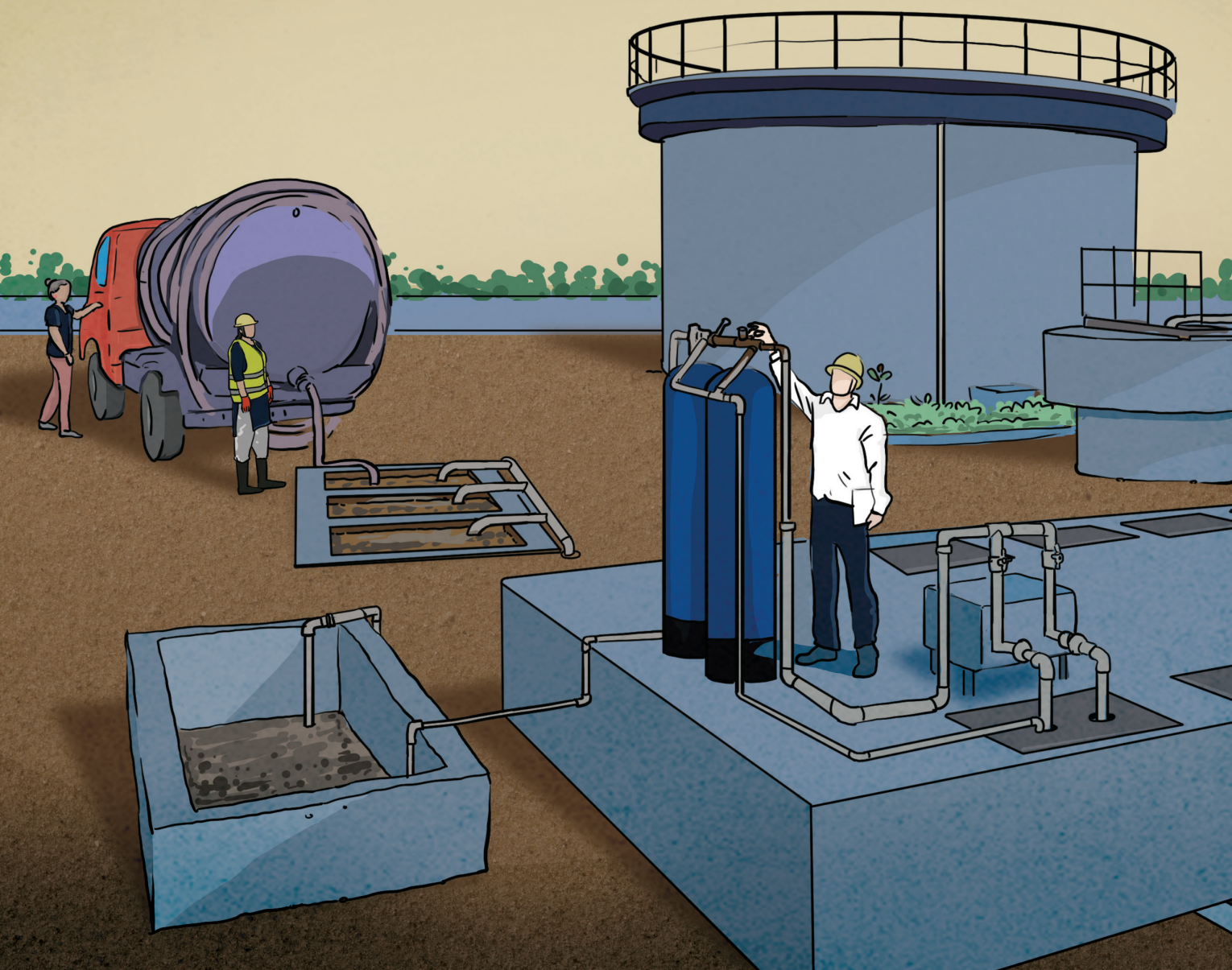
ENHANCING SUSTAINABILITY AND EFFICIENCY IN FSSM PLANTS

ASSESSMENT OF O&M ARRANGEMENT IN UTTAR PRADESH



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ASSESSMENT OF O&M ARRANGEMENT IN UTTAR PRADESH

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1. Executive summary

Uttar Pradesh has made significant strides in improving sanitation through faecal sludge and septage management (FSSM). Starting with a single treatment plant in 2018, the state now operates 59 plants, comprising 39 faecal sludge treatment plants (FSTPs) and 20 co-treatment facilities. Most of these plants were constructed by Jal Nigam, the technical wing of Department of Urban Development, UP and later transferred to the urban local bodies (ULBs) for operation and maintenance (O&M). However, the handover of these plants faced delays of over a year and lacked proper documentation. Most of the handovers were limited to a single-page inventory, without detailed project reports (DPRs), warranty documents and operation manuals. As a result, ULBs faced challenges in plant operations and warranty-based repairs.

These plants are critical for safely managing the septage generated by on-site containment systems, which serve majority of the urban population. The functionality and sustainability of these plants heavily depend on their effective operation and maintenance.

To understand the O&M arrangements in place, the Centre for Science and Environment (CSE) conducted a detailed study in 21 ULBs where O&M arrangements have been established. The primary data was collected and interviews were done with the ULB officials, plant operators, and contractors to understand the ground reality. The study aimed to provide a comprehensive analysis of the existing O&M arrangements, identify challenges, and recommend strategies for sustainability of FSSM operations.

Key findings and challenges

1. **Variations in O&M responsibility:** The plants are primarily operated by one of three entities: the ULB, self-help groups (SHGs) or a contractor. Out of the 21 plants studied, eight were operated by ULBs, four by SHGs and nine plants by contractors.

2. **Financial arrangements:** ULBs are using three funding sources for O&M expenses: own-source revenue (OSR), State Finance Commission (SFC) funds and AMRUT Mitra programme for SHGs. It has been observed that the ULB and SHG-managed plants are more cost-effective than those managed by contractors. However, dedicated efforts are required to enhance

their utilization, particularly in ULB and SHG-managed plants. Considering the profit margin, the O&M costs in 20 of the 21 ULBs fall within the limit prescribed in the government advisory.

3. **Operational performance:** Contractor-managed plants demonstrate higher capacity utilization (42 per cent on average) compared to ULB SHG-managed plants (18 per cent on average). Low prioritization of desludging by ULBs contributes to underutilization.

4. **Delayed payments:** Payment delays exceeding three months were observed in seven out of 12 plants (contractor + SHG-run plants), severely impacting SHGs and contractors. The delay is mainly caused by poor coordination among stakeholders, rather than a lack of funds.

5. **Contracting issues:** Out of seven reviewed contracts, three lack clear terms, including payment clauses, roles and responsibilities, penalty provisions, and performance standards. Three out of nine ULBs awarded contracts for duration of one year or less. The short contract duration leads to increased administrative efforts and lack of continuity.

6. **Desludging fee-based unique O&M arrangement in Banda:** This arrangement offers a unique approach to plant management, as it imposes no financial burden on the ULB while ensuring efficient desludging services and plant operations. However, the competition between the ULBs and the contractor in providing the desludging services has restricted the contractor's revenue to 25,000–45,000 INR per month, which is inadequate to sustain the plant operations effectively.

Recommendations

1. **Strengthen the handover process**: Standardize handover protocol including documents like detailed project reports (DPRs), warranty papers, and operational manuals to avoid operational hurdles.

2. **Improved contracting practices**: Cities should refer the state-issued model contract "Operation and Maintenance of Faecal Sludge Treatment Plant/ Co-Treatment Plant and Desludging Vehicles" to clearly define the terms of engagement, role and responsibilities, payment terms, penalty clauses, etc.

3. **Enhance financial mechanisms:** Establish robust systems for timely payments to contractors and SHGs to maintain service quality. This is an

important component in ensuring the sustainability of the plant operations. ULBs may consider establishing an escrow account to ensure timely payment to contractors.

4. **Enhanced operational performance and plant utilization:** Mandate the use of "Standard Operating Procedure for Operation and Maintenance of FSTPs and Co-treatment Plants in Uttar Pradesh" and ensure that all plant operators adhere to the prescribed schedules to operate and maintain the treatment plants efficiently. To increase the plant utilization rate, cities should prepare a city-level desludging plan, prioritizing scheduled desludging from government institutions and raising public awareness about regular desludging practices.

5. **Optimizing the Banda O&M arrangement for long-term sustainability and scalability:** ULBs should direct all desludging requests and fees to the contractor to ensure long-term sustainability of desludging fee-based O&M model, enabling them to generate enough revenue to operate the plant effectively. The success of this arrangement could provide a scalable solution for other ULBs, promoting the efficient management of FSSM services over the long term, without incurring additional financial costs on the ULB.

Lessons for other Indian states and the Global South

The findings from Uttar Pradesh's FSSM journey offer critical learnings for sanitation planning in other parts of India and developing countries in the Global South. Cities must adopt decentralized approaches tailored to their specific needs, integrating municipal, community-led, and private sector participation for efficient service delivery. Ensuring financial sustainability requires innovative funding mechanisms, including escrow accounts and user fee-based models. Capacity building is essential, with municipal bodies requiring enhanced technical expertise and contract management skills. Transparent monitoring practices, including regular quality-testing of treated water and robust record-keeping, must be institutionalized to ensure long-term efficiency.

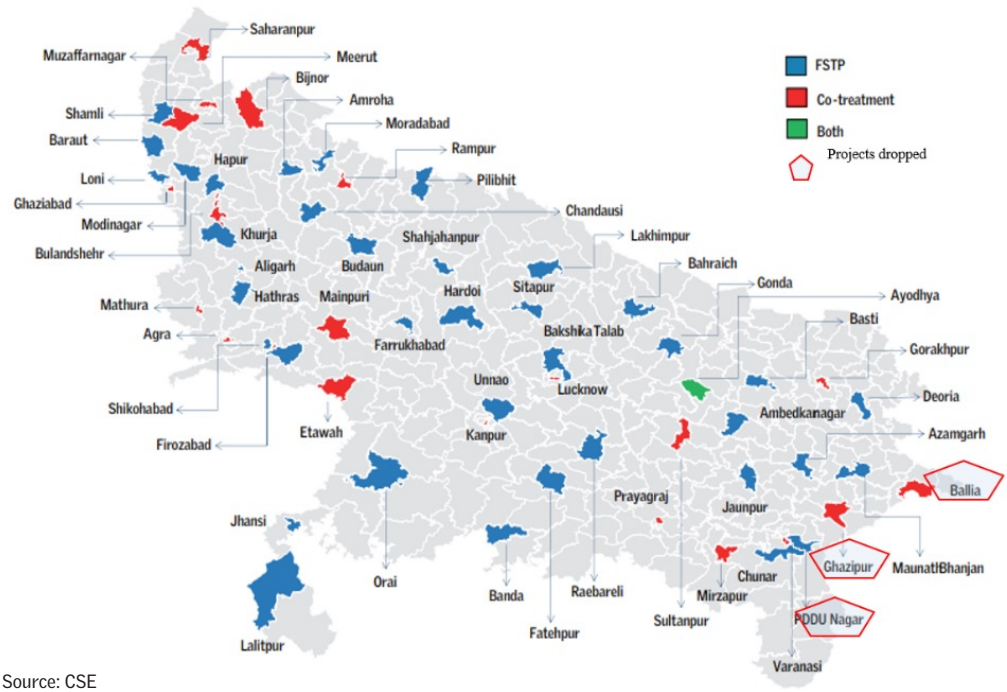
2. Background

Recognizing the prevalence of on-site sanitation systems such as septic tanks, Uttar Pradesh (UP) recognized the need for effective non-sewered sanitation management. In 2019, UP initiated its journey towards faecal sludge and septage management (FSSM) by introducing the 'Uttar Pradesh State Septage Management Policy'.

