

Training OF Trainers

**Faecal Sludge and
Septage Management**

IFSM Toolkit

Prepared for
Sanitation Capacity Building Platform of
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Introduction

Faecal Sludge and Septage Management has been a neglected area in most of the Indian cities. It has not received attention because of poor understanding of faecal sludge/ septage, lack of proper technical guidance, inadequate resources, shortage of skilled manpower and lack of finance. As per census 2011, toilets connected with onsite sanitation system are higher than the ones connected to sewer networks in India; 40 percent of households with toilets connected to sewer network as compared to 60 percent that depend on onsite sanitation systems, mainly septic tanks. An analysis of service level benchmark information suggests that majority of the cities depend fully on onsite sanitation systems.

Currently on-site pit latrines and septic tanks account for a substantial proportion of toilets in urban India. Further, as urban households without toilets obtain facilities over the next few years under SBM, it is likely that many will acquire on-site arrangements like pit latrines and septic tanks in cities at locations where sewerage systems are not available. Thus, while the containment of human waste will be largely achieved under SBM, its treatment still poses a huge challenge. While onsite sanitation is prevalent in cities, there are major gaps in its implementation across the sanitation service chain. While the gaps and consequences of lack of access to toilets are well reported, those relating to septage collection, conveyance and treatment remain largely unknown and unaddressed by most, if not all, municipal bodies and most state governments. Even in the general discourse, this major health hazard is not well understood or talked about.

Septage Management is a significant element of urban sanitation. With Swachh Bharat Mission (SBM), Government of India has set an impressive target of universal access to improved sanitation for all by 2019. The Clean India Mission has specific goals of creating open defecation free cities and integrated city-wide sanitation. The wide prevalence of on-site sanitation system in India necessitates the need to explore on-site sanitation options along with improved access to toilets and safe management of septage.

Citywide Integrated Faecal Sludge Management (IFSM) planning involves assessment and planning across the full service chain. It was observed that though many city officials aspire to adopt Integrated Faecal Sludge Management (IFSM) plan in their cities but there is lack of know-how, understanding and capacity to actually implement it. It is in this context that a web-based IFSM toolkit for Citywide Assessment and Planning was developed at the CEPT University under the Performance Assessment System (PAS) Project, an action research programme funded by the Bill and Melinda Gates Foundation.

IFSM Toolkit for Citywide Assessment and Planning

The main objective of the toolkit is to help users identify key areas of assessment for commencing IFSM planning in a city through a step-by-step approach and various tools for data collection and field assessment. It will help initiate informed discussion among stakeholders and provide for 'evidence-based' decision making by city authorities.



The tools are organized around five key areas: a) Service Performance, b) Institutions Regulations Policy, c) Technology Options, d) Private Service Providers and e) Financial Assessment. Assessing the current situation of FSM in these five areas is important to develop a FSM plan that is technically appropriate and financially feasible at local level. Assessment in each area entails review of available information at city level, identifying information gaps, and conducting field studies where necessary. The web-based toolkit can be accessed at <http://ifsmtoolkit.pas.org.in/>.

Module 1: Assessing Service Performance across the Full Service Chain

Assessing service performance across the service chain through a city level assessment is the first step in planning process. It is an important exercise, which provides an initial sense of the state of FSM in the city, help in understanding the context and identifying gaps in key services. The data collection and field assessments in the city should start with a kick-off meeting with key stakeholders.

Assessment areas		
Assessment through City level Performance Indicators	Assessment across each link in the service chain	Summary and vision
Assessment Tools		
1. SANIPLAN: Information collection and initial performance assessment	a. SaniPlan , SaniPlan-FSM b. Data for SaniPlan Input: List of sources	
2. Physical and spatial analysis of city	a. Sample maps	
3. Field assessment of toilets and onsite systems	a. SaniTab tool (Android installer.apk file) b. Manual for Surveyors c. Template for survey of small contractors and masons d. Template for technical assessment of onsite systems	
4. Field assessment of emptying services and treatment	a. Template: Onsite system emptying service b. Template: Wastewater quality assessment	

Assessment Areas

Assessment through City Level Performance Indicators

A sanitation service chain includes links for Access – Collection – Conveyance – Treatment – Reuse/Disposal. Service performance assessment is done for each of these links in the chain on the basis of key indicators. This is done using the first module of SANIPLAN for performance assessment. SANIPLAN provides a structured approach to data collection for this. Performance indicators have been developed as SAN-Benchmarks to capture different city contexts with full onsite sanitation, as well as mixed systems that have part sewerage and part onsite systems. SANIPLAN also enables traffic light analysis by comparing with benchmarks and peer performance.

Assessment across each link in the Service Chain

Detailed assessment of services will need to be done across each link in the chain through appropriate field assessments:

