visits. These visits aimed to broaden the perspectives of state and city officials by exposing them to global best practices and supporting the mainstreaming of safe septage management in UP.

Parallely, CSE also prepared SFDs for the selected four cities, which was the essential step in developing the City Sanitation Plans (CSP). CSE highlighted the value of SFDs as both assessment and advocacy tools. The SFDs offer the City Sanitation Task Force (CSTF) a clear understanding of the critical points of failure in urban sanitation service delivery within each city.

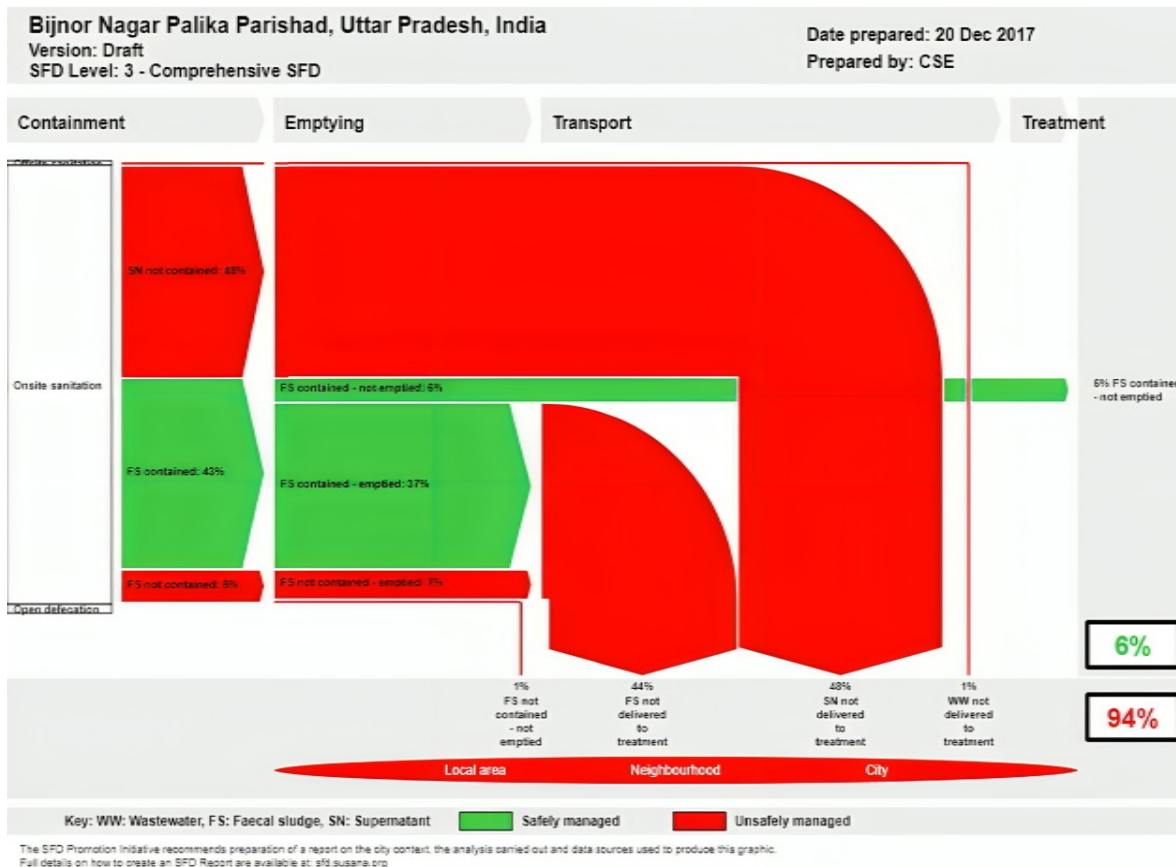
The first SFD was prepared for Bijnor city in December 2017. It showed that only six per cent of the city’s excreta was being safely managed, while the remaining 94 per cent was unsafely managed, posing serious risks to public health and the environment.

In addition to capacity building of four cities and state officials, CSE worked closely with the Chunar and Bijnor city authorities in constituting the CSTF, facilitating regular meetings, identifying priority areas for intervention, and finalising the action plan for septage management.

3.3 Formalising partnership with the government

To scale up septage management efforts across the state, CSE entered into a non-financial Memorandum of Understanding (MoU) with Department of Urban Development (DoUD), Government of Uttar Pradesh to provide ‘Support for effective Septage Management in Uttar Pradesh’ in January 2018.

As part of this engagement, CSE established a programme support unit (PSU) in Lucknow to support, facilitate, and handhold state and city-level officials in planning, creating operating guidelines and enabling frameworks, as well as designing and executing FSSM practices in cities across the state of Uttar Pradesh. CSE also supported in capacity-building of the State and ULB functionaries and conducting focused research.

Figure 7: Shit Flow Diagram: Bijnor

Source: CSE

In late 2018, CSE also partnered with National Mission for Clean Ganga (NMCG). Beyond providing support at the national level, this engagement placed CSE as a knowledge partner for implementing high-visibility, high-impact models of faecal sludge management. Under this initiative, CSE set up technical support units (TSUs) in Chunar and Bijnor to assist city-level officials in planning, designing, and operationalising FSSM solutions.

3.4 Assessment of excreta management in 62 cities of UP

Further to build upon the traction and present a comprehensive overview of wastewater and septage management at the state level, CSE undertook a study to prepare Shit Flow Diagrams for 62 major cities in Uttar Pradesh, of which 14 were along the main stem of river Ganga.

JHANSI – A PIONEER IN SEPTAGE MANAGEMENT IN UP

While other cities were still struggling with the complexities of septage management, Jhansi emerged as a leader in this field. Located in southern Uttar Pradesh, the historic city of Jhansi has been a front-runner in addressing the treatment of septage. Owing to its geography, Jhansi faces the dual challenge of water scarcity and dominance of rocky strata that made laying of conventional underground sewerage networks both difficult and expensive.

Recognising these constraints, Jhansi took the unconventional path of non-sewered sanitation and started the journey towards faecal sludge and septage management (FSSM) in 2017.

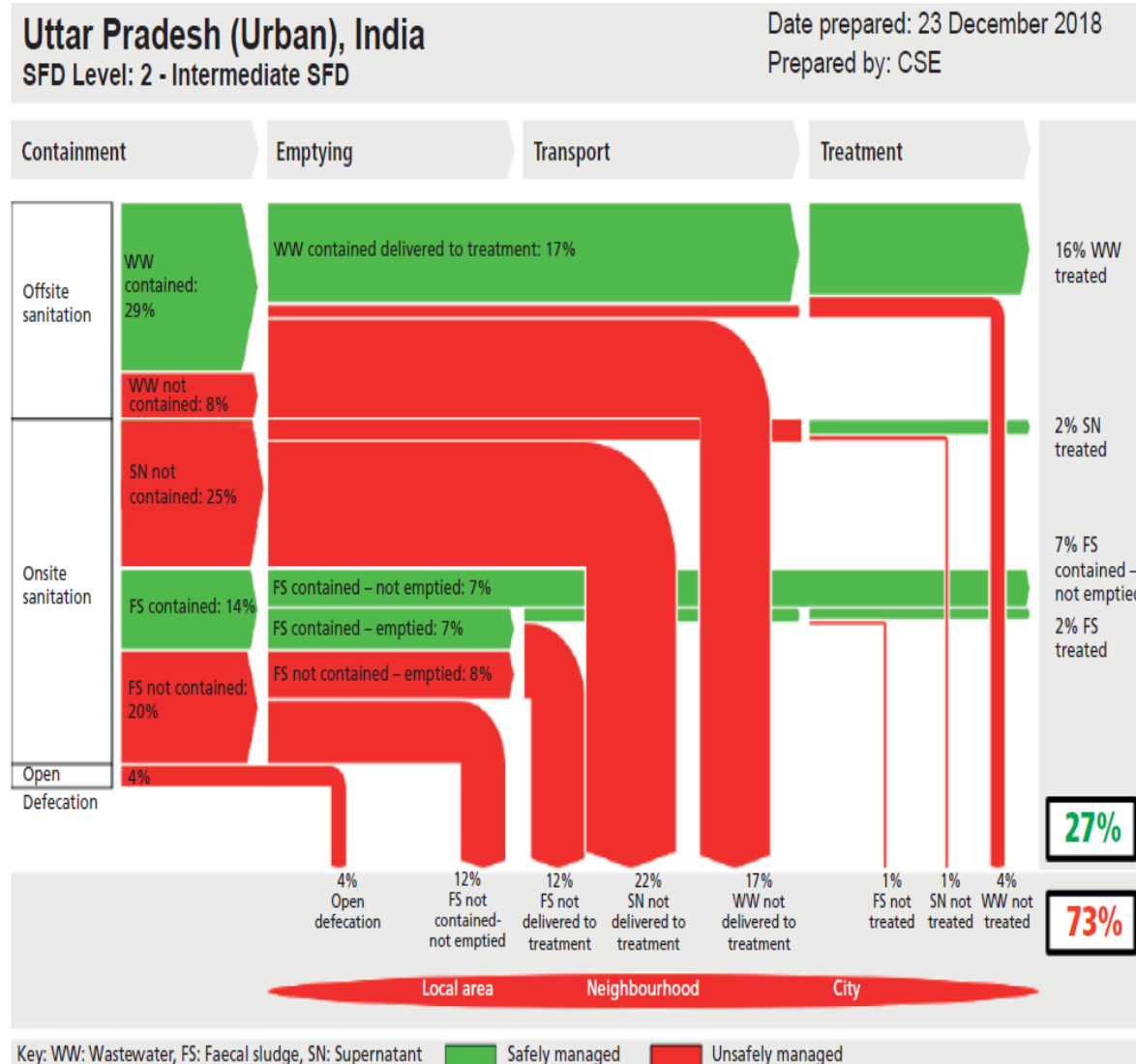
Jhansi was the first city to draft the FSSM bye-laws in 2017, which were later passed in 2023. In 2018, Jhansi became the first city in Uttar Pradesh to establish a faecal sludge treatment plant (FSTP) of 6 kilolitres per day (KLD), funded through 14th Finance Commission funds. Jhansi opted for a nature-based treatment system, for ease of operations, and low maintenance requirements.

The city adopted a unique, incremental approach towards septage management. The city started with FSTP that had a treatment capacity of 6 KLD and further expanded the treatment capacity to 18 KLD in 2022. An additional 32 KLD plant is also being operationalised in 2024.

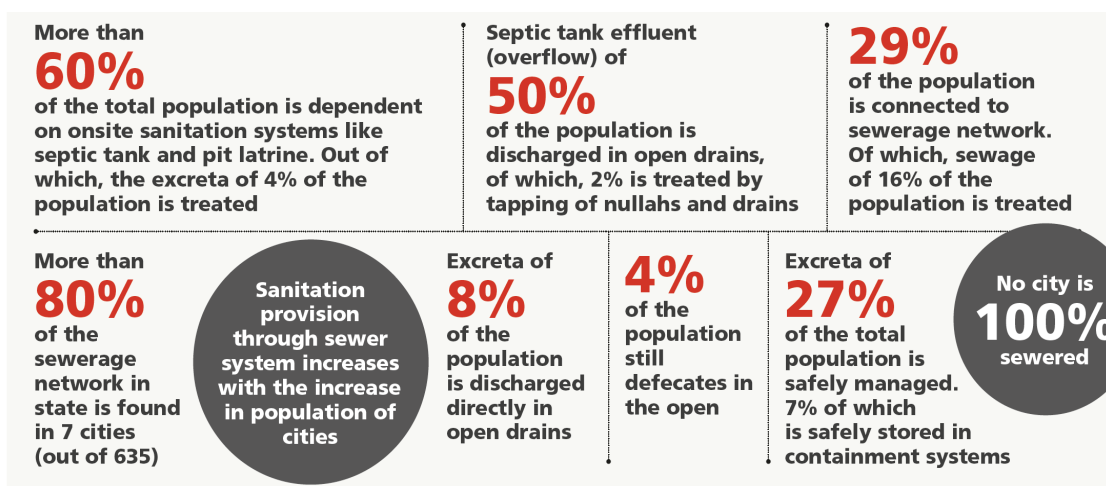


To understand the gaps in the service delivery, SFDs were developed for each of the selected cities. The cities were grouped into four clusters based on population size and cluster-level SFDs were also created to highlight common challenges faced by cities within each group. The findings and analysis from these 62 cities, along with previously prepared SFDs for four cities (Bijnor, Chunar, Ramnagar, and Gangaghat) were consolidated and documented in the following two key reports:

Figure 8: UP state-level SFD



- Volume 1: *Managing Septage in Cities of Uttar Pradesh - An analysis of the sanitation chain in 66 cities, through SFDs, 2019* briefly describes about each stage of sanitation chain, analysis through cluster SFDs, and proposes action plan.
- Volume 2: *Assessment of Excreta Management: Factsheets for 66 cities in Uttar Pradesh, 2019*, is a compilation of SFD factsheets of each of the 66 cities.



*This study is done based on data collected by CSE in October, 2018

The SFDs of urban Uttar Pradesh were prepared based on data collected from 66 cities. The key observations are mentioned above.