The first faecal sludge treatment plant was built in Jhansi with a capacity of 6 KLD in 2018. By the end of 2023, UP had a total of 59 treatment plants—39 FSTPs and 20 co-treatment facilities—across 56 urban local bodies. Among these, 54 plants were funded under AMRUT and constructed by Jal Nigam, three were funded and built by ULBs using 14th Central Finance Commission (CFC) funds, and two were funded under the National Mission for Clean Ganga—one constructed by Jal Nigam and the other by Uttar Pradesh Power Corporation Limited.

Fifty-four plants, funded under AMRUT and constructed by Jal Nigam, were intended to be handed over to ULBs for operation and maintenance after a three-

Map 1: Location of FSSM Plants



Source: CSE

month trial run. Except a few, most of the treatment plants were constructed and ready for handover by December 2022. However, the plants faced delay of over a year in handing-over process due to various reasons including poor interdepartmental coordination and poor quality of construction.

However, the remaining five plants, funded by ULBs and NMCG, were immediately handed over to the respective ULBs, except for one, where the handover will occur after a five-year O&M period. As of January 2024, the number of plants handed over was 40, which increased to 53 in September 2024.

Table 1: State-level status of handover of the plants

Handover after five years	Not done	Done	Grand total
1	5	53	59

Source: CSE assessment as on September 2024

During the handover, Jal Nigam did not provide essential documents related to the treatment plant, such as the detailed project report, operation manual, and warranty papers etc. Instead, only a list of items at the treatment plant was provided. As a result, ULBs are facing difficulties with O&M procedures and the repair of treatment units.

After the construction and handover of the plants, ensuring their functionality and sustainability became a major challenge. The functionality of the plant is influenced by various factors, with the regular operation and maintenance (O&M) being a crucial one.

The O&M costs outlined in Jal Nigam's original contract, which was supposed to be borne by the ULBs, was significantly high. This was mainly because the cost was based on the ideal practice of scheduled desludging of septic tank every three years, with a fixed fee of 2,500 rupees per trip. However, in practice, desludging is done on a demand basis, with varying desludging fees. The Centre for Science and Environment (CSE), New Delhi, which is supporting the State in scaling up Faecal Sludge and Septage Management (FSSM), conducted a study on treatment systems across the state to assess the resources needed for O&M and provided recommendations for the revised O&M costing.

Following the CSE's research findings, the Department of Urban Development (DoUD), Uttar Pradesh issued an advisory (see *Annexure 1*) to ULBs on operation and maintenance cost. CSE has been supporting ULBs in streamlining the FSSM services, including setting-up O&M arrangements of the plants. ULBs have chosen

the O&M arrangements based on their context and needs. Broadly, there are three arrangements for plant operation and maintenance:

1. Operated by ULB
2. Operated by self-help group (SHG)
3. Outsourced to a contractor

The O&M cost varies based on the preferred arrangement for O&M.

2.1 Objective of the report

The study aimed to conduct a landscaping of the existing operation and maintenance arrangements in-place till September 2024. These O&M arrangements are deliberately not referred to as an 'O&M model,' as various urban local bodies are still experimenting and exploring different options and approaches. It would be premature to label them as a 'model' or recommend them for scaling up. The objective of the study was to:

- Review the existing operation and maintenance arrangements at FSSM plants
- Analyze the financial and other factors that contribute to the functionality and sustainability of the treatment plants
- Identify areas of improvement and provide recommendations with a focus on enhancing functionality and sustainability of the plants

2.2 Methodology

Selection of ULBs: After handover, it was the ULB's responsibility to operate and maintain the plants. In UP, the plants were either managed by ULBs, SHGs or contractors.

In 17 cities, ULBs were managing the plants. Out of these 17, only 8 ULBs were considered for the O&M study as the remaining ULBs still exploring the options and managing the plant by themselves as an interim arrangement.

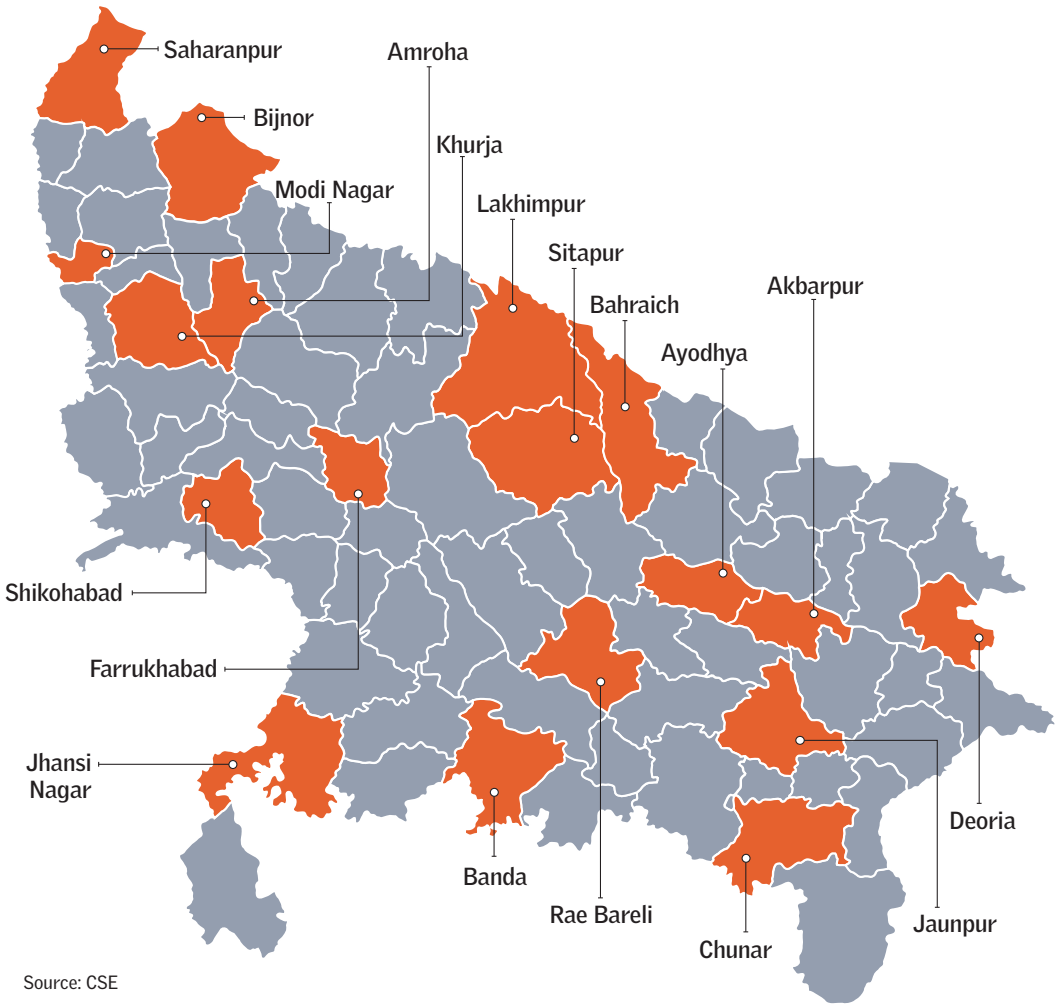
In 10 cities, the contractor who constructed the plant was operating it. However, the ULB had not made any formal agreement with the contractor, and these ULBs were not considered for the study.

Table 2: Status of O&M arrangement of plants—who is managing the plant

State-level O&M status	No arrangement	Old contractor who constructed the plant	Contractor on-board	SHG	ULB	Grand total
	19	10	9	4	17	59
ULBs selected for study	-	-	9	4	8	21

Source: CSE assessment as on September 2024

Map 2: Location of plants selected for the study



Source: CSE

Table 3: List of ULBs selected for study

S. no.	ULB	Treatment facility	Treatment capacity (KLD)
1.	Sitapur	FSTP	32
2.	Hapur	FSTP	32
3.	Bahraich	FSTP	32
4.	Khurja	FSTP	32
5.	Loni	FSTP	32
6.	Modinagar	FSTP	32
7.	Jaunpur	FSTP	32
8.	Shikohabad	FSTP	32
9.	Deoria	FSTP	32
10.	Amroha	FSTP	32
11.	Banda	FSTP	32

S. No.	ULB	Treatment facility	Treatment capacity (KLD)
12.	Lakhimpur	FSTP	32
13.	Shahjahanpur	FSTP	32
14.	Farrukhabad	FSTP	32
15.	Jhansi	FSTP	18
16.	Ayodhya	FSTP	32
17.	Raebareli	FSTP	32
18.	Akbarpur	FSTP	32
19.	Chunar	FSTP	10
20.	Saharanpur	Co-treatment	25
21.	Bijnor	Co-treatment	20

Source: CSE assessment as on September 2024

The research was conducted in 21 ULBs (19 FSTPs and 2 co-treatment plants) where plants are operational and have a formal operations and maintenance arrangement in place. These ULBs represent various geographic regions across the state.

Data collection and analysis:

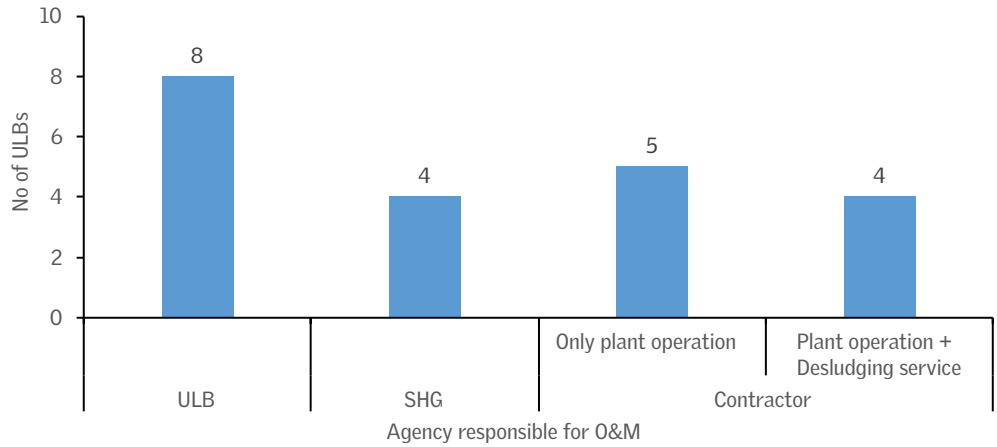
- The questionnaires were designed for ULB officials and plant operators to gather information on various aspects of plant operations and maintenance.
- Additionally, semi-structured interviews were held with contractors via phone and contracts were studied to understand their perspectives and challenges.
- After data collection, the information was analyzed to draw insights and develop recommendations.

3. Overview of O&M arrangements

3.1 Responsibility of the operation and maintenance

The agency responsible for operation and maintenance differ across cities. In eight urban local bodies, the municipal corporation/council themselves manages the plants. In four ULBs, self-help groups (SHGs) are responsible for O&M. Contractors are engaged in nine ULBs, with their duties limited to plant operations in five cities. In the remaining four cities, contractors are responsible for both, the plant operations and providing desludging services for septic tank cleaning.