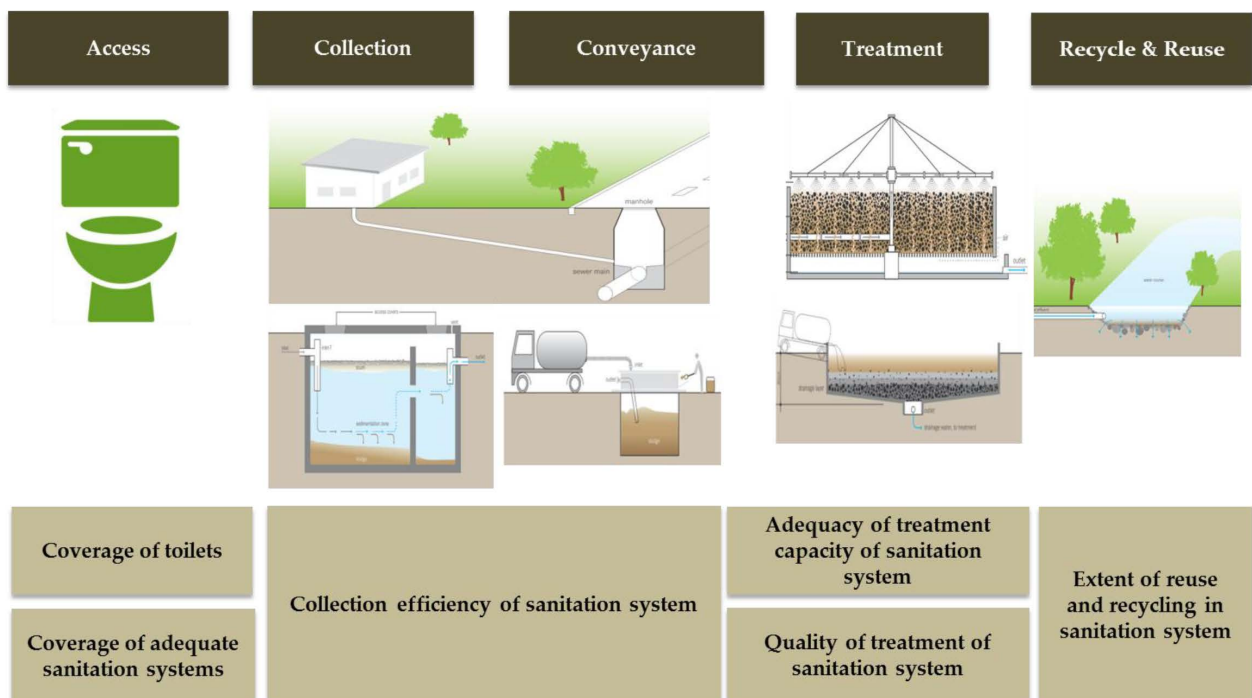
Access: Describes the type of toilet facilities available to the residents. It is useful to assess dependency of residents on of individual,community and public toilets. Ideally such information should be assessed for various zones/wards of the city.

Collection of septage: Describes the ways of collecting, storing,and sometimes treating the Faecal waste generated by the users. It is necessary to identify the type of toilets (septic tanks, double pits etc), and details related to location, size, design and access for emptying.

Conveyance: It is also important to assess how the faecal sludge is conveyed from household/community toilets to the treatment / disposal site. One needs to identify who is involved in emptying, the equipment used (e.g. septic tank emptier, jetting machine) and its details related to type and size and the fees charged for emptying by public and/or private agencies. As far as possible, details should be collected for different wards/zones of the city. The monitoring system for FSM should also be assessed.

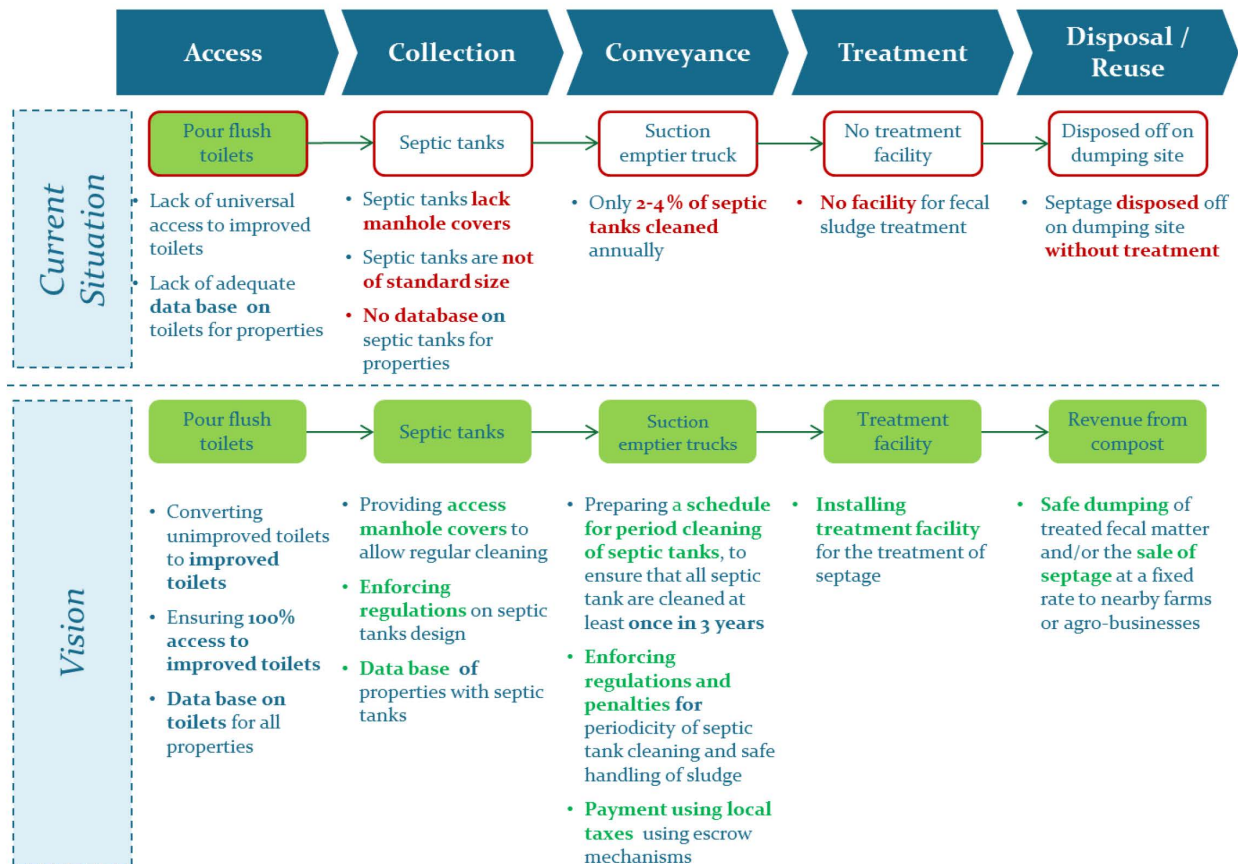
Septage treatment, disposal: Assess how the collected faecal sludge is treated. In a large number of cities, it is often discarded in water bodies or on the ground without any treatment. It is important to assess the soil and water quality at the location where the septage is being treated / dumped.