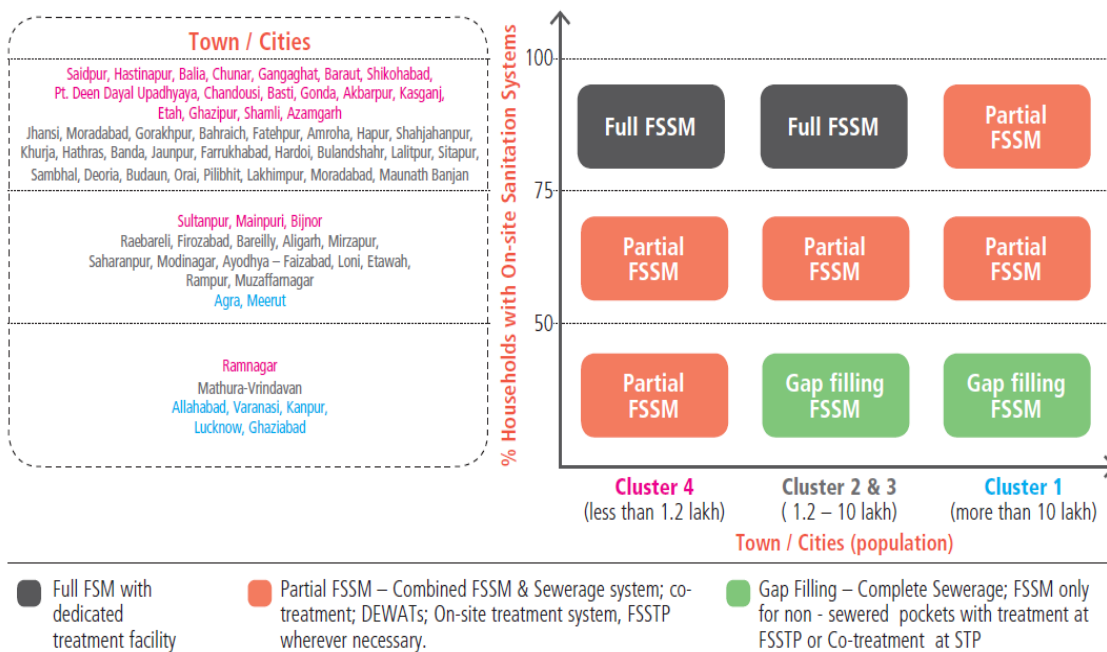
The city-level SFDs were used to develop the state-level SFD, which highlighted that only 27 per cent of the population's excreta was being safely managed. Similarly, cluster level and basin level SFDs were prepared to help in communicating the current sanitation scenario with the decision makers and developing state level FSSM approach for the state.

3.5 Preparing for the leap in urban sanitation

After conducting a baseline assessment of the on-ground situation, CSE organised a state-level workshop on 22nd October 2018, chaired by the Principal Secretary of the Department of Urban Development (DoUD), Government of Uttar Pradesh. The workshop highlighted the absence of effective septage management in the state, emphasising its negative impacts on public health and water body pollution. CSE presented key findings from the *Excreta Management* study in 66 cities, along with a proposed state-level approach to septage management. Along with this, MOUNT (an online aggregator platform for disseminating knowledge on sustainable technologies and good practices for wastewater and faecal sludge management) and *SANi-KiT* (a web-based tool for preparing CSPs) were also launched. The study findings served as an eye-opener for the state and played a critical role in catalysing the scale-up of the FSSM initiative. As a result of CSE's continued advocacy and research efforts, the state government agreed to expand FSSM solutions across all AMRUT cities, marking a significant milestone in Uttar Pradesh's journey towards improved septage management.

CSE also highlighted that the National Urban Sanitation Policy (NUSP) mandates each state to develop its own policies and technical solutions to address onsite sanitation, including the safe containment and management of faecal sludge. In line with this, CSE began providing support for the formulation of a State Septage Management Policy, which was an important step toward institutionalising and streamlining FSSM across Uttar Pradesh.

Figure 9: FSSM approach proposed by CSE for urban areas in UP



Source: CSE



State-level workshop on faecal sludge and septage management in Lucknow

4. Scaling-up the initiative

With the mandate from the Department of Urban Development (DoUD) secured in 2018, the journey towards scaling up began. The following year was primarily focused on planning, tendering and construction processes. However, this wasn't without challenges.

4.1 Planning for FSSM plants

The state planned the construction of 35 FSTPs, each with a uniform treatment capacity of 32 KLD under AMRUT scheme. Additionally, 21 co-treatment plants were proposed with capacities ranging from 25 KLD to 100 KLD, based on city population. UP prioritised medium-sized population cities for setting up FSTPs, particularly in cities with minimal to no sewerage network. For larger cities with functional sewer systems and available unutilised capacity at existing STPs, co-treatment facilities were proposed as a more viable option.

CSE studied the plan and suggested that a one-size-fits-all approach would not be effective for FSTPs. CSE highlighted that the treatment plant capacity depends on multiple factors, like city population, type of containment systems, desludging pattern, climate, etc., and a city level feasibility study should be done prior to deciding the capacity of the FSTP. The treatment capacity of each plant must be customised as per the city requirements to ensure sustainable operations.

Despite these recommendations, the State proceeded with the original plan, which led to operational challenges in many cities. These challenges are discussed later in the Section 5.2 of the report, along with the support provided by CSE to help the State in addressing them.

4.2 Strengthening the tendering process

To roll-out this plan, UP Jal Nigam (UPJN) was entrusted with the responsibility of tendering and construction of FSSM plants. With support of UPJN, four ULBs (Lakhimpur, Raebareli, Loni, Modinagar) tendered out FSTPs and started the construction process. These tenders were issued by the division level office of UP Jal Nigam. Despite starting early, the work stopped after a while due to planning, coordination, and other construction-related issues.

Post this incident, the State decided to roll-out all the tenders and monitor the construction progress in a centralised manner through UPJN head office

in Lucknow. In mid-2018, UPJN released the first tender package for seven mechanised FSTPs. However, despite multiple attempts, the tender received a very poor response from bidders.

To address the issue, CSE supported the UPJN. After reviewing the tender documents, CSE highlighted that many of terms and conditions are very stringent, such as turn-over of the firm, past experience, and technical expertise, etc., which were usually used for large projects like STPs. CSE also recommended that the tender should be technology-agnostic to allow fair competition and help select the most suitable, cost-effective, and sustainable solution, without giving preference to any particular technology.

Further, to simplify the terms and conditions in the tender, CSE facilitated multiple rounds of joint discussions between potential bidders and UPJN officials. After incorporating the feedback from CSE and potential bidders, UPJN issued a revised Notice Inviting Tender (NIT) in December 2018 under the DBOT (Design, Build, Operate, and Transfer) model. The NIT, covering the construction of 31 FSTPs and 21 co-treatment plants, were released in multiple packages.

The DBOT model, being technology-agnostic, allowed bidders the flexibility to propose customised FSTP or co-treatment plant designs based on local requirements. The scope of work mentioned in the NIT included the design and construction of the plants, a three-month trial run, and a one-year Defect Liability Period (DLP) following the trial. Additionally, it required the operation and maintenance of the plants for five years, with associated costs to be borne by the ULBs. This clause led to a major challenge in operationalising the plants and is discussed further in Section 5.2 of the report.

During this period, CSE also organised multiple rounds of training programmes to build the capacity of the State and UP Jal Nigam officials. These programmes were focused on effective FSSM practices and the planning and design of decentralised wastewater treatment systems. By the end of 2019, most of the contracts were awarded for the construction of FSTPs and co-treatment plants.

4.3 Deepening support in Chunar and Bijnor

To initiate field-level assessments and ground-work, a Memorandum of Understanding (MoU) was signed with the Nagar Palika Parishads of Chunar and Bijnor in February 2019. The partnership aimed at establishing technical support unit (TSU) in each ULB and providing technical assistance for effective city-level septage management.

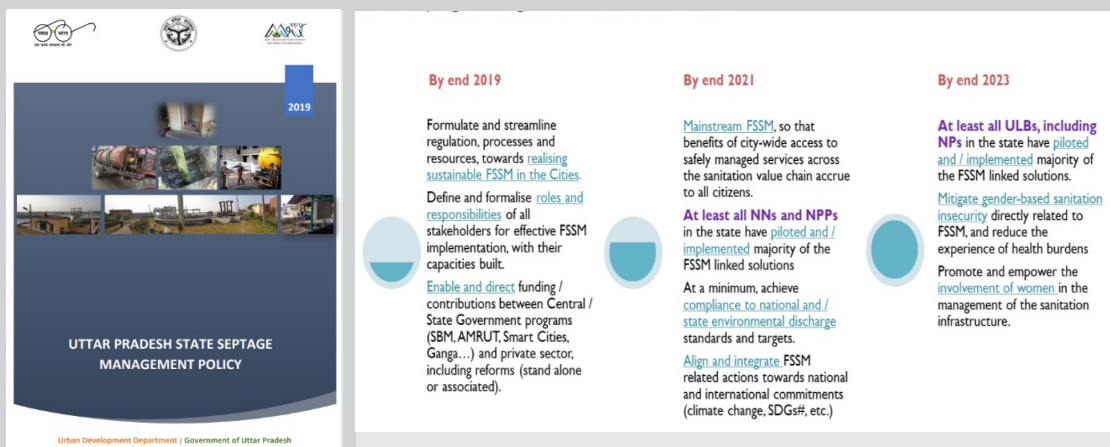


FS sample collection in Bijnor



Trenching site for temporary FS disposal in Chunar

SEPTAGE MANAGEMENT VISION FOR UTTAR PRADESH



At the state level, CSE provided support to the state government by developing the FSSM guidelines in February 2018, followed by draft policy in March 2019. These served as the foundation for the Uttar Pradesh State FSSM Policy.

A major milestone in the state's septage management journey was achieved in October 2019, when the government formally released the "UP State Septage Management Policy", highlighting its commitment to improving sanitation. The policy aimed to address the needs of the urban poor and those relying on on-site sanitation systems, while also reducing pollution by promoting safe treatment of faecal sludge and septage.

While the state has made significant progress in promoting septage management, it is now crucial to revisit the targets outlined in the policy, particularly the goal of achieving FSSM implementation across all ULBs by 2023.

The initial phase of work focused on testing and characterising faecal sludge and septage, along with conducting a feasibility study for setting up treatment plants in both cities. While designing the treatment facilities, CSE prioritised low-energy, nature-based treatment systems that require minimal operation and maintenance.

This was followed by city-level training programmes to build the capacity of private desludging operators and masons, supported by the construction of demonstration units, such as model septic tanks and twin-pit containment systems.

In the same year, both cities also adopted city-level FSSM bye-laws through board resolutions. The site preparation and construction work of the FSTP in Chunar commenced in November 2019 but was impacted by the COVID-19 pandemic.

4.4 Responding to the crisis: Support during the COVID-19

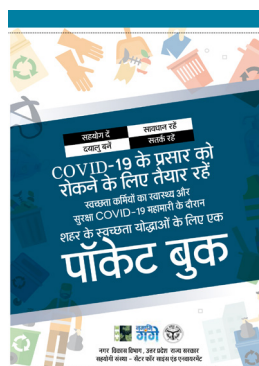
As the work was starting to get streamlined and construction was about to begin in many cities, things were hit hard by the sudden outbreak of the COVID-19 pandemic in March 2020. The construction activities slowed down significantly and even stopped completely in many places. Given the situation on the ground, CSE realigned its focus and began supporting the safety of sanitation workers, whose role became more critical than ever as frontline responders during the crisis.

Since desludging was also considered an essential service, CSE helped desludging operators to get emergency service passes from local authorities, especially when movement was restricted during the lockdown.

Some of the key support activities carried out by CSE across 15 ULBs during COVID time included:

- Distributed over 1,500 PPE kits and thermal scanners
- Installed foot-operated hand-washing stations for sanitation workers
- Conducted field-level orientation sessions on health and safety for sanitation workers
- Organised online state-level training sessions for sanitary inspectors
- Developed a technical guidebook for sanitary inspectors to help ensure worker safety
- Launched IEC campaigns promoting COVID-safe practices through wall paintings, slogan writing, and audio messages in Hindi and Urdu
- Created an online repository featuring government advisories, best practices, communication materials, and blogs related to COVID-19

Resuming the work in Chunar and Bijnor: As the initial wave of COVID-19 passed, construction activities gradually resumed. CSE, through its technical support units (TSUs) in Chunar and Bijnor, closely supported the ULBs and





Bijnor co-treatment plant (20 KLD), commissioned in July 2022



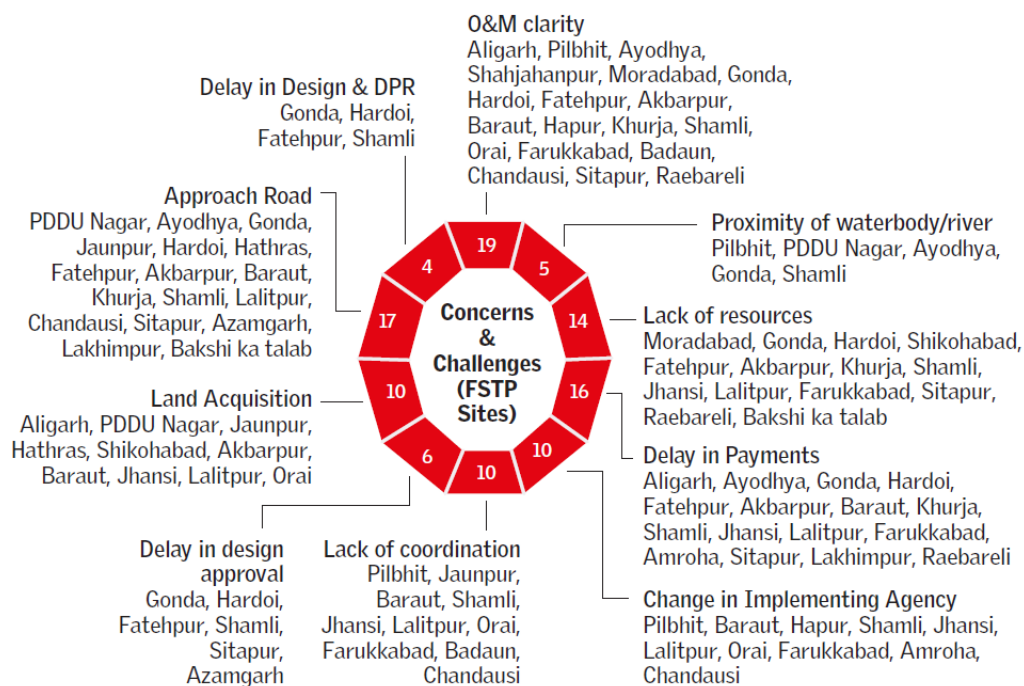
Chunar FSTP (10 KLD), commissioned in September 2022

monitored the progress of the treatment plants on a daily basis. The construction work on both plants began in 2021, and they were successfully commissioned by September 2022.

