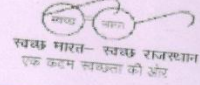


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आयुक्त/अधिशिषी अधिकारी
नगर निगम/परिषद/पालिका,
समस्त नगर निकाय, राजस्थान।

विषय :- Faecal Sludge and Septage Management पॉलिसी लागू करने हेतु।

शहरी विकास मंत्रालय भारत सरकार द्वारा स्वच्छ भारत मिशन (शहरी) अर्न्तगत नगर निकायों को खुले में शौच मुक्ति हेतु शौचालयों के निर्माण के लिए दिशा निर्देश प्रदान किये हैं। जिनके अनुसार नगर निकायों द्वारा शौचालयों का निर्माण किया जा रहा है। राजस्थान की नगरीय निकायों को मार्च 2018 तक खुले में शौच से मुक्त किये जाने का लक्ष्य है।

शौचालयों निर्माण के उपरान्त स्लज (Sludge) को जहाँ सीवर लाइन उपलब्ध है, वहाँ सीवर लाइन से जोड़ा जा रहा है। जहाँ सीवर लाइन उपलब्ध नहीं है उन शौचालयों के पिट, सैप्टिक टैंक इत्यादि को खाली करने एवं उनके Sludge के प्रबंधक हेतु भारत सरकार द्वारा Faecal Sludge and Septage Management (FSSM) Policy जारी की गयी है।

शहरी विकास मंत्रालय भारत सरकार द्वारा जारी Faecal Sludge and Septage Management (FSSM) Policy राज्य की समस्त नगर निकाय के लिए एतद् द्वारा लागू की जाती है।

यह सक्षम स्तर से अनुमोदित है।

संलग्न:-Faecal Sludge and Septage Management (FSSM) Policy

(पवन अरोड़ा)

निदेशक एवं संयुक्त सचिव

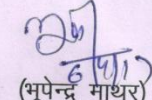
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(भूपेन्द्र माथुर)
मुख्य अभियन्ता

NATIONAL POLICY ON FAECAL SLUDGE AND SEPTAGE MANAGEMENT (FSSM)

February 2017





FOREWORD



SHRI M VENKAIAH NAIDU

Minister of Urban Development, Housing & Urban
Poverty Alleviation and Parliamentary Affairs

On 2nd October 2014, the Government of India launched the Swachh Bharat Mission towards achieving a Clean and Open Defecation Free India by 2019. The mission has been successful in bringing to the fore issues in the areas of sanitation and solid waste management. As the mission has entered its third year, significant progress has been made across the 4041 cities/towns with innovative approaches being adopted to not only improve service delivery but also make the mission a Jan Andolan. This is reflected in the physical progress achieved under the mission until now which includes construction of 29,18,669 individual household toilets and 1,10,665 Community & Public Toilets across all cities/towns.

With 475 cities certified Open Defecation Free, it is equally critical to put our efforts towards the safe collection, treatment and disposal of all human waste that is collected from onsite sanitation systems such as septic tanks, in order to achieve safe sustainable sanitation for all.

To address this issue, my Ministry is committed to helping states and cities in India to make rapid improvements in managing their faecal sludge and has launched the Atal Mission for Rejuvenation and Urban Transformation, which focuses on the provision of sewerage facilities and septage management in 500 cities across the country. States and cities have been urged to include an FSSM plan as part of their AMRUT State Level Implementation Plans. Further, it is heartening to see cities taking the next step to become ODF+ by taking up initiatives in the area of FSSM, as part of the Swachh Bharat Mission. The states of Tamil Nadu, Maharashtra and Odisha have already released state level Septage Management policies to ensure proper FSSM in their respective cities and I urge other states to lead by example.

To put our best efforts forward to implement faecal sludge management initiatives, there are a variety of roles that multiple stakeholders must play. While city officials have the mandate to ensure service provision and implementation partners can share the technical expertise, there is also an opportunity for the private sector to provide FSSM services in urban India. Only through such a collaborative multi-stakeholder approach can we make India Swachh and open defecation free (ODF).