Extent and nature of reuse: The treated sludge can be used as fertilizer or used to generate energy. Assess how the sludge is used, assess the market, if any, for treated sludge.



Summary and Vision

The summary of assessment combines SANIPLAN results with field assessments to provide a citywide picture across the service chain. This can guide stakeholder consultation and deliberations on a vision to improve performance for end-to-end sanitation. This may be done using simple charts across the service chain as well as charts indicating faecal sludge flows across the service chain to show performance in relation to prevailing norms. The vision will suggest what needs to be achieved and potential actions across the full service chain.



Assessment Tools and Resources

The data collection and field assessments in the city should start with a kick-off meeting with key stakeholders. As a first step, it will be necessary to obtain background information about the city. For this, identify available plan documents, any recent surveys done by the local government as well as by any research / academic institutions in the city.

Examples of key plan documents and key data sources:

Census of India, 2001. 2011	Service Level Benchmark (SLB) report
City Master (Development) Plan	Environment Status Report (ESR)
City Sanitation Plan (CSP)	Municipal budgets and financial statements
City Development Plan (CDP)	Recent surveys carried out for any projects
Slum Free City Action Plan	DPR of any projects at state or central level
ODF City Plan	Water audit/ Energy audit

Assessment of service performance can be done with the following 4 main tools. This information and analysis will also help in establishing an overall understanding of the existing situation of the city. In cities where adequate data or information is not available from local government systems or earlier studies, SANITab may be used for property level information collection.

1. SANIPLAN: Information collection and initial performance assessment

SANIPLAN provides structured input formats for data needed to assess SAN-Benchmarks. It covers aspects related to: Demography, access to toilets and septic tanks, community/ public toilets, sewerage connections and network, septic tank emptying, treatment facilities for sewage, grey water and faecal sludge treatment. It also seeks financial information related to taxes / charges for septic tank emptying, and overall financial situation of the local government.

SANIPLAN enables assessment of service performance for SAN Benchmark indicators along with peer comparisons. It uses the set of indicators suggested by the Service level benchmarking (SLB) framework of the Government of India. The wastewater indicators have been adapted to capture the onsite sanitation systems as per SAN-Benchmarks. The model allows the user to specify ranges for peer comparisons.

- a. **SaniPlan , SaniPlan-FSM**: Excel based decision support tool. Users can input values, select different actions for service improvement and see results in the form of dashboards. SaniPlan as a whole covers all 3 sectors i.e. water, sanitation and solid waste. However, SaniPlan-FSM has been tailored to suit only IFSM needs.
- b. **Data for SaniPlan Input: List of sources**: SaniPlan requires a large number of data inputs. This checklist provides suggestions about possible sources for data points.

2. Physical and spatial analysis of city

The detailed assessment of the city sanitation should also include spatial analysis. It is important to understand the variation in physical and socio-economic characteristics over space. For this purpose, maps with ward and administrative boundaries and other features should be used to depict the analysis of sanitation situation in the city.

- a. **Sample maps:** A collection of maps that can be used as examples of maps that need to be generated for IFSM and planning.

3. Field assessment of toilets and onsite systems

It is important to get information on type of toilets used (dry, pour flush, flush) and the containment (single pit, two-pit, septic tank, sewer connection). This information may be available from the census or other local studies. In case this is not readily available, it may be necessary to carry out a house/property level survey. Based on time and resources available, one can do a sample survey or cover all households/properties. For a sample survey, one has to ensure adequate representation of all wards/zones and all socio-economic groups. Use of tools like SaniTab (see link) can help in conducting rapid surveys.

- a. **SaniTab tool** (Android installer .apk file): PAS Project has developed an android based application named 'SANITAB' as a data collection, survey and a mapping tool. This tool, consisting of an online questionnaire, can be used by any city council to conduct household level sanitation survey in the city using personal digital assistants (PDAs).
- b. **Manual for Surveyors:** Contains instructions for surveyors using SaniTab for each question as well as using the app.
- c. **Template for survey of small contractors and masons:** A guide containing points for assessing capacity of local contractors and masons that are involved in the actual construction of toilets.
- d. **Template for technical assessment of onsite systems:** This checklist provides a list of areas and parameters needed for assessing onsite faecal waste systems. It also provides 'desirable' qualities/ good practices for the same next to each assessment parameter for easy comparison.

4. Field assessment of emptying services and treatment

Field assessment of emptying services for septic tanks and septage treatment needs to be done at two levels. One is at the household level to assess services related to emptying septic tank and the other is on how the septage is treated, and if not where is it disposed. Emptying of septic tank is done by local government or private enterprises. It is important to assess the current emptying practices, by both public and private sector in terms of their response time, costs, fees, equipment used and disposal of septage. It is necessary to assess how the septage is discharged, treated and reused. Often collected septage is dumped on ground or in water bodies without any treatment. This has serious implications on soil and ground water. It is important to assess how the septage is disposed of. The environmental implication of this practice needs to be assessed in terms of ground water pollution and soil quality.

- a. **Template for Onsite system emptying service:** Onsite systems require periodical emptying which maybe provided by the local government or private providers. This template assists users in easily collecting information required to assess adequacy of existing services.
- b. **Template for Wastewater quality assessment:** The effluent and septage being discharged need to adhere to established wastewater quality norms. This template provides all related standards in one place.