4.5 Implementation support during the construction phase

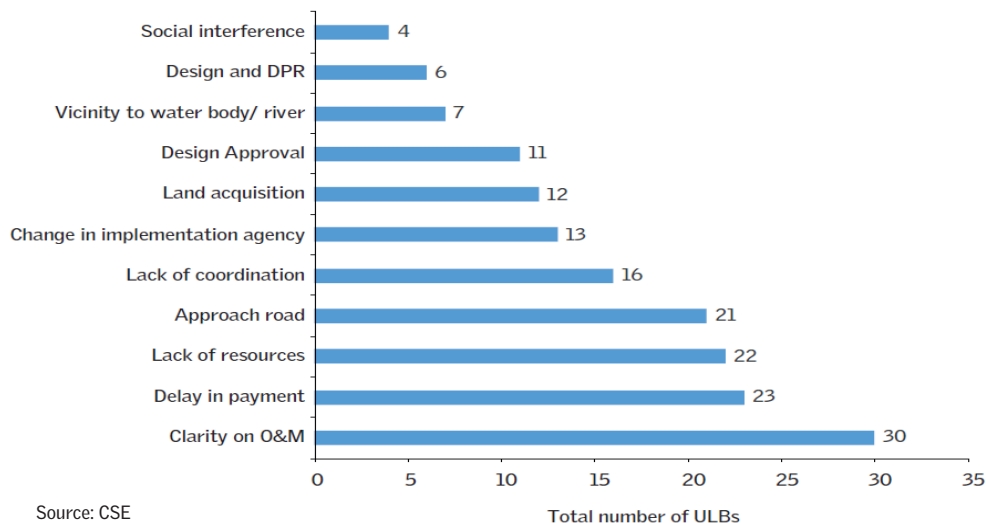
The construction also started on other plants that had been sanctioned by the UP Jal Nigam. As COVID-related travel restrictions eased, CSE team visited all the cities where FSTPs and co-treatment facilities were under construction. These

Figure 10: Concerns and challenges at FSTP sites in UP



Source: CSE

Figure 11: Challenges faced by ULBs



Visit to FSTP at Pilibhit

visits aimed to assess the physical progress in the infrastructural work, map the treatment chains, and identify the challenges faced during the construction phase.

The findings from the field visits were documented in a report titled *Septage management for citywide inclusive sanitation in Uttar Pradesh*, released in 2022. CSE's field findings and recommendations enabled the state to identify and address key bottlenecks, such as poor approach roads, limited resources, and delays in design approvals, which helped fast-track the construction process.

Initially, 35 FSTPs and 21 co-treatment plants were proposed under the AMRUT scheme. However, due to land unavailability and other challenges, one FSTP and

Map of Uttar Pradesh showing the distribution of FSTP, Co-treatment, and Both projects. The map is color-coded: blue for FSTP, red for Co-treatment, and green for Both. Projects dropped are indicated by a pink outline. The map shows a high density of projects in the western and central parts of the state, with a significant number of projects dropped in the eastern part, particularly in Ballia, Ghazipur, and PDDU Nagar.

two co-treatment plants had to be dropped from the original plan.

Table 1: Overview of FSSM plants in UP

Source: CSE

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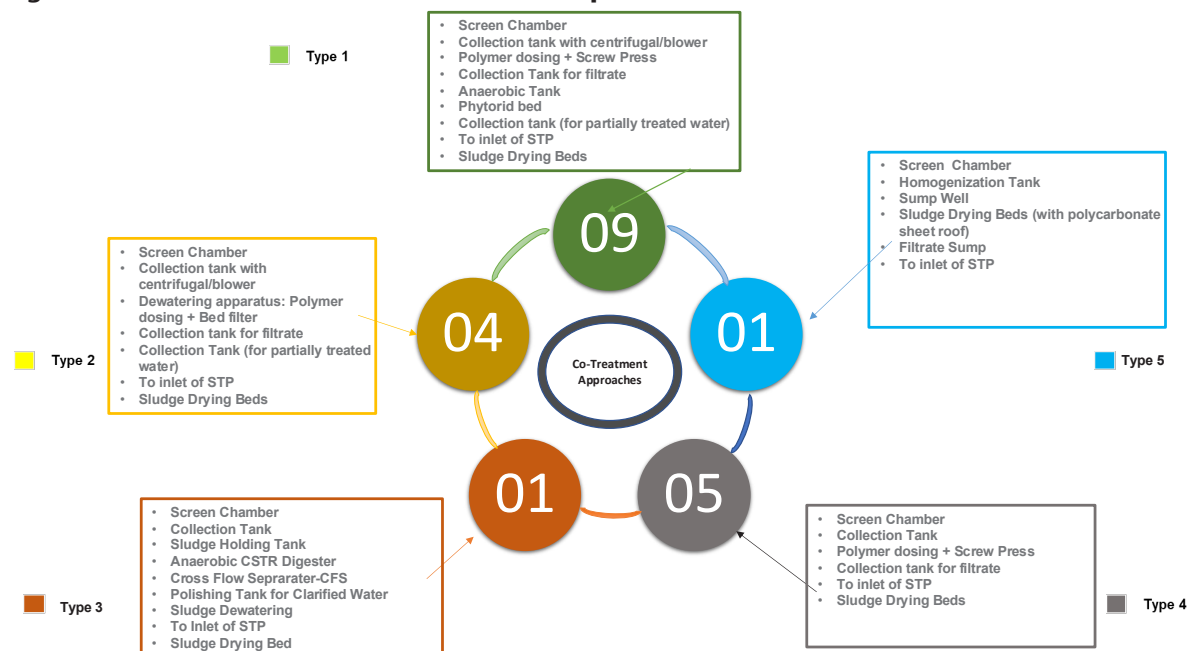
and co-treatment plants. This documentation later helped in designing focused training for plant operations and maintenance, and assessing the resources required at the city level to ensure smooth functioning of the plants.

In Uttar Pradesh, the 39 FSTPs can be broadly categorised into two types—hybrid and nature-based systems (NbS). Most FSTPs follow a hybrid model, primarily using screw press technology for solid-liquid separation. The nature-based systems include two variations—Planted Drying Beds (PDBs) and Tiger Bio-Filters (TBFs), which use tiger worms for treatment.

Figure 12: Treatment chains of FSTPs in UP



Figure 13: Treatment chains of co-treatment plants in UP



5. Operationalising the plants and moving towards sustainability

5.1. Celebrating a milestone: Transitioning to operational phase

With the majority of FSTPs and co-treatment plants nearing completion, the focus began shifting from construction to their operationalisation. To mark this milestone and encourage peer learning, the State government, in collaboration with CSE, organised a National Workshop on the occasion of World Water Day, 21st and 22nd March, 2023.

The workshop aimed to showcase Uttar Pradesh's progress in FSSM and draw lessons from other states working towards sustainable and inclusive sanitation and water management. The workshop discussed on policy and programmatic priorities for a successful transitioning from infrastructure provisioning to sustainable and inclusive sanitation.



State Urban Development Minister digitally inaugurated 25 FSTPs and 10 co-treatment plants



Glimpses of the national workshop on the occasion of World Water Day, 21-22 March, 2023

The workshop was attended by around 400 participants which includes officials from Municipal Corporations, Nagar Palika Parishad, Jal Kal and Jal Nigam and sector experts from other states. The workshop brought together experiences from other states in India and discussions on thematic topics, making it a learning event for all.

A key highlight of the event was the inauguration of 25 FSTPs and 10 co-treatment plants by the Hon'ble Urban Development Minister of Uttar Pradesh, Mr. Arvind Kumar Sharma, marking a significant step forward in the state's sanitation journey.

5.2. Enabling the operationalisation and ensuring sustainability

The transition from construction to the operational phase marked a critical shift for the state. To support this, CSE continued its engagement at both state and city levels. Between 2023 and 2025, CSE made over 250 visits across 56 cities to identify on-ground issues and challenges. These learnings were shared with the Department of Urban Development (DoUD), and CSE supported in the development of guidelines, advisories, and technical documents as per the city's requirements.

At the state level, in collaboration with DoUD through the SBM and AMRUT offices, CSE facilitated regular online and in-person review meetings, organised training programmes, and actively engaged with stakeholders at multiple levels. At the city level, CSE worked with elected representatives, ULB officials, sanitation inspectors, engineers from ULBs, Jal Kal and Jal Nigam departments, and plant operators or contractors to ensure effective FSSM operations.

The following key initiatives were undertaken at the city level to support the operationalisation of the treatment plants. The state issued multiple directives and provided a step-by-step approach to guide ULBs through this process.

- **Establishing city-level institutional frameworks**

- o **City-level FSSM bye-laws:** As the plants were ready to operate, it was essential to establish clear city-level regulations to streamline faecal sludge management. To support this, CSE developed *State Model Bye-Laws for Faecal Sludge and Septage Management*. The state government issued the model FSSM bye-laws to all ULBs of Uttar Pradesh, with directions to contextualise them as per local requirements.



WORLD TOILET DAY 2023: MOVING BEYOND TOILETS

The state took a proactive role in encouraging ULBs to pursue higher standards of sanitation. In alignment with this vision, and to foster discussion on pathways to achieving safe and inclusive sanitation, the Department of Urban Development (DoUD), in collaboration with CSE, organised a state-level workshop on the occasion of World Toilet Day, held on 17th November 2023.

Addressing the gathering, Dr Nitin Bansal (IAS), Director, Urban Local Bodies, UP said: "From our target of making UP open defecation free, we have now moved towards higher goals—ranging from ensuring sustainability of sanitation infrastructure, addressing septage management, upgrading public toilets, and focusing on inclusion of women and marginalised communities on a priority basis. To do all this, the state government is working together with its partners, including CSE."



Model FSSM Bye Laws, Model Contract document and ESM report launched by the Director, DLB UP

CREDIT: CSE



City officials attending the workshop

CREDIT: CSE

The bye-laws defined the roles and responsibilities of ULBs, private desludgers, and citizens, and included provisions for desludging fees and penalties for improper disposal. The process of formal notification through the state gazette involved several steps, including city-level approvals, public consultations via newspaper publications, and final state-level notification.

To ease this process, CSE organised a state-level training to help city officials through drafting and gazette notification procedures. As a result, the number of cities with gazette-notified FSSM bye-laws increased from one in 2023 to six in 2024, and further to 17 in 2025. In addition, 17 more cities have submitted bye-laws for final notification, and seven cities have already passed them in their municipal board meetings.

- o **Registration of private desludging operators:** Emptying and transportation is the most critical component in sanitation service chain as it serves as a bridge between containment system and the treatment plant. This is also an integral part while developing city-level FSSM bye-laws. Out of 56 ULBs, private operators are active in around 50 ULBs for providing desludging services. Streamlining their operations is critical in ensuring regular sludge and prevent indiscriminate dumping of septage in water bodies or open lands.

To ensure identification, registration, and licensing of private desludging operators, CSE facilitated the registration drive at the city level. CSE also prepared the required format for the registration and licensing, which were issued by the state government to ULBs.

Till 2025, around 270 private operators were registered by the ULBs. However, the actual operators working on the ground is much more. There is still a need to put efforts on the registration and monitoring of private operators to ensure they discharge the sludge only at the plant.

- o **Determination of city-level desludging fees—Desludging fee calculator:** Linked to the above, another important component is determining appropriate desludging fees. A study by CSE in selected cities of Uttar Pradesh showed a wide variation in

Registration No. - 10562122000372 New Trade Licence

उत्तर प्रदेश सरकार
Government Of Uttar Pradesh
Loni Nagar Palika Parishad
अनुमति प्रमाण पत्र
Licence Certificate

उत्तर प्रदेश सरकार अधिनियम 1988 की धारा 54(1) की धारा 28, 36, 41 व 43 से जारी है

SEWER JETTING MACHINE LICENCE

नाम Name	MOHD SAMIM
पति / पति का नाम Father / Husband Name	MOHD SADIK
अनुमति संख्या Acknowledgement No	LP09821220000410
दुकान / दुकान का नाम TradeShop Name	UP17R6576
दुकान / दुकान का पता TradeShop Address	INDRAPURI WARD 18
राजस्व शुल्क Registration Fees	1000 (Paid for 1 years)
मशीन नंबर Machine No	9821813061
रजिस्ट्रेशन अवधि Registration for	3 years(01/04/2021 to 31/03/2024)
वैधता अवधि Validity for	1 years(01/04/2021 to 30/03/2022)
पता Place	Loni
रजिस्ट्रेशन की तिथि Date of Registration	01/01/2001

For Certificate Verification please visit <https://www.e-nagarewap.gov.in>

Signed by Shalini
Date: 22-02-2022 14:21:19
Reason: Trade Licence Certificate

License issued to private desludging operator by Loni Nagar Palika

Figure 14: Excel-based desludging calculator

Do not change

User input cell

Desludging Cost Calculator		
Cost Component	Default Value	User Input
No. of trips (Per annum)	1000	0
Avg Dist covered per desludging (KM)	18	0
Avg Distance covered Per Year	18000	0
Fuel cost per year	₹ 4,05,000	₹ 0
Driver's Sal per year	₹ 1,82,500	₹ 0
Helper1 Sal per year	₹ 1,46,000	₹ 0
Maintenance per year	₹ 35,000	₹ 0
Registration/license per year	₹ 5,000	₹ 0
Insurance of vehicle per year	₹ 10,000	₹ 0
PPE per year	₹ 5,000	₹ 0
Other exp per year	₹ 15,000	₹ 0
Interest Charges on Vehicle Per Annum	₹ 26,300	₹ 0
Office Cost (yearly)	₹ 1,20,000	₹ 0
Admin & General (yearly)	₹47,490.00	₹ 0
Profit per annum	₹ 0	₹ 0
Total Desludging Cost Per Annum	₹ 9,97,290	
Desludging cost Per trip	₹ 997	
Desludging fee per trip	₹ 1,200	
Profit per trip	₹ 203	
Government subsidy	₹ 0	

Source: CSE

fees, ranging from Rs 500 to Rs 3,500 per trip. However, there was a lack of clarity on how ULBs arrived at these rates. Without affordable desludging fees, ensuring inclusive sanitation services remains a challenge.

