Guidebook for Urban Local Bodies to Implement Septage Management Plan

Swachh Maharashtra Mission (Urban)
Urban Development Department, Govt. of Maharashtra

Swachh Maharashtra Mission

A Systematic Approach by Government of Maharashtra

Vision

Under Swachh Maharashtra Mission (Urban), Government of Maharashtra envisages "ODF Communities" moving towards "ODF+ and ODF++ Communities" by addressing entire service chain of sanitation and not focusing only on number of toilets constructed in the cities.

Government of Maharashtra has adopted a systematic approach by keeping in view city as a unit and encouraging city managers for moving towards improved sanitation by prioritising access and use of own toilets and implementing plans for safe management of faecal waste.

Foreword

Government of Maharashtra launched "Swachh Maharashtra Mission Urban" on 15th May, 2015. Under the leadership of Honourable Prime Minister Shri. Narendra Modiji, we are committed to fulfil Mahatma Gandhi's dream of Swachh Bharat by eliminating open defecation in the State and we also want to move towards more sanitized state by safely managing wastewater.

"Swachh Maharashtra" is essentially a Mission led by local governments and other stakeholders and facilitated by the State Government. With support and guidance from Urban Development Department, all urban local bodies in Maharashtra are committed to make Maharashtra Open Defecation Free (ODF) by October 2017 and also move towards ODF + and ODF ++ by safely managing their wastewater. Various initiatives, innovative ideas and achievements at city level demonstrate that our dream of Swachh Maharashtra will come true.

I congratulate Urban Development Department and 'Team Swachh Maharashtra' for developing this "Guidebook for urban local bodies to implement septage management plan". This guidebook will be very useful for officials and other stakeholders to sustain their ODF status.

With political will, backed by a dynamic team and massive support from the citizens, Government of Maharashtra is all set not only to achieve universal access to sanitation, but also achieve sanitized cities by safe wastewater management and thereby making our cities clean, safe and healthy. Government of Maharashtra's journey towards becoming sanitized state will certainly become a source of inspiration for other States

Mr. Devendra Fadnavis
Chief Minister,
Maharashtra

September 26, 2016

Key Message

Under the dynamic leadership of Honourable Chief Minister of Maharashtra Shri. Devendra Fadnavis, the Government of Maharashtra is geared up to walk the way towards “Swachh Bharat”.

Local governments are being facilitated and encouraged by the State through building their capacities and engaging in a dialogue with them at various workshops and discussions. Today, results of State level efforts are evident at local level. In fact, some cities have become role models for other cities and States.

Local leadership has played a crucial role in shouldering the responsibility to achieve the targets and have responded phenomenally to Swachh Maharashtra Mission Urban. Open Defecation Free Cities has laid the foundation of ‘ODF Maharashtra’ and now cities are moving towards being ODF+.

I am happy that the Urban Development Department is publishing this “Guidebook for urban local bodies to implement septage management plan”. I am sure that this guidebook will provide guidance to other cities and States in adopting a systematic approach to meet the goals of “Swachh Bharat”.

I extend my best wishes to all urban local governments for moving towards “Swachh Maharashtra” and thus making the “Swacch Bharat” dream and vision of Honourable Prime Minister, Shri. Narendra Modi, come true and get implemented in true spirit!

Dr. Ranjit Patil
Minister of State,
Government of Maharashtra

September 26 , 2016

Acknowledgement

Government of Maharashtra launched "Swachh Maharashtra Mission Urban (SMMU)" , in alignment with the Swachh Bharat Mission (Urban), of Ministry of Urban Development, Government of India.

The SMMU has developed strategic components to ensure coverage of sanitation facilities to all ULBs in the state. This is being done through financial and programmatic support to households and ULBs for community and/or household level sanitation. However, the SMMU has taken a view that "construction of toilets needs to be complemented with mechanisms of promoting usage of toilets, eliminating open defecation practices, managing faecal waste safely and thereby creating "ODF Communities". Towards this end, we have set incentive funds for ODF cities to move towards ODF+.

The Swachh Maharashtra Mission Urban strategy envisages "ODF Communities" moving towards "ODF+ and ODF++ Communities" by addressing the entire service chain of sanitation and not focusing only on number of toilets constructed in the cities. The mission is geared up under the dynamic leadership of Honourable Chief Minister of Maharashtra, Mr. Devendra Fadnavis. This "Guidebook for urban local bodies to implement septage management plan" gives an useful insight on the planning and implementing septage management plan as envisaged in ODF+ framework by SMMU. Our effort is to make a comprehensive document that is user friendly for city managers in decision making and in taking actions at local level.

This guidebook is the result of team work and synergy of contribution from "Team Swachh Maharashtra" and all ULBs in Maharashtra ably assisted by CEPT University, Ahmedabad and RCUES, All India Institute of local self-government (AIILSG), Mumbai. I wish to place on record my deep appreciation of this team effort and hope that implementers and stakeholders in the state and in India will find this guide useful in understanding the process of making cities ODF+.

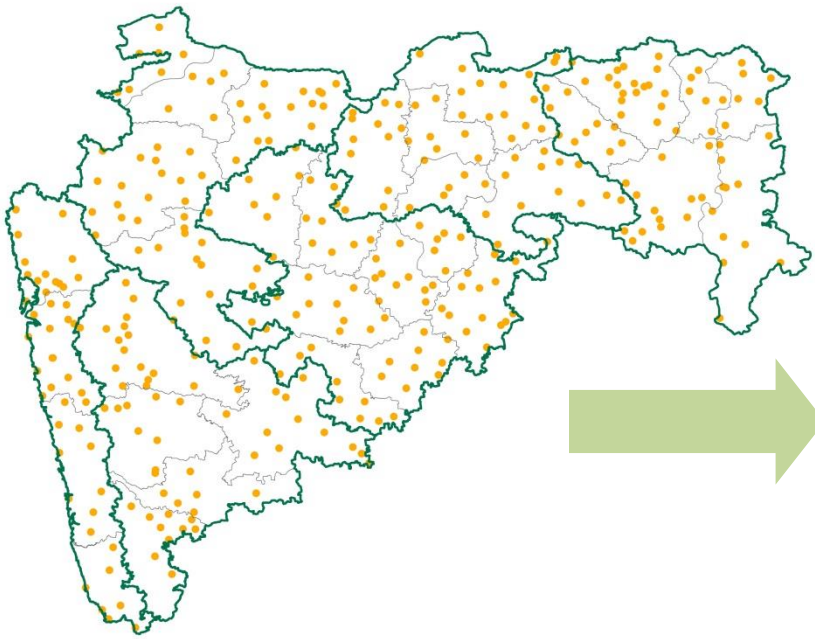
Mrs. Manisha Patankar- Mhaiskar , IAS
Secretary, Urban Development Department,
Government of Maharashtra

September 26, 2016

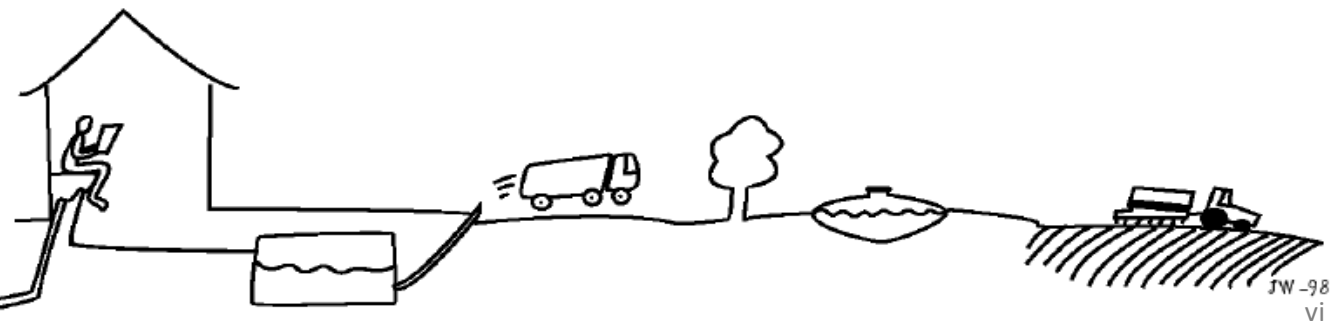
About this Guidebook

In Maharashtra, only 32 cities are partially covered with sewer systems. Majority of household toilets are connected to onsite systems like septic tanks or pits. The new toilets constructed since the launch of Swachh Maharashtra Mission, Urban (SMMU) in 2015 by are being connected to septic tanks. However it is observed that while toilets are constructed, there is no proper management of faecal waste / septage in terms of collection, emptying , treatment and disposal.
The guidebook seeks to address this gap by focusing on how ULBs can plan and implement septage management in their cities.

This guidebook explicates goals of Swachh Maharashtra Mission (Urban) and provides a roadmap for achieving Open Defecation Free plus (ODF +) Cities under the mission. This guidebook is intended to be a reference guide for all ULBs, state governments and other partners engaged in planning and implementation of septage management plan under Swachh Bharat Mission and AMRUT Mission.