FOREWORD



SHRI RAO INDERJIT SINGH

Minister of State, Ministry of Urban Development
Government of India

Expansion in the coverage of sanitation services in urban India is imperative citing the associated negative externalities within the health domain and beyond. While the objective of making the country open defecation free by the year 2018 is on track under Governments' mutually reinforcing schemes like Swachh Bharat Mission (SBM) and Atal Mission for Rejuvenation and Urban Transformation (AMRUT), more than 65% of household toilets are beyond the coverage of sewerage network.

Though the efforts are ongoing to expand the sewerage network in Indian cities, keeping in view the current resource endowments it is imperative to explore decentralized solutions. It gives me immense pleasure to introduce the National Policy on Faecal Sludge and Septage Management that induces and sensitizes national, state and local bodies to decentralized sanitation approaches, and propositions such as approaches as a viable alternative to centralized sewerage systems where appropriate.

Since the States have the responsibility of the implementation of this policy, considerable flexibility is granted to states to develop their own models to further the cause of FSSM. The National Policy, in this context, acts as a guiding document for the States by setting the context, priorities and direction for states and cities to ensure proper implementation of FSSM across urban India.

I am optimistic that with the introduction of this policy we would further strengthen the implementation effort nationally culminating towards achievement of envisaged targets under SBM and AMRUT.

PREFACE



SHRI RAJIV GAUBA

Secretary, Urban Development

Sanitation in India is key to achieving improved public health and enhanced socio-economic outcomes. To achieve this objective, Ministry of Urban Development has launched two key schemes namely, Swachh Bharat Mission (SBM) and Atal Mission for Rejuvenation & Urban Transformation (AMRUT). While SBM aims to end open defecation by universalizing construction and use of toilets, AMRUT is aimed at strengthening the sewerage and water supply network of the country. Both schemes aim to holistically address the existing gaps under the sanitation value chain in India.

At present, the penetration of sewerage systems is low in the country and more than 45% of urban Indian households are dependent on On-Site Sanitation (OSS) systems. Thus, till the time the Government's vision of 100% sewerage universalization is achieved, it is felt that faecal sludge output needs to be managed in an environmentally safe and sustainable manner using complementary and alternative methods of treatment.

In view of this, the Ministry of Urban Development is launching the National Policy on Faecal Sludge and Septage Management (FSSM) to facilitate nationwide implementation of FSSM in India. The key objective of this policy document is to set the context, priorities and direction for states and cities in this regard.

It is hoped that this policy will help in generating awareness and furthering the cause of FSSM for achieving safe and sustainable sanitation for urban India.

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1 TERMINOLOGY

Faecal Sludge: “Faecal Sludge” is raw or partially digested, in a slurry or semisolid form, the collection, storage or treatment of combinations of excreta and black water, with or without grey water. It is the solid or settled contents of pit latrines and septic tanks. The physical, chemical and biological qualities of faecal sludge are influenced by the duration of storage, temperature, soil condition, and intrusion of groundwater or surface water in septic tanks or pits, performance of septic tanks, and tank emptying technology and pattern.

Faecal sludge is the solid or settled contents of pit latrines and septic tanks. Faecal sludge (FS) comes from onsite sanitation systems. Examples of onsite technologies include pit latrines, non-sewered public ablution blocks, septic tanks, aqua privies, and dry toilets.

Septage: “Septage” is the liquid and solid material that is pumped from a septic tank, cesspool, or such onsite treatment facility after it has accumulated over a period of time. Usually, septic tank retains 60% - 70% of the solids, oil, and grease that enter it. The scum accumulates on the top and the sludge settles to the bottom comprising 20% - 50% of the total septic tank volume when pumped. Offensive odour and appearance are the most prominent characteristics of Septage. It is a host of many disease-causing organisms along with the contamination of significant level of grease, grit, hair, and debris.

Septage is the combination of scum, sludge, and liquid that accumulates in septic tanks.

The effluent from the septic tank can be collected in a network of drains and/or sewers and treated in a treatment plant designed appropriately. The accumulating sludge at the bottom of the septic tank however, has to be also removed and treated once it has reached the designed depth or at the end of the designed desludging frequency whichever occurs earlier. Such a removal is possible only by trucks. While sucking out the sludge, the liquid in the septic tank will also be sucked out. Such a mixture is referred to as septage.