To address this, CSE developed a simple desludging cost or fee calculator to support cities in determining city-specific, desludging fees. The calculator is based on two primary cost components—the distance travelled by the vehicle per trip and the number of trips made per day. Subsequently, the

state government issued a directive asking cities to use the cost calculator while determining their desludging fee.

Following the use of the desludging cost calculator, many cities revised their desludging fee. For instance, Pilibhit and Moradabad, which previously charged up to Rs 3,000 per trip, have now revised their rates; Pilibhit to Rs 2,000 and Moradabad to Rs 1,500 per trip.

• Plant handover

In UP, most of the treatment plants were constructed by the Uttar Pradesh Jal Nigam and were subsequently handed over to the ULBs for operation and maintenance. However, ULB officials were not involved during the planning and construction phases. This lack of engagement led to suspicion among ULBs regarding the functionality and construction quality of the plants, causing significant delays in the handover process, which extended over a year.

To address this, CSE facilitated city-level multi-stakeholder meetings involving contractors, ULBs, and UPJN officials to streamline the handover. As a result, all operational plants have now been transferred to ULBs, except one in Meerut.

Despite the progress, the handover process remained inadequate. In most cases, handover was limited to a basic one-page inventory, with no accompanying detailed

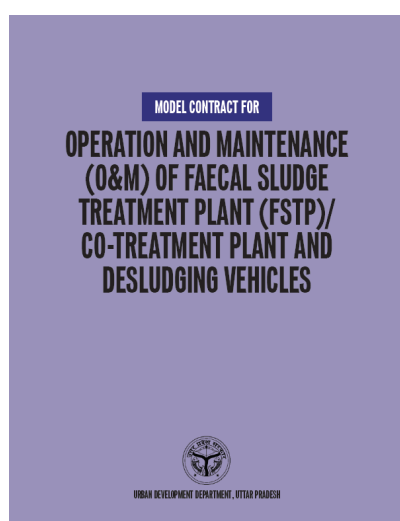
project reports (DPRs), warranty documents, or operation and maintenance manuals. This incomplete documentation led to challenges for ULBs in managing plant operations and claiming warranty-based repairs.

- **Operation and maintenance of the plants**

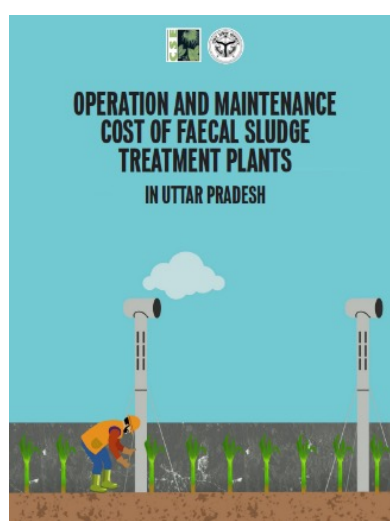
As the plants were handed over by Jal Nigam to ULBs for operations and maintenance (O&M), they were not clear regarding the mode of operations. The State government informed ULBs that they are free to manage the plants either by themselves or by engaging any contractor or women self-help groups (SHGs). To operationalise the treatment plants, CSE provided the support at multiple fronts, such as support for establishing O&M arrangement, budgeting for O&M cost, and SOPs for operation and maintenance of the plants.

- o **Model contract for engagement of Contractors for O&M:** Since this was the first time ULBs were given the responsibility of managing liquid waste/FSSM plants, they requested support in drafting appropriate terms and conditions for engaging contractors for the O&M of these plants. To ensure speedy engagement of contractors for the O&M of plants, CSE prepared a *Model Contract for engagement of Contractor for O&M of FSSM plant*, which was issued by the state.

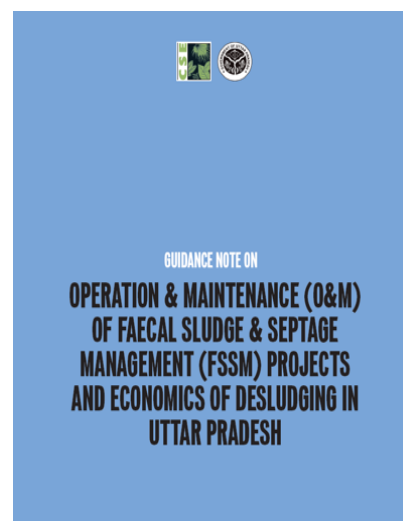
Currently, contractors are managing 32 plants, with ULBs managing 22 plants and SHGs engaged in four plants. One of the plants—the co-treatment plant in Ayodhya—still does not have any O&M mechanism in place.



Model Contract for engagement of Contractor for O&M of FSSM plant



Operation and maintenance cost of FSTPs in UP



Guidance note on O&M FSSM projects and economics of desludging in UP

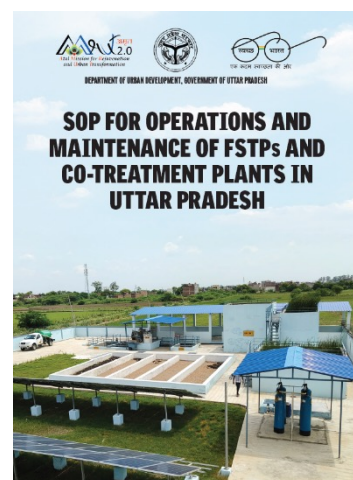
As the sustainability and efficiency of these plants heavily depend on robust operation and maintenance mechanism, CSE assessed the existing O&M arrangements across 21 ULBs. The evaluation covered cost-effectiveness, performance efficiency, financial sustainability, as well as governance mechanisms in plants managed by ULBs, self-help groups, and contractors. Based on the findings, CSE provided actionable recommendations to enhance operational efficiency, streamline financial mechanisms, and strengthen oversight.

- o **State guidelines on O&M costs:** As mentioned earlier in section 4.2, the NIT for construction of FSTPs or co-treatment plants also included a clause for operation and maintenance for a period of five years. The existing contracts between the UPJN and the contractors responsible for construction of the plants indicated a heavy amount for O&M—Rs 1.25 crore per year for O&M of a 32 KLD plant. This generated a misconception among the ULBs that O&M was to be done only by those contractors. This has discouraged the ULBs from running the plants on their own due to lack of funds. Therefore, it was crucial for the DoUD to guide cities on the costing of the plants and allowing flexibility to ULBs to run the plants.

Cities required guidance from the state government on the O&M costing of the plants. Therefore, CSE did a study on the costing of plant operations in the UP context. The state government, based on the findings of the CSE study, issued a letter mentioning the cost figures for the O&M of plants. Cities were suggested to delink O&M costing of plant operations from the costing of desludging services.

- o **Standard operating procedures for O&M of plants:** Uttar Pradesh has a variety of treatment chains across its FSTPs and co-treatment plants. As mentioned earlier, contractors did not provide operation manuals to the ULBs, which created significant challenges for plant operations.

To address this gap, DoUD, with support of CSE, developed *Standard Operating Procedures (SOPs) for the operation and maintenance of FSTPs and co-treatments plants in Uttar Pradesh*, tailored specifically to the treatment technologies adopted in the state. These SOPs aimed to equip plant



SOP for O&M of FSSM Plants

operators, engineers, and ULB officials with a clear and comprehensive understanding of the required O&M practices. The document also serves as a reference for regular monitoring and ensuring long-term, sustainable plant operations. To make the SOP easier to understand and follow, especially for city officials and plant operators, the SOPs were also translated into Hindi.

To support operators and engineers in ensuring effective plant operations, CSE developed daily and monthly checklists customised to each city's specific treatment chain. These customised checklists were later adopted and issued by city officials to plant operators or designated nodal officers. The checklists provided step-by-step guidance for daily operations and defined preventive measures on both daily and monthly basis, helping to minimise the risk of plant breakdowns and ensure smooth functioning.

Additionally, CSE has organised multiple training programmes for city engineers, SHG members, and plant operators to build their capacity in effectively managing the operations and maintenance of these plants.

- Plant-level technological upgradations:** As the FSTPs and co-treatment plants became operational, several encountered challenges arising from technical, design, or construction-related issues. For example, all co-treatment plants were found to lack filter media in the sludge drying beds



Before: Directly pumping the septage After: Pumps removed from the place, screen chamber constructed followed by pumping of septage

Technological upgradations: Case of Agra co-treatment plant

(SDBs), and many had poorly designed screen chambers and sludge drying beds. Additionally, some co-treatment plants in cities like Agra, Varanasi, Prayagraj, Ghaziabad, and Meerut faced issues with non-compatible inlet points, hindering the smooth discharge of septage.

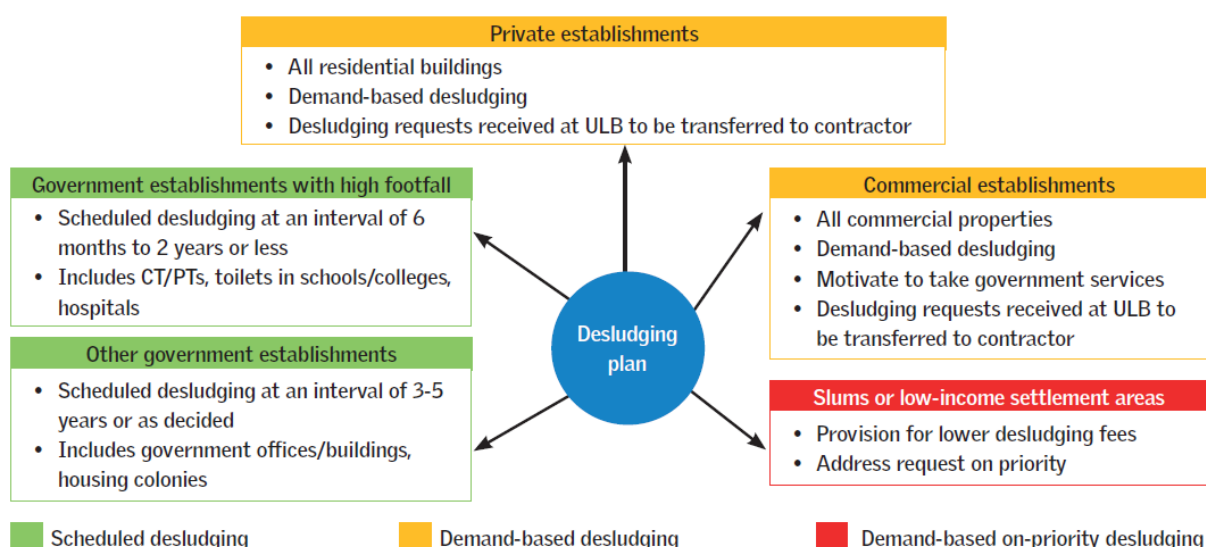
Similarly, a number of FSTPs experienced technical difficulties. Plants in Mirzapur, Farrukhabad, and Jhansi had undersized screening chambers and septage discharge points, while those in Khurja, Amroha, Baraut, and Shamli lacked properly constructed ramps near the sludge drying beds, making it difficult to manage dewatered sludge.

To resolve these issues and ensure smooth operations, CSE provided targeted technical support to address plant-specific challenges. This included redesigning screen chambers, guiding the construction of ramps, and suggesting corrective measures tailored to each plant's requirements.

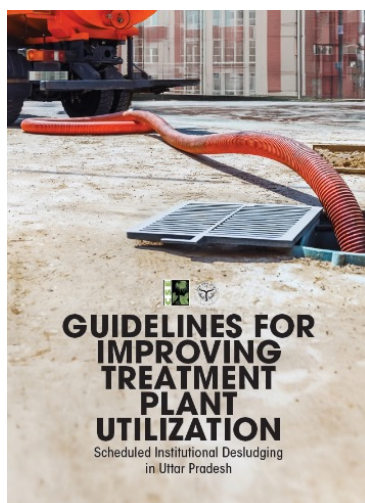
- Enhancing capacity utilisation**

- State guidelines for improving plant utilisation:** As the treatment plants became operational, many plants faced challenges in receiving an adequate quantity of faecal sludge regularly. To address this, with support from CSE, the state developed and issued guidelines to enhance treatment plant utilisation through preparation and implementation of a structured desludging plan. A key feature of this guideline is the combination of

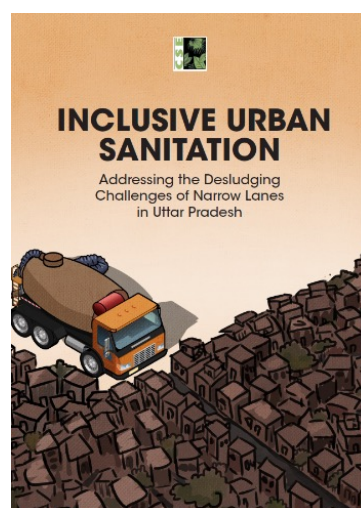
Figure 15: Components of city-level desludging plan



Source: CSE



Guidelines for improving treatment plant utilization



Report on addressing desludging challenges in narrow lanes

institutional scheduled desludging with demand-based desludging, its focus is on scheduled desludging of septic tanks in all government-owned or managed establishments. This includes, but not limited to, community and public toilets (especially those with high footfall), government offices and buildings, housing colonies, Avas Vikas complexes, educational institutions, hostels, government hospitals and healthcare facilities, and community halls.