Moving towards ODF +



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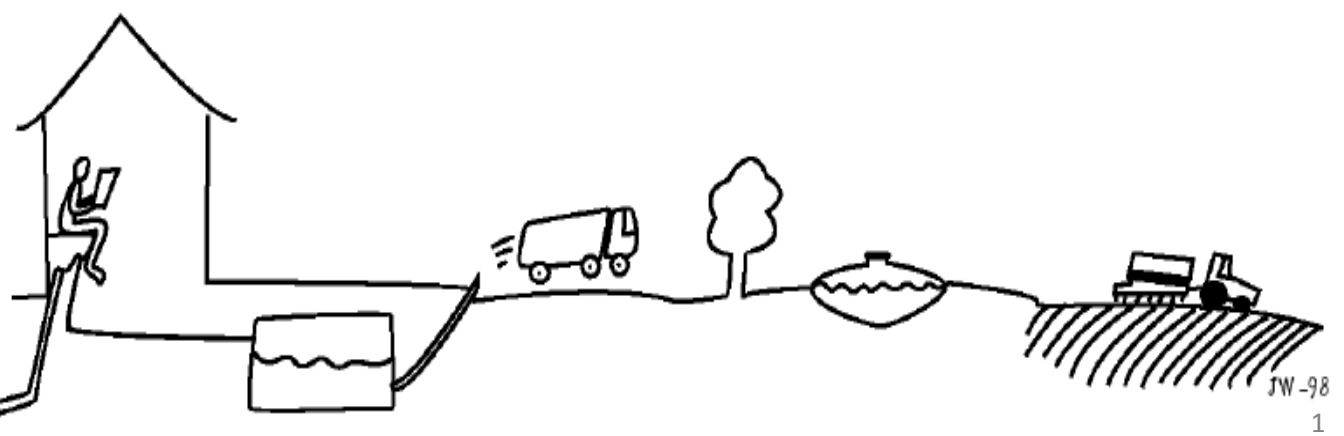
1 SEPTAGE MANAGEMENT



Introduction to Septage Management

- **What is Septage Management?**

"Septage" is the liquid and solid material that is pumped from a septic tank (S.T.), pit, cesspool, or other on-site containment facility after it has accumulated over a period of time.

Septage management covers the entire service chain starting from design of septic tank, collection, conveyance, safe treatment and reuse or safe disposal of septage. Proper treatment and management of faecal sludge/septage is integral to safe sanitation practices.

Need of septage management in Maharashtra. . .

32 cities

have partial underground sewerage system

40%

toilets are connected to septic tanks

Once in 8-10 years

cleaning frequency of septic tanks

Only 12 ULBs

treat the septage/faecal sludge at the STPs.

Majority of the cities dump the septage in open grounds.

Recognizing the growing importance of safe faecal sludge management practices, there is an emerging need for framing an operative guideline for Septage management for ULBs…

Background

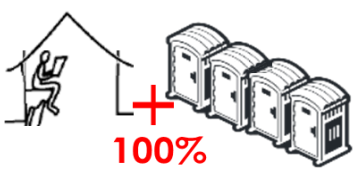
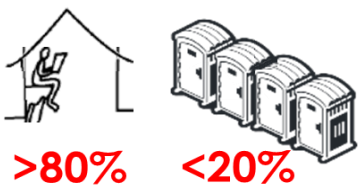
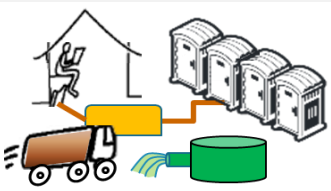
What are “ODF+ Cities” in Maharashtra ?

A framework developed by Government of Maharashtra for defining “ODF+ Cities” in Maharashtra

As a long term vision, Government of Maharashtra aims to move towards improved sanitation by encouraging access to own toilets with safe management of faecal waste. Cities where 80% of residential properties have access to own toilets, remaining population have access to public/community toilets and safe collection, conveyance and treatment / disposal of faecal matter is practiced are called ODF+ cities.

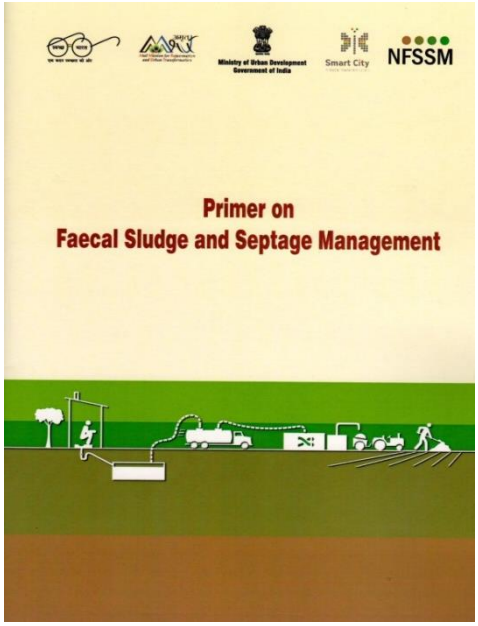
With many new toilets being built under SMMU, cities have to face increased challenges in disposing the faecal waste. For creating awareness about the need of own toilets and safe and regular management of faecal waste SMMU has identified the whole process of ‘granting’ ODF status to cities. In order to encourage ULBs for taking into consideration entire service chain of sanitation, Government of Maharashtra has developed concept of “ODF+ Cities”.

Framework for “ODF and ODF+ Cities”

ODF	 No visible OD, faeces	 100% access to own/community/ public toilet	 All toilets connected to disposal system
ODF+	 No visible OD, faeces	 At least 80% access to own toilet; rest CT/PT	 All toilets connected to disposal system; safe collection conveyance and

Recognition of Septage Management by State and National Government

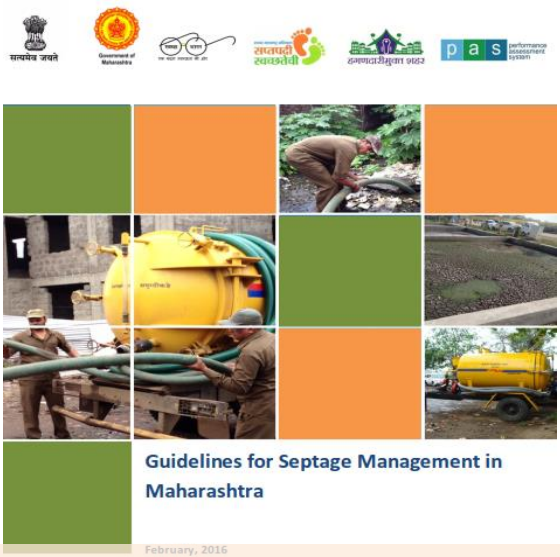
National declaration on Septage Management by MoUD, 2016



- One of the major thrust areas of AMRUT and Smart Cities is Septage Management. The National Urban Sanitation Policy has accorded high importance to planning and implementation of actions for the organized and safe management of faecal matter from on-site installations.
- The importance of safe and hygienic facilities with proper disposal and proper operations & maintenance (O&M) of all sanitary facilities has been emphasized. Development of a Septage Management Plan as a part of city sanitation plans has also been recommended.

" The end objectives and corresponding benefits of SBM can only be achieved through complete faecal sludge and septage management "

Advisory on Septage Management MoUD, 2013



Guidelines on Septage management Govt. of Maharashtra, 2016

Key Challenges

Are Septic Tanks built as per Codes/ Specifications ?

Are septic tanks linked to soak pits?

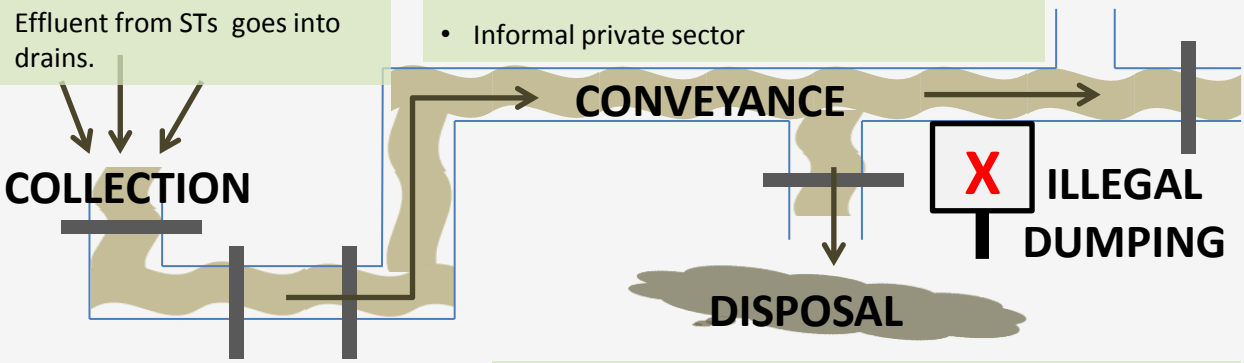
How often are septic tanks cleaned ?

What happens to the SEPTAGE?

ISSUES…

- STs are oversized and are cleaned at an interval of 8-10 years.
- Effluent from STs goes into drains.

- All cities have at least 1 truck. But if they were to perform regular scheduled cleaning, it will require more than 1 truck.
- Informal private sector



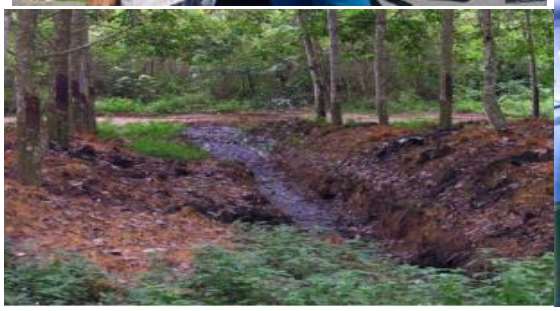
- None of the cities have independent septage treatment facilities.
- Septage is dumped at dumpsite or open land.