Septic tank: An underground tank that treats sewage by a combination of solids settling and anaerobic digestion. The effluents may be discharged into soak pits or small-bore sewers, and the solids have to be pumped out periodically.

Sewage: Sewage is defined as the wastewater containing human body waste matter (faeces and urine etc), either dissolved or undissolved, discharged from toilets and other receptacles intended to receive or retain such human body wastes. The effluent coming out of septic tanks or any such facility is also sewage.

Sewerage System: The underground conduit for the collection of sewage is called Sewer. A network of sewer appurtenances intended for the collection and conveyance of sewage generated from each of the properties to a sewage pumping station for pumping to sewage treatment plant for further treatment and disposal is called sewerage system.

2 INTRODUCTION

2.1. EXISTING SITUATION

According to Census 2011, India's urban population is 377 million or 31% of the total population, which is expected to increase to 600 million by 2031. The Census 2011 also showed that in 4,041 statutory towns, 7.90 million households (HHs) do not have access to toilets and defecate in the open¹. Under the Swachh Bharat Mission (SBM), it is envisaged that nearly 80% of these 7.90 million HHs (or nearly 6.3 million HHs) will meet their sanitation needs through newly-built individual household toilet (IHHT) and the remaining 20% (or nearly 1.6 million HHs) will rely on existing or newly-built community toilets. Weak sanitation has significant health costs and untreated faecal sludge and septage from cities is the single biggest source of water resource pollution in India. Human waste has clearly been identified as the leading polluter of water sources in India, causing a host of diseases including diarrhoea, agricultural-produce contamination and environmental degradation.

India's bigger cities have large, centralized sewerage systems with vast underground pipelines, pumping stations and huge treatment plants. These systems are expensive to build and even more expensive to operate effectively, as they require continuous power, a large amount of water, skilled operators and extensive electro-mechanical maintenance. It is for this reason that India's 7,000+ small towns do not have such systems

and are unlikely to be covered by centralised sewerage systems in the near future.

2.2. NEED FOR FSSM POLICY

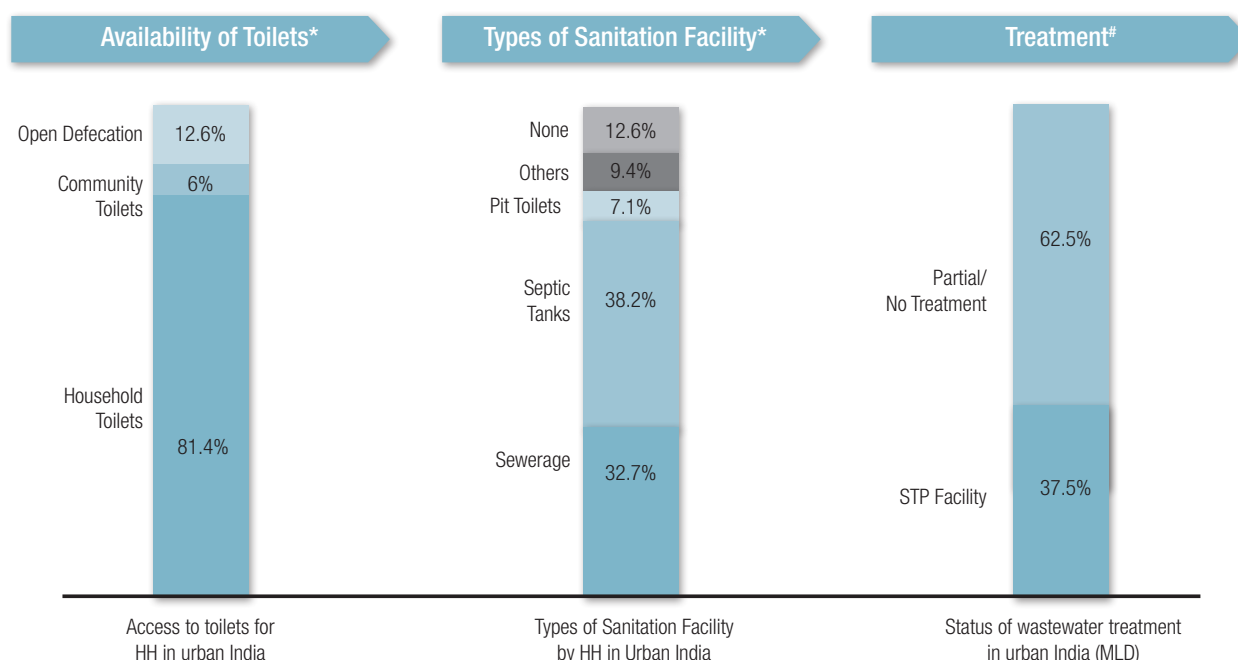
According to the data released in the report "Inventorization of Sewage treatment plants, 2015" by the Central Pollution Control Board, out of the 816 municipal sewage treatment plants (STPs) listed across India, 522 are operational (only 64% are functioning), 79 STPs are Non Operational, 145 STPs are under construction and 70 STPs are proposed. The treatment capacity that is available is only for 37% of the total 62,000 MLD (million litres per day) of human waste that is generated in urban India.