- o **Improving accessibility in narrow-lanes:** The small and medium towns of UP are also facing challenges in providing desludging services in areas with narrow lanes (road width less than 7–8 feet). A major hurdle is the difficulty in accessing septic tanks located in these constrained spaces, particularly in older parts of towns and unplanned settlements. To address this, CSE conducted a study across four towns to better understand the desludging issues in such areas. Based on the findings, CSE proposed practical solutions, including the use of smaller-sized desludging vehicles and double-boosting pump sets to extend the reach and effectiveness of desludging operations.
- **Safe reuse of treated water and biosolids**

As septage is treated in FSSM plants, two main end-products are generated—treated water and biosolids. In most FSTPs, the treated water is reused within the plant premises for purposes such as gardening. However, there are exceptions—such as Jhansi and Moradabad—where the treated water is also being utilised for road cleaning and watering plants in city parks and along roads. In co-treatment plants,

treated water is reused in the same manner as treated sewage from STPs, facilitating reuse in areas like thermal power plants, agriculture, and industrial reuse.

Despite progress in water reuse, the management of biosolids remain a significant challenge. With the current plant utilisation, UP is generating around 7,500 tonne of biosolids in a year and has the potential to produce around 19,000 tonne of biosolids from FSSM plants. However, CSE's laboratory analysis² highlighted that the biosolids contain high levels of pathogens, making them unsuitable for direct



Reuse of treated water in Moradabad Nagar Nigam



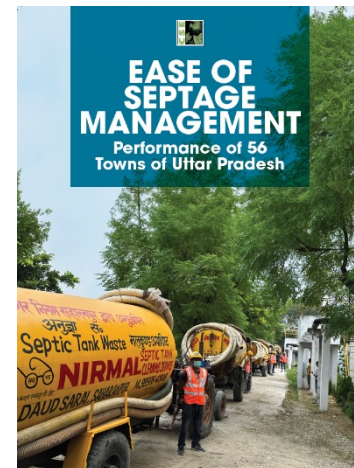
Co-composting in Bakshi Ka Talab Nagar Panchayat

application in agriculture. They require an additional level of treatment before safe reuse.

To address this challenge, CSE organised an online training programme on co-composting practices across India and also initiated a pilot project on co-composting of biosolids with solid waste in five ULBs (Loni, Raebareli, Bakshi Ka Talab, Deoria, and Amroha) of Uttar Pradesh. With technical support from CSE, these ULBs are piloting co-composting through various methods such as windrow, pit, and drum composting. The findings and learnings from these pilots will support the development of guidelines to help other ULBs adopt and scale up co-composting practices.

• Regular monitoring

- Record-keeping:** To enable plant utilisation monitoring and make informed decision, uniformed record-keeping at the city-level was very critical. To support this, DoUD, with the support of CSE, prepared and issued the guidelines for maintaining records related to desludging operations and septage treatment. It included the data to be maintained at the plant level and at the ULB level. Another format for monthly reporting was also prepared to capture the monthly data on plant utilisation, reuse of end-products and any issue related to plant operations.



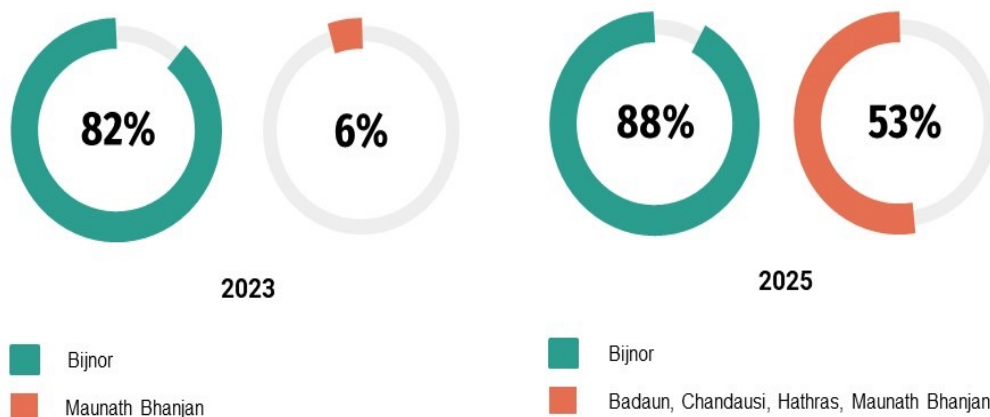
Ease of septage management report

Star rating

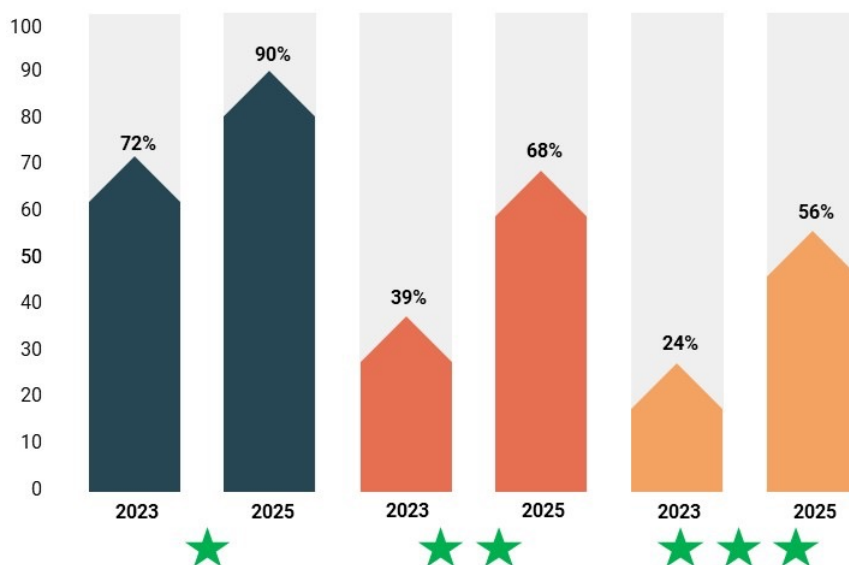
	★	★★	★★★
2023	Aligarh, Bijnor, Chunar, Jhansi, Hapur, Loni, Shamli (7)	None qualified	None qualified
2025	Chunar, Bahraich, Jaunpur, Ayodhya, Basti, Deoria, Gonda, Varanasi, Mirzapur, Aligarh, Sitapur, Akbarpur, Sultanpur, Mainpuri, Kanpur, Firozabad, Sikohabad, Bijnor, Saharanpur, Ghaziabad, Moradabad, Rampur, Shamli, Hapur, Khurja, Meerut, Jhansi, Lalitpur, Unnao, Bakshi Ka Talab (30)	None qualified	None qualified

Cities leading the way

Best and Worst compliance towns



Category wise compliance



- o **Assessment of sanitation performance of cities—Ease of septage management tool:** To assess the performance on ULBs on the functionality, sustainability, and inclusivity of city sanitation services, the ESM tool—a star-rating tool for a friendly competitive ranking of towns and cities—was developed by CSE.

The ESM tool, containing 34 same-weighted indicators, was applied first time in 56 cities in October 2023. The findings of the report, shared in a state-level workshop, indicated that only seven cities managed to secure 1-star rating and no city achieved 2- or 3-star rating (see *Star rating* above).

As cities began working towards higher levels of sanitation service delivery, many showed significant progress in terms of functionality, inclusivity, and sustainability. Overall, the number of cities with a one-star rating increased from seven in 2023 to 30 in 2025.

Bijnor remained the top performer across all the categories (see *Best and Worst compliance towns* above).

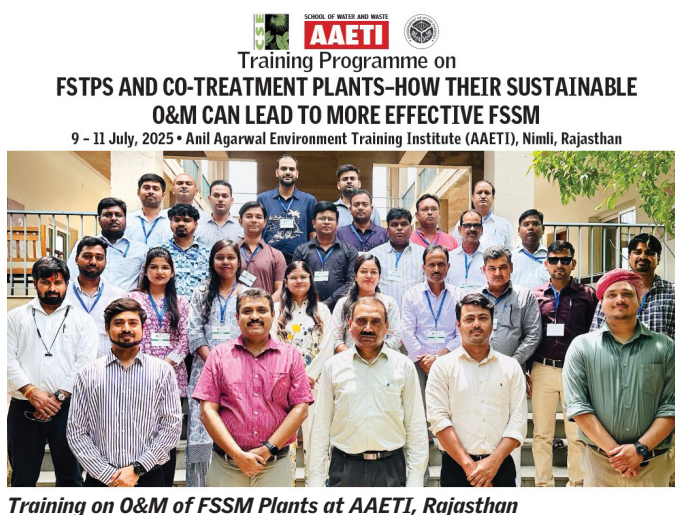
The progress was also seen at the indicator level. The share of indicators meeting the two-star category increased from 39 per cent to 68 per cent, while compliance with the three-star indicators increased from 24 per cent to 56 per cent (see *Category-wise compliance* above).

• Capacity-building

Capacity-building on the operational, management, and technical aspects is crucial, especially when FSSM plants are handed over to ULBs, who have limited experience in managing such plants.

To bridge this gap, CSE conducted a series of online and on-site training programmes and workshops for officials from AMRUT, SBM, UPJN, and ULBs. These

programmes were aimed to build comprehensive understanding of sanitation systems, with a focus on FSSM. Two training programmes that played a critical role in operationalising the plants focused on the operation and maintenance of treatment plants and the formulation of FSSM bye-laws at the city-level. These were specifically designed for executive officers and engineers from ULBs, Jal Kal departments, and plant operators.



The capacity-building initiatives also included exposure of state and city officials to various national best practices on FSSM. The exposure visits were organised to states like Odisha, Tamil Nadu, and Karnataka, enabling ULB officials to learn from successful models of community engagement and innovative approaches to solving sanitation-related challenges.



Glimpses of various IEC activities in different cities

EMERGING AS A GLOBAL LEARNING MODEL ETHIOPIAN DELEGATION'S VISIT TO UTTAR PRADESH

UP's work on FSSM has started gaining international recognition. In 2023, a high-level 12-member delegation from Ethiopia, including officials from Ethiopian Ministry of Water and Energy, Ministry of Finance and Prime minister's office, and representatives from regional offices and urban service authorities, visited FSTPs and co-treatment plants in UP to study the state's approach to faecal sludge management. The visit was part of a Knowledge Exchange Programme, facilitated by CSE to showcase practical and scalable sanitation models.

The delegation interacted with the officials from Department of Urban Development, Uttar Pradesh and discussed about the scaling-up of FSSM in Uttar Pradesh and what Ethiopia can learn and adopt from it. During the visit, the delegates visited the FSTP in Raebareli, Jhansi, and Chunar, and the co-treatment plant in Varanasi. They witnessed the implementation of FSSM services at the city-level; they interacted with plant operators, SHG members, and city officials to understand how a decentralised and non-sewered sanitation system can be sustained at the city-level.

The Ethiopian team appreciated UP's progress, particularly the combination of policy support, phased infrastructure rollout, and institutional support for sustaining the initiative. The visit highlighted UP's emergence as a leading example of how to scale effective FSSM solutions in developing contexts.



Meeting with Officials from Department of Urban Development, UP in Lucknow



Visit to Jhansi FSTP



Visit to I&D STP in Varanasi



Visit to Raebareli FSTP



Discussion with city officials in Jhansi



Visit to Varanasi co-treatment plant



Visit to Chunar FSTP

• **Community awareness programme**

In UP, implementation of FSSM is still at a nascent stage. Thus, to raise awareness among citizens at the city level, communication strategies were designed with a focus on promoting the construction of proper septic tanks and encouraging regular desludging practices. With support from CSE, the Department of Urban Development (DoUD) launched statewide IEC (Information, Education, and Communication) campaigns in two phases—first from January to March, 2024 through SBM funding, and the second one from August to November, 2024 under AMRUT.

To help cities in effective implementation of these campaigns, CSE developed and compiled a range of IEC collaterals. A variety of awareness activities were carried out during the campaign period, including stakeholder meetings, exposure visits to FSSM plants, hoardings, wall paintings, and branding or slogan writing on desludging vehicles.

5.3 Mainstreaming gender through women SHGs in FSTP operations

As part of a pioneering gender inclusion effort, UP took active part in the AMRUT Mitra initiative, under the collaboration of AMRUT 2.0 and DAY-NULM, focusing on engaging self-help groups (SHGs) in urban water and sanitation infrastructure. The initiative was launched by the Ministry of Housing and Urban Affairs (MoHUA) in March, 2024 to commemorate International Women's Day, with the theme of



Site visit of potential SHGs to Jaunpur FSTP



SHGs engaged in group activity during training at Raebareli FSTP



SHG members working in Khurja FSTP



Training programme at Sitapur FSTP



Manisha, SHG Supervisor, Sitapur FSTP

"When I first joined as a supervisor at the FSTP, my family was worried, mainly about my safety and how I would manage work along with taking care of my children. Even officials had doubts if I could handle the responsibilities over time.

But now, after one year on the job, I'm proud to say I've not only proved them wrong but gained their full support. My family is happy and relieved, and I'm proud to be able to support them financially while doing meaningful work."

"Women for Water, Water for Women." It highlighted the crucial role of women in driving sustainable water and sanitation solutions, while also empowering them through meaningful participation in urban infrastructure services.

Under this initiative, four cities namely, Sitapur, Khurja, Raebareli, and Jaunpur, were selected to pilot SHG-led operations and maintenance of FSTPs. The state

executed 87 projects under the broader AMRUT Mitra initiative, engaging a total of 804 women, out of which 16 women were specifically trained and engaged for O&M responsibilities at FSTPs. In each city, a four women team was deployed—consisting of a supervisor, two sanitation workers, and one gardener. A dedicated budget of Rs 8.5 lakhs was allocated for SHG engagement in each FSTP.

CSE worked in close coordination with the AMRUT Mission and the State Urban Development Agency (SUDA), Uttar Pradesh, and provided technical support for this pilot initiative since its inception in March 2024. CSE played a key role in enabling smooth coordination between AMRUT, SUDA, District Urban Development Agency (DUDA), ULBs, and SHG members to operationalise activities at both state and city levels. The following are the key activities undertaken for the engagement and capacity-building of SHGs:

- Budgeting and proposal development:** To operationalise the project, a tentative budget was prepared with support from CSE. The budget accounted for the engagement of four SHG members per FSTP, along with other expenses related to operation and maintenance. Based on this, the proposal was submitted through the government's online portal for necessary approvals.