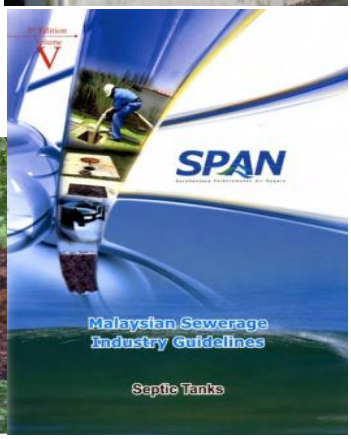
Good Practices - Malaysia

Nationalization of sewerage services **1993**

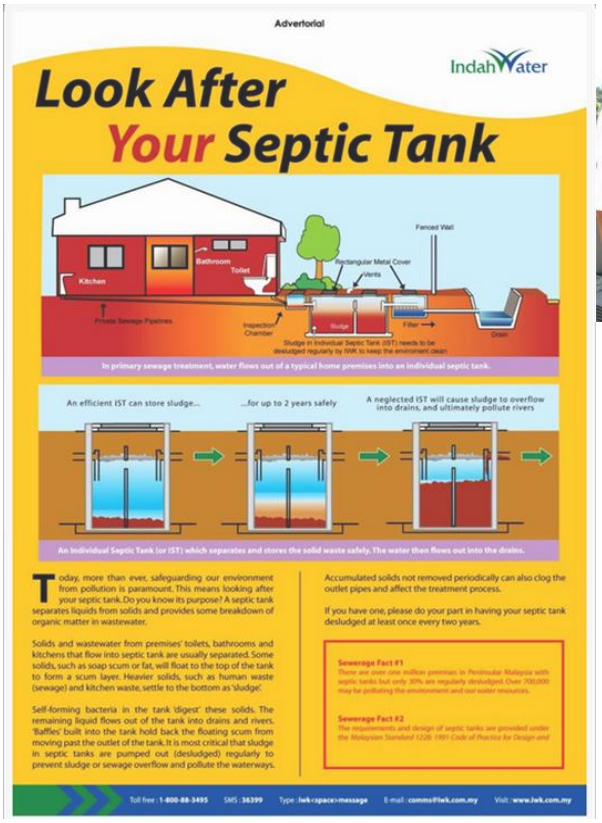
IWK builds sewers, develops desludging services, constructs septage and wastewater treatment facilities across the country, establishes policy guidelines and standard operating procedures for developers and wastewater operators.

2008





In **Malaysia,** local governments were responsible for both water and sewerage services, but usually lacked the capacity to provide adequate sewerage services. In response, Malaysia nationalized sewerage services in 1993, and transferred the wastewater assets to the federal government, and offered services through a single, private concessionaire, **Indah Water Konsortium**(IWK). From 1993 to 2008, IWK built sewers, developed desludging services, constructed septage and wastewater treatment facilities across the country, and, together with the regulatory agency, established clear policy guidelines and standard operating procedures for developers and wastewater operators. The provision of sewerage services was regulated and licensed by one regulatory body **Suruhanjaya Perkhidmatan Air Negara**(SPAN) and this included fecal sludge extraction, transportation, and treatment and disposal. FSM services for individual septic tanks within IWK's concession areas were scheduled and undertaken on a 2-year cycle by IWK. Although, desludging every three years is now recommended and a thrust is being given to raising awareness of households of this practice. Now private entrepreneurs are also allowed with IWK, however many operate as sub-contractors to IWK due to the security provided by the latter in securing work for them.



IWK prepare general awareness posters regarding the importance of regular desludging of septic tanks.

IWK provide training as well to improve septage management services.
Seeing facilities with their own eyes and learning directly from their peers helped these participants in training workshops to improve and redesign sanitation programs in their own cities.

Examples of collection vehicles in Malaysia.

LESSONS to LEARN :-

Establish clear policies and institutional responsibilities.

Obtain national financial support for capital investments and operating expenses.

Engage the private sector in providing sewerage infrastructure and operations services.

Address collection and containment first.

Source:- A Rapid Assessment of SEPTAGE Management in Asia, USAID, January,2010.

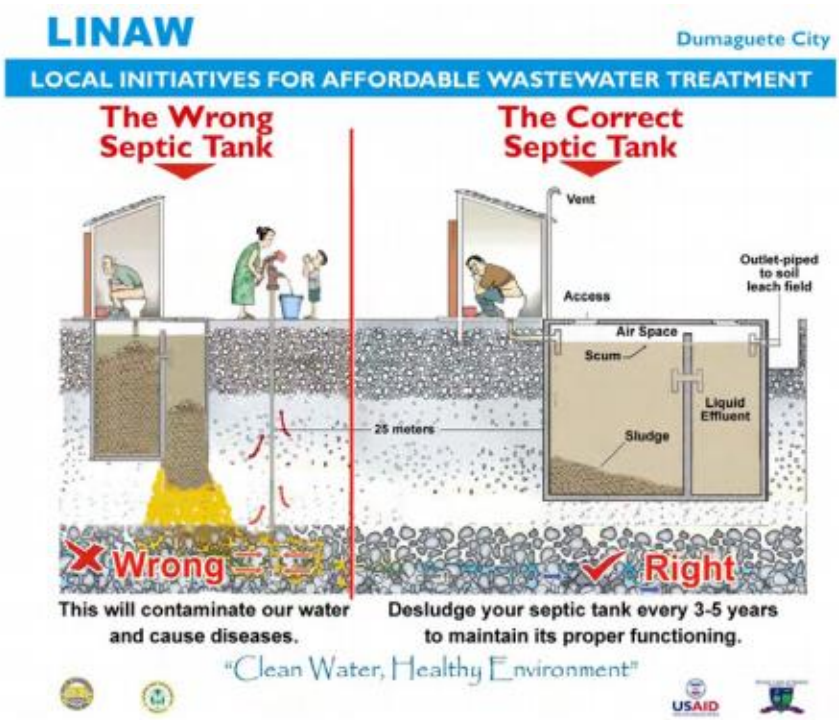
Good Practices - Philippines

Clean Water Act **2004**

NSSMP **2005**

USAID and the World Bank, support a number of local governments in developing septage initiatives **2009**

Achieve goal of the NSSMP- to improve water quality and protect public health in urban areas of the Philippines. **2020**



In June 2012, the **Philippine** Government approved the **National Sewerage and Septage Management Program (NSSMP).** The national government agenda to drive wide-scale sanitation improvement through the implementation of sewerage and FSM projects was a major initiative. NSSMP provided up to a **40% cost share to local cities and municipalities to implement sewerage projects**. It also launched a national program to promote FSM and the values associated with regular septic tank cleaning. ULBs often suffer due to lack of political will. To offset this, NSSMP also provided technical assistance and targeted outreach and training to motivate and build the capacity of local officials to undertake FSM programs. The national government did not share costs with local governments. These programs were to be designed, operated, and maintained at a significantly lower cost, with operation and maintenance expenses spread among the municipality, private companies, and end-users through fees (tariffs). Currently, **San Fernando**, **Dumaguete** and **Manila** are undertaking a systematic implementation of the IFSM model.

Local Regulations for Septage Management, Philippines

Developing regulations is essential in order to increase awareness and understanding of septage management among the key stakeholders. Major provisions from the septage management ordinances, Philippines have been listed below:-

- Inspection of new septic tanks
- User fees to be added and penalties for violators
- Septage must be disposed off in a designated place
- Periodic & regular desludging every 3-5 yrs

Manila Water Company, Inc., a private concessionaire that provides water and wastewater services in Metro Manila, has been a leader in septage management in the Philippines.
The private sector options should be explored in providing sewerage infrastructure and operations services

Cities in the Philippines have developed dramatic promotional posters that alert the public about septic tank pollution and encourage participation in frequent desludging programs.

Source:- A Rapid Assessment of SEPTAGE Management in Asia, USAID, January,2010.

Good Practices - Vietnam

POLICY- "Orientation for Urban Sewerage and Drainage Development (OUSDD) until 2020"

1999

All dry and bucket latrines to be eliminated by

2005

Vietnam Building Code requires dischargers to pre-treat their domestic wastewater in septic tanks before it enters the public sewerage system.

2008

Over three-quarters of urban households in **Vietnam** rely on septic tanks. Both public and private septage collection companies exist; the public companies dispose of waste in septage treatment facilities, where they exist, and landfills, while private companies tend to dispose of septage in waterways and drains, contributing to high levels of water pollution that cost Vietnam $780 million each year in health, water, and economic losses. Until 1999 the national government of Vietnam had not issued regulations on septage collection, treatment, or disposal. Through the OUSDD Vietnam leveraged almost $850 million in official development assistance for cities and provincial towns to construct sewerage and drainage infrastructure.

Things took a turn for the better when the Government passed a decree 80/ND-2014 that emphasized on sludge management, FSM, resource recovery and household connection. Several policies were laid down to encourage private sector participation. The World Bank and Asian Development Bank provided assistance in FSM in three large cities. This led to other cities forming regulations on septic tank emptying requirements. Research studies were conducted to arrive at appropriate faecal sludge treatment technologies. Multi-disciplinary studies were done on sale of treated septage and sustainable business models were conceived.

In terms of cost recovery, the wastewater tariff was increased step-wise and cross subsidiary options were explored.

A private desludging company empties the contents of its vacuum truck into a city sewer. In Vietnam, where most cities rely on both public and private providers, private participation poses an opportunity to expand and improve desludging services.