Currently on-site pit latrines and septic tanks account for a substantial proportion of toilets in urban India – over 47% of urban Indian households depend on onsite facilities (Census 2011) and this proportion is increasing. 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.

In the absence of adequate safe and sustainable sanitation, many Indian cities are already suffering the consequences, in the form of health ailments and serious pollution of water and soil resources.

¹ SBM Urban Guidelines, Ministry of Urban Development, Government of India

FIGURE 1: STATUS OF SANITATION IN URBAN INDIA



Source: * Census of India 2011; # CPCB, Inventorization of STPs (2015)

In contrast with the large proportion of on-site sanitation (OSS) systems, limited attention has been accorded to proper construction and maintenance of OSS and the management and safe disposal of faecal sludge and septage from such septic tanks and pit latrines. While construction standards have been codified by the Bureau of Indian Standards (BIS), the actual construction was largely left to households to manage – in practice, the installations are subject to local practices and considerable variations are observed. In many instances for example, soak-away or drain fields are not provided.

Limited capacities and resources with Urban Local Bodies (ULBs) also resulted in little regulation of maintenance and cleaning of septic tanks and pits – in many cases, households do not report cleaning for a number of years. Some ULBs have

desludging equipment or there are private players providing cleaning services but the supply of desludging services is far from adequate. In many instances faecal sludge and septage is dumped in drains and open areas posing considerable health and environmental risks. Sanitary workers also work in hazardous conditions to clean OSS pits and tanks sometime without adequate protective gear and equipment. In most Indian cities, there is limited data and information on the types and number of OSS toilets and septage disposal systems and practices.

The problem of Faecal sludge and septage / sewerage must be addressed in a holistic manner, with a strategy that provides for minimum needs and is appropriate and affordable for all areas, considering the local situation. It must also address the enablers in the form of suitable regulation

and institutional framework, capacity building and education and awareness among all stakeholders. This policy seeks to address the efficiency of systems in place for onsite sanitation whereof the faecal sludge output needs to be managed in an environmentally safe manner including the proper engineering design, construction and maintenance of septic tank systems, pit latrines and such other systems generating faecal sludge.

2.3. GAPS AND ISSUES IN URBAN SANITATION

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!

Access: Issues in access to toilets arise due to households having financial issues and space crunch for constructing individual toilets. This leads to members of households without toilets practicing open defecation². There are also significant cultural and social barriers (issues around perceptions of pollution and caste; and a general social acceptance of open defecation that prevents households from investing in safe sanitation and its universal and consistent use – in both urban and rural areas. This behavioural aspect is one of the significant reasons why India has such high rates of open defecation compared to other even poorer and less developed countries in Africa and in Asia.