Graph 1: Plant O&M: Responsible authority or agency

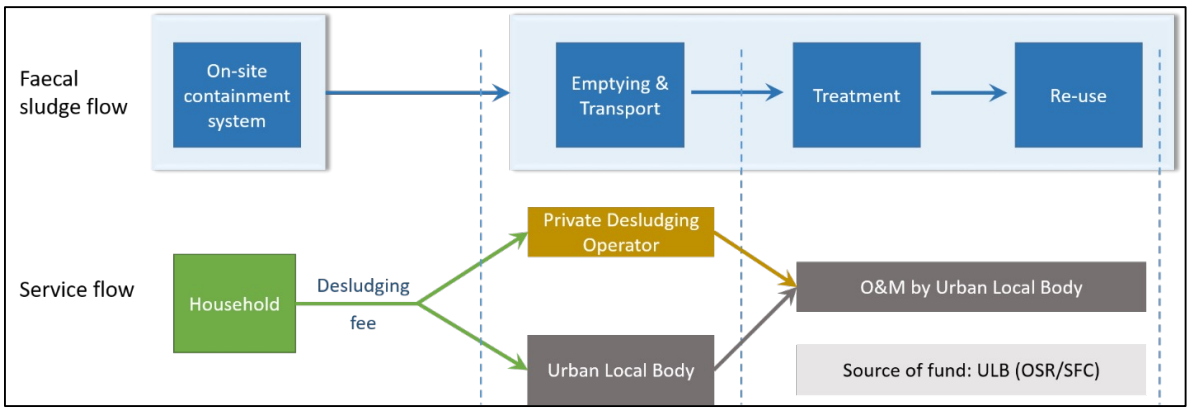


Source: CSE

3.2 Operation and maintenance by ULB

In this arrangement, the ULB staff handle plant operation and maintenance, while desludging services are provided by both the ULB and private desludging operators (see *Figure 1*). Most of the ULBs are utilizing their Own Source Revenue (OSR) and State Finance Commission (SFC) funds to meet operation and maintenance expenditure. This includes but not limited to the expenditure on staff salaries, chemicals and other materials required to run the plant, any repair or replacements etc.

Figure 1: FSSM service flow in ULB-run plant



Source: CSE

Discussions with officials revealed that this approach was primarily chosen because it proved more cost-effective than outsourcing to a contractor. Additionally, some ULBs either struggled to find suitable contractors or had bad experiences with outsourcing, prompting them to take on plant management themselves. Eight ULBs are operating the plants through this arrangement, including, Hapur, Bahraich, Modinagar, Deoria, Lakhimpur, Farrukhabad, Amroha and Bijnor.

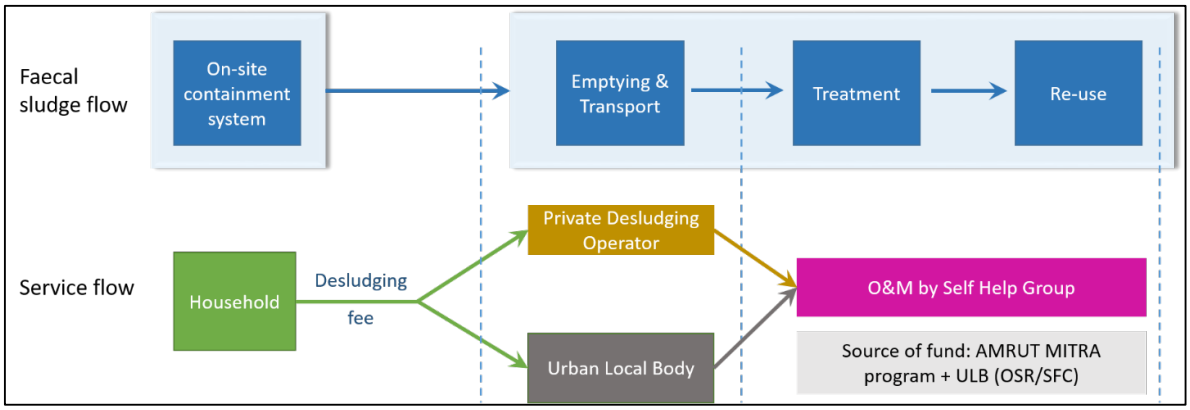
3.3 Operation and maintenance by SHG members

In this arrangement, the women SHG members were engaged for operation and maintenance of the plants. The desludging service is provided by the ULB and private desludging operators (see *Figure 2*).

The O&M expense are primarily covered by the AMRUT Mitra programme, while any additional expenditure on plant operation and maintenance is borne by ULB through OSR or SFC funds. The central government allocates funds to the State AMRUT department, which, through the State Urban Development Agency (SUDA), transfers the salaries of SHG members directly to their accounts. Meanwhile, O&M funds are disbursed to the ULB upon receiving a request for funds.

As part of the AMRUT Mitra initiative, SHG members were engaged in four ULBs—Sitapur, Jaunpur, Khurja, and Raebareli. The Ministry of Housing and Urban Affairs provided detailed guidelines for SHG engagement. The CSE supported in selection of cities, on-boarding of SHG members and their capacity building.

Figure 2: FSSM service flow in SHG-run plant



Source: CSE

3.4 Operation and maintenance by contractor

There are many variations among ULBs under this arrangement. Out of 21 ULBs, nine have engaged contractors for operation and maintenance of the plant.

Out of nine ULBs, six ULBs had engaged the same contractor who constructed the plant for its operation and maintenance. Since the notice inviting tender (NIT) for constructing the treatment plant already included a clause for seven years of O&M, these ULBs did not need to go through the tendering process. These six ULBs directly signed a Memorandum of Understanding (MoU) with the contractor, after negotiating the O&M costs.

In the remaining three ULBs, negotiations with the original contractor failed, so a new contractor was engaged through a tendering process.

Discussions with officials highlighted that this arrangement was chosen to ensure efficient plant operations, as ULBs lack the technical expertise and skilled human resources. In this setup, the ULBs focus primarily on monitoring and facilitating the plant's operations.

There are two broad categories in terms of scope of work: 1) Plant O&M only, and 2) Plant and desludging vehicle's O&M. In five ULBs, contractors were engaged only for the operation and maintenance of the plant. On the other hand, in four ULBs, contractors are also providing desludging services.

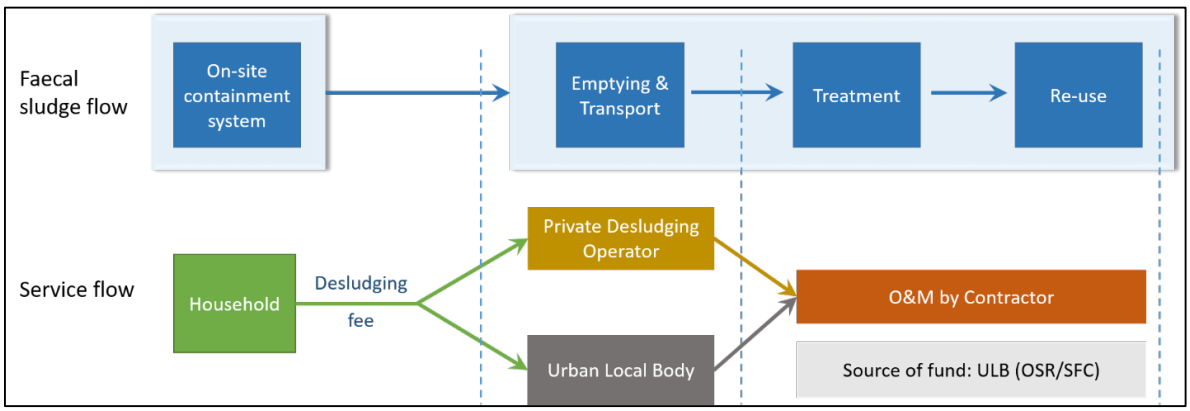
3.4.1 Contractor responsible only for the O&M of the plant

In this arrangement, the contractor was engaged for the operation and maintenance of the treatment plant. The desludging service is provided by the ULB and private

desludging operators (see *Figure 3*).

In five ULBs—Loni, Ayodhya, Saharanpur, Chunar and Shikohabad—contractors receive a fixed monthly payment for O&M. The ULBs cover these costs using their OSR and SFC funds, except in Chunar, where the expenses are funded by NMCG until March 2026.

Figure 3: FSSM service flow in contractor-run plant (Plant O&M only)



Source: CSE

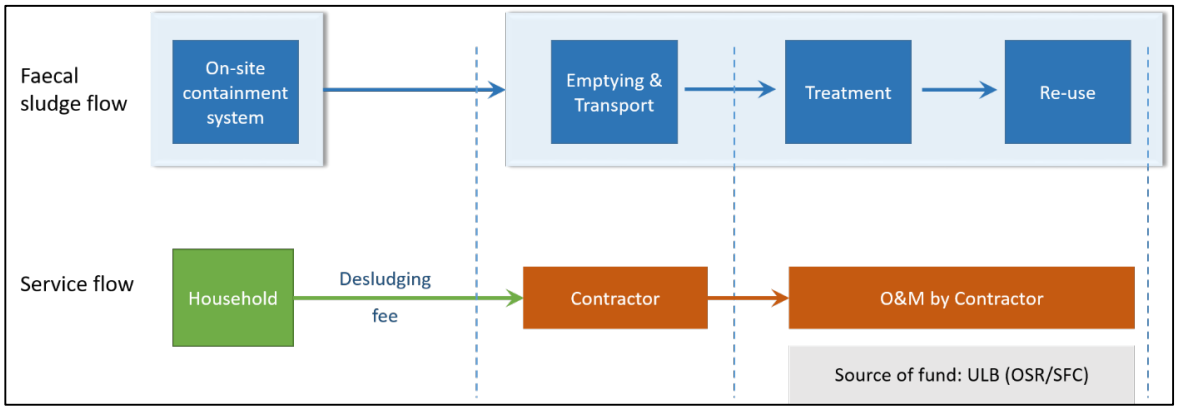
3.4.2 Contractor responsible for desludging and O&M of the plant

For the ease of management, four ULBs have outsourced the responsibility for the operation and maintenance (O&M) of desludging services and treatment plants to a contractor. While the contractor handles desludging services, the scope of vehicle maintenance and desludging fee collection varies across cities. There are three distinct arrangements under which contractors manage both the desludging services and treatment plants:

1. In Shahjahanpur and Jhansi, the contractor is fully responsible for providing desludging services, desludging fees collection, and O&M of desludging vehicles and the treatment plant (see *Figure 4*). Along with the ULB, the contractor also conducts information, education, and communication (IEC) campaigns to promote regular desludging and share their contact details for raising the desludging request.

   Since there are no private desludging operators in these cities, all desludging requests are directed to the contractor. After receiving a request, the contractor provides the service and collects the desludging fees. The ULB pays the

Figure 4: FSSM service flow in contractor-run plant (Case 1: Plant O&M and desludging)

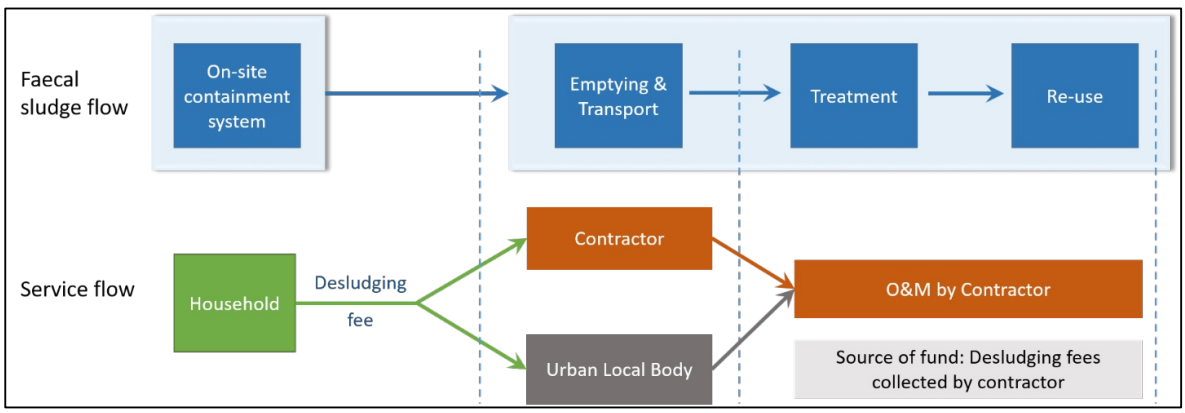


Source: CSE

contractor a fixed monthly amount for the plant's O&M. From the combined desludging fees and plant O&M payments, the contractor covers the costs for the driver and helper, fuel, desludging vehicle maintenance, and the operation and maintenance of the treatment plant.