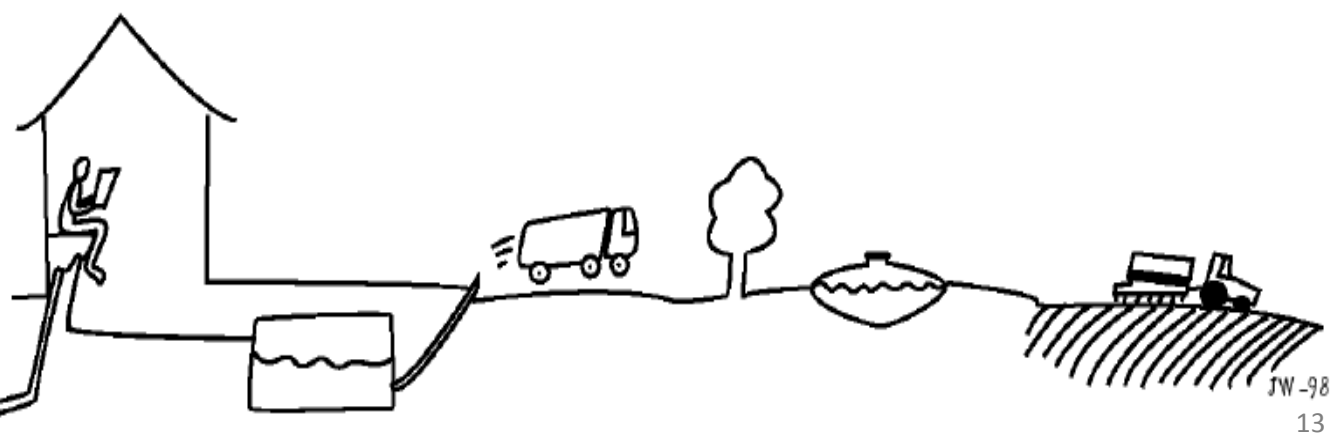
LESSONS to LEARN :-

Promote Appropriate Technology	Resource Recovery should be advocated.
Establish a National Septage Management Policy	Effective Organization for the O&M of FSM components is needed
Guideline for Safe Reuse of Excreta in Agriculture should be developed	Incorporate Septage Management into Local Regulations, and Enforce Them.

Actual Costs of FSM should be calculated, and Tariffs should aim at full Cost Recovery

Source:- A Rapid Assessment of SEPTAGE Management in Asia, USAID, January,2010.

2 CITY-LEVEL ASSESSMENT



2.1 Sanitation Service Chain

Assessing service performance across the service chain through a city level assessment is the first step in planning process. This exercise provides an initial sense of the state of septage management in the city and helps in understanding the context and identifying gaps in key services.

a) Access and Collection

- Type of toilet
- Type of use (individual/ shared/ community)
- Ways of collecting, storing

b) Conveyance

- Process of emptying septic tank -
- Transport of Septage
- Fees of conveyance
- Location of Dump Site

c) Treatment and Reuse/ Disposal

- Assess the capacity requirement / adequacy of a Septage Treatment Facility
- Reuse of treated septage
- Market and demand of reuse

Individual and Community Toilets

Septic Tanks

Emptying Truck

Septage Treatment Plant

2.2 Assessment across the Service Chain

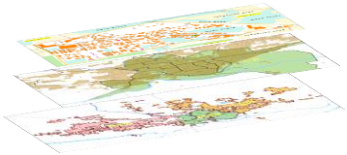
A Assessment of Access

ULBs should perform field assessments to understand:-

- Dependency on individual, community and public toilets
- Spatial variations where possible

To undertake this assessment refer survey checklist, attached in Annexure 1.SaniTab Tool can also be used for the same.

% population defecating in the open



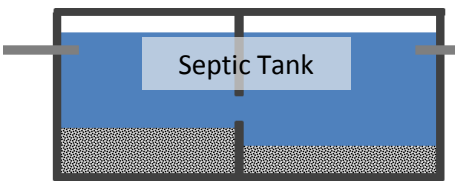
Locate toilets and sanitation facilities on a map

Spatial variations in the access to toilets between slum and non-slum population

B Assessment of Collection

ULBs must evaluate existing containment systems.
ULBs can:-

- Assess dependency on onsite systems (septic tanks, twin pits etc)
- Assess details related to location, size, design and access for emptying. These details can be retrieved by interviewing contractors or the masons.



Septic Tanks located below the toilets are inaccessible.

Inaccessible septic tanks with sealed tops.

3 chambered septic tanks of sufficient size with access covers

Refer Part A, Chapter 9 on On-Site sanitation in CPHEEO Manual, 2013 for designing septic tanks.

Septic Tank DO'S

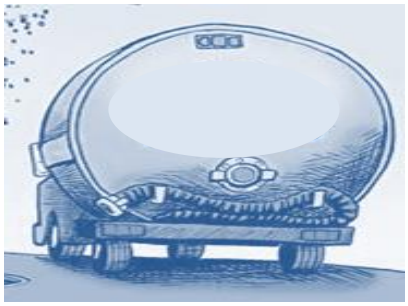
- **Construct at least a 2-chambered septic tank.**
- **The size of the tanks should be as per Nagarpalika norms.**
- **The septic tank should be constructed away from the structure so that the chambers are accessible.**
- **Provide openable covers to all chambers for inspection and desludging.**
- **Septic tank should be covered with ventilation pipes, the top being covered with mosquito proof wire mesh.**

2.2 Assessment across the Service Chain

C Assessment of Conveyance

Prior to planning septic tank emptying services for an effective septage management plan, ULBs should:-

- Assess available infrastructure (number of septic tank emptiers).
- Process for septic tank emptying practiced by public and/or contractors.
- Capture details related to type/size of trucks.
- Capture coverage in different parts of the city.
- Assess monitoring and complaint redressal systems.



DEMAND	Current septage management practice	Recommended septage management practice	SERVICE
	~2-4% of tanks cleaned per year (once in >8-10 years)	~33% of tanks cleaned per year (once in 2- 3 years)	

For 10,000 septic tanks to be cleaned in a 3 year cycle, 3333 septic tanks need to be cleaned annually.
Assuming 333 working days in year, 10 septic tanks need to be cleaned on a daily basis.

If 1 truck can clean 5 septic tanks, a ULB must procure no less than 2 trucks to meet the required target.

Assessment for Involvement of the Contractors

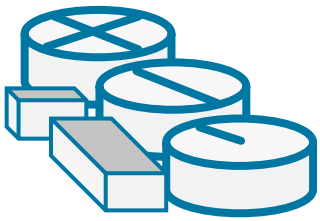
- **Role of Contractors**
- **Capacity of contractor in Annual Cleaning Frequency**
- **Assessment of contracts**
- **Registration/Licensing of Contractor**
- **Charges of cleaning incurred by the contractor**

2.2 Assessment across the Service Chain

D Assessment of Treatment and Disposal/Reuse

The ULBs must not dispose septage collected from the Septic Tanks without any treatment. ULBs should first:-

- Identify present location where the septage is being treated / dumped.
- Assess the possibility of septage treatment at existing STP in the city or nearby city by checking the available capacity and treatment technology.
- Assess extent and nature of reuse of treated septage.



Assess the soil type and water table at the Dump Site

Perform a Landscape Study of surrounding areas of the dump site (for sale of treated septage)

2.3 Assessment of Institutional and Regulatory Aspects

A **Assessing policies and regulations affecting FSM at local level –** It is essential to review existing policies and regulations related to sanitation and septage management with a focus on their implications on each link in the service chain: toilet - septic tank design and technical considerations, building plan approval process for onsite sanitation systems, licensing procedures for septic tank emptiers, regulatory provisions related to waste disposal and quality standards.

User Interface

Collection

- The building regulations and/or urban planning regulation that prescribe minimum sizes and types of toilets (refer section 17.4, Part II, DCPR). Refer to part VII, Development Control & Promotion Regulations for design of septic tanks.
- Financial provisions related to funding or subsidies for user interface and collection. Eg:- SBM

Conveyance

Manual scavenging Act,2013 prohibits the activity of manual scavenging and propagates the eradication of the use of insanitary latrines.

Treatment & Disposal/ Reuse

For waste treatment and reuse/disposal, the Maharashtra Pollution Control Board/Central PCB norms should be followed.