Module 2: Enabling Environment: Policy, Regulation and Institutions

Sanitation is increasingly seen as a key issue in environmental protection. Improper disposal of human wastes can pollute water bodies, groundwater, and land surfaces and affect the quality of life for those living in the area. This requires moving away from a 'complaint redressal' mode of FSM service delivery to a service delivery mode for FSM. In this context, it is important to understand and assess the prevailing enabling and regulatory environment as well as capacity of local stakeholders to manage the citywide FSM services. This can be assessed by a review of: a) State/national policies and guidelines on FSM, b) Regulatory framework for treatment, disposal, and reuse of faecal matter, and c) assessing roles and responsibilities of local government for FSM.

Assessment areas		
National and state policy and guidelines	Regulatory regime for FSM and the institutional roles	Assessing local capacity for FSM
Assessment Tools		
5. Assessing policies and regulations affecting FSM at local levels	a. Sample policies and guidelines (NUSP , FSM guidelines GOI /GoM , GoTN , FSM in Urban Maharashtra , Other Sanitation Acts)	
6. Assessing capacity at local level: local government and other stakeholders	a. Examples of Process mapping b. Examples of citizens charter c. Interview guide for local government to assess capacity for PSP	

Assessment Areas

National and state policy and guidelines on FSM

In many developing countries, it is recognized that a large number of cities depend on on-site systems of waste water and FSM, and that they will continue to do so in the foreseeable future. New FSM policies are beginning to emerge at national and local level. Where such policies exist, it is important to identify key aspects of these policies that affect FSM at city level. Key policy areas to be assessed relate to the roles and responsibilities of various agencies at state and local level. It will also be necessary to assess areas of compliance for local government as required by the national or state policies.

While the municipal legislations/constitutions generally provide roles and responsibilities of local governments on sanitation, it is important to review the provisions in the national/state level policy on FSM and its consequent impact on role of local government.

Specifically the aspects to be reviewed include: a) National and State (Province) laws and policies that provide the overall framework for FSM; b) financial provisions related to grants for project funding or subsidies for facilities for different components of the service chain, c) Rights and responsibilities of

citizen and local governments and other service providers, and d) Equity aspects in the policies and programmes through analysis of budgetary allocations for specific groups and locations.

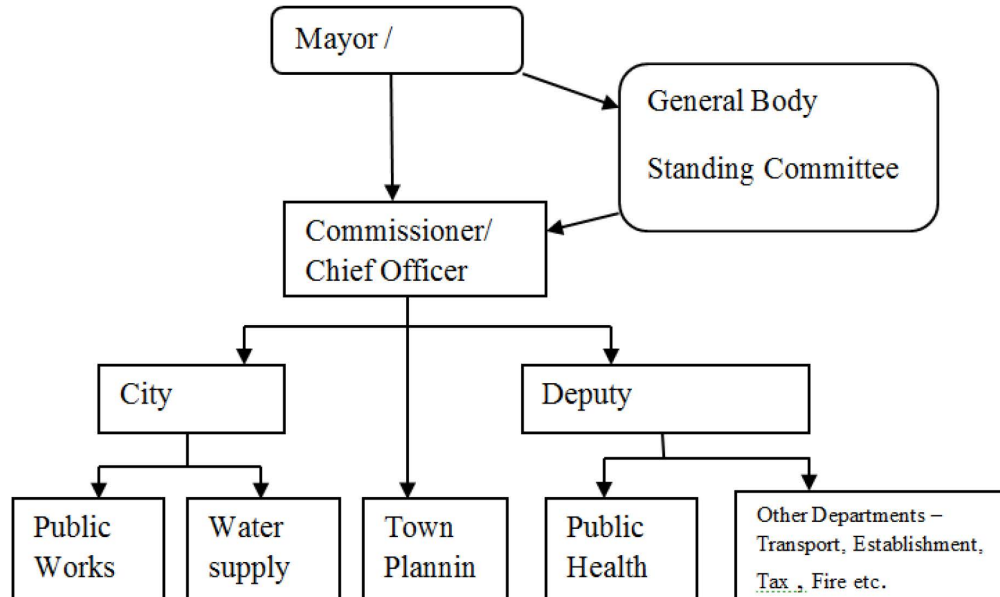
Regulatory regime for FSM and the institutional roles

Regulatory framework for each link of the FSM chain may be different, so it is necessary to explore various regulations that affect different links. For example, for toilets – it is the building regulations and/or urban planning regulation that prescribe minimum sizes and type of toilets. This is monitored at the local level through the building permission process.

There are state and local regulations related to design, discharge standards, building codes, planning and contracts. The health department of local government generally regulates waste water discharge (drains, stagnant water pools etc.). For waste treatment and disposal to natural water bodies, the state/national environmental regulations provide guidance. State bodies as well as local governments may also levy fines for offenders.

Assessing local capacity for FSM

Understanding of the institutional setup at local level is essential for understanding how the system works. Key aspects of assessment include identifying important stakeholders and key decision making authorities.



It is important to assess local government capacity to deliver FSM services and its ability and willingness to engage private sector enterprises for delivering FSM services. Local government capacity maybe assessed in terms of its organizational structure, number of staff by educational background and experience, data management, monitoring systems and robust internal processes for FSM services delivery or monitoring. The assessment will require both data on structure and staff but also more qualitative assessment of staff awareness and commitment to sanitation services. An

important consideration will also be to review processes related to different aspects of FSM service delivery through appropriate process mapping exercises.

Assessment Tools and Resources

Analysis of the institutional setup is essential for understanding how the FSM system works. It is important to identify the key decision making authorities and important stakeholders within the system. The set of tools include assessment of hierarchy within the local government and the roles and responsibilities at each level of the hierarchy in the sanitation department. A stakeholder analysis should also be done.