2. In Banda, the contractor primarily manages desludging and plant operations. The contractor responsible for constructing the plant was also engaged to provide desludging services and operate and maintain the treatment plant, with all associated costs covered by the contractor (see *Figure 5*). To recover these expenses, the contractor charges desludging fees from households: ₹1,500 per trip for a 1,500-liter vehicle and ₹2,500 per trip for a 3,500-liter vehicle purchased under AMRUT programme.

Figure 5: FSSM service flow in contractor-run plant (case 2: Plant O&M and desludging)



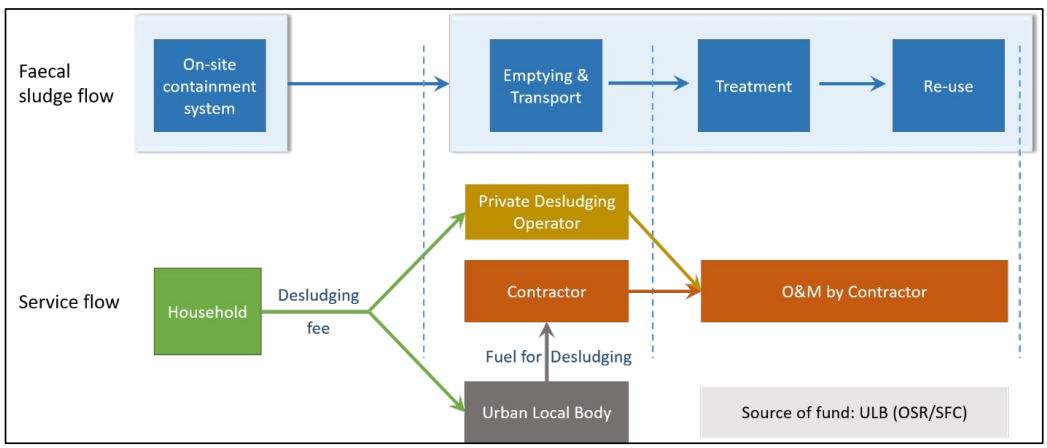
Source: CSE

However, the process for registering desludging requests in Banda is not streamlined. In Banda, there are no private desludging operators. So, if a desludging request is registered with the ULB, the ULB provides the service and collects the desludging fees. On the other hand, if the request is registered with the contractor, the contractor provides the service and collects the fees. On average, both the ULB and the contractor receive an equal number of desludging requests, ranging from 15 to 20 per month. This competition between the ULB and the contractor has limited the contractor's revenue to 25,000–45,000 INR per month, which is insufficient to sustain the plant operations effectively.

While this model currently appears economical for the ULB, as it involves no direct financial burden, discussions with the contractor highlighted challenges. The contractor finds the existing financial model unsustainable for plant operations and maintenance and has indicated that they will be unable to continue operations beyond the defect liability period (DLP), which ends in February 2025, without financial support from the ULB. The analysis and the discussion with contractor highlighted that transferring all the desludging requests and fees to contractor could make this arrangement viable.

3. In Akbarpur, the contractor is fully responsible for the operation and maintenance of the treatment plant. However, for desludging services, the contractor's role is limited to the desludging operation itself. While the contractor covers the salaries of the desludging vehicle's driver and helper, the ULB directly bears other expenses related to fuel and vehicle maintenance (see *Figure 6*).

Figure 6: FSSM service flow in contractor-run plant (case 3: Plant O&M and desludging)



Source: CSE

In this setup, a household can register a desludging request to the ULB after paying the desludging fee. The ULB then forwards the request details to the contractor, directing them to provide the desludging service. The ULB provides 25 liters of fuel at a time and monitors the distance traveled by the desludging vehicle. Once the fuel is nearly over, an additional 25 liters is provided. Based on the current fuel price and vehicle efficiency, the cost to the ULB is approximately 17–18 rupees per kilometer. After desludging is completed, the sludge is transported to the treatment plant for processing. For the plant's O&M, the ULB pays the contractor a fixed monthly amount.

So, at present, Uttar Pradesh has six distinct O&M arrangements involving urban local bodies, self-help groups, or contractors for plant operations. Typically, 3–5 staff members are deployed per plant, though this number ranges from 1 to 8. This includes only the staff responsible for plant operations, excluding those involved in desludging activities. Most of these arrangements have been operational for approximately one year, with a few exceptions since 2018.

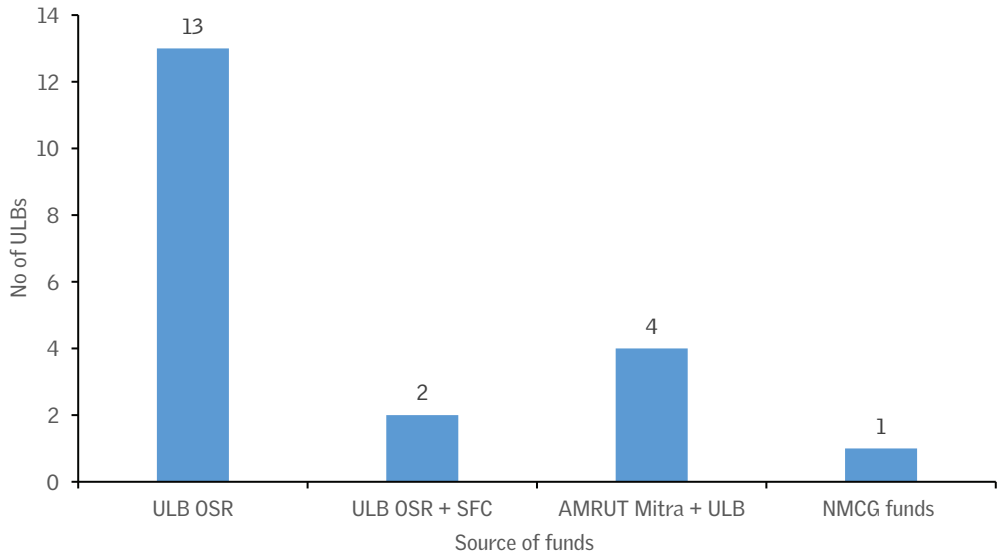
4. Financial arrangements

4.1 Source of funds

To cover operation and maintenance expenses, different funding sources are utilized. Out of the 21 ULBs, 13 are covering their O&M costs using their own funds also referred to as board funds or own source revenue (OSR), while two ULBs are supplementing their own funds with funds from the State Finance Commission (SFC) (see *Graph 2*).

In four ULBs, funds from the AMRUT Mitra programme, along with additional ULB funds, are utilized for the operation and maintenance of the plants. Another one ULB is utilizing funds from NMCG for the operation and maintenance.

Graph 2: Source of funding for covering the O&M expenses



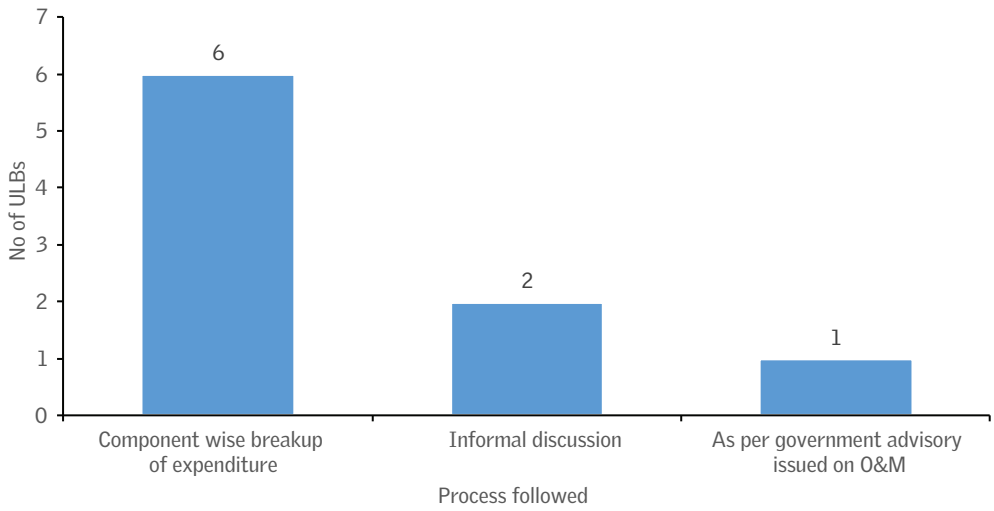
Source: CSE

4.2 Process of deciding the O&M cost

To support ULBs on arriving at operation and maintenance cost, the Department of Urban Development (DoUD), UP issued an advisory (see *Annexure 1*) based on the findings from CSE's study. The advisory includes only the O&M cost of the treatment plant, excluding desludging related expenses and the profit margin.

The ULBs were responsible for determining the O&M cost, especially when engaging a contractor. The assessment shows that, of the nine ULBs that have

Graph 3: Process of deciding the O&M cost



Source: CSE

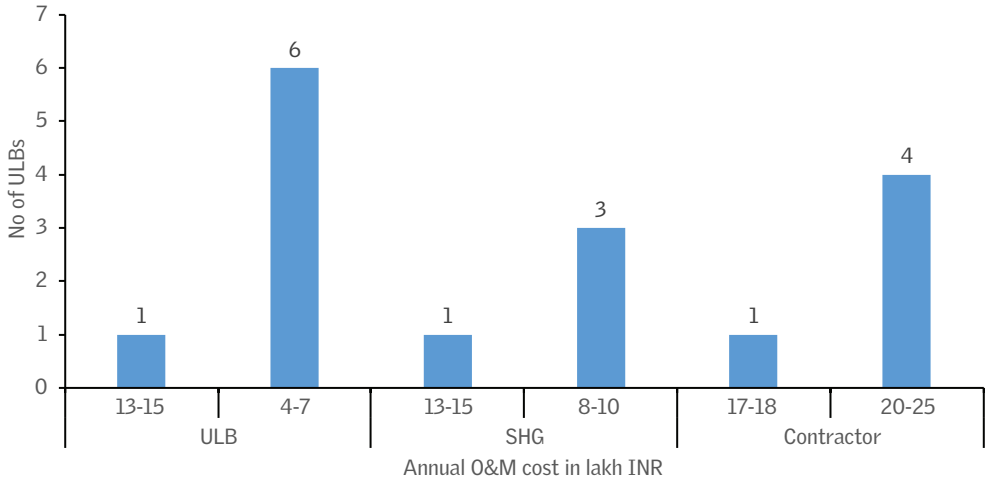
engaged contractors, six have set costs based on a detailed breakup of expenses by component, two based on informal discussions with the contractor, and one according to the government advisory.

4.3 Operation and maintenance cost

The operation and maintenance cost of treatment plants varies from around 2 to 55 lakhs INR/year (see *Annexure 2*). The variation in cost is mainly due to the difference in capacity of treatment plant and the type of agency involved for O&M. However, it is interesting to note that, with the profit margin considered, the O&M costs in all 21 ULBs, except for Jhansi, fall within the limit prescribed in the government advisory (see *Annexure 1*).

1. **32KLD FSTP O&M cost:** The graph shows the operation and maintenance costs of 16 faecal sludge treatment plants, each with a capacity of 32KLD, managed by different entities (contractor, SHG and ULB) As previously mentioned, the Banda plant (32 KLD) incurs no cost to the ULB and is therefore included in the analysis. Among the 16 plants, 12 utilize screw press technology, three employ lamella clarifiers, and one operates with tiger bio-filter technology.
    - o ULBs that manage FSTPs directly, have significantly lower O&M costs (4–7 lakhs INR/year).
    - o SHG-managed plants show a moderate range of costs (8–10 lakhs INR/year).

Graph 4: O&M cost of 32 KLD FSTP



Source: CSE

- Contractor-managed plants show higher O&M costs (17–25 lakhs INR/year).