2.3 Assessment of Institutional and Regulatory Aspects

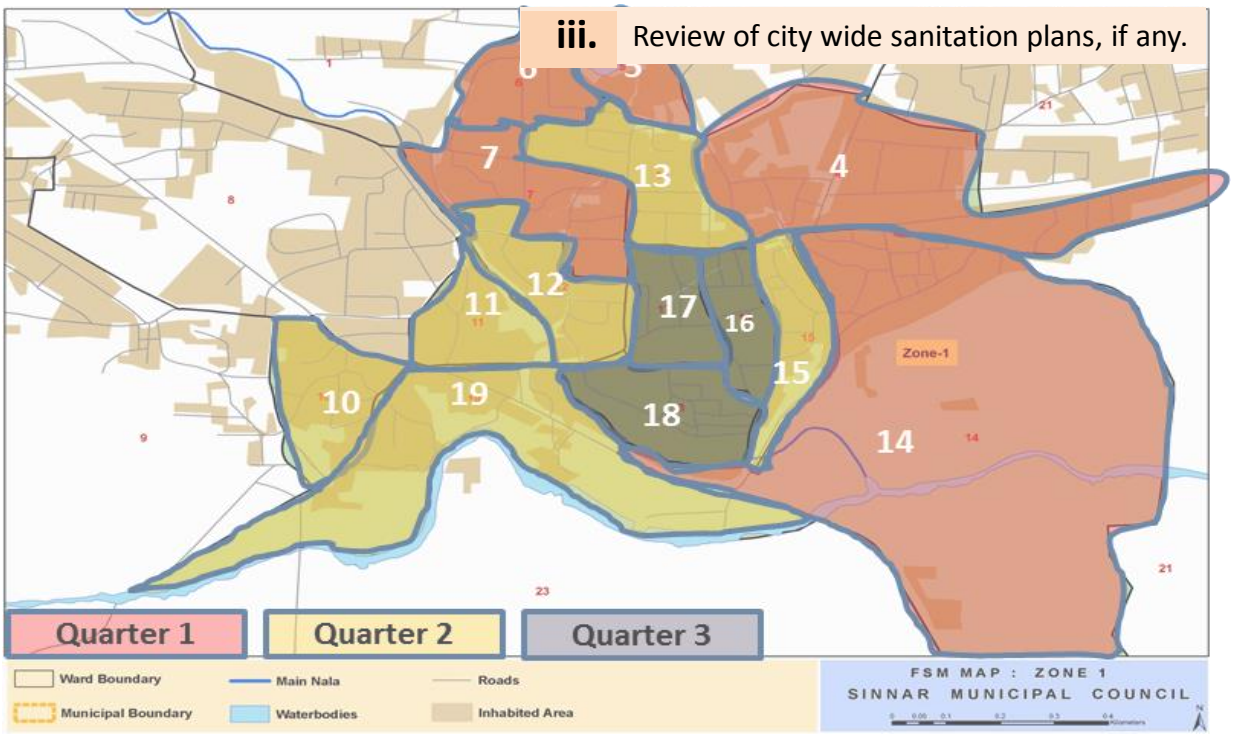
B

Assessing capacity of Stakeholders.
It is also important to identify the roles and responsibilities of all the stakeholders engaged in regulating septage in cities.

i. Assess the need of the staff in sanitation department or the involved contractors to undergo specific training in septage management.

ii. Is there a formal monitoring or reporting system about the work done by each staff in the agency? Are the records maintained properly? Are they computerized?

iii. Review of city wide sanitation plans, if any.



iv. Review of existing outsourcing contracts and its management.

2.4 Assessment of Finances

A Assessment of Finance Requirements

Capital and operating expenditure is required for various activities across FSM service chain. The ULBs should assess:-

- Investments required on capital assets for septage management.
- Investment required per year on Operation and Maintenance for septage management.

B Assessment of Potential Sources of Finance

The potential sources of funds for capital expenditures will require a review of:-

- Available FSM related programs which provide capital grants. Terms and conditions and related process for each will need to be identified.
- In case of private sector participation, the willingness of private players to meet capital expenditure will also need to be assessed.

For O&M expenditure, it will be necessary to assess:-

- The ULB's should assess the required tariffs for meeting O & M expenditure.
- The possibility of taxes that the local government can levy and transfer from its general sources.
- Prevailing user charges and if needed.
- Preliminary willingness to pay assessment through sample survey.

All overall assessment of government schemes/programmes can also be done. The ULBs can integrate these financial aspects with existing schemes/activities.

Potential Finance Instruments

Grants

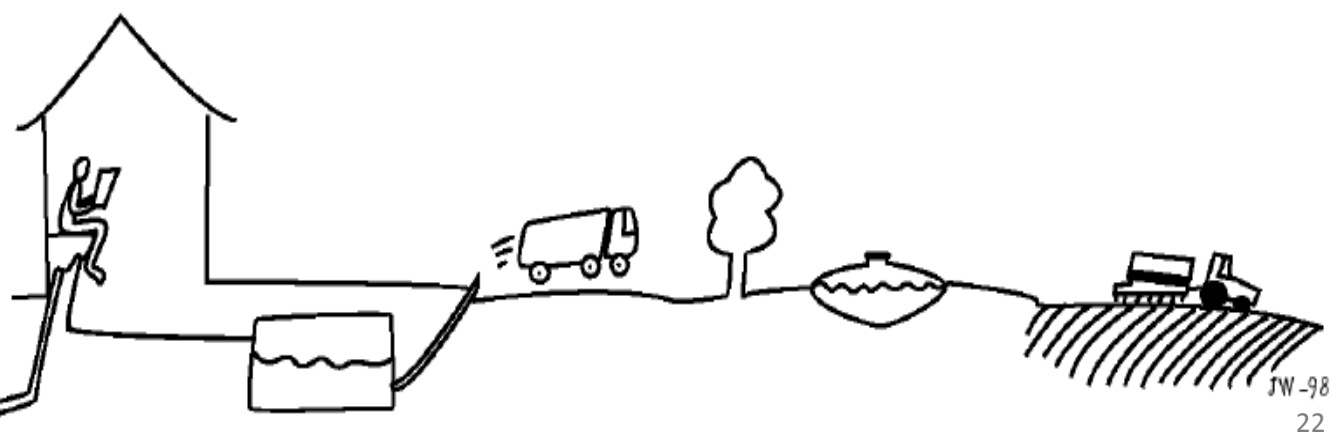
Rewards

Equity

Lending

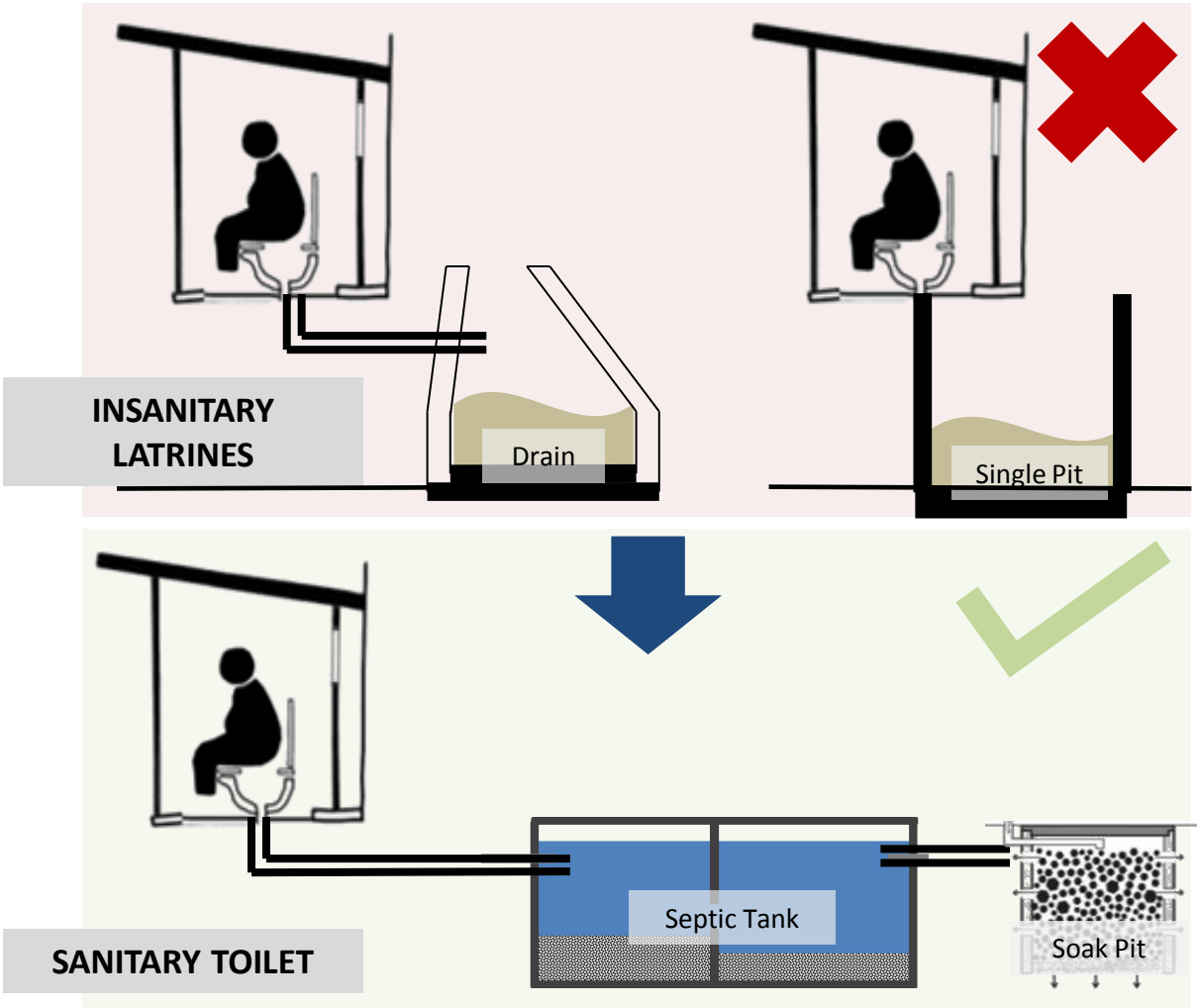
Royalty

3 STEPS FOR CITYWIDE FSM PLANNING



3.1 Proper Design of Toilets

A **All insanitary latrines to be converted to sanitary toilets** with twin pits/ septic tanks.



B The design and construction of septic tanks should be as per Swachch Bharat Mission, 2014.

C **Notices to be issued to all property owners** whose septic tanks do not meet the standard design guidelines.

Community Toilet Block with a Septic Tank

NOTE:- Refer to the National Building Code, 2005 and CPHEEO Manual, 2013 which takes references of design norms from IS: 2470 on Code of practice for installation of septic tanks (Part 1: Design and Construction and Part 2: Secondary treatment and disposal of Septic Tank Effluent).