5. Assessing policies and regulations affecting FSM at local level

It is essential to review existing policies and regulations related to sanitation, and septage management. Often such policies are framed at national or state level. The policies and regulations have to be reviewed with a focus on their implications on each link in the service chain: a) policies toilet and septic tank/pit design and technical considerations, (b) the building plan approval process for onsite sanitation systems, c) licensing procedures for septic tank emptiers, d) appropriate selection of private sector partners through bidding and related contracting procedures, and e) regulatory provisions related to waste disposal and quality standards. Special attention needs to be paid on the equity aspects of such policies.

a. Sample policies and guidelines

- [National Urban Sanitation Policy - India](#)
- [Feacal Sludge Management guidelines by Government of India](#)
- [Feacal Sludge Management guidelines by Government of Maharashtra](#)
- [Feacal Sludge Management guidelines by Government of Tamil Nadu](#)
- [Feacal Sludge Management in Urban Maharashtra](#)
- [Other Sanitation Acts](#)

6. Assessing capacity at local level: local government and other stakeholders

Stakeholder Analysis: At the local level, a number of stakeholders are likely to influence IFSM policy, plan and implementation. It is useful to assess all stakeholders ranging from staff from local government, elected representatives, local civil society organizations, other NGOs, consultants, credit institutions, and organizations of local professionals and businesses.

A stakeholder analysis may be done to identify important stakeholders in the city that can have direct and indirect links to FSM activities. A stakeholder mapping is done on the basis of the influence of each stakeholder and their interest in the IFSM related activities. This analysis helps identify key stakeholders, who must be consulted at different stages of FSM process through appropriate stakeholder consultation processes.

- a. **Examples of process mapping:** It is also be useful to identify key activities linked to FSM for which process mapping is done to identify their efficiency and key changes needed. Process mapping can be done using a workflow diagram that provides a clearer understanding of a process or series of parallel processes.
- b. **Examples of citizen's charters:** Many local governments have developed Citizens' Charters to assess service provision. A Citizens' Charter represents the commitment of the Organisation towards standard, quality and time frame of service delivery, grievance redress mechanism, transparency and accountability. It would be good to assess whether the local government's citizens charter includes FSM services.
- c. **Interview guide for Local government to assess capacity for PSP:** This tool is a detailed interview guide that will help us understand overall experience of local government related to involvement of private sector participation for provision of urban services. This tool will help us understand the rationale behind entering into PSP, It will help to assess the capacity of the municipality in terms of whether they were able to draft the PSP on their own or did they require any external support. The tool will help to understand the procurement process of PSP and what kind of monitoring systems were established to monitor the PSP and lastly the tool will help to understand whether the local government has the institutional capacity to undertake PSP in FSM services.

Module 3: Technology Options for FSM Services

In designing a citywide IFSM service, it is important to assess technology options for each link in the service chain. This ranges from appropriate toilets and onsite systems such as septic tanks and conveyance to treatment and reuse. For toilets and septic tanks, assessment of these systems is necessary. For emptying services, options such as scheduled emptying of pits/septic tanks and assessing infrastructure requirements need to be assessed. Finally, many technologies are available for septage treatment. These will need to be assessed using a framework for choosing an appropriate option for treatment of septage at a city level. The possibility of reuse will also need to be assessed.

Assessment areas		
Assessing technical options for toilets and septic tanks	Assessing options for emptying services and conveyance	Assessing options for treatment and reuse of faecal sludge/septage
Assessment Tools		
7. Assessing options for conveyance of septage services	a. Determining infrastructure required for septic tank emptying cycle b. Template for licensing of septage transporter c. Template manifest form for emptying	
8. Assessing options for treatment and reuse of faecal sludge	a. Factors influencing selection of treatment facilities	

Assessment Areas

Assessing technical options for toilets and septic tanks

The performance assessment area provides an understanding of frameworks used in assessing current facilities, services and technology. For developing a citywide IFSM Plan, it would be necessary to identify various technical options to refurbish current facilities. For existing toilets, this would include aspects such as conversion of single pit or service latrines to an improved latrine (e.g. two-pit ventilated or a toilet with septic tanks). For toilets with septic tanks, some refurbishment may be necessary to ensure that it has accessible openings for easy emptying. For new toilet construction, there are various options to be considered – such as pre-fabricated toilets or in-situ construction. On containment of faecal sludge, there are options such as bio-toilets, eco-san toilets etc. Each of these options will have to be assessed on the basis of its capital and operating costs for the household, and its service quality.

Assessing options for emptying services and conveyance

Based on the analysis carried out for existing system, appropriate options for organizing the emptying services will need to be assessed. The two main options generally considered or used are: a) a scheduled service organized around 3 to 5 year cycle as being done in some cities in Vietnam and Philippines, or b) a demand-based or on call service as in Dakar, Senegal or Accra, Ghana.

For example, the scheduled service is preferable where: a) regulation requires this, b) capacities of septic tanks across properties are not significantly different at least within each zone, c) where there is a history /experience of providing such services (e.g. for SWM) through ULB itself or by contracts with private sector. The decision may also be affected by presence of private service providers and their capacity and preferences. Similarly, the choice would also be affected by the spatial pattern of the city and current or potential location for septage treatment or disposal. To assess this choice, at least a qualitative assessment exercise maybe developed to assess the likely efficiency gains from providing a scheduled service. Where more detailed data is available, a modelling exercise can be done to assess efficiency in terms of time savings and total costs over a 3 to 5 years period. In any case, qualitative assessment should be done for each option. The factors to be considered may include current regulatory provision, likely efficiency gains, local acceptability among decision makers and different consumers.

Once an assessment of these two options is developed, it should be discussed and agreed upon with local stakeholders and key decision makers.