The O&M cost in case of ULB and SHG-managed treatment plant appears to be low, as they reported mainly the operation costs and minor repairing work. The future expenditure on any major repair or maintenance is not considered in this and will be borne by the ULB as and when required. While contractors have also accounted the cost for routine maintenance like replacement of filter media or screens, cleaning of tanks, electromechanical (E&M) repair or replacement, etc.

2. **20 & 25 KLD co-treatment plant:** The O&M cost of the 20 KLD co-treatment plant in Bijnor is significantly lower (1–2 lakhs INR/year) compared to the 25 KLD co-treatment plant (17–18 lakhs INR/year) in Saharanpur. This difference is primarily due to the type of technology employed and the agency involved for O&M.

3. **10 KLD & 18 KLD FSTP:** The annual O&M cost of the 10 KLD FSTP in Chunar is significantly lower (5 lakhs INR/year) compared to the 18 KLD plant in Jhansi (55 lakhs INR/year), even though both use the same treatment technology—planted drying bed-based treatment chain. Both plants are operated by contractors. Upon reviewing the contract, it has been found that the O&M costs in the Jhansi contract are overestimated, particularly expenses related to filter media, resulting in disproportionately high overall costs.

COST IMPLICATIONS OF EFFICIENT PLANNING AND SELECTION OF APPROPRIATE TECHNOLOGY

The 20 KLD co-treatment plant in Bijnor, designed by CSE and managed by the ULB, employs a low-cost, nature-based treatment system that minimizes operation and maintenance expenses—costing 1–2 lakhs INR per year. It uses natural processes for sludge dewatering and requires only one human resource for O&M of the co-treatment plant.

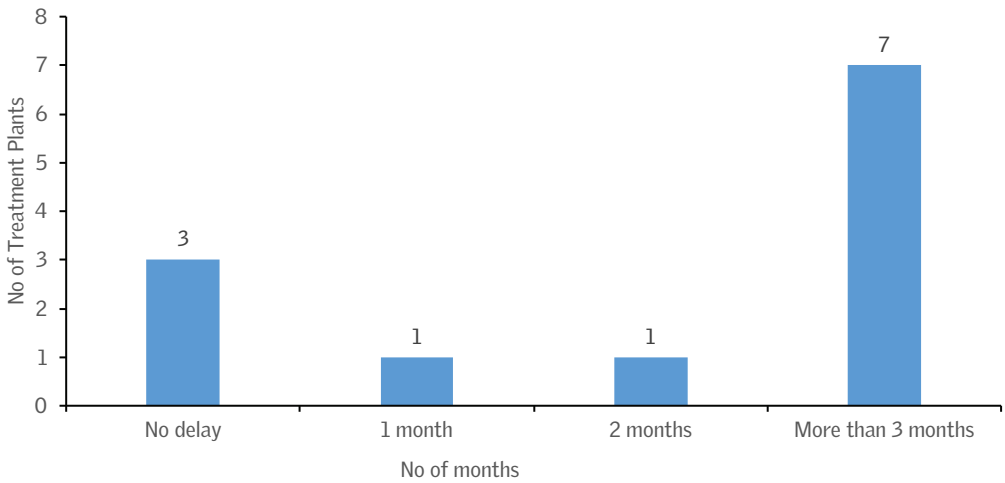
In contrast, the 25 KLD co-treatment plant in Saharanpur, designed through Jal Nigam, utilizes hybrid technology, incorporating a screw press for dewatering—a process that is cost-intensive. Managed by a contractor, its O&M costs also include overhead charges and expenses for maintaining civil infrastructure and electromechanical (E&M) components. The total annual O&M cost for this plant is approximately 17–18 lakhs INR, which is substantially higher compared to the nature-based treatment system in Bijnor.

4.4 Delay in payments

Timely payment by the ULB to the agency responsible for the plant's O&M is crucial for its long-term sustainability. Delays in payments disrupt plant functionality by hindering the operations and workforce efficiency.

This analysis focuses on 12 out of 21 treatment plants, excluding those where the plant is directly operated by the ULB and Banda—where there is no financial cost to the ULB. The study found that in five plants, where contractors are engaged, payments are either made on time or experience only minor delays of one to two months.

Graph 5: Delays in payment



Source: CSE

However, in seven plants, delays of over three months were observed. Out of these seven, four plants are operated by SHGs. Given the weak financial background of the women SHG members, these delays significantly affect their livelihoods. The main cause of the delay is poor inter and intra-departmental coordination.

In three other cases, contractors face delays of over three months. Despite this, they continue to pay their staff on time. However, continued delays limit the contractors' interests and affect the quality of plant operations. These delays are due to internal issues and a lack of commitment from ULB officials.

During the discussion with ULB officials, it was found that the delay was not primarily due to a lack of funds but rather resulted from poor stakeholder coordination and negligence by the local government.

5. Additional parameters related to O&M

5.1 Plant utilization

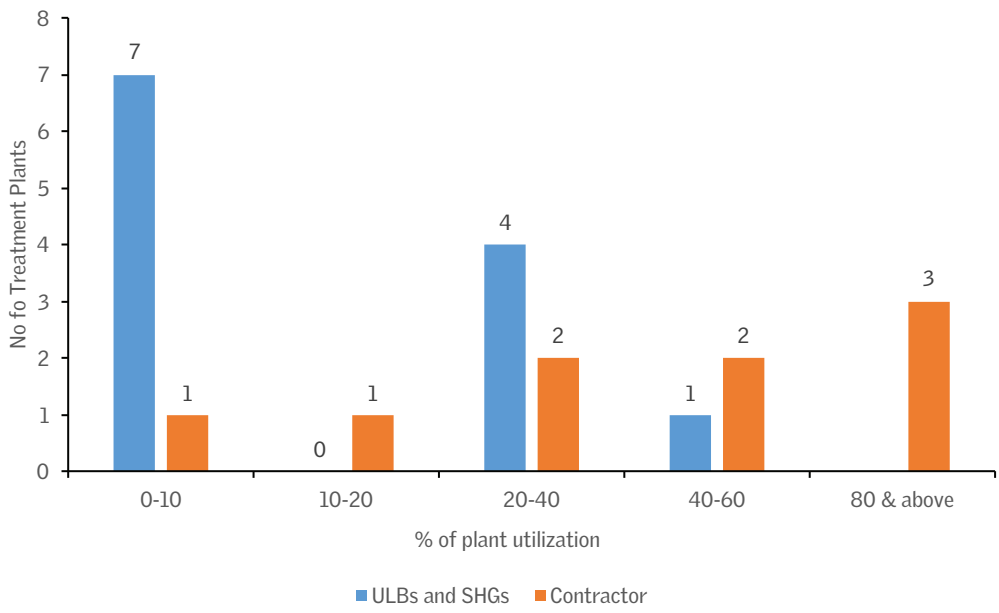
Setting up a formal arrangement for operation and maintenance of the plants is the first step towards operationalizing the plant. However, to ensure the functionality and achieve long-term sustainability, it is important that the sludge reaches the treatment plant regularly.

The graph below (see *Graph 6*) shows the percentage of plant utilization as per O&M agency engaged:

Key observations:

- In 7 out of 12 treatment plants where either SHGs or ULBs manage the plants, utilization rates are very low, ranging from 0 to 10 per cent.
- Only one ULB-managed plant reports a utilization rate exceeding 40 per cent.
- In contrast, 5 out of 9 contractor-managed plants have utilization rates above 40 per cent.

Graph 6: Plant utilization as per the O&M agency



Source: CSE

Insights:

- The data analysis shows that, on average, all 12 ULB and SHG-managed plants are operating at 18 per cent capacity utilization. While collectively, the 9 plants, operated by the contractors, are running at 42 per cent capacity utilization.
- Discussions with stakeholder shows that ULBs tend to place low priority on desludging operations when ULB themselves or SHGs manage the plant.

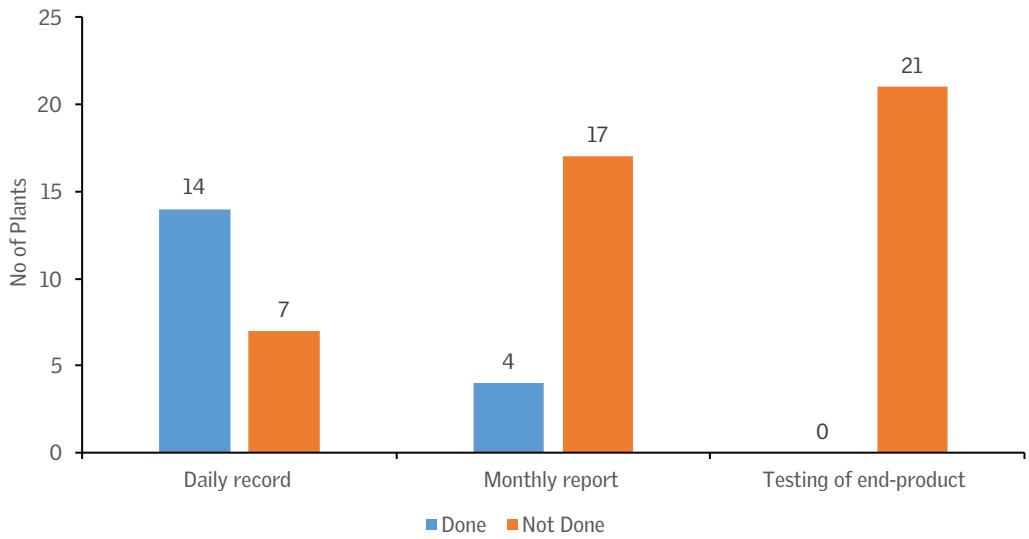
5.2 Record-keeping and performance-monitoring

Effective record-keeping supports plant functionality and sustainability by enabling performance monitoring, preventive maintenance and regulatory compliance. It helps in informed decision-making, ensures accountability, and transparency, eventually enhancing operational efficiency.

To address this, DoUD issued the guidelines (see *Annexure 3*) for maintaining records related to desludging operations and septage treatment. The survey result showed that out of 21, only 14 plants are maintaining the daily record as per the State guidelines. Among these only four have prepared and submitted the monthly report.

The operational efficiency of treatment plants is most effectively assessed by monitoring the quality of treated water and bio-solids. However, no ULB has conducted such testing to evaluate plant performance. While CSE has been testing treated water and bio-solids at several treatment plants, the findings reveal significant gaps in the treatment process.

Graph 7: Record-keeping and performance-monitoring



Source: CSE

5.3 Contracting practices

Clearly defined terms and conditions are crucial as they outline responsibilities, set performance standards, payment terms and mandate maintenance and upgrades. It supports accountability, efficient dispute resolution and ensure smooth operations.

Of the nine plants managed by contractors, contract documents were received and reviewed for seven plants. Of these seven, only four included detailed terms and conditions on the agreement. Remaining three contracts lack clarity on payments terms, role and responsibilities, performance monitoring criteria, penalty clause, dispute resolution etc. One contract document did not even mention the contract commencement date.

While ULBs compensate contractors for operating and maintaining treatment plants, the contract documents neither provided nor referenced any standard operating procedures (SOPs) for scheduled or periodic maintenance of the plant.

Also, the government advisory (see *Annexure 1*) clearly says that the contract duration should not be less than two years. However, it was observed that out of nine, three ULBs awarded contracts with a duration of one year or less. Discussions with contractors highlighted that longer contract durations provide greater confidence in the continuity and stability of their work.

6 Key findings and challenges

1. Gaps in handover process of treatment plants

- In UP, the handover of treatment plants has been delayed by over a year due to various reasons. When the handover finally took place, it was limited to a single page that simply listed a broad inventory.
- Key documents such as the detailed project report (DPR), warranty papers for electro-mechanical units, and operational manuals were not provided to the ULBs by the Jal Nigam or the contractors responsible for constructing the plants.
- In the absence of operation manual and other related documents, ULBs faced challenges in operating the plants and obtaining warranty-based repairs for electro-mechanical components.