O&M and safety precautions panel installed in Jaunpur FSTP

- o **SHG identification and onboarding:** The AMRUT and SUDA, with support from CSE, initiated the selection and onboarding of SHG members across four cities. The identification process began in March 2024, immediately following the announcement of the initiative. During this phase, CSE provided technical support and field-level facilitation by visiting all four FSTPs. This included conducting preliminary orientation sessions for SHG members, assisting in the identification and selection of suitable candidates as per the AMRUT Mitra guidelines, and facilitating the finalisation and issuance of work orders.
- o **Capacity-building of SHGs:** Following the onboarding and preliminary orientation of SHGs, CSE conducted training needs assessments (TNA) to design an effective capacity-building programme. Based on the findings from the TNAs, CSE developed tailor-made training modules and provided two rounds of hands-on training aimed at equipping SHGs with the practical knowledge required for FSTP operation.

This initiative has been renewed from June 2025 after successfully running for a year, which represents a significant progress, showcasing how structured support and capacity-building can empower women to take on leadership roles in managing critical sanitation infrastructure.



Lab scientist conducting titration for Total Kjeldahl Nitrogen analysis



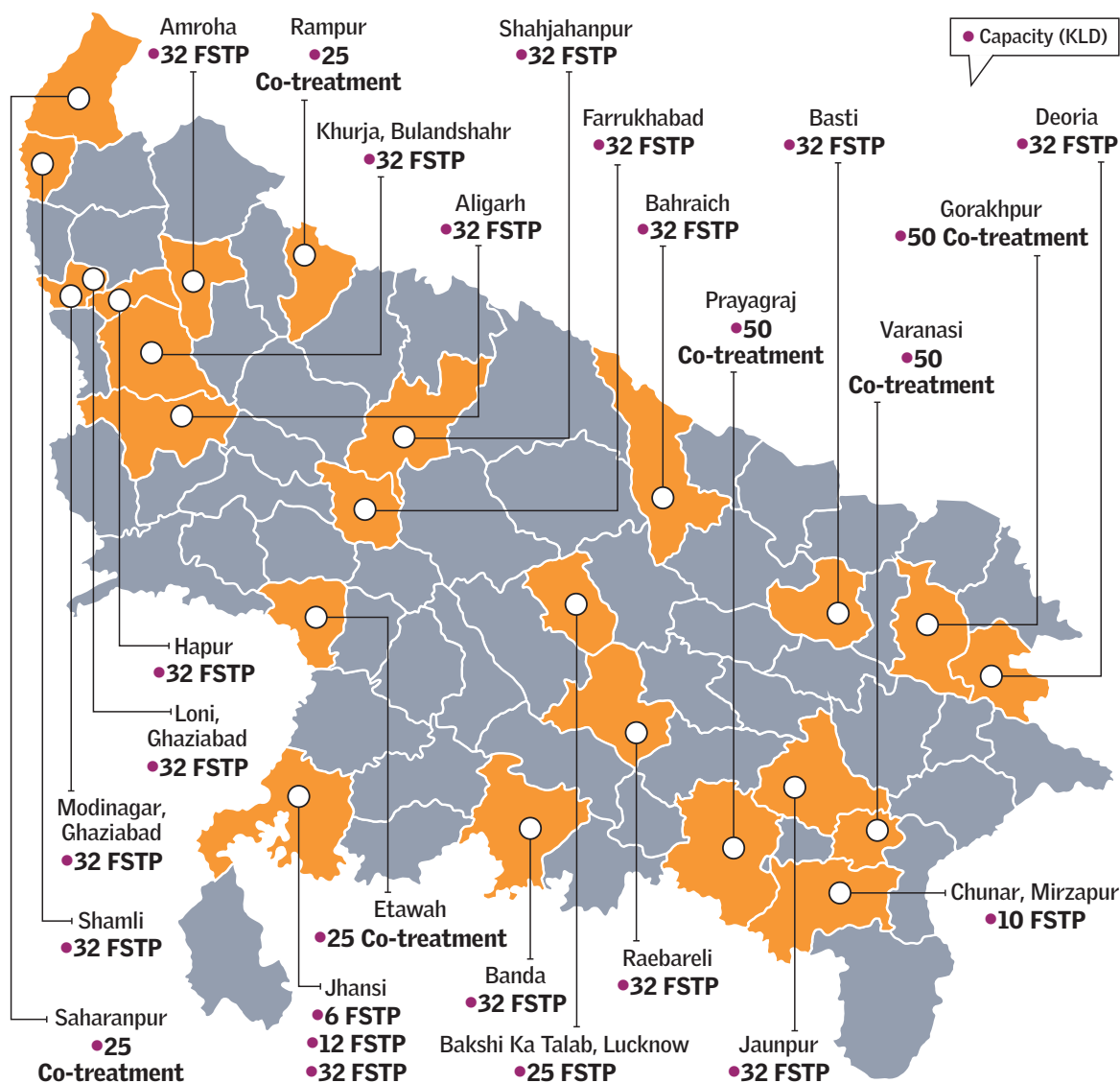
Biosolids sample collection from Farrukhabad Nagar Palika

5.4 Monitoring plant effectiveness through laboratory analysis

Mere operation of FSTPs is not enough to ensure environmental and public health safety. The effectiveness of these systems must be tested against performance standards set by national (CPCB and National Green Tribunal) regulatory authorities. Recognising this need, the Environmental Monitoring Laboratory of CSE undertook an assessment of selected treatment plants as they became operational.

CSE lab team conducted sampling in two phases across a total of 26 treatment plants (20 FSTPs and six co-treatment plants) over a six-month period in the first phase, and five months in the second. The samples were collected from four points—raw faecal sludge from desludging vehicle, inlet after solid-liquid separation, treated water at the outlet, and biosolids.

Map 2: Treatment plants where CSE conducted laboratory testing



Source: CSE

For treated water, the following physico-chemical parameters were analysed—pH, Total Solids (TS), Total Suspended Solids (TSS), Total Dissolved Solids (TDS), Chemical Oxygen Demand (COD), Biological Oxygen Demand (BOD), Total Kjeldahl Nitrogen (TKN), Ammoniacal Nitrogen (TN), Total Phosphorus (TP), and Faecal Coliforms (FC).

Similarly, for biosolids, the parameters included—pH, Electrical Conductivity (dS/m), Carbon, Nitrogen, Heavy Metals, Faecal Coliforms, *E. coli*, Salmonella, and Helminth Eggs.

Since India currently does not have specific regulatory standards for biosolids, the results were compared against benchmarks set under the Fertilizer Control Order (FCO) of 2009 and 2013.

Key findings

- o *Treated water quality*: Most of the plants met the required standards for treated water, showing compliance with parameters like pH, BOD, COD at the outlet. Although, meeting standards for Faecal Coliform (FC) is still a challenge in several locations.
- o *Biosolid quality*: On the other hand, the biosolids produced at many plants were found unsuitable for direct reuse in agriculture, largely due to the presence of pathogens (due to inadequate drying), high levels of Faecal Coliform and *E. coli*, and heavy metals. The biosolids also showed high nitrogen but low carbon content, making them imbalanced for direct land application as fertilizer.

The findings were shared with the State, and plant-specific recommendations were also communicated to the respective ULBs to facilitate necessary changes in operational protocols or upgrades required to improve plant performance.

6. Key challenges faced so far

While Uttar Pradesh's journey in FSSM has made significant visible progress, it presents many key learnings. Many challenges have emerged across the sanitation service chain, from inadequate planning and implementation to capacity gaps. These challenges offer lessons on how institutional strengthening and contextual support is very critical for operationalising and sustaining any initiative.

- o **Policy and institutional gaps:** While the state came out with its FSSM Policy in 2019, the roll-out on the ground has been inconsistent. Despite policy mandates, there is no clear accountability mechanism within ULB structures for sustained sanitation service delivery.

Similarly, many ULBs formulated their city-level FSSM bye-laws. However, its implementation is not even planned yet.

- o **Planning and design shortcomings:** The one-size-fits-all approach to faecal sludge treatment plant capacity was not aligned with actual sludge generation and city typologies. This led to underutilisation of plants in many cities. Also, in many cities, treatment chain—particularly in co-treatment plant with secondary treatment modules—was over-designed and also overlooked local climatic conditions, affecting operational efficiency. Similarly, while installing solar panels in FSTPs was a progressive step toward sustainability, but the absence of conventional electricity connections in most of the FSTPs created operational challenges. The technical issues with solar systems led to delay in day-to-day functioning.

Moreover, the ULBs were largely excluded from the planning and design process, which slowed down their ownership and understanding of plant infrastructure.

- o **Construction to operationalisation disconnect:** The transition from construction to operations has been rough. Most of the plants were handed over by UPJN to ULBs without sufficient documentation, DPRs, O&M manuals and warranty papers. The ULBs, who were not involved in the design phase, were left confused and hesitant to take ownership. In some cities, this led to long delays in getting the plants up and running.

- o **Lack of clarity among ULBs post hand-over:** Post hand-over process, the absence of clear guidelines on budgeting, staffing, and day-to-day management of FSSM facilities led to confusion and delays in decision-making at city-level. In several cases, ULBs were unsure about engaging operators or managing desludging services. To resolve ambiguity, state issued a guideline detailing step-by-step approach for streamlining FSSM services.
- o **Gaps in O&M costing:** One of the major operational hurdles faced by ULBs was confusion around the O&M cost of the plants. The original tenders packaged construction with O&M for five years at significantly inflated budgets (Rs 1.25–4 crore per year), which made ULBs think they could not afford to run the plants themselves.

Additionally, there was ambiguity over whether ULBs were allowed to engage new contractors, manage the plants in-house, or were obligated to continue with the original construction contractor. These ambiguities were resolved through multiple review meetings, and clear guidelines from the state on costing norms and possible financing options for the operation and maintenance.

- o **Irregular sludge affects plant sustainability:** Around 15 plants have been receiving inconsistent and low amount of sludge (less than 20 per cent of the plant capacity) due to weak coordination with private operators, limited public awareness, or low sludge generation in case of smaller ULBs. When sludge does not arrive regularly, the plants operate below capacity, leading to operational inefficiencies.

To address this, the state introduced structured desludging plan, especially scheduling the desludging from government buildings, community or public toilets, and high-footfall establishments, and pushed for the registration and monitoring of private desludging operators. However, still more focused efforts are needed to ensure a regular and sufficient amount of sludge reaches the plant, which is essential for maximising plant utilisation and ensuring long-term sustainability.

- o **Biosolid quality remains a concern:** The biosolids produced at many plants were unsuitable for direct agricultural reuse due to the presence of pathogens (from inadequate drying), high levels of Faecal Coliform, E. coli, and heavy metals. In addition, while the solids showed high nitrogen, they had low carbon content, making them imbalanced, thus unusable as fertilizers.

This raises important questions: Should there be separate standards for nitrogen-rich biosolids? Should co-composting with organic waste be made mandatory before reuse? Should fertilizer standards be adapted for biosolids to reflect different nutrient needs of soils? More importantly, what steps must be taken at each treatment plant to ensure pathogen-free sludge fit for safe reuse?

- o **Capacity gaps at the local level:** Most of the ULBs lacked the technical expertise and institutional readiness to manage FSSM systems. The officials were mostly not familiar with plant operations, desludging coordination, and monitoring processes. Frequent staff transfers further disrupted continuity. Although the multiple trainings and SOPs helped bridge these gaps, there is a need of dedicated sanitation teams and regular capacity-building at the city level to ensure long-term sustainability.

7. Key lessons learned

- o **Sustainability of FSSM is a governance issue:** Challenges in operationalising the FSSM plants in UP and sustaining the initiative are more of governance and administration, and less of engineering. State government took measures to create a conducive environment; cities which are quick and responsive took charge of the plants, rectified faulty modules in the plant, started O&M and promoted desludging through a structured process. Key policy and guidelines issued by the Department of Urban Development related to O&M arrangement and costing, model contracts, model FSSM bye-laws, etc., proved to be critical for the advancement of FSSM work in the state.
- o **Incremental approach to scale-up:** Starting small and scaling gradually has proven to be an effective approach in UP. By piloting FSSM interventions in selected cities like Jhansi, Chunar and Bijnor, the state was able to identify practical challenges, test suitable treatment technologies, and adapt implementation strategies based on local realities. These early pilots served as learning grounds for developing city-level institutional arrangements, and engaging with private desludging operators.

The phased scaling has allowed for adjustments and refinements, ensuring more effective and sustainable implementation across diverse regions.

- o **Upscaling FSSM requires careful planning:** UP's experience shows that scaling-up also requires more than just infrastructure—it demands careful, city-specific planning. Long-term planning for FSSM should carefully consider certain crucial components to ensure sustainability of the plants, such as:

Technology selection: The type of treatment technology has a direct impact on future operations and maintenance costs. Nature-based solutions may involve higher capital costs upfront but offer lower operational expenses over time. They also require less skilled manpower for routine functioning, making them a practical option for small and medium towns.

Locating the plant: Plants built far from the city increase transportation costs for desludging, making the service less affordable and less attractive for private operators. Ideally, the plant should be situated within or close to city limits to encourage regular use and ensure operational efficiency. It should

also be located away from flood-prone areas to avoid service disruptions and infrastructure damage during extreme weather events.

Right-sizing the plant: Plant's size determines future sustainability; an underutilised plant sees increased O&M cost per KLD. Plant design must be based on a detailed feasibility study that considers population size, desludging frequency, containment types, and local institutional capacity.

- o **Continuously engage with ULBs:** Another major lesson from UP is that infrastructure alone is not enough, continuous engagement with ULBs is essential. Most of the ULBs had limited prior experience with non-sewered sanitation systems and were hesitant to take over plant operations, especially in the absence of clear guidance or support.