Once the choice is made, further assessment should be done in terms of number, type and capacity of septic tank emptier to be used. This will depend on quantitative analysis based on load and trips required as well as on the prevailing road patterns in the city and ease of access to properties. More detailed planning may include route planning for a scheduled service, though in case of contracts with private providers, this will ideally be done by the selected private providers.

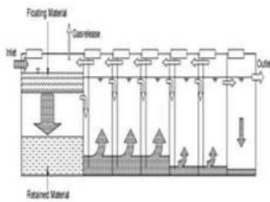
Assessing options for treatment and reuse of faecal sludge/septage

Most cities in South Asia lack septage treatment facilities. There are various options available to treat faecal sludge. These are: Waste Stabilization Ponds; Constructed Wetlands; Drying Beds (Planted/Unplanted); Settling/Thickening Ponds; Mechanical De-watering etc.

These technical options have to be assessed on the basis of (a) their technical performance; (b) capital and operating cost; (c) land requirement; (d) electricity requirement for 24x7; and (e) potential for reuse. A sanitation system matrix developed by PAS may be useful in such assessment.

User Interface/ Collection

Improved Septic tank



Bio-digester toilet



Conveyance

Conventional Vacuum Tanker



Mini-Vacuum Tanker (Vacutug)



Treatment / Reuse

Sludge drying bed



Co-composting



Assessment Tools and Resources

Assessment of technology options can be done with the following two main assessment tools focused on assessing options for emptying services and for treatment of faecal sludge.

7. Assessing options for conveyance of septage services

To assess options for septic tank emptying and conveyance of septage, it is important to determine the requirement for septic tank emptiers – both type and quantity. This tool enables calculation of these requirements using factors such as: number of septic tanks, type of areas to be reached, cleaning cycle expected, and distance to treatment site.

- Determining infrastructure required for septic tank emptying cycle:** Onsite systems require regular emptying. This excel based tool allows the user to calculate infrastructure requirements for the same based on population, sludge generation, desired cycle length etc.
- Template for licensing of septage transporter:** In cases where the local body is not directly involved in transportation of septage and has outsourced the process, the operating agency needs to be issued licenses to be able to carry out the work. This tool contains a template for the same as well as related instructions.
- Template manifest form for emptying:** Manifest forms are an integral part of a comprehensive septage management program. It contains information on the type and quantity of the waste being transported, instructions for handling the waste, and signatures of all parties involved in the disposal process. This ensures accountability in the process. This tool contains a template for such a form.

8. Assessing options for treatment and reuse of faecal sludge

This tool provides a ready framework for assessing options for treatment and reuse of faecal sludge. The various technologies are listed along with their characteristics. Assessment can be done on suitability of these technologies in a particular context on the basis of various factors viz: land requirement, capital and operating costs, level of mechanization etc.

- a. **Factors influencing selection of treatment facilities:** A comparison of the available technologies for septage treatment on the basis of various parameters such as capital and operating costs, land requirements, ecological effect etc.

Module 4: Potential of Private Sector Role across the Service Chain

While the city governments generally have the mandate to ensure service provision, often there is an active private sector that provides FSM services in the city. It is necessary to assess the current role of private sector providers as well as their potential role in a citywide service provision.

The assessment will thus need to start with a quick landscape analysis, and can be followed by a detailed assessment after the FSM strategy is developed. Interviews with the city government officials will be needed to assess their views and perceptions of various options for private sector engagement.

Assessment areas		
Assessing local government capacity for PSP	Landscape study of private sector	Develop and review potential structure of PSP option
Assessment Tools		
9. Guide to a landscape study of private sector	a. Interview guide for Private sector players	
10. Review of potential structure of PSP option	a. Interview guide for Local government about FSM-PSP structure and contracts b. Interview guide for Private sector about FSM-PSP structure contracts c. Model contract/bid documents (O&M / construction)	

Assessment Areas

Assessing local government capacity for PSP

The main objective of this assessment is to understand the past experience of local government with planning and implementing engagements with the private sector in provision of urban services. This would be based on an understanding of the processes and key stakeholders required for implementing a private sector engagement right from the evaluation of need for the project to contracting, implementation and monitoring. This assessment would help to assess the key challenges that are encountered before, during and after awarding the contract as well as the positive practices that have enabled success from local government point of view.

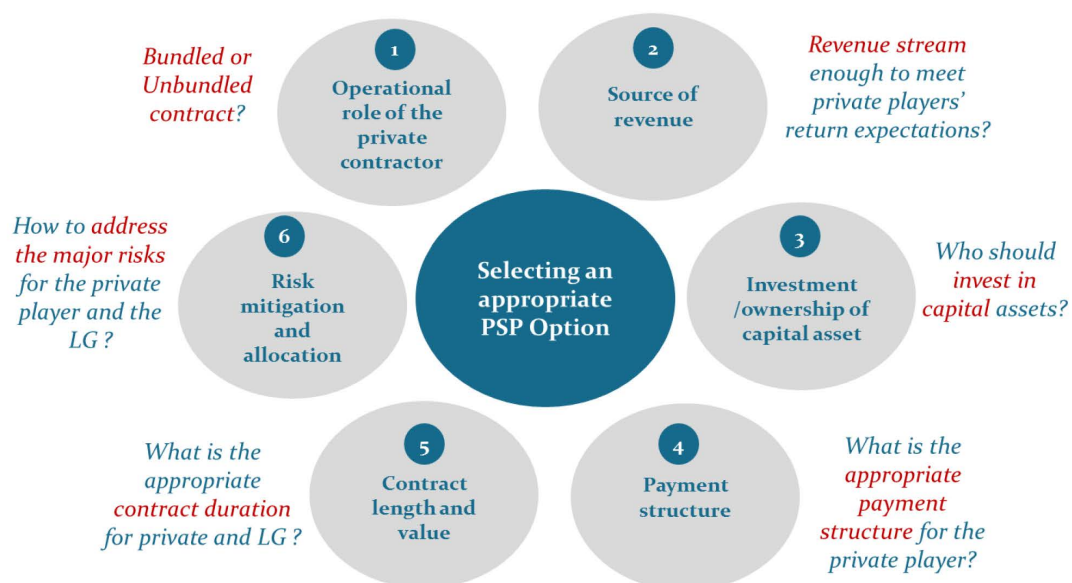
Landscape study of private sector

In order to assess the potential and scope for private sector involvement, it is necessary to assess the types of private players operating within city area or in the region to assess their interest in citywide IFSM services. This landscape study would help provide an Assessment would include work profile, interest, expertise and capacity and willingness to undertake various activities of septage management services.