2. Variations in O&M responsibility

- As of September 2024, only 21 out of the 53 handed-over plants had formal O&M arrangement in place.
- The plants are primarily operated by one of three entities: the ULB, SHGs or a contractor. Eight plants were operated by ULBs, four by SHGs and nine plants by contractors.

3. Financial arrangement

- ULBs are using three sources for funding the O&M expenses: own-source revenue (OSR), State Finance Commission (SFC) funds and AMRUT Mitra programme for SHGs.
- The ULB and SHG-managed plants are more cost-effective than those managed by contractors. However, dedicated efforts are required to enhance their utilization, particularly in ULB and SHG-managed plants.
- With the profit margin considered, the O&M costs in all 21 ULBs, except for Jhansi, fall within the limit prescribed in the government advisory.

4. Operational performance

- The contractor-managed plants demonstrate higher capacity utilization (42 per cent on average) compared to ULB and SHG-managed plants (18 per cent on average).
- Low prioritization of desludging by ULBs contributes to underutilization.

5. Delayed payments

- Payment delays exceeding three months were observed in seven out of 12 plants (contractor and SHG-run plants), severely impacting SHGs and contractors.
- The delay is mainly caused by poor coordination among stakeholders, rather than a lack of funds.

6. Record-keeping and monitoring:

- Only 14 plants maintain daily records, and only four submit monthly reports as per the format issued by the government.
- No ULBs have conducted the quality testing of treated water or bio-solids.

7. Contracting issues

- Out of seven reviewed contracts, three lack clear terms, including payment clauses, roles and responsibilities, penalty provisions, and performance standards.
- This ambiguity could result in disputes and inefficiencies, effecting the plant's functionality.
- Three out of nine ULBs awarded the contract for duration of one year or less. The short contract duration leads to increased administrative efforts and lack of continuity.

8. Desludging fee-based O&M arrangement in Banda:

- This arrangement offers a unique approach to plant management, as it imposes no financial burden on the ULB while ensuring efficient desludging services and plant operations.
- However, the competition between the ULB and the contractor in providing the desludging services has restricted the contractor's revenue to 25,000–45,000 INR per month, which is inadequate to sustain the plant operations effectively.
- Discussions with the contractor and further analysis indicate that transferring all desludging requests and fees to the contractor could make this arrangement financially viable.

9. Key insights on O&M arrangement

O&M agency	Strength	Weakness or requires attention	What needs to be done
ULB & SHG-run plant	• Highly cost-effective • No additional costs, such as overheads or profit margins • Greater control of plant operations by the ULB	• Inadequate attention on desludging services and plant operations • Need for skilled engineers in ULB, with expertise in treatment processes and plant management • Require regular interaction with staff or SHG members at the plant for team building • Delay in any upgrades or major purchase due to administrative processes • Insufficient availability of necessary PPEs	• Regular monitoring of desludging services and plant utilization or performance • Conduct training of ULB officials on technical and management aspects • Prioritize workers safety by ensuring the availability of PPEs and tools. • Deploy committed staff to ensure efficient plant operation
Contractor-run plant	• Higher plant utilization and efficiency • ULB can better monitor the plant • Timely maintenance in case of breakdown • Availability of PPEs in most cases	• High operational costs for ULB • Payment delays from ULB to contractors • ULB requires strong contract management skills • Potential disputes with contractors may disrupt operations • Greater dependency on the contractor for plant functioning	• Ensure timely payments to contractors, preferably through an escrow account • Refer to the state-issued model contract—link the payment with plant treatment efficiency and ensure strict implementation on state-issued SOP for O&M • Strengthen ULB oversight with regular monitoring • Conduct training of ULB officials on technical and management aspects

7. Recommendations

1. Strengthen the handover process

- Standardize handover protocol including documents like detailed project reports (DPRs), warranty papers, and operational manuals to avoid challenges during plant operation.
- A third-party verification of the quality of plant construction before they are handed over to the ULB, as the quality of construction was a significant deterrence in the handover process.

2. Improved contracting practices

- Mandate the use of the model contract "Operation and Maintenance of Faecal Sludge Treatment Plant/Co-Treatment Plant and Desludging Vehicles" (see *Annexure 4*) to avoid any ambiguity and clearly define the terms of engagement, role and responsibilities, payment terms, penalty clauses etc.
- As suggested by the government advisory (see *Annexure 1*), the duration of contract should not be less than two years to ensure continuity of work and reduce administrative processes.

3. Enhance financial mechanisms

- Establish robust systems for timely payments to contractors and SHGs to maintain service quality. This is an important component in ensuring the sustainability of the plant operations.
- ULBs may consider establishing an escrow account to ensure timely payment to contractors.

4. Enhanced operational performance and plant utilization

- Mandate the use of "Standard Operating Procedure for Operation and Maintenance of FSTPs and Co-treatment Plants in Uttar Pradesh" (see *Annexure 5*) and ensure that all plant operators adhere to the prescribed schedules to operate and maintain the treatment plants efficiently.
- ULBs need to put focused efforts towards increasing the plant utilization rates. They should prepare a city-level desludging plan as per the guidelines given by the Department of Urban Development, UP, (see *Annexure 6*) prioritizing scheduled desludging from government institutions and encourage public to promote regular desludging.

5. Establish treatment quality monitoring and record-keeping mechanism

- Conduct regular quality testing of treated water and bio-solids, preferably on a monthly basis, to assess the plant's operational efficiency. The release of payment to the contractor should be linked with quality of treatment.
- Strengthen record-keeping practices following the advisory issued by the government for transparency and operational oversight. These records should be submitted at the State AMRUT office monthly.

6. Optimizing the Banda O&M arrangement for long-term sustainability and scalability

- ULB should direct all desludging requests and fees to the contractor to ensure the long-term sustainability of the desludging fee-based O&M model, allowing the contractor to generate sufficient revenue for effective plant operation.
- Focus should be placed on encouraging regular desludging of septic tanks, as this is directly linked to the plant's sustainability.
- Success of this arrangement could offer a scalable solution for other ULBs, promoting efficient management of FSSM services in the long term, without incurring additional financial burdens on the ULB.

8. Annexures

Annexure 1: Government advisory on O&M costing of FSTP and co-treatment plants

प्रेषक,

राज्य मिशन निदेशक (अमृत)
नगरीय प्रशिक्षण एवं शोध केंद्र व् स्थानीय निकाय निदेशालय
चौथा तल, गोमती नगर विस्तार सेक्टर 7
लखनऊ

सेवा में,

नगर आयुक्त, नगर निगमः– इलाहाबाद, अलीगढ़, आगरा, कानपुर, लखनऊ, गोरखपुर, वाराणसी, सहारनपुर, गाजियाबाद, मुरादाबाद, मथुरा–वृन्दावन, बरेली, फिरोजाबाद, मेरठ, झाँसी, शाहजहाँपुर एवं अयोध्या उ0प्र0।

अधिशासी अधिकारी, नगर पालिका परिषदः– शिकोहाबाद, हाथरस, मैनपुरी, फतेहपुर, फर्रूखाबाद, इटावा, रायबरेली, सुल्तानपुर, हरदोई, लखीमपुर, उन्नाव, सीतापुर, देवरिया, जौनपुर, बदायूँ, पीलीभीत, मुजफ्फरनगर, शामली, मोदीनगर, लोनी, बड़ौत, खुर्जा, बुलन्दशहर, हापुड़, चन्दौसी, रामपुर, सम्भल, अमरोहा, उरई, बांदा, ललितपुर, मऊनाथ भंजन, आजमगढ़, बहराइच, अकबरपुर, गोण्डा, मिर्जापुर, बस्ती उ0प्र0।

पत्रांकः एसएमएमयू/ 438 /1073/2023 दिनाँकः 24 नवम्बर, 2023

विषय– अमृत के अंतर्गत फीकल स्लज एवं सेप्टेज प्रबंधन (FSSM) संयंत्रों के संचालन और रखरखाव (O&M) की लागत एवं सेप्टिक टैंक सफाई शुल्क (Desludging fees) निर्धारण के सम्बन्ध में।

महोदय,

उल्लेखनीय है कि आपकी निकाय में अमृत योजना के अंतर्गत उ0प्र0 जल निगम (नगरीय) के द्वारा FSTP/Co-treatment plant का निर्माण कार्य पूर्ण किया जा चुका है, जिसका संचालन परियोजना के हस्तान्तरण के पश्चात नगरीय निकायों के द्वारा ही किया जाना है।

FSTP/Co-treatment plant के संचालन एवं रख–रखाव हेतु निदेशक, नगरीय निकाय निदेशालय के पत्र संख्या–423/01/न0 प्रशि0/2023, दिनांक 07 नवम्बर, 2023 के द्वारा FSSM Bye-Laws (Draft) एवं पत्र संख्या–422/01/न0 प्रशि0/2023, दिनांक 07 नवम्बर, 2023 के द्वारा O&M के लिये Model Contract (Draft) प्रेषित किया जा चुका है।

नगरीय निकायों को अमृत योजना के अंतर्गत फीकल स्लज एवं सेप्टेज प्रबंधन (FSSM) संयंत्रों के संचालन और रखरखाव (O&M) की लागत एवं शहर में सेप्टिक टैंक सफाई शुल्क (Desludging fees) के बारे में मार्गदर्शन हेतु विवरण निम्नवत् है :–

1. <u>FSSM संयंत्रों का संचालन और रखरखाव (O&M)</u> :–

I. FSSM संयंत्रों के संचालन और रखरखाव (O&M) में आने वाला व्यय (प्रतिलिपि संलग्न) निकाय को केंद्रीय वित्त आयोग (CFC)]/ राज्य वित्त आयोग (SFC) अथवा निकाय निधि में उपलब्ध राशि से वहन करना होंगा।

II. 32 KLD FSTP के संचालन एवं रखरखाव (O&M) की शुद्ध अनुमानित लागत ₹ 1.4 लाख से ₹ 1.9 लाख प्रतिमाह के बीच में आती है। Technology के हिसाब से संचालन और रखरखाव (O&M) की लागत निम्नलिखित है, जिसका विवरण पृथक से संलग्न है :–

क्र.सं.	FSTP टेक्नोलॉजी	प्रतिमाह लागत(लाख)	वार्षिक लागत (लाख)
1.	ड्राईंग बेड्स बेस्ड नेचुरल सिस्टम	₹ 1.40	₹ 16.8
2.	टाइगर बायो–फिल्टर बेस्ड सिस्टम	₹ 1.86	₹ 22.3
3.	हाइब्रिड सिस्टम	₹ 1.54	₹ 18.5

III. भिन्न क्षमताओं पर आधारित Co-treatment plants के संचालन और रखरखाव (O&M) की शुद्ध अनुमानित लागत ₹ 0.94 लाख से ₹ 1.73 लाख प्रतिमाह के बीच में आती है। भिन्न–भिन्न क्षमता (Capacity) वाले Co-treatment plants के संचालन और रखरखाव (O&M) की अनुमानित लागत निम्नवत् दी गयी है-

क्र.सं.	Co-treatment क्षमता (KLD)	प्रतिमाह लागत (लाख)	वार्षिक लागत (लाख)
1.	25	₹ 0.94	₹ 11.3
2.	50	₹ 1.08	₹ 13.0
3.	75	₹ 1.32	₹ 15.8
4.	100	₹ 1.73	₹ 20.8

IV. भविष्य में होने वाले सभी अनुबंधों (Contracts) में संयंत्र का संचालन और रखरखाव (O&M) की लागत एवं शहर में सेप्टिक टैंक सफाई शुल्क (Desludging fees) घटक अलग होने चाहिए। नए अनुबंधों की अवधि 02 वर्ष से कम नहीं होनी चाहिए।