Regular interaction with ULB officials and other stakeholders through field visits, review meetings, training programmes, and hands-on technical assistance helped build the confidence of ULB staff. It also created a channel for real-time problem-solving, whether related to O&M planning, contractor engagement, costing, or technical issues related to the plants. With consistent support from the state and CSE, many ULBs showed higher plant utilisation, faster adoption of bye-laws, and better coordination with desludging operators.

- o **State leadership drives change:** Strong leadership at the state level is critical for planning, implementing, and sustaining FSSM initiatives. The state plays a central role in coordinating multiple stakeholders, providing timely guidance, regular monitoring and ensuring long-term sustainability. The active participation by the state not only facilitate effective operations but also instills confidence among ULBs.
- o **City-level enablers for successful implementation:** The motivation and commitment of city officials are key to sustaining FSSM initiatives locally. For example, many ULBs, such as Unnao, Orai, Mathura, Hapur, etc., were initially not performing well. However, after city-level officials with greater commitment, motivation, and sometimes with prior FSSM experience took charge, these cities improved significantly and reached a good performance level. This motivation is often supported by incentives, such as better rankings in Swachh Survekshan, India's annual cleanliness and sanitation survey for cities and towns. Effective coordination between administrative and political leadership is equally crucial, particularly for establishing regulatory frameworks, engaging citizens, and integrating private operators to sustain the initiative.

KEY ACHIEVEMENTS

Policy leadership

The release of the Uttar Pradesh State Septage Management Policy (2019) provided a strong policy foundation for faecal sludge management, making UP one of the first states in India to adopt a state-level FSSM policy.

Institutional strengthening

The FSSM bye-laws have been institutionalised and adopted in 17 cities, with 17 more in the pipeline, marking a significant step toward regulatory framework and accountability mechanism at city-level.

Large-scale FSSM implementation

The construction of 39 faecal sludge treatment plants and 20 co-treatment plants across 56 cities—supported by AMRUT, NMCG, and ULB funds—represents one of the largest state-level FSSM infrastructure initiatives in India.

Operational performance of plants

Out of 59 plants, 23 are operating at more than 40 per cent of their designed capacity. At the state level, septage treatment has increased significantly, from just 50 KLD in 2020 to over 700 KLD in 2025.

Tools backed by ground research to support efficient operations

Development of tools like the Desludging Fee Calculator, Ease of Septage Management tool, Standard Operating Procedures, and record-keeping formats have been developed to help ULBs monitor and manage FSSM systems effectively. These tools can be used universally with certain level of customisation.

Mainstreaming gender in sanitation operations

Engagement of women's self-help groups for the operation and maintenance of FSTPs in four cities is a notable step toward promoting gender equity and livelihood generation in WASH services.



8. The path ahead

Uttar Pradesh has made significant progress in establishing faecal sludge and septage management systems across cities. But as climate change becomes a growing reality, this progress needs to go a step further, towards building systems which are resilient, sustainable, and part of a circular approach to managing water. The future of FSSM in UP depends on building sanitation systems that not only safeguard public health but also strengthen water security and climate resilience. Following are the emerging priorities that will shape the path ahead:

- 1. Maximise utilisation of existing plants:** The plants have been built across 56 cities, but many of them are underutilised. The state must prioritise to ensure a regular flow of sludge to these plants. This can be done by setting regular desludging schedules, improving coordination with private operators, and encouraging desludging from public buildings and institutions. Ensuring these plants are fully utilised is essential to make the most of public investment and minimise environmental impact.
- 2. Ensure quality and efficiency of treatment:** It is not enough for plants to run, they need to treat the waste to certain standards set by the regulatory bodies. The regular laboratory testing and stronger monitoring of the plants is essential. The inefficient treatment systems can contribute to serious health instead of solving them.
- 3. Closing the loop—Reuse treated water and biosolids:** Treated water and biosolids are resources, not waste. The reuse of treated water for landscaping, road cleaning, or other municipal (non-potable) purposes can reduce freshwater demand. Moreover, the safe reuse of biosolids, through co-composting, can support soil health and reduce reliance on chemical fertilisers. The state should develop clear guidelines and incentivise cities to promote this shift towards waste-to-value practices as part of a circular economy.
- 4. Strengthen institutional ownership and capacity at the ULB level:** The sustainable FSSM systems depend on strong leadership at the state and city-level. Many ULBs still need support to plan, manage, and finance these services effectively. The continued hand-holding and trainings are important.

- 5. Establish digital public infrastructure for service monitoring:** To make sanitation services more reliable and transparent, the state should invest in digital public infrastructure. This includes dashboards to track plant performance, real-time monitoring of desludging vehicles, digital service request, and feedback systems. These digital interventions can improve accountability and enable ULBs to make faster, data-driven decisions, and improve service delivery.
- 6. Leverage learnings to scale FSSM across all ULBs under SBM 2.0:** As the state moves into the next phase, there is a clear need to scale faecal sludge and septage management across all remaining ULBs, particularly under the SBM 2.0 mission. The mission envisions citywide used water and septage management, with a focus on small and medium towns, most of which lack sewerage systems. To effectively implement this vision, it is important to build on the lessons learned so far from FSSM implementation in the state. The experiences in areas like FSSM planning, technology selection, desludging operations, and institutional frameworks offer valuable learnings that can help design effective, scalable and context-appropriate solutions.

Annexure

1. List of knowledge products, government guidelines, advisories and technical document

S. no.	Title	Type	Link
1	Compilation of key guidelines and advisories issued by the Department of Urban Development, UP	Report	https://www.cseindia.org/streamlining-faecal-sludge-and-septage-management-in-uttar-pradesh-12859
2	SHG Capacity Building in FSSM- Training Module for Effective O&M	Report	https://www.cseindia.org/shg-capacity-building-in-fssm-training-module-for-effective-o-m-12854
3	Training Need Assessment for women Self Help group in the O&M of treatment plants	Report	https://www.cseindia.org/training-need-assessment-for-women-self-help-group-in-the-o-and-m-of-treatment-plants-12749
4	Guidance note on Engagement of Self-Help Groups for O&M of FSTPs and Co-treatment Plants	Report	https://www.cseindia.org/summary-of-the-webpage-for-the-guidance-note-on-engagement-of-self-help-groups-for-o-and-m-of-fstps-and-co-treatment-plants-12658
5	Enhancing Sustainability and Efficiency in FSSM Plants: Assessment of O&M arrangement in UP	Report	https://www.cseindia.org/enhancing-sustainability-and-efficiency-in-fssm-plants-12673
6	Guidelines for Improving Treatment Plant Utilization	Report	https://www.cseindia.org/guidelines-for-improving-treatment-plant-utilization-12557
7	Monitoring and Evaluation of FSTPs and STP Co-treatment Plants in Uttar Pradesh	Report	https://www.cseindia.org/monitoring-and-evaluation-of-fstps-and-stp-co-treatment-plants-in-uttar-pradesh-12359
8	SOP for Operations and Maintenance of FSTPs and Co-Treatment Plants in Uttar Pradesh (Hindi)	Technical Document	https://www.cseindia.org/sop-for-operations-and-maintenance-of-fstps-and-co-treatment-plants-in-uttar-pradesh-hindi-12534
9	SOP for Operations and Maintenance of FSTPs and Co-Treatment Plants in Uttar Pradesh (English)	Technical Document	https://www.cseindia.org/sop-for-operations-and-maintenance-of-fstps-and-co-treatment-plants-in-uttar-pradesh-12533
10	Malasur: Stop the demon Manage scientifically	Report	https://www.cseindia.org/malasur-stop-the-demon-manage-scientifically-12361
11	Septage Management In Uttar Pradesh Scaling Up and Sustainability Lessons	Report	https://www.cseindia.org/septage-management-in-up-12358
12	Inclusive Urban Sanitation Addressing the Desludging Challenges of Narrow Lanes in Uttar Pradesh	Report	https://www.cseindia.org/inclusive-urban-sanitation-addressing-the-desludging-challenges-of-narrow-lanes-in-uttar-pradesh-12063
13	Ease of Septage Management- Performance of 56 cities of UP	Report	https://www.cseindia.org/ease-of-septage-management-11972
14	Ease of Septage Management tool (ESM)	Report	https://www.cseindia.org/ease-of-septage-management-tool-11686
15	Guidance note on Operation & Maintenance (O&M) of Faecal Sludge Septage Management (FSSM) Projects and Economics of Desludging in UP	Guidance note	https://www.cseindia.org/guidance-note-on-operation-maintenance-o-m-of-faecal-sludge-septage-management-fssm-projects-and-economics-of-desludging-in-up-12002
16	Operation Maintenance Cost of Faecal Sludge Treatment Plants in Uttar Pradesh	Report	https://www.cseindia.org/operation-maintenance-cost-of-faecal-sludge-treatment-plants-in-uttar-pradesh-11679
17	Model Contract for Operation and Maintenance (O&M)	Technical Document	https://www.cseindia.org/model-contract-for-operation-and-maintenance-o-m--11958

18	State Model Bye-Laws for Faecal Sludge and Septage Management (FSSM)	Technical Document	https://www.cseindia.org/state-model-bye-laws-for-faecal-sludge-and-septage-management-fssm--11956
19	Guidelines: For Planning, Designing and Implementation of Deep Row Entrenchment (DRE) in Towns with <20,000 Population in Uttar Pradesh	Guidance note	https://www.cseindia.org/implementation-of-deep-row-entrenchment-dre-in-towns-with-2020-000-population-in-uttar-pradesh-11698
20	Septage Management for City-Wide Inclusive Sanitation in Uttar Pradesh	Report	https://www.cseindia.org/septage-management-for-city-wide-inclusive-sanitation-in-uttar-pradesh-11364
21	Septage Management in Bijnor Town	Report	https://www.cseindia.org/septage-management-in-bijnor-town-11676
22	Septage Management in Chunar Town	Report	https://www.cseindia.org/septage-management-in-chunar-town-11678
23	Septage Management in Jhansi Town	Report	https://www.cseindia.org/septage-management-in-jhansi-town-11677
24	National Workshop: Pathway Towards Inclusive and Responsible Sanitation Services (FSSM) in Uttar Pradesh	Compilation of Workshop	https://www.cseindia.org/national-workshop-pathway-towards-inclusive-and-responsible-sanitation-services-fssm-in-uttar-pradesh-11689
25	Monitoring Tools for Urban Lake in Uttar Pradesh	Technical Document	https://www.cseindia.org/monitoring-tools-for-urban-lake-in-uttar-pradesh-12059
26	Pocket Book for Sanitary Inspectors: Health and Safety of Sanitation Workers During COVID-19	Technical Document	https://www.cseindia.org/hindi-pocket-book-for-sanitary-inspectors-health-and-safety-of-sanitation-workers-during-covid-19-10219
27	Status of Grey-Water Management in Rural Areas of Rae Bareli District	Report	https://www.cseindia.org/grey-water-mis-management-in-rural-areas-of-rae-bareli-district-12212
28	Assessment of Excreta Management	Report	https://www.cseindia.org/assessment-of-excreta-management-9269
29	Assessment of Faecal Sludge Management (Vol-2)	Report	https://www.cseindia.org/assessment-of-faecal-sludge-management-9078
30	Managing Septage in Cities of Uttar Pradesh	Report	https://www.cseindia.org/managing-septage-in-cities-of-uttar-pradesh-9268
31	Managing Septage in Cities of Uttar Pradesh (Vol-1)	Report	https://www.cseindia.org/managing-septage-in-cities-of-uttar-pradesh-9072
32	Managing Septage in Ganga Cities	Report	https://www.cseindia.org/managing-septage-in-ganga-cities-10453

2. List of critical letters related to FSSM operationalisation

S. no.	Letter on	Date
1	Establishing Faecal Sludge and Septage management Bye – Laws at the city level	7 Nov 2023
2	Model contract document for engaging contractors in managing the FSSM plants	7 Nov 2023
3	Guidelines on costing of FSSM plants and fixing desludging fees	24 Nov 2023
4	Engaging women SHGs for O&M of FSTPs under AMRUT Mitra	30 Apr 2024
5	Guidelines for daily and monthly record keeping at the plant	17 May 2024
6	Step-wise city level action points for operationalizing the FSSM plants	21 June 2024
7	City level IEC campaign - Malasur: Stop the demon	14 Aug 2024
8	Guidelines for maximizing desludging potential at the plant	13 Sep 2024
9	Standard Operating procedures for O&M of FSTPs and Co-treatment plants	30 Jan 2025
10	Guidance note for sustainable operations of the plants	24 March 2025
11	Guidance note on engagement of SHGs for O&M of FSSM plants	21 May 2025

3. City-wise plant details

S. no.	City name	Handover status	O&M responsibility	Plant utilisation in %	FSSM byelaws
1	Shahjahanpur (FSTP, 32 KLD)	Done	Contractor	30	Gazette notified
2	Raebareli (FSTP, 32 KLD)	Done	SHG	30	Gazette notified
3	Sitapur (FSTP, 32 KLD)	Done	SHG	7	Sent for Gazette notification
4	Lakhimpur (FSTP, 32 KLD)	Done	ULB	25	Sent for Gazette notification
5	Ayodhya (co-treatment, 25 KLD)	Done	NO	0	Published for objections
6	Ayodhya (FSTP, 32 KLD)	Done	Contractor	36	Published for objections
7	Jaunpur (FSTP, 32 KLD)	Done	SHG	38	Gazette notified
8	Mirzapur (co-treatment, 25 KLD)	Done	ULB	42	Passed by Council
9	Pilibhit (FSTP, 32 KLD)	Done	ULB	0	Published for objections
10	Baraut (FSTP, 32 KLD)	Done	Contractor	8	Drafted
11	Chunar (FSTP, 10 KLD)	NA till 2026	Contractor	100	Gazette notified
12	Bakshi-Ka-Talab (FSTP, 25 KLD)	Done	ULB	10	Gazette notified
13	Jhansi (FSTP, 6 KLD)	Done	Contractor	80	Gazette notified
14	Jhansi (FSTP, 12 KLD)	Done	Contractor	80	Gazette notified