3.2 Desludging of Septic Tanks

A **Desludging / emptying of septic tanks** should be undertaken by **mechanical devices** like suction emptier trucks / vacuum tankers, as per the Government of India act on the Employment of Manual Scavengers and Construction of Dry Latrines (Prohibition) Act, 1993.

B ULBs can also license existing septic tank operators in their city to operate their services

C It is essential for the employees engaged in the activity of septic tank emptying to use protective gear like gloves, boots, face mask etc.

D ULBs should **adopt pre-determined scheduled septic tank desludging** services. The city can be divided into zones and then a quarterly desludging service plan for a given year can be developed.

Pros & Cons of scheduled Septic Tank cleaning practice

On-Demand Basis	Scheduled Practice
Cleaning is done **on-call** by the household, who do not see the need for regular cleaning The **cleaning services** of the ULB are currently treated as a **complaint redressal** system for overflowing septic tanks rather than a regular cleaning and maintenance service.	Septic tanks will be cleaned on a **pre-determined schedule.** **Regulations** and **penalties** will be set in place to **ensure periodic cleaning** **Awareness generation** activities will educate households about the need for regular cleaning
The ULBs operates the trucks (either owned or borrowed) when the demand arises.	Each town will require an additional **number of trucks to meet service standards** (which can be **operated by a private player)**
Households generally pay a certain amount once in >8-10 years to get tanks cleaned during the time of overflow.	**Local taxes levied** by the ULB will be used to **recover** the **operating expenses** for regular cleaning.

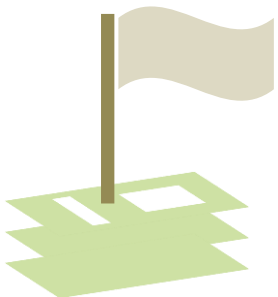
3.2 Desludging of Septic Tanks

D ULBs should either provide the emptying services themselves or enter into appropriate management contracts with private agencies. The contracts can be structured in the following two ways:-

i. The ULBs own the emptying truck and contract out the cleaning and emptying services to licensed contractors. The contractors can work according to the scheduled septic tank cleaning plan.
ii. The contractors can invest in procuring emptying trucks as well as operate them.

Taxes/charges can be levied for the service provided by the ULBs, while the contractors can be compensated through a management fee.

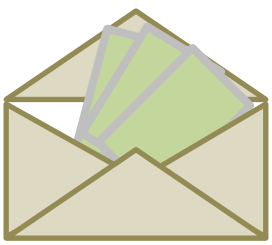
When structuring a CONTRACT:



1 Assess ownership of assets

The private sector can invest in procuring emptying trucks as well as operate them or operate the ULB trucks according to the scheduled septic tank cleaning plan.

The ULBs will benefit significantly from either type of arrangement.



2 Define the Payment Structure

Since cleaning of septic tanks is an ongoing activity, a fixed monthly fee should be kept against a target number of septic tanks to be cleaned, provided the schedule is followed.

Refurbishment is a one time activity in which the cost per tank is known. Hence a fixed fee per refurbished tank should be kept.

3 Define the Contract Value & Length

The length of contract can be decided on the basis of the septic tank emptying cycle.
The contract value can be decided based on the O&M expenses that the ULB is going to incur for operating this services.

3.3 Treatment and Reuse/Disposal of Septage

A **As per the CPCB Norms Septage collected from the septic tanks or pits should not be disposed without any treatment.**

B If STP is not available in the city or nearby that can receive the septage, then ULB should plan for new septage treatment facility.

Septage Treatment Plant

Biogas Treatment Plant

Co-Composting

Planted Sludge Drying Bed

Unplanted Sludge Drying Bed

Such a new faecal sludge treatment facility should be designed to cater to expected volumes of septage generated in urban local body

C **Input quality of the collected septage should be tested by the operators** at the treatment facility for checking presence of any metal or traces of industrial waste.

D Septage can be reused , if it meets the parameters mentioned in Guidelines for Septage Management in Maharashtra. There are various options for reuse of septage, for e.g. as compost. Septage can hence be sold as Septage to farms or agro-businesses.

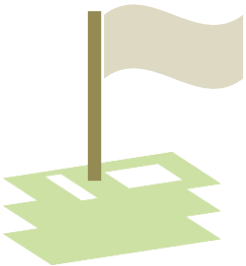
3.3 Treatment and Reuse/Disposal of Septage

E **ULBs should consider the involvement of private sector parties for activities related to operation and maintenance of treatment facility. Following steps should be followed while developing a PSP structure.**

i. Defining the operational role of the Contractors

The private sector can be involved in activities related to either construction of the treatment facility or operations and maintenance of the treatment facility.

ii. Ascertaining Investment and Ownership of Asset

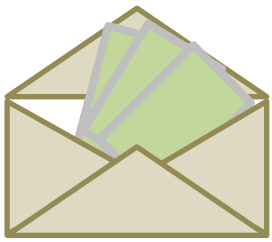


A concession agreement between both the ULBs and the private player can be drafted.

iii. Determining the Source of Revenue

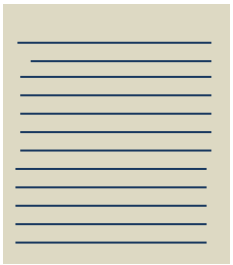
The treated septage can be sold to small or medium scale farmers and agro-based industries to be used as fertilizers or for soil-enrichment.

iv. Finalizing the Payment Structure



Construction of a treatment facility would be a one time activity. Hence, an overall fixed fee can be given to the private player.

v. Deciding on Contract Length and Value



The length of contract can be the operations and maintenance cycle. The contract value can be decided based on the O&M expenses.

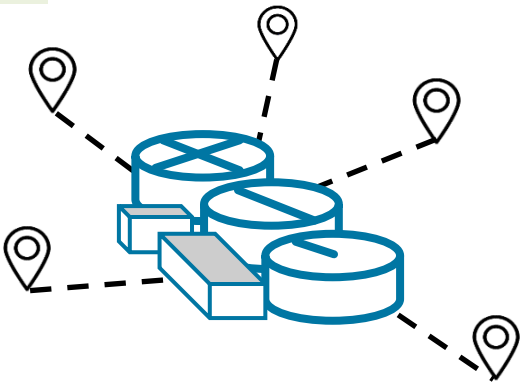
vi. Mitigating and Allocating Risks

There are several types of risks that must be managed across the lifecycle of any public private partnership.

Planning a new treatment facility?

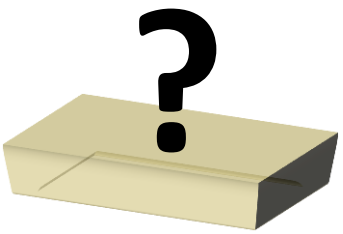
What measures can be taken for appropriate planning of a Septage Treatment Facility?

i. Distance of treatment site



The transport of relatively small fecal sludge volumes (5-10m^3 per truck) on congested roads over long distances in large urban areas is financially unfeasible. A site that is too far away implies fewer trips per day, less revenue and more fuel costs to private operators.

ii. Land availability



Projects are often delayed because of non-availability or high price of land.

ULB should identify the land bank for treatment facility. ULB should also explore the possibility of developing septage treatment facility at solid waste dumping or treatment site.

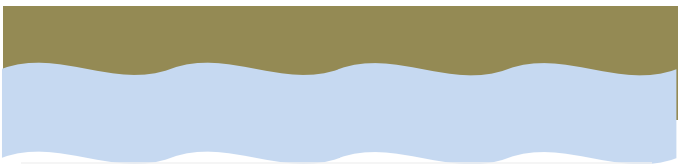
iii. Reliability of electricity

It is also important to assess the availability and reliability of electricity if treatment technology has mechanical operated parts.

iv. Neighborhood

A treatment site may generate nuisance, especially bad odors. For this reason it should be located at an appropriate distance from the residential areas.

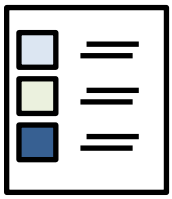
v. Geological Parameters



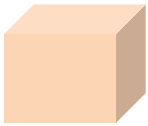
Assessment of existing geological conditions on site like groundwater table, type of soil, prone to flooding, is always recommended as it may directly affect selection of technology option.

3.4 Monitoring FSM Systems

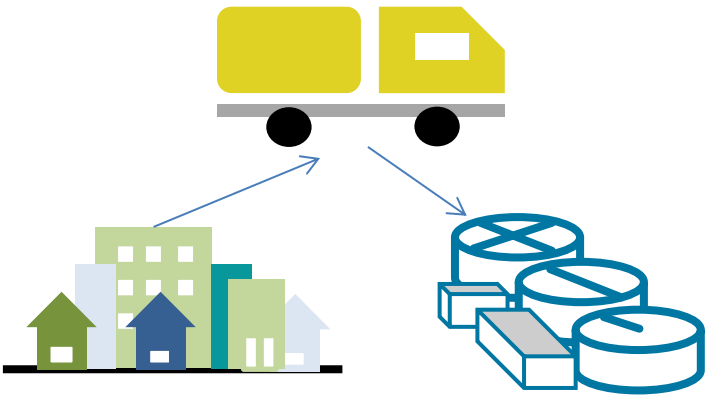
A **Recordkeeping and manifest forms** should be an integral part of a comprehensive septage management program.