Septage collection and conveyance: Regular cleaning of septic tanks through a systematic extraction and collection procedure is essential to check environmental pollution. The frequency of cleaning is determined by the desired performance of the OSS system for the local conditions. For example, if the septic tank is soaking away into the ground, with no ground water issues, frequency of emptying can be less. On the other hand, if effluent is overflowing to surface drain, more regular emptying may be required to prevent sludge overflow. Notably, the following issues create barriers to regular tank cleaning, and septage collection:

- **Illegal Manual scavenging:** Though a specific act has been passed against Manual Scavenging, (The Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013), social and cultural acceptance of such practices act against formal and systematic methods of cleaning tanks.
- **No / Limited access to tanks:** Septic tanks are often placed under toilets, or are sealed, or cemented over, making it difficult to access them for cleaning/ emptying which dis-incentivizes their frequent cleaning.
- **Inappropriate tank sizing & design:** Septic tanks connected to individual toilets are often oversized due to lack of awareness among construction contractors about the design norms. These tanks do not meet the standards prescribed in the National Building Code, the Indian Standard Codes and the CPHEEO³ Manual. As a result, households typically notice

² Swacchta Status Report - NSSO

³ The Central Public Health and Environmental Engineering Organization (CPHEEO) is the technical wing of the MoUD and deals with matters related to urban water supply and sanitation <http://cpheeo.nic.in/Onsite%20Sanitation/suk/cha/Chap1-6.pdf>

the need for cleaning once the tanks fill up, and call for emptying services.

In many cases, where households do not understand the utility of a septic tank as a requisite pre-treatment unit, it merely acts as a large containment tank, with overflow to the drains.

Masons who construct these, often oversize them at the request of the households. This leads to extraction and emptying being done at very infrequent levels (once in 10-15 years). The overflow is often just connected to available open drains instead of a proper soak pit, making entire drain surroundings a health hazard.

- **Lack of infrastructure, and a regulated schedule for cleaning:** ULBs are often faced with financial and personnel constraints in providing recommended service levels to households - for example, insufficient suction emptier trucks, trained human resource, safety equipment, etc. to ensure regular cleaning/emptying of septic tanks.
- **Lack of formal private players:** The sector is dominated by informal small-scale contractors that lead to difficulty in monitoring of the process that they follow for emptying and disposal. Domination by informal players also makes it harder to institutionalize best practices and regulations, which prevents establishment of norms around scheduled and safe cleaning.

Treatment and Disposal: Typically, most small-medium towns and cities lack adequate centralized/ decentralized facilities and designated sites for sewage and for septage treatment and disposal. As a result, all sewage is dumped without treatment into the rivers, while untreated sludge and septage is disposed of in a dumping ground/

any water body available, and often these sites are some distance away from the main city.

Poor Awareness: Faecal Sludge and septage management has been accorded low priority and there is poor awareness about its inherent linkages with public health.

Fragmented Institutional Roles and Responsibilities: There are considerable gaps and overlaps in institutional roles and responsibilities at the national, state, and city levels.

Lack of an Integrated City-wide Approach:

Faecal Sludge and septage management investments are currently planned in a piece-meal manner and do not take into account the full cycle of safe confinement, treatment and safe disposal.

Limited Technology Choices: Technologies have been focussed and the disposal techniques are not environmental friendly no cost-effective, and sustainable investments for safe management and disposal has been thought off on a large scale.

Gender Sensitive Gap: The burden of poor sanitation (compounded by the lack of FSSM services) disproportionately affects women, especially the urban poor, because this falls along established fault-lines of malnutrition and family health caregiving. This policy, therefore, will promote gender mainstreaming in FSSM where women are seen as active agents and participants of change, not merely as recipients or victims of policies. The Economic Survey Report (2016-17) of the Finance Ministry indicates the adverse impact of lack of sustainable sanitation on health of women and impedes in cognitive development of girls and infants.



2.4. NATIONAL DECLARATION ON FSSM

MoUD recognizes that the end objectives and corresponding benefits of SBM cannot be achieved without proper management of faecal sludge and septage across the sanitation service chain. Further, it is well understood that sewerage coverage will not meet the complete sanitation needs in all areas, and a strategy which is a combination of OSS and off-site (decentralised and centralised) must co-exist in all cities and must be given equal attention. Over time the relative proportions of coverage by OSS and off-site systems may change but both will need to be managed well. However, the current policies are not explicit enough and also do not provide an outcome-focused direction on this issue. As a first step, MoUD and a host of research and civil society organisations jointly drafted and signed a National Declaration on Faecal sludge and Septage management (FSSM) on 9th September, 2016. Pursuant to the Declaration, this FSSM

Policy is being promulgated to address the gaps and provide the necessary directions to diverse stakeholders engaged in provision of FSSM services.