S. no.	City name	Handover status	O&M responsibility	Plant utilisation in %	FSSM byelaws
15	Jhansi (FSTP, 32 KLD)	Done	Contractor	35	Gazette notified
16	Lalitpur (FSTP, 32 KLD)	Done	NO	0	Published for objections
17	Unnao (FSTP, 32 KLD)	Done	ULB	38	Sent for Gazette notification
18	Moradabad (FSTP, 32 KLD)	Done	ULB	76	Gazette notified
19	Rampur (co-treatment, 25 KLD)	Done	Contractor	88	Published for objections
20	Amroha (FSTP, 32 KLD)	Done	Contractor	62	Gazette notified
21	Aligarh (FSTP, 32 KLD)	Done	Old contractor	30	Sent for Gazette notification
22	Hathras (FSTP, 32 KLD)	Done	Contractor	12	Sent for Gazette notification
23	Saharanpur (co-treatment, 25 KLD)	Done	Contractor	66	Gazette notified
24	Loni (FSTP, 32 KLD)	Done	Contractor	61	Gazette notified
25	Ghaziabad co-treatment, 50 KLD)	Done	Old contractor	33	Passed by Council
26	Khurja (FSTP, 32 KLD)	Done	SHG	25	Passed by Council
27	Modinagar (FSTP, 32 KLD)	Done	ULB	56	Gazette notified
28	Bijnor (co-treatment, 20 KLD)	Done	ULB	50	Gazette notified
29	Banda (FSTP, 32 KLD)	Done	Contractor	23	Sent for Gazette notification
30	Hardoi (FSTP, 32 KLD)	Done	ULB	0	Drafted
31	Fatehpur (FSTP, 32 KLD)	Done	Contractor	70	Drafted
32	Akbarpur (FSTP, 32 KLD)	Done	Contractor	20	Gazette notified
33	Shikohabad (FSTP, 32 KLD)	Done	Contractor	30	Sent for Gazette notification
34	Hapur (FSTP, 32 KLD)	Done	ULB	53	Published for objections
35	Shamli (FSTP, 32 KLD)	Done	ULB	9	Passed by Council
36	Orai (FSTP, 32 KLD)	Done	ULB	25	Sent for Gazette notification
37	Farrukhabad (FSTP, 32 KLD)	Done	ULB	25	Sent for Gazette notification
38	Badaun (FSTP, 32 KLD)	Done	ULB	20	Published for objections
39	Chandausi (FSTP, 32 KLD)	Done	Contractor	10	Passed by Council
40	Gonda (FSTP, 32 KLD)	Done	ULB	65	Drafted
41	Bahraich (FSTP, 32 KLD)	Done	ULB	25	Published for objections
42	Deoria (FSTP, 32 KLD)	Done	Contractor	56	Gazette notified

S. no.	City name	Handover status	O&M responsibility	Plant utilisation in %	FSSM byelaws
43	Azamgarh (FSTP, 32 KLD)	Done	Old contractor	10	Sent for Gazette notification
44	Muzzaffarnagar (co-treatment, 25 KLD)	Done	Contractor	75	Gazette notified
45	Mathura (co-treatment, 25 KLD)	Done	Contractor	62	Sent for Gazette notification
46	Gorakhpur (co-treatment, 50 KLD)	Done	ULB	63	Passed by Council
47	Etawah (co-treatment, 25 KLD)	Done	ULB	30	Passed by Council
48	Mainpuri (co-treatment, 25 KLD)	Done	ULB	28	Passed by Council
49	Firozabad (co-treatment, 25 KLD)	Done	Contractor	60	Sent for Gazette notification
50	Bulandshehr (co-treatment, 25 KLD)	Done	ULB	80	Gazette notified
51	Sultanpur (co-treatment, 25 KLD)	Done	Old contractor	21	Sent for Gazette notification
52	Maunath Bhanjan (FSTP, 32 KLD)	Under Construction	NO	0	Drafted
53	Lucknow (co-treatment, 100 KLD)	Done	Old contractor	40	Sent for Gazette notification
54	Kanpur (co-treatment, 100 KLD)	Done	Old contractor	36	Sent for Gazette notification
55	Agra (co-treatment, 75 KLD)	Done	Contractor	55	Drafted
56	Meerut (co-treatment, 50 KLD)	Not done	Old contractor	10	Sent for Gazette notification
57	Varanasi (co-treatment, 50 KLD)	Done	Old contractor	45	Passed by Council
58	Prayagraj (co-treatment, 50 KLD)	Done	Contractor	31	Gazette notified
59	Basti (FSTP, 32 KLD)	Done	ULB	9	Sent for Gazette notification

4. List of trainings provided by Centre for Science and Environment for UP officials

S. no.	Training title	Date	Online/ Onsite	UP exclusive
1	Training on O&M of FSTPs and Co-treatment Plants in Uttar Pradesh	July 8-11, 2025	Onsite	Yes
2	SHG refreshers training in 04 UP towns	February 12 & 15, March 5, 2025	Onsite	Yes
3	Towards Sustainability of Waterbodies in Uttar Pradesh - A training programme for government officials of Uttar Pradesh	January 22-24, 2025	Onsite	Yes
4	Residential Training on "Reuse of Treated Wastewater and Biosolids	January 6-9, 2025	Onsite	No
5	State-Level Training Program on O&M of FSTPs and Co-treatment Plants	December 19-20, 2024	Onsite	Yes
6	Restoration of Urban Lakes and Waterbodies	September 18-20, 2024	Onsite	No
7	Reuse of Treated Wastewater and Biosolids	March 5-8, 2024	Onsite	No

S. no.	Training title	Date	Online/ Onsite	UP exclusive
8	Planning and Designing of Faecal Sludge and Septage Management Systems	February 20–23, 2024	Onsite	No
9	Training of Trainers Cum Workshop on Used Water Management through Interception and Diversion Systems	December 6–8, 2023	Onsite	No
10	Advanced Residential Training Programme on Decentralised Wastewater Treatment and Local Reuse	November 28–December 1, 2023	Onsite	No
11	Operations and Maintenance of FSTPs and Co-Treatment Plants for ULBs in Varanasi	October 4–5, 2023	Onsite	Yes
12	State level training on Operation & maintenance for Co-treatment & FSTP's in Bijnor	September 26–27, 2023	Onsite	Yes
13	Training on preparation of FSSM Byelaws for city level officers in Lucknow	August 29, 2023	Onsite	Yes
14	Residential Training Programme Operation and Maintenance of Faecal Sludge Treatment and Co-Treatment Plants	August 22–25, 2023	Onsite	No
15	Training on Operation and Maintenance of FSTPs for Women SHGs in Khurja, Raebareli, Sitapur, and Jaunpur	July 16,18,19 & 25, 2023	Onsite	Yes
16	State level training on Integrated Wastewater Septage Management in Lucknow	May 18, 2023	Onsite	Yes
17	Advanced Residential Training Programme on Urban Groundwater Management	January 10–13, 2023	Onsite	No
18	Advanced Residential Training Programme on Water Sensitive Urban Design and Planning (WSUDP) – Rainwater Harvesting at different scales	November 9–12, 2022	Onsite	No
19	Residential Training Programme on Operation and Maintenance of Faecal Sludge and Co-Treatment Plants	July 19–22, 2022	Onsite	Yes
20	Training on Effective Faecal Sludge and Used Water Management	April 27–30, 2022	Onsite	Yes
21	Advanced Residential Training Programme on Urban Waterbodies Rejuvenation and Management	February 22–24, 2022	Onsite	No
22	Two day training program on Health and Safety of Desludging operators in Prayagraj	February 16–17, 2022	Onsite	Yes
23	Advanced Training on Decentralised Wastewater Management and Local Reuse	December 21–23, 2021	Onsite	No
24	Advanced Residential Training Programme on Water Sensitive Urban Design and Planning (WSUDP) – Rainwater Harvesting at different scales	November 30–December 2, 2021	Onsite	No
25	Advanced Training Programme on Decentralized Wastewater, Faecal Sludge and Septage Management	October 25–28, 2021	Onsite	No
26	Advanced Training Programme on Decentralized Wastewater, Faecal Sludge and Septage Management	March 9–12, 2021	Onsite	No

S. no.	Training title	Date	Online/ Onsite	UP exclusive
27	10th Onsite and Offsite Management of Sewage for Citywide Sanitation	January 13–14, 2021	Online	Yes
28	9th Onsite and Offsite Management of Sewage for Citywide Sanitation	December 22–23, 2020	Online	Yes
29	8th Onsite and Offsite Management of Sewage for Citywide Sanitation	December 15–16, 2020	Online	Yes
30	7th Onsite and Offsite Management of Sewage for Citywide Sanitation	November 25–26, 2020	Online	Yes
31	6th Onsite and Offsite Management of Sewage for Citywide Sanitation	November 10–11, 2020	Online	Yes
32	5th Onsite and Offsite Management of Sewage for Citywide Sanitation	October 15–16, 2020	Online	Yes
33	4th Onsite and Offsite Management of Sewage for Citywide Sanitation	October 8–9, 2020	Online	Yes
34	3rd Onsite and Offsite Management of Sewage for Citywide Sanitation	September 23–24, 2020	Online	Yes
35	2nd Onsite and Offsite Management of Sewage for Citywide Sanitation	September 3–4, 2020	Online	Yes
36	1st Onsite and Offsite Management of Sewage for Citywide Sanitation	August 13–14, 2020	Online	Yes
37	2nd State Training for Master Trainers on Health and Safety of Sanitation Workers during COVID-19 crisis	July 4, 2020	Online	Yes
38	1st State Training for Master Trainers on Health and Safety of Sanitation Workers during COVID-19 crisis	May 27, 2020	Online	Yes
39	International Training & Exposure Visit for Faecal Sludge and Septage Management (FSSM) in Bangladesh	February 8–13, 2020	Onsite	Yes
40	AMRUT Capsule III: Training Programme on Integrated Wastewater and Faecal Sludge Management for Municipal Functionaries of Uttar Pradesh	February 26–28, 2020	Onsite	Yes
41	AMRUT Capsule II -Training Programme on Integrated Wastewater and Faecal Sludge Management– for Municipal Functionaries of Uttar Pradesh	January 22–24, 2020	Onsite	Yes
42	Training programme on Designing Onsite Sanitation Systems for masons in Chunar	January 20–22, 2020	Onsite	Yes
43	Training programme on Designing and Construction of Onsite Sanitation Systems for masons in Bijnor-	January 16–18, 2020	Onsite	Yes
44	Training Programme on "Citywide Inclusive Sanitation	December 10–12, 2019	Onsite	Yes
45	Training Programme on Mainstreaming Water-Energy Nexus in Wake of Climate Change	November 26–29, 2019	Onsite	No
46	Integrated Orientation Capacity Building Training Programme for Municipal Functionaries of UP	October 30–November 1, 2019	Onsite	Yes

S. no.	Training title	Date	Online/ Onsite	UP exclusive
47	Training on Emptying and Transportation of Faecal Sludge and Septage	October 14–15, 2019	Onsite	No
48	CSE-WHO Training Programme on Sanitation Safety Planning:	September 3–6, 2019	Onsite	No
49	Advanced Training on Planning and Designing for Treatment of Faecal Sludge & Septage	July 22–27, 2019	Onsite	Yes
50	Training Programme on Water Speaks: Effective communication for advocacy influence and impact	July 9–12, 2019	Onsite	No
51	Training Programme on Tools and Approaches for Citywide Water and Sanitation Management: Part II: Non – Sewered Sanitation	April 23–26, 2019	Onsite	No
52	Training and Exposure Visit for Planning and Implementation of Faecal Sludge and Septage Management	December 17–21, 2018	Onsite	Yes
53	Training Programme on Effective Faecal sludge and Septage Management for Mainstreaming Citywide Sanitation	May 29–31, 2018	Onsite	Yes
54	Training on Sewerage to Sustainable Sanitation: Mapping of Excreta Flow and Faecal Sludge & Septage Management	October 10–13, 2017	Onsite	Yes
55	Training Program on Preparation of City Sanitation Plan: City's Journey Beyond ODF- Part II	December 5–7, 2016	Onsite	Yes

References

1. Anon, 2021. *National Inventory of Sewage Treatment Plants*, Central Pollution Control Board, New Delhi. Available at <https://cpcb.nic.in/status-of-stps/>, as accessed on 28 October 2025
2. Sunita Narain, Ashitha Gopinath et al, 2024, *Monitoring and Evaluation of FSTPs and STP Co-treatment Plants in Uttar Pradesh*, Centre for Science and Environment, New Delhi. Available at <https://www.cseindia.org/monitoring-and-evaluation-of-fstps-and-stp-co-treatment-plants-in-uttar-pradesh-12359>, as accessed on 28 October 2025

This report documents the landmark journey of Uttar Pradesh (UP) in establishing sustainable faecal sludge and septage management (FSSM), marking a critical shift from achieving household toilet coverage to ensuring safely managed sanitation. It captures how the state's progressive policy framework, anchored by the State Septage Management Policy, has driven one of India's most significant sanitation scale-ups.

While celebrating the rapid establishment of faecal sludge treatment plants (FSTPs) and co-treatment facilities, the report offers an assessment of ongoing implementation challenges, particularly addressing issues such as low plant utilisation and capacity building. Crucially, it outlines the next critical steps for long-term sustainability—strengthening regulatory oversight, embedding gender-inclusive practices through the empowerment of women self-help groups (SHGs), and maximising resource recovery to secure a resilient and self-sustaining sanitation future for all of UP.

It is an essential read for policymakers and urban practitioners seeking to understand how to translate a national sanitation mandate into successful, large-scale municipal action, including overcoming challenges in finance, operations, and community engagement.



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