Evaluation



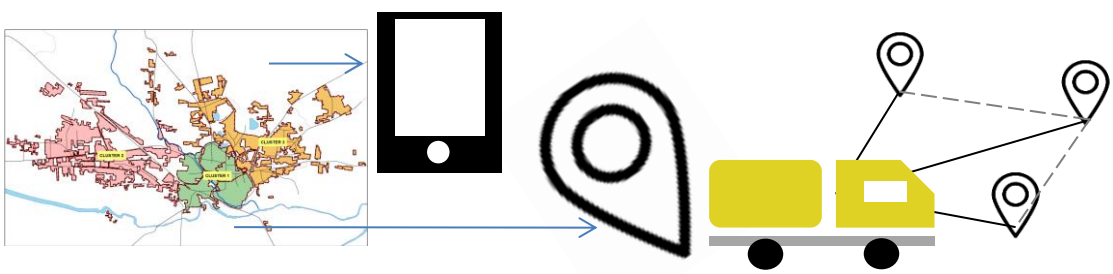
Data Sets



D **An MIS system to monitor the services at property / household level needs to be developed** using SaniTab or as suggested in Guidelines for Septage Management in Maharashtra need to be developed and maintained.

E **Consumer grievance redressal system** for faecal sludge management should also be set up as a part of urban local body record keeping systems and helpline numbers to be shared with residents as a part of monitoring and record keeping systems for faecal sludge management.

B The completed document or documents with signatures of the household/property, suction truck operator and treatment plant operator should be submitted to the local government for their records and this should be linked to payment of operators.



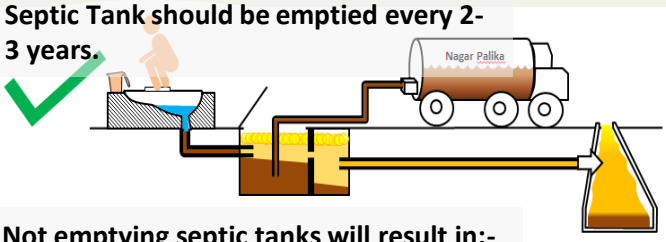
C **GIS** should be used to be plan the route of suction emptier trucks and tracking these for regular record keeping.

3.5 Awareness Generation and Capacity Building

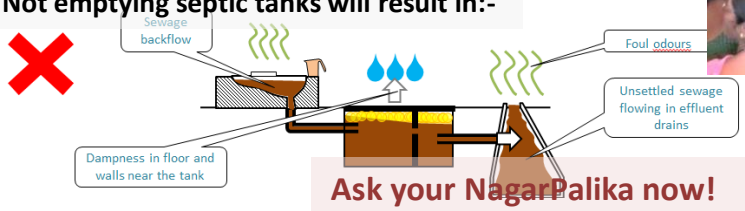
A **Awareness generation activities** should be carried out at the beginning of introducing a scheduled service in all wards and then **repeated periodically over the three year cycle.**

WHY should you empty your Septic Tank regularly?

Septic Tank should be emptied every 2-3 years.



Not emptying septic tanks will result in:-



Ask your NagarPalika now!

Members of Resident Welfare Associations, community organizers, self-help groups and the general public should be made sensitized periodically regarding the need for a sound faecal sludge management system

Pamphlets can be distributed to educate people about septic tanks and its management.

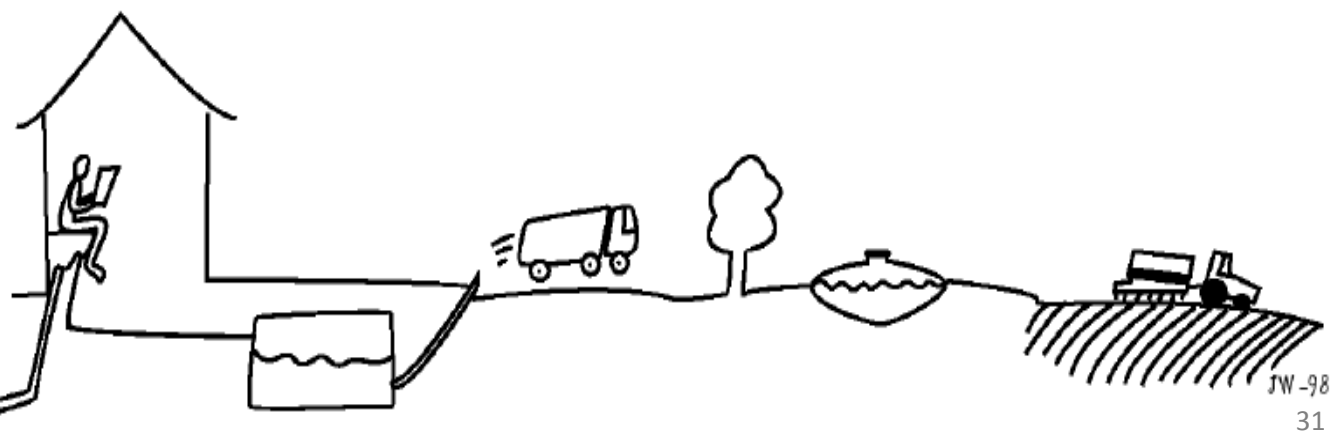
B Municipal Commissioners/ Chief Officers, Engineers, Sanitary Inspectors, Health Officers, and Sanitary Workers should be well trained in safe septage management and its best practices.

MUNICIPAL STAFF + **PRIVATE VENDORS**

Regular training sessions on safe collection, treatment and reuse/disposal should be held.

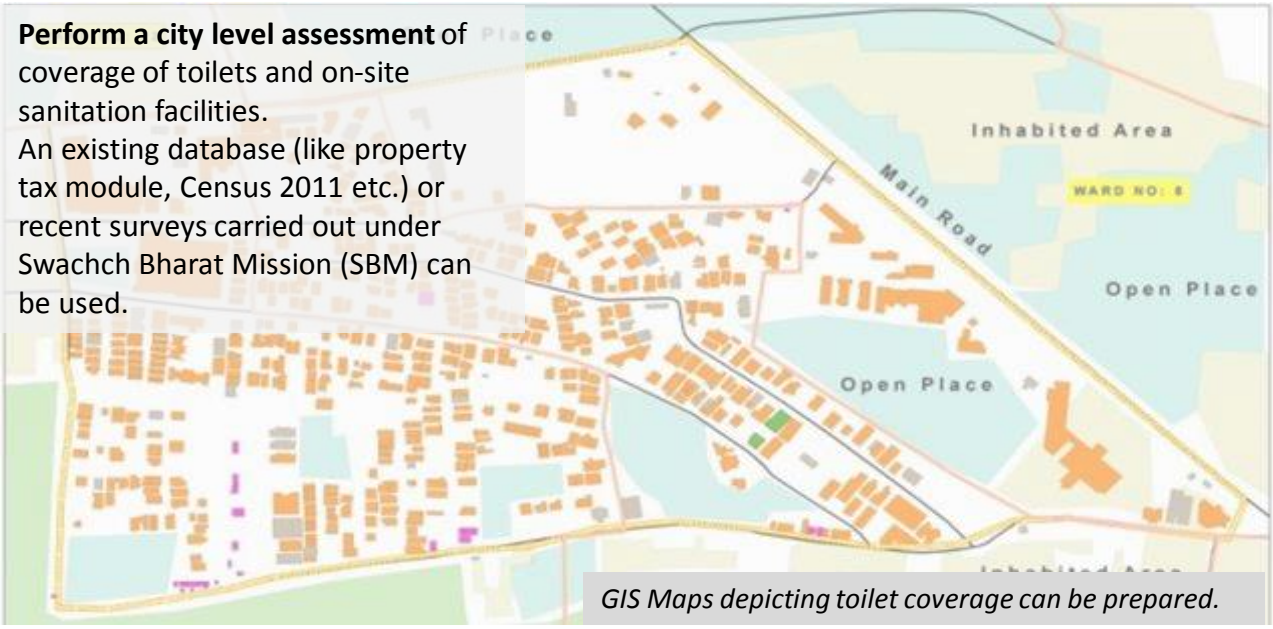
ULBs should ensure all safety norms are clearly explained to the septage transporters. Private Operators and Transporters should be well trained in the processes comprising the sanitation service chain as well.

4 IMPLEMENTATION



4.1 Creation of Database

Perform a city level assessment of coverage of toilets and on-site sanitation facilities.
An existing database (like property tax module, Census 2011 etc.) or recent surveys carried out under Swachch Bharat Mission (SBM) can be used.



GIS Maps depicting toilet coverage can be prepared.

Creation of new database is possible in the event of absence of any type of data. A database on toilet availability, type of connection and presence of on-site sanitation facilities can be created based on questionnaire (see Guidelines for Septage Management in Maharashtra, February 2016). This data can be linked with property tax database.

- Toilet Availability?
- Where is the toilet connected to?
- Size and Shape of Septic Tanks

?

- No. of Chambers in Septic Tanks?
- Cleaning frequency of Septic Tanks?
- Accessibility to Septic Tanks

Monitoring of cleaning of septic tanks can be done using the database. The households can be alerted about upcoming cleaning schedule of septic tanks as well.

PAS Team has developed a Mobile App- "SaniTab" for conducting household level sanitation surveys, which can be used by the ULBs.