2.5. FSSM INTERNATIONAL PERSPECTIVE

Globally, around 2.7 billion people are served by onsite sanitation technologies and it is expected that the number is going to get doubled by 2030. On Site Sanitation (OSS) is not only used to fulfill the needs of rural population but also the needs of around one billion people in urban areas. In developing countries OSS, have much wider coverage than sewer systems. For example, in Sub-Saharan Africa, 65-100% of sanitation access in urban areas is provided through onsite technologies. Though OSS is used widely the management of FSSM is inadequate and needs critical attention.

- With the fast urbanization the conventional sewerage systems are not likely to keep pace with the growing demand in the developing countries
- Most of the Sewerage systems that have been constructed in low-income countries have failed because of high O & M costs.
- For more than a decade, there is a shift in approach among the practitioners globally and they have started to acknowledge and consider decentralized technologies and FSSM services as long-term and sustainable options.

3 OBJECTIVES AND SCOPE

3.1. VISION

The vision for Faecal Sludge and Septage Management in urban India is:

All Indian cities and towns become totally sanitized, healthy and liveable and ensure sustenance of good sanitation practices with improved Onsite Sanitation Services together with faecal sludge and septage management to achieve optimum public health status and maintain clean environment with special focus on the poor.

3.2. OBJECTIVES

The key objective of the urban FSSM Policy is to set the context, priorities, and direction for, and to facilitate, nationwide implementation of FSSM services in all ULBs such that safe and sustainable sanitation becomes a reality for all in each and every household, street, town and city. More specifically, the Policy will:

- i. Move India on the path of mainstreaming FSSM in urban India by the year 2019, and ensure that all benefits of wide access to safe sanitation accrue to all citizens across the sanitation value chain with containment, extraction, transportation, treatment, and disposal / re-use of all faecal sludge, septage and other liquid waste and their by-products and end-products.
- ii. Suggest and identify ways and means, including the methods and resources, towards creation of an enabling environment for realising safe and sustainable FSSM in India.

- iii. Define the roles and responsibilities of various government entities and agencies, and of other key stakeholders such as the private sector, civil society organisations and citizens for effective implementation of FSSM services throughout the country.
- iv. Enable and support synergies among relevant Central Government programs such as SBM, AMRUT and the Smart Cities Mission to realise safe and sustainable sanitation for all at the earliest, possibly by the year 2019.
- v. While not compromising the eventual compliance to the strict environmental discharge standards already set, recognising the constraints in achieving these standards, adopt an appropriate, affordable and incremental approach towards achieving these standards.
- vi. Mitigate gender-based sanitation insecurity directly related to FSSM, reducing the experience of health burdens, structural violence, and promote involvement of both genders in the planning for and design of sanitation infrastructure.

3.3. SPECIFIC MILESTONES

3.3.1. Leveraging FSSM to achieve 100% access to safe sanitation

- Promoting access for households to safe faecal sludge and septage management facilities (including proper disposal arrangements).



- Promoting community-planned and managed faecal sludge and septage management wherever necessary, for groups of households.
- Adequate availability and 100 % upkeep and management of Public Sanitation facilities in all Urban Areas, to rid them of open defecation and environmental hazards and to safely manage their faecal sludge and septage.

3.3.2. Achieving Integrated Citywide

Sanitation: Mainstreaming Sanitation

- Mainstream thinking, planning and implementing measures related to faecal sludge and septage management in all sectors and departmental domains as a cross-cutting issue, especially in all urban management endeavours.
- Strengthening national, state, city and local institutions (public, private and community) to accord priority to sanitation provision, including planning, implementation and O&M management.

- Extending access to proper faecal sludge and septage management facilities for poor communities and other disadvantaged settlements.