Develop and review potential structure of PSP option

There are six decision areas processes involved in structuring and assessing a PSP option for septage management.

1. **Operational role of Private Sector – appropriate bundling of contracts:** Should the local government put out an integrated FSM contract for the entire service chain, or unbundle the contract for specific activities
2. **Return expectations and source of revenue:** What are the likely revenue requirements to meet private players' return expectations? What could be the potential sources for these revenues – taxes or user charges?
3. **Investment and ownership of capital assets:** Should the capital investments in the vacuum truck and sludge treatment facility be borne by the private players or by the local government?
4. **Payment structure:** What is the appropriate payment structure? E.g. should it be a fee per unit, or a lump sum contract or a monthly fee?
5. **Contract length and value:** What is the appropriate contract duration and value which compensates private players for the risks they undertake, while providing the local government with the flexibility to switch providers?
6. **Risk mitigation and allocation:** What are the major identified risks for the private sector and the city government that need to be mitigated? If it is difficult to mitigate some risks how should these be allocated?



Once these key questions are addressed, it will be possible to develop an appropriate structure of engagement with the private sector as well as develop the necessary contracts and bid documents. Based on these, a further round of detailed consultations should be done with both the local government as well as a few key private players to get their feedback.

Assessment Tools and Resources

9. Guide to a landscape study of private sector

This tool is a detailed interview guide that will help the municipality identify the work profile, interests, capacity, willingness and interests of private sector in undertaking various activities of septage management. It will help to assess/understand four key areas: a) number of private players in the market, b) technical capacity of private players, c) barriers and enabling factors for undertaking PSP, d) potential Interest of the private sector in various activities of septage management, and e) their perceptions of risks and expected returns.

- a. **Interview guide for Private sector players:** A guide cum sample questionnaire for assessing the capacity of private players being considered for outsourcing operations.

10. Review of potential structure of PSP option

The potential PSP structure as developed along the six key decision areas will need to be backed by draft contract and bid documents. This set of decisions and materials should be reviewed by further round of interviews with both the local government officials as well as a few of the potential private sector contractors. The attached interview guides can be used for this purpose. Based on the feedback, these documents can be finalized in order to proceed to procurement.

- a. **Interview guide for Local government about FSM-PSP structure and FSM contracts:**
The potential PSP structure as developed along the six key decision areas will need to be backed by draft contract and bid documents. This set of decisions and materials should be reviewed by further round of interviews with both the local government officials as well as a few of the potential private sector contractors. The attached interview guides can be used for this purpose. Based on the feedback, these documents can be finalized in order to proceed to procurement. Interview guide for Local government about FSM-PSP structure and FSM contracts: A guide to assessing the local government's preferences on the various options in contract bundling for outsourcing and the standard terms and clauses of such contracts.
- b. **Interview guide for Private sector about FSM-PSP structure contracts:** A guide to assessing the private sectors's interest in the various options in contract bundling and their preferences and understanding about the standard terms and clauses of such contracts.
- c. **Model contract/bid documents (O&M / construction):** Comprehensive model formats for contract/ bid documents.

Module: 5 Financial Assessment

To ensure financial sustainability of FSM services, it is important to assess capacity for financing of both capital and O&M expenditure over the plan period. This can start with an assessment of financial requirements for both capital and O&M expenditures. The assessment also provides guidance on potential sources of finance for meeting these expenditures including through external grants, private sector investments, user contributions, external debt or through local government internal resources.

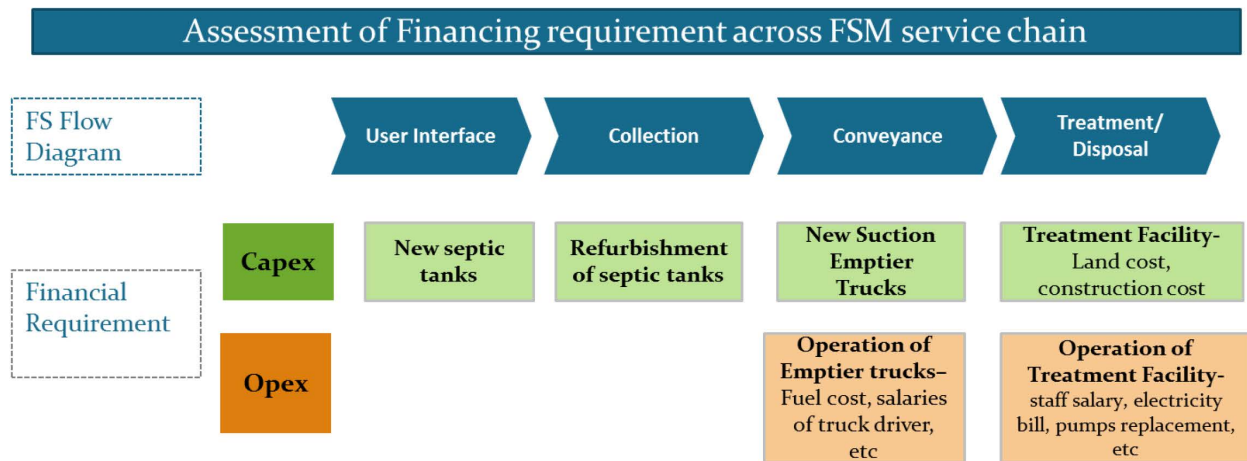
Assessment areas		
Assessment of finance requirements and potential sources	Potential sources of finances for capital/ O&M expenditures	Review of required tariffs
Assessment Tools		
11. SANIPLAN: Financing plan and tariff review	a. SaniPlan , SaniPlan-FSM b. Financial planning using SaniPlan	
12. Assessing willingness to pay and to charge	a. Questionnaire: Assessing willingness to pay b. Sample resolution by local government	