4.2 Council Resolution

ULBs should adopt scheduled septage management cycle by means of council resolutions. Council Resolution for the following should be done as suggested below:-

General Body Meeting Resolution No. ____ Dated _____,
XYZ Municipal Council, XYZ.
Resolution No. _____
Subject: Implementing regulated septic tank emptying and septage treatment facility in the city through private sector participation

Resolution: As per Census 2011 out of 7580 households, 5145 households have individual toilets of which 4429 household toilets are connected to septic tanks. During the assessment conducted by XYZ Municipal Council, it was found that majority of household level septic tanks did not adhere to the design norms suggested by IS codes and CPHEEO manual. Majority of the septic tanks were oversized, due to which they are being cleaned either at any interval > 8-10 years or they have never been cleaned. Because of this the solids get consolidated inside the septic tanks and the treatment efficiency / capacity of septic tanks is reduced. The effluent coming of such septic tanks has high level of BOD which may have health implications on humans coming in contact with it. This untreated effluent is also directly disposed off into river Krishna through road side drains into the ghats section.
The municipal council provides demand based septic tank emptying services to the households at a charge of Rs. 1000 / trip and the septage is disposed off without treatment at the solid waste dump site location. This will have implications on environment as well as health of humans / animals. To support more regular cleaning of septic tanks and avoid dumping of untreated septage, it is necessary to plan for a regulated septic tank emptying service and treatment plant for septage. The recent MoUD advisory on septage management recommends that septic tanks should be cleaned at an interval of 3 years and that septage should be treated and then reused. The benefits of doing this are that treatment efficiency / capacity of septic tanks would not be stressed due to huge emptying cycles, planned emptying of septic tanks would take place and definite revenue stream from emptying of septic tanks and sale of treated septage would take place. So it's necessary that the municipal council implements an integrated fecal sludge management (IFSM) plan for XYZ city.
In accordance with this resolution, the municipal council has taken the decision to implement a regulated septic tank emptying service and septage treatment facility at the solid waste dump site located at City Survey no 238 (old) / 259 (new). The septic tank emptying services (i.e. truck procurement and operations) and operations of septage treatment facility will be undertaken by private sector. For sustaining this private sector participation in IFSM services, taxes will be levied on the properties and all the properties will be mandated to empty the septic tanks once every three years as per the schedule provided by municipal council. The property owner will be responsible for providing access manholes covers and proper access to septic tanks to carry out septic tank emptying services. New regulations and bye-laws will be introduced to manage the onsite sanitation systems.
Through this resolution an approval is given for carrying out the IFSM activities through private sector participation and introducing appropriate taxes, regulations and mandates for successful implementation of the same.

ULBs can adopt by means of council resolutions, the following:-

1. City-Wide Desludging
2. Land Allocation for FSM
3. Levy Tax/Charge
4. Regulations for FSM
5. Private Sector Involvement
6. Administrative & Financial Approval for FSM
7. Penalties for Citizens & Private Sector
8. Float Tenders
9. Work Order to Private Sector

4.3 Mobilization of Financial Resources

Capital and operational expenses can be mobilized via the following means:-

CAPEX

- CSR
- Loans
- Convergence with existing schemes
- Swachhta Kosh
- Crowd-Funding
- 14th Finance Commission
- State/Central Government Funds

OPEX

- Tariffs
- Tax
- Sale of treated Septage

4.4 Bid/Tender Documents

A There are three possible options for contracts between ULBs and the private sector. The bid / tender documents need to be developed for the same.

SERVICE CHAIN

IFSM ACTIVITES	COLLECTION	CONVEYANCE	TREATMENT	
	Refurbishment of septic tanks with accessible manhole covers	Periodic cleaning of septic tanks along a regulated schedule	Construction of treatment facility	Operation and maintenance of the treatment facility
Option 1				
Contract 1 A	Refurbishment & Cleaning of Septic Tanks			O&M of treatment facility
Contract 1 B			Construction of treatment facility*	
Option 2				
Contract 2 A	Refurbishment & Cleaning of Septic Tanks			
Contract 2 B			Construction* and O&M of treatment facility	
Option 3				
Contract 3 A	Refurbishment & Cleaning of Septic Tanks, Construction and O&M of treatment facility			

*It is essential to get **technical sanctions** from State assigned Technical Agency for construction of treatment facility.

B E-tenders should be floated by the ULBs for the contracting options that the city has developed.

See example of tender document – Annexure 2.

Annexure 1 - Survey Form for Assessment

Q No	Question	Options
1	Form id	
2	Locality type	Slum
		Non-Slum
3	What is the name of the locality?	Locality Name _____
4	Ward no:	Number ____
5	Property number as per Council property tax records:	Number ____
6	Status of property during the survey	Open
		Locked
		Vacant
7	Type of Property	Residential
		Institutional
		Commercial
		Mixed
8	Mark the house typology (only if 7 = Residential)	Bungalow
		Apartment
		Row House
		Wada
		Chawl
		Hut
		Others, specify _____
9	Select the type of Institution (only if 7 = Institutional)	Hospital
		Dispensary
		School/College
		Religious Institutions
		Government Office
		Others, specify _____
10	Select the type of commercial (only if 7 = Commercial)	Industry
		Shop
		Hotel / Lodge
		Others, specify _____
11	Name of Apartment/Building:	
12	Number of Blocks	Number
13	Name of the respondent/ building secretary:	
14	Contact no. of building secretary:	Number ____
15	How many flats are there in this apartment?	Number ___
		Don't know
16	How many toilets are there in this property?	Number ____
		Don't Know

17	Number of flats that are occupied	
18	How many households are there on this property?	Number ___
19	Name of the respondent/Head of the Household	First name _____ Middle name _____ Last name _____
20	Please provide a mobile Contact no. of head of the household	Number ____
21	What is the tenure status of this property?	Owner occupied
		Tenant occupied
22	Please provide the name of the owner of this property: -	Name _____
		Don't Know
23	Please provide a mobile contact no. of owner	Number ____
		Don't Know
24	How many persons are there in this household? (for Commercial, approx numbers of toilet users)	children (less than 6 year):___, Other Male: ___ Other female: ___
25	Do you have your own toilet on your premises?	Yes or No
26	If you don't have your own toilet on your premises, what do you and other family members do for defecation?	Use a toilet shared with neighbours
		Use a community toilet
		Use a public toilet
		Open defecation
		Others, specify _____
27	What is your own toilet connected to for disposal?	Sewer Network
		Septic tank with soak pit
		Septic tank connected to open/closed drain
		Single Pit
		Double pit
		Directly to open/closed drains
		Others, specify _____
28	No. of septic tanks in the property	1
		2
		3
		Don't Know
29	Type of septic tank: 1. Individual 2. Shared	Individual
		Shared
30	This property shares septic tank with: _____	
31	What is the shape of your septic tank	Rectangular
		Circular
		Don't Know
32	Provide dimensions: ("L" relevant only if rectangular) - -	Don't know
		Length (ft.) _____
		Breadth/Diameter (ft.) _____
		Depth (ft.) _____

33	Septic tank outfall is connected to	Soak pit
		Open drain
		Covered drain
		Open land
		Others, specify
		Don't Know
34	When was the septic tank emptied the last time?	Last 6 months
		From 6 to 12 months
		12-24 months
		24-36 months
		More than 36 months
		Never emptied
		Don't know/Remember
35	Why was the septic tank emptied?	Blocked toilet
		Overflow from access hole/manhole
		Smell
		Others, specify
		Don't know/remember
36	Were there any problems during emptying of septic tanks?	Access or distance for suction truck to house
		Break floor tiles to access septic tank
		Break concrete manhole to access septic tank
		Difficult to locate the septic tank
		Smell during emptying
		Made a mess
		No problem found
		Others, specify
		Don't know
37	Is the septic tank accessible from road for cleaning by using a suction emptier truck?	Yes
		No
38	Is there proper access with manholes/covers for any of the chamber of septic tank which can be easily opened	Yes
		No

Annexure 2 - Tender Document

ABC MUNICIPAL COUNCIL, ABC
E- TENDER NOTICE NO: A1 for 2016-2017

Tenders on lump sum basis in online (E-Tender) system are invited by the Chief Officer, ABC Municipal Council, ABC (Phone No.0xxxx/xxxxxx) for the following Municipal Council work. Contractors/Agencies with experience in following work and who fulfill the qualification criteria are invited to apply. The detailed information about tender is available on https://www.mahatenders.gov.in

S.No.	Name of Work	Annual Estimated Cost of Tender	Earnest Money	Time Limit	Cost of Blank tender forms
1	2	3	4	5	6
1.	Scheduled Cleaning of Septic Tanks	To be given by the bidder	xxxxxxxx	n Years	xxxxxxxx

The detailed tender document is required to be scanned and uploaded along with this E-Tender by the bidder/Contractor or their representative. The bidder must also submit hard copies of technical documents mentioned in the tender in a sealed envelope before the due date to the office of Office of Chief Officer, ABC Municipal Council, Taluka ABC, Dist. D

S.No.	Activities	Date	Time
1.	Publishing Date	dd/mm/yyyy	4:00 PM
2	Document Sale Start Date	dd/mm/yyyy	4:00 PM
3	Document Sale End Date	dd/mm/yyyy	6:00 PM
4	Pre Bid Meeting Date	dd/mm/yyyy	12:00 PM
5	Bid Submission Start Date	dd/mm/yyyy	11:00 AM
6	Bid Submission End Date	dd/mm/yyyy	6:00 PM
7	Technical Bid Opening Date	dd/mm/yyyy	11:00 AM
8	Financial Bid Opening Date	dd/mm/yyyy	11:00 AM

For more information, log on to:

www.swachh.maharashtra.gov.in

www.pas.org.in

These guidelines are prepared in consultation with **Urban Development Department, Government of Maharashtra**, with the support from **CEPT University, Ahmedabad** and **All India Institute of Local Self Governments (AIILSG), Mumbai** under the **Performacne Assessment System (PAS) Project.**