3.3.3. Sanitary and Safe Disposal

- Promoting proper functioning of faecal sludge and septage management systems and ensuring proper collection and disposal of the faecal sludge.
- Promoting recycle and reuse of treated sewage for non-potable applications wherever possible.
- Promoting proper design and construction of OSS facilities.

3.3.4. Awareness Generation and Behaviour Change

- Generating awareness about faecal sludge and septage management and its linkages with public and environmental health amongst communities

and institutions including hazards from OSS liquid overflow.

- Promoting mechanisms to bring about and sustain behavioural changes aimed at adoption of healthy sanitation designs and practices, including the responsibility to ensure safe containment and management of faecal sludge and septage by urban households including liquid effluent.

3.4. SCOPE

Only on-site sanitation facilities and areas served by such facilities would fall under the purview of this FSSM Policy. It does not seek to cover network or conventional sewerage system (including treatment plants) of wastewater/sewage management.

However it will address synergies between FSSM and sewerage systems or municipal solid waste (MSW) management, e.g., co-treatment of faecal sludge and septage at sewage treatment plants or co-treatment and management of faecal sludge and septage, and MSW.

Unless otherwise specified, the scope of this Policy extends to all the projects, programs and schemes of the Central Government that facilitate and

support sanitation services, urban development and improved delivery of services in urban and peri-urban areas of India. It also covers the initiatives undertaken and/or supported by all Central Government Ministries, Departments, Agencies, Authorities and Public Sector Undertakings that have a bearing on sanitation services in urban and peri-urban areas. Further, the Policy applies to every urban local body, outgrowths in urban agglomerations, census towns as declared by the Registrar General and Census Commissioner of India, notified areas, notified industrial townships, areas under the control of Indian Railways, airports, airbases, Ports and harbours, defence establishments, special economic zones, State and Central Government organisations, places of pilgrimage, religious and historical importance as may be notified by respective State Government from time to time.

The State Governments, ULBs, and relevant public and private utilities should take necessary steps to ensure that this Policy covers all the projects, programs and schemes related to provision of onsite sanitation services in their respective jurisdictions, irrespective of the source(s) of funding for these projects, programs and schemes.

4 LEGISLATIVE AND REGULATORY CONTEXT

4.1. CENTRAL LAWS AND RULES

The legal context for FSSM includes municipal building byelaws, environment laws, laws for the legal prohibition of “manual scavenging” and institutional laws that provide for the establishment, powers and functions of local authorities. The first category, which includes the Municipal Law, the Environment (Protection) Act, 1986 and the Water (Prevention and Control of Pollution) Act, 1974 provide a framework for control of effluent, sewage and septage discharge. Further, the Solid Waste Management (SWM) Rules, 2016 under the Environment (Protection) Act apply to the final and safe disposal of post-processed residual faecal sludge and septage to prevent contamination of ground water, surface water and ambient air. Further, the SWM Rules 2016 will also apply for disposal and treatment of faecal sludge and septage, before or after processing, at landfills and for use as compost. The provisions of the National

Building Code of India published by the Bureau of Indian Standards (BIS) as applicable for Septic tanks, soak pits, cess pools, leach pits, drainage fields etc. also need to be examined and taken into account while framing the FSSM policy. The Model Building Bye-Laws (MBBLs), 2016 framed by the Town and Country Planning Organisation can also be referred.

The Employment of Manual Scavengers and Construction of Dry Latrines (Prohibition) Act, 1993 put a ban on dry latrines, i.e., latrines with no water-seal or flushing mechanism, and the employment of persons for manually carrying human excreta. This was supplemented in 2013 with the Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013 by which “hazardous cleaning” in relation to sewers and septic tanks was also banned. The law now provides that manual cleaning of sewers and septic tanks, if necessary, may be carried out only in highly controlled situations, with adequate safety precautions, and in accordance with specific rules and protocols for the purpose.

5 ROLES AND RESPONSIBILITIES

The Ministry of Urban Development (MoUD), Government of India (GoI) will be responsible for the overall guidance, coordination and interpretation of this Policy. It will disseminate the Policy among the State and ULB governments as well as dovetail it with the Ministry's urban development programmes and schemes. It will provide the necessary technical and planning support to the States and ULBs and will also design, lead and implement a national awareness campaign on this issue.