Assessment Areas

Assessment of finance requirements and potential sources

The first step in Financial Assessment is to determine the financing requirements for proposals for the full service chain – starting with toilets in the user interface, to collection, conveyance and treatment or disposal. The finance requirements are essentially based on costs of achieving the various improvement activities suggested. It is also important to ensure that both capital costs and O&M costs are assessed. SANIPLAN can be used to assess these costs.

In addition to these costs, there may also be additional activities such as awareness generation, improving data and monitoring systems and improving efficiency in collection of taxes and user charges by the local government. SANIPLAN enables the users to identify all actions. Actions are categorized as: a) data improvement measures, b) process/ policy improvement measures, c) existing system improvement measures, and d) creation of new infrastructure. All selected actions are calibrated to generate a profile of phasing, as well as capital and O&M expenditure requirements.



Potential sources of finances for capital/O&M expenditures

For developing a financing plan for FSM, potential sources of funds for capital expenditures will be required and terms and conditions for each will need to be identified. The potential sources for capital expenditures may include grants from national/provincial government; own resources of local government, CSR funds from corporate sector or loan from financial institutions. In case of private sector participation, the willingness of private players to meet capital expenditure will also need to be assessed. Similarly, background assessment of various ongoing programmes at the state and national levels will provide an idea of the possibility of accessing such funds to meet the capital expenditure requirements as well as for other needs such as awareness generation or data improvement measures.

SANIPLAN enables users to suggest possible sources for each selected action.

Review of required tariffs

An overall assessment of city finances will help to assess ability and willingness of city government to meet its own obligations for meeting its share of capital expenditure and to ensure sustainable sources for O&M expenditure through local taxes, user charges or surplus from its revenue account. If the local government plans to take debt, its sustainability through adequate debt service coverage will need to be assessed. This assessment can be carried out in SANIPLAN. This will require information for at least 3 to 5 years on local government revenue and expenditure to be able to project municipal finances over the plan period for overall municipal budget as well as separately for wastewater and sanitation sector.

This assessment in SANIPLAN makes it possible to assess the extent of tariff increases necessary for sanitation related taxes or charges as well as for the general tax such as property tax, which is the main source of own income for most local governments. It may also be possible for the local government to levy a sanitation tax. Assessment of taxation involves an assessment of ability to levy tax/user charge and affordability and willingness to pay. Consultation with administrators and elected representatives on their willingness to levy such a tax/user charge is very important. This can also be backed by focus group discussions among key user groups in the city.

Assessment Tools and Resources

Financial assessment can be done mainly through SANIPLAN. It provides features for assessing financing requirements as well as exploring the implications of different sources of finance for both capital and O&M expenditures. Its detailed assessment of municipal finances also helps to carry out an analysis of required tariff levels.

11. SANIPLAN – Financing plan and tariff review

SANIPLAN provides a structured approach to assessing financial requirements as well as to assess required tariff levels. Tariffs are determined on the basis of both sources of capital expenditure as well as a detailed analysis of municipal finances.

In order to assess the levels of acceptable tariffs, discussions with various stakeholders will be needed including local government both staff and elected representatives as well as the households and property owners who use these services. For the latter, focus group discussions with different groups including the poor will be needed.

- a. **SaniPlan , SaniPlan-FSM:** Excel based decision support tool. Users can input values, select their choices and see results in the form of dashboards. SaniPlan as a whole covers all 3 sectors i.e. water, sanitation and solid waste. However, SaniPlan-FSM has been limited and tailored to suit IFSM needs.
- b. **Financial planning using SaniPlan:** A guide to using Saniplan for financial planning.

12. Assessing Willingness to pay and to charge

In designing a FSM plan, it is important to assess how much the people are willing to pay for a regular or a demand based emptying service. Associated with the willingness to pay is the criterion of ability to pay (or affordability). Such assessments are usually undertaken through a survey or Focus Group Discussion (FGD), where the potential consumers are asked their willingness to pay for different level of service. The assessment of affordability requires greater understanding of the socio-economic status of the community. Since private sector provision of FSM is new in many cities, it is important to assess if there is a real demand and willingness to pay for FSM services by private sector. In case, the service is expected to be based on taxes or annual charges to be paid to the local government, it is also equally important to assess the willingness of the local government to levy these charges. SANIPLAN provides options and can be used for discussion with decision makers.

- a. **Questionnaire: Assessing willingness to pay:** Sample questionnaire for conducting survey to assess citizens' willingness and ability to pay for FSM services.
- b. **Sample resolution by local government:** An example of a formal expression of opinion or intention of the local body to a) Undertake FSM activities, b) Levy a sanitation tax and open an escrow account for the same.



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About C-WAS and PAS Programme

Center for Water and Sanitation (C-WAS) at CEPT University carries out various activities – action research, training, advocacy to enable state and local governments to improve delivery of services. In recent years C-WAS has focused our work on urban sanitation. Indicators are developed for measuring on-site sanitation and a framework for citywide sanitation planning. C-WAS also supports cities in implementing city sanitation plans that focus on making cities open defecation free (ODF). In support of these efforts, the team is also working on developing innovative sanitation financing mechanisms.