V. संयंत्र का संचालन और रखरखाव (O&M) एवं शहर में सेप्टिक टैंक सफाई सेवाएं प्रदान करने के लिए एक अथवा दो अलग–अलग ठेकेदार को देने का निर्णय निकाय को अपने स्तर पर लेना होगा।

2. शहर में सेप्टिक टैंक सफाई शुल्क (Desludging fees)

I. दूरी और चक्कर की संख्या (Number of Trips) के आधार पर शहर में सेप्टिक टैंक सफाई हेतु वैक्यूम टैंकर की प्रति चक्कर (आना–जाना) अनुमानित लागत एवं शुल्क (Based on certain assumptions) (प्रतिलिपि संलग्न) निम्नवत् है :–

क्र.सं.	प्रति चक्कर पूर्ण दूरी (कि.मी)	डिस्लजिंग लागत (₹) एक टैंकर द्वारा प्रतिदिन चक्कर				डिस्लजिंग शुल्क (₹) एक टैंकर द्वारा प्रतिदिन चक्कर			
		1	2	3	4	1	2	3	4
1.	10 से कम	1,350	750	550	450	2,200	1,200	800	700
2.	10-15	1,450	850	750	550	2,300	1,300	1000	800
3.	15-20	1,600	1000	800	700	2,400	1,400	1,100	900
4.	20 से अधिक	1,700	1,200	1000	850	2,600	1,600	1,200	1,100

नोट :– फील्ड ऑब्जरवेशन के आधार पर एक टैंकर द्वारा लगाई जाने वाले चक्कर की अधिकतम संख्या 04 ली गयी है।

II. अगर निकाय पूरे शहर में सेप्टिक टैंक क्लीनिंग सेवाएं नो प्रॉफिट नो लॉस के आधार पर प्रदान करने की ज़िम्मेदारी लेना चाहता है तो ऊपर दी गयी लागत का सन्दर्भ लेते हुए प्रति चक्कर शुक्ल निर्धारित कर सकता है।

III. अगर निकाय शहर के प्राइवेट ऑपरेटर्स के सहयोग से सेवाएं प्रदान करना चाहता है या प्रति चक्कर कुछ प्रॉफिट की अपेक्षा रखता है तो ऊपर दिया गया शुल्क का सन्दर्भ लेकर निर्धारित कर सकता है।

IV. निकाय को प्राइवेट ऑपरेटर्स से परामर्श कर के शुल्क निर्धारित करना चाहिए और उसके बाद ही शुल्क को उपविधि (FSSM Byelaws) का हिस्सा बनाए।

V. City Specific लागत और शुल्क जानने हेतु, निकाय CSE द्वारा बनाए गए डिस्लजिंग कैलकुलेटर[1] का प्रयोग कर सकता है।

संलग्नकः– उपरोक्तानुसार।

भवदीय,

24/11/2023

(पी0 के0 श्रीवास्तव)
अपर मिशन निदेशक (अमृत)

[1] https://drive.google.com/file/d/1pR9Z3xMGnQB2R-PN3me6c8nkYuzvLUCU/view?usp=drive_link

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

Annexure 2: Plant-wise details related to operation and maintenance

S. no.	ULB name	Capacity and type of plant	Agency managing the plant	O&M cost per year (INR)	Scope of work	Number of staff	Plant utilization per cent	Source of fund
1.	Hapur	32 KLD FSTP	ULB	7,00,000	Only plant operation	5	25	ULB OSR
2.	Bahraich	32 KLD FSTP	ULB	3,80,000	Only plant operation	2	5	ULB OSR
3.	Modinagar	32 KLD FSTP	ULB	7,20,000	Only plant operation	4	10	ULB OSR+SFC
4.	Farrukhabad	32 KLD FSTP	ULB	6,60,000	Only plant operation	5	25	ULB OSR
5.	Bijnor	20 KLD Co-treatment	ULB	1,50,000	Only plant operation	1	25	ULB OSR
6.	Lakhimpur	32 KLD FSTP	ULB	6,60,000	Only plant operation	4	45	ULB OSR
7.	Deoria	32 KLD FSTP	ULB	6,00,000	Only plant operation	4	45	ULB OSR
8.	Amroha	32 KLD FSTP	ULB	13,50,000	Plant operation and desludging service	3	30	ULB OSR+SFC
9.	Sitapur	32 KLD FSTP	SHG	14,34,000	Only plant operation	8	7	AMRUT Mitra+ULB
10.	Khurja	32 KLD FSTP	SHG	8,00,000	Only plant operation	6	5	AMRUT Mitra+ULB
11.	Jaunpur	32 KLD FSTP	SHG	9,00,000	Only plant operation	4	10	AMRUT Mitra+ULB
12.	Raebareli	32 KLD FSTP	SHG	8,40,000	Only plant operation	4	15	AMRUT Mitra+ULB
13.	Shahjahanpur	32 KLD FSTP	Contractor	17,70,000	Plant operation and desludging service	4	30	ULB OSR
14.	Loni	32 KLD FSTP	Contractor	20,48,150	Only plant operation	7	45	ULB OSR
15.	Jhansi	18 KLD FSTP	Contractor	55,44,000	Plant operation and desludging service	7	80	ULB OSR
16.	Ayodhya	32 KLD FSTP	Contractor	24,55,200	Only plant operation	3	3	ULB OSR
17.	Banda	32 KLD FSTP	Contractor	0	Only plant operation	3	9	No financial burden
18.	Akbarpur	32 KLD FSTP	Contractor	24,80,000	Plant operation and desludging service	4	25	ULB OSR
19.	Chunar	10 KLD FSTP	Contractor	5,00,000	Only plant operation	1	100	NMCG
20.	Saharanpur	25 KLD Co-treatment	Contractor	17,20,728	Only plant operation	4	100	ULB OSR
21.	Shikohabad	32 KLD FSTP	Contractor	21,80,640	Only plant operation	2	30	ULB OSR

Annexure 3: State guidelines on record-keeping

प्रेषक,

राज्य मिशन निदेशक (अमृत),
नगरीय प्रशिक्षण एवं शोध केन्द्र व स्थानीय निकाय निदेशालय,
चौथा तल, गोमती नगर विस्तार सेक्टर–7,
लखनऊ ।

सेवा में,

नगर आयुक्त/महाप्रबन्धक (जल),
नगर निगमः– प्रयागराज, अलीगढ़, आगरा, कानपुर, लखनऊ, गोरखपुर, वाराणसी, सहारनपुर, गाजियाबाद, मुरादाबाद, मथुरा–वृन्दावन, फिरोजाबाद, मेरठ, झाँसी, शाहजहाँपुर एवं अयोध्या उ0प्र0।

अधिशासी अधिकारी/जलकल अभियन्ता,
नगर पालिका परिषदः–शिकोहाबाद, मैनपुरी, फतेहपुर, फर्रूखाबाद, इटावा, रायबरेली, सुल्तानपुर, हरदोई, लखीमपुर, उन्नाव, सीतापुर, देवरिया, जौनपुर, बदायूँ, पीलीभीत, मुजफ्फरनगर, शामली, मोदीनगर, लोनी, बड़ौत, खुर्जा, बुलन्दशहर, हापुड़, चन्दौसी, रामपुर, सम्भल, अमरोहा, उरई, बांदा, ललितपुर, मऊनाथ भंजन, आजमगढ़, बहराइच, अकबरपुर, गोण्डा, मिर्जापुर एवं बस्ती उ0प्र0।

पत्रांकः एसएमएमयू/ 1095 / 1073 / 2024 दिनाँकः 17 मई, 2024

विषयः अमृत योजनान्तर्गत निर्मित FSTP and Co-Treatment Plants के संचालन एवं रख–रखाव (Operation & Maintenance) के सम्बन्ध में।

महोदय,

उल्लेखनीय है कि आपकी निकाय में अमृत योजनान्तर्गत FSTP and Co-Treatment Plants निर्मित हो चुके हैं, जिनमें से अधिकांश का हस्तान्तरण जल निगम के द्वारा नगरीय निकायों को किया जा चुका है। अतः नगरीय निकायों के द्वारा FSTP and Co-Treatment Plants का उपयोग पूर्ण क्षमता के साथ किया जाना अतिआवश्यक है, इसके लिये राज्य मिशन निदेशालय (अमृत) के स्तर से समय–समय पर मार्गदर्शन प्रदान किया जाता रहा है। इस कार्य के लिये नगर विकास विभाग के Knowledge partner - Centre for Science & Environment (CSE) के द्वारा भी FSTP and Co-Treatment Plants के संचालन एवं रख–रखाव (O&M) हेतु समय–समय पर सम्बन्धित निकायों की handholding की गई है तथा इस सन्दर्भ में निदेशालय एवं क्षेत्रीय स्तर पर कार्यशालायें भी आयोजित की गई हैं।

FSTP and Co-Treatment Plants के संचालन एवं रख–रखाव (O&M) के प्रभावी अनुश्रवण (Monitoring) हेतु पृथक–पृथक दो प्रारूप (Format-1, Format-2 एवं Format-3) संलग्न कर इस आशय के साथ प्रेषित किये जा रहे हैं कि Format-1 पर FSTP and Co-Treatment Plants पर desludging हेतु आने वाले ULB vehicles एवं Private Vehicles का दैनिक विवरण, Format-2 पर नगरीय निकायों में सेप्टिक टैंक खाली कराये जाने हेतु भवन स्वामियों/नागरिकों से प्राप्त होने वाले अनुरोधों (Desludging Requests) का विवरण अंकित करना सुनिश्चित किया जाये तथा Format-3 पर FSTP and Co-Treatment Plants के संचालन एवं रख–रखाव (O&M) से सम्बन्धित मासिक विवरण प्रत्येक माह के प्रथम सप्ताह में राज्य मिशन निदेशालय (अमृत) की ई–मेल–smmuup.amrut@gmail.com पर प्रेषित करना सुनिश्चित किया जाये।

संलग्नक :–उपरोक्तानुसार।

भवदीय,
17/5/24
(पी0 के0 श्रीवास्तव)
अपर मिशन निदेशक (अमृत)

प्रतिलिपि– निम्नलिखित को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित :–

1. निदेशक, नगरीय निकाय निदेशालय, उ0प्र0, लखनऊ।
2. प्रबन्ध निदेशक, उ0प्र0 जल निगम (नगरीय), लखनऊ।
3. मुख्य अभियन्ता (नागर), उ0प्र0 जल निगम (नगरीय), लखनऊ।
4. अधिशासी अधिकारी, नगर पालिका परिषद–बिजनौर, चुनार एवं नगर पंचायत–बख्शी का तालाब।
5. Centre for Science & Environment (CSE)

17/5/24
(पी0 के0 श्रीवास्तव)
अपर मिशन निदेशक (अमृत)

Annexure 4: Model contract for O&M of plants and desludging vehicles

FSTP/Co-Treatment Plants का संचालन

प्रेषक,

निदेशक,
नगर निकाय, उ0 प्र0,
गोमती नगर विस्तार सेक्टर - 7
लखनऊ ।

सेवा में,

1- नगर आयुक्त,
नगर निगम- प्रयागराज, अलीगढ़, आगरा, कानपुर, लखनऊ, गोरखपुर, वाराणसी, सहारनपुर, गाजियाबाद, मुरादाबाद, मथुरा-वृन्दावन, फिरोजाबाद, मेरठ, झाँसी, शाहजहाँपुर एवं अयोध्या उ0 प्र0।

2- अधिशासी अधिकारी,
नगर पालिका परिषद/नगर पंचायत- शिकोहाबाद, हाथरस, मैनपुरी, फतेहपुर, फर्रुखाबाद, इटावा, रायबरेली, सुल्तानपुर, हरदोई, लखीमपुर, उन्नाव, सीतापुर, देवरिया, जौनपुर, बदायूँ, पीलीभीत, मुजफ्फरनगर, शामली, मोदीनगर, लोनी, बड़ौत, खुर्जा, बुलन्दशहर, हापुड़, चन्दौसी, रामपुर, अमरोहा, उरई, बांदा, ललितपुर, मऊनाथ भंजन, आजमगढ़, बहराइच, अकबरपुर, गोण्डा, मिर्जापुर, बस्ती, बक्शी का तालाब, चुनार, बिजनोर उ0 प्र0।

पत्रांक: 422/01/नगरीय प्रशिक्षण/2023 **दिनांक: 07 नवम्बर, 2023**

विषय:-उत्तर प्रदेश की निकायों में FSTP/Co-Treatment Plants के संचालन-रखरखाव (O&M) के लिए Model Contract के संबंध में।

महोदय,

कृपया उपर्युक्त विषयक संदर्भ में अवगत कराना है की अमृत योजना के अंतर्गत आपकी निकाय में FSTPs/Co-treatment plants निर्मित किए गए हैं, जिन्हे संचालन हेतु जल निगम द्वारा संबन्धित नगरीय निकायों को हस्तांतरित (handover) किया जाना है। इसी क्रम में अगला मुख्य कार्य इन plants का सुदृढ़ संचालन और रखरखाव (O&M) एवं plants की sustainability को बनाए रखना है। निकाय, यदि plants का संचालन और रखरखाव का दायित्व किसी निजी फ़र्म को देना चाहता है, तो उनकी आवश्यकता को ध्यान में रखते हुए नगर विकास विभाग ने CSE के सहयोग से मॉडल अनुबंध (Model Contract) तैयार किया है।

अतः मॉडल अनुबंध (Model Contract) संलग्न कर इस आशय के साथ प्रेषित किया जा रहा है कि निकाय अपनी आवश्यकता के आधार पर मॉडल अनुबंध (Model Contract) को संशोधित कर, plants का संचालन और रखरखाव किया जाना सुनिश्चित करें।

संलग्नक: State Model Contract for Operation and Maintenance (O&M) of Faecal Sludge Treatment Plant (FSTP)/Co-treatment plant and desludging vehicles

भवदीय,

07/11/23
(डॉ नितिन बंसल)
निदेशक।

https://www.cseindia.org/content/downloadreports/11958

Annexure 5: Standard operating procedure for operation and maintenance of FSTPs and co-treatment plants in Uttar Pradesh

प्रेषक,

निदेशक,
नगर निकाय, उ0प्र0,
सेक्टर–7, गोमती नगर विस्तार, लखनऊ।

सेवा में,

1. नगर आयुक्त,
नगर निगम– प्रयागराज, आगरा, कानपुर, लखनऊ, मुरादाबाद, गोरखपुर, वाराणसी, सहारनपुर,गाजियाबाद, मथुरा–वृन्दावन, फिरोजाबाद, मेरठ, शाहजहाँपुर, झाँसी, अलीगढ़, एवं अयोध्या, उ0प्र0।
2. अधिशासी अधिकारी,
नगर पालिका परिषद/नगर पंचायत– शिकोहाबाद, हाथरस, मैनपुरी, फतेहपुर, फर्रुखाबाद, इटावा, रायबरेली, सुल्तानपुर, हरदोई, लखीमपुर, उन्नाव, सीतापुर, देवरिया, जौनपुर, बदायूँ, पीलीभीत, मुजफ्फरनगर, शामली, मोदीनगर, लोनी, बड़ौत, खुर्जा, बुलन्दशहर, हापुड़, चन्दौसी, रामपुर, उरई, बांदा, ललितपुर, मऊनाथ भंजन, आजमगढ़, बहराइच, अकबरपुर, गोण्डा, मिर्जापुर, बस्ती, बिजनौर, चुनार, बक्शी का तालाब, उ0प्र0।

पत्रांक– 155/[illegible]/ 04-प /2025 · लखनऊ:दिनांक 30 जनवरी, 2025

विषय– **उत्तर प्रदेश की निकायों में FSTPs/Co-treatment plants के संचालन/रखरखाव (O&M) हेतु Standard Operating Procedure (SOP) तैयार किये जाने के संबंध में।**

महोदय,

कृपया उपर्युक्त विषयक संदर्भ ग्रहण करने का कष्ट करें जिसके माध्यम से प्रदेश की निकायों में FSTPs/Co-treatment plants के संचालन/रखरखाव (O&M) हेतु Standard Operating Procedure **(SOP)** तैयार किये गये हैं जिनके संचालन हेतु जल निगम द्वारा संबंधित नगरीय निकायों को हस्तांतरित (Handover) पूर्व में ही किया जा चुका है। उक्त के क्रम में FSTPs/Co-treatment plants के समुचित संचालन/रखरखाव (O&M) किया जाना है। इस परिप्रेक्ष्य में निकाय की आवश्यकता को ध्यान में रखते हुए Centre for Science and Environment (CSE) का सहयोग प्राप्त करते हुए "SOP" for Operations and Maintenance (O&M) of FSTPs and Co-treatment Plants of Uttar Pradesh" संलग्न करते हुए इस आशय से प्रेषित किया जा रहा है कि Standard Operating Procedure (SOP) में दिये गये दिशा–निर्देशों का अनुपालन FSTPs/Co-treatment plants का समुचित संचालन रखरखाव (O&M) किया जाना सुनिश्चित करें।

संलग्नक:-SOP for Operations and Maintenance (O&M) of FSTPs and Co-treatment Plants in Uttar Pradesh

भवदीय,

(अनुज कुमार झा)
निदेशक

संख्या एवं दिनांक तदैव।

प्रतिलिपि–निम्नलिखित को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित।

1–प्रमुख सचिव, नगर विकास विभाग, उत्तर प्रदेश शासन, लखनऊ।
2–राज्य मिशन निदेशक (अमृत), राज्य मिशन निदेशालय उ0प्र0, लखनऊ।
3–प्रबन्ध निदेशक, उ0प्र0 जल निगम (नगरीय), लखनऊ।
4–सीनियर प्रोग्राम मैनेजर, सेंटर फॉर साइंस एंड एनवायरमेंट, (सी0एस0ई0), लखनऊ।
5–गार्ड फाइल।

(अनुज कुमार झा)
निदेशक

https://www.cseindia.org/sop-for-operations-and-maintenance-of-fstps-and-co-treatment-plants-in-uttar-pradesh-12533

Annexure 6: Guidelines for preparing a city-level desludging plan

FSTP/Co-Treatment Plants का संचालन

प्रेषक,

राज्य मिशन निदेशक (अमृत एवं अमृत 2.0)
अमृत मिशन निदेशालय, उ0प्र0
नगरीय प्रशिक्षण एवं शोध केन्द्र व स्थानीय निकाय निदेशालय,
गोमती नगर विस्तार, सेक्टर–7, लखनऊ।

सेवा में,

नगर आयुक्त/महाप्रबन्धक (जल), नगर निगमः– इलाहाबाद, अलीगढ़, आगरा, कानपुर, लखनऊ, गोरखपुर, वाराणसी, सहारनपुर, मथुरा, गाजियाबाद, मुरादाबाद, फिरोजाबाद, मेरठ, झाँसी, शाहजहाँपुर एवं अयोध्या उ0प्र0। (FSTP एवं Co-Treatment Plant से सम्बन्धित)।	अधिशासी अधिकारी/जलकल अभियन्ता, नगर पालिका परिषदः–शिकोहाबाद, हाथरस, मैनपुरी, फतेहपुर, फर्रूखाबाद, इटावा, रायबरेली, सुल्तानपुर, हरदोई, लखीमपुर, उन्नाव, सीतापुर, देवरिया, जौनपुर, बदायूँ, पीलीभीत, मुजफ्फरनगर, शामली, मोदीनगर, लोनी, बड़ौत, खुर्जा, बुलन्दशहर, हापुड़, चन्दौसी, रामपुर, अमरोहा, उरई, बांदा, ललितपुर, मऊनाथ भंजन, आजमगढ़, बहराइच, अकबरपुर, गोण्डा, मिर्जापुर, बस्ती उ0प्र0। (FSTP एवं Co-Treatment Plant से सम्बन्धित अमृत निकाय)।

पत्रांकः एसएमएमयू/ 1905 /1073/2024 दिनाँकः 13 सितम्बर, 2024

विषयः अमृत निकायों में निर्मित FSTP/Co-Treatment Plants के प्रभावी संचालन हेतु डिस्लजिंग पोटेंशियल (Desludging potential) आंकने और Scheduled institutional desludging plan (सुनियोजित संस्थागत सेप्टिक टैंक सफाई) क्रियान्वयन करने के सम्बन्ध में दिशानिर्देश।

महोदय,

उक्त विषय से सम्बंधित आपके निकाय में अमृत तथा अन्य योजना के अंतर्गत FSTP/Co-Treatment Plants का निर्माण कार्य पूर्ण हो चुका है, जिसके संचालन और रखरखाव का दायित्व हस्तांतरण के पश्चात् नगरीय निकाय का है। इन Treatment Plants (संयंत्रों) को उनकी अधिकतम क्षमता पर चलाने हेतु पर्याप्त स्लज सुनिश्चित करना निकाय के लिए काफी महत्वपूर्ण है।

इस सन्दर्भ में निकाय को Desludging potential आंकना और Scheduled institutional desludging plan बना कर क्रियान्वित करना है। (प्रारूप – संलग्नक 1)

Desludging potential – निकाय के सेप्टिक टैंक से निकले स्लज की प्रतिदिन मात्रा (Sludge volume) का आंकलन है, जिसके आधार पर यह पता चलेगा कि संयंत्र अधिकतम कितनी क्षमता पर संचालित हो सकता है। Desludging potential के आधार पर एक Desludging plan बनेगा, जिसके अंतर्गत आवासीय व व्यावसायिक भवन मौजूदा demand based desludging practice पर आधारित रहेंगे तथा जबकि निकाय में स्थित समस्त सामुदायिक शौचालयों (Community Toilets) व सार्वजनिक शौचालयों (Public Toilets) सहित सरकारी भवनों की Desludging पहल स्वरुप एक Schedule/plan के आधार पर होगी जिसे Scheduled institutional desludging का नाम दिया गया है।

निकायों में Desludging potential और Scheduled institutional desludging plan को बनाने और क्रियान्वयन की विस्तृत जानकारी हेतु दिशा निर्देश इस आशय के साथ प्रेषित किये जा रहे हैं कि कृपया आपके निकाय में अमृत तथा अन्य योजना के अंतर्गत निर्मित FSTP/Co-Treatment Plants का पूर्ण क्षमता के साथ प्रभावी संचालन सुनिश्चित कराने का कष्ट करें।

संलग्नक –

1. Desludging potential और Scheduled institutional desludging plan प्रारूप
2. Desludging potential और Scheduled institutional desludging plan बनाने और क्रियान्वयन हेतु दिशा निर्देश

संलग्नक :– उपरोक्तानुसार।

भवदीय,
13/9/24
(पी0 के0 श्रीवास्तव)
अपर मिशन निदेशक (अमृत)

https://www.cseindia.org/guidelines-for-improving-treatment-plant-utilization-12557

Uttar Pradesh has made considerable progress in faecal sludge and septage management (FSSM), expanding from a single treatment plant in 2018 to 59 plants across the state. However, the sustainability and efficiency of these facilities depend on robust operation and maintenance (O&M) practices. This report, developed by the Centre for Science and Environment (CSE), presents an in-depth analysis of O&M arrangements across 21 urban local bodies (ULBs). It evaluates cost-effectiveness, performance efficiency, financial sustainability, and governance mechanisms in plants managed by ULBs, self-help groups (SHGs) and contractors.

The report provides actionable recommendations to enhance operational efficiency, streamline financial mechanisms and strengthen oversight. It serves as a critical resource for policymakers, municipal authorities, and sanitation practitioners aiming to improve the long-term functionality of FSSM infrastructure in Uttar Pradesh.

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