GoI recognizes that sanitation is a State subject and on-ground implementation and sustenance of public health and environmental outcomes requires strong city level institutions and stakeholders. Although there are some common elements

across urban areas of India, there are a number of factors, constraints and opportunities that are peculiar to specific situation of States and cities with respect to sanitation, climate, physiographic factors, economic, social and political parameters, and institutional variables. Therefore, each state and city needs to formulate its own FSSM strategy and integrate the same in their respective State and city sanitation plans in overall conformity to the National Policy (See Annexe 1 for State Level FSSM Template). Several other stakeholders such as households, civil society organisations, the private sector (small, medium and large), research organisations, too have a critical role to play in achievement of safe and sustainable FSSM services for all.

TABLE 1: SUMMARY OF ROLES AND RESPONSIBILITIES

Institution	Lead Role	Supportive Role
Ministry of Urban Development	• Technical and planning support to States and ULBs • Training and capacity building of State level officials and those from select ULBs • Funding through specific schemes and plans • National level awareness and behaviour change campaign • Support Research and Capacity Building in the sector • Create enabling environment for participation of the private sector, NGOs and CSOs in provision of FSSM services including to the poor and marginalized households and areas • National level monitoring and evaluation	Formulation of State and City level FSSM strategies and implementation plans
Ministry of Environment, Forest and Climate Change	• Enforce compliance of the relevant environmental laws and rules during the collection, transport, treatment and disposal of faecal sludge and septage	Support and build capacity of State Pollution Control towards enforcement of relevant laws and rules

Institution	Lead Role	Supportive Role
Ministry of Social Justice and Empowerment	• Strive towards elimination of manual scavenging and rehabilitation of manual scavengers • Monitor and evaluate progress at the National Level • National level awareness campaign	Help States and ULBs eliminate manual scavenging and rehabilitate manual scavengers
Ministry of Women and Child Development		Gender mainstreaming of IEC material for FSSM across the country
State Governments	• Develop State level FSSM Strategy and Implementation Plan • Develop Operative Guidelines on FSSM • Training and capacity building of ULB officials and others engaged in provision of FSSM services • State level awareness and behaviour change campaign • Create enabling environment for participation of the private sector, NGOs and CSOs in provision of FSSM services including to the poor and marginalized households and areas • Funding through specific schemes and plans • Support Research and Capacity Building in the sector • State level monitoring and evaluation	• Technical, financial and administrative support to ULBs • Encourage coordination and cooperation among ULBs • Regulate and help ULBs set up systems to ensure financial sustainability in provision of FSSM services • Implement Municipal Byelaws.
Urban Local Bodies	• Design, develop, plan and implement ULB level FSSM strategy • Set up and ensure operation of systems for 100% safe and sustainable collection, transport, treatment and disposal of faecal sludge & septage • Develop expertise, in-house and outsourced, to provide safe and effective FSSM services • Awareness and behaviour change campaign to engage diverse stakeholders • Develop training programmes for masons to build requisite skills in construction of quality septic tanks as per BIS / NBC norms • Set up systems to ensure financial sustainability in provision of FSSM services • Achieve objectives of FSSM Policy in a time-bound manner • Design and implement plans to eliminate manual scavenging and rehabilitate manual scavengers • Funding through specific schemes and plans • Monitor and evaluate FSSM strategy and implementation plan • Implement Municipal Byelaws	Create enabling environment for NGOs and private initiatives to achieve safe and sustainable FSSM
Households	• Timely and regular cleaning of septic tanks through approved entities • Regular maintenance and monitoring of septic tanks • Timely payment of user fee and/or charges, if any, towards FSSM services • Practice Building Byelaws for construction of OSS.	Engage with decision-makers at State and ULB level to ensure that they receive good quality FSSM services

6 IMPLEMENTATION APPROACH

It is envisaged that State-specific FSSM Policy, Strategy and Guidelines conforming to the National Policy will be developed by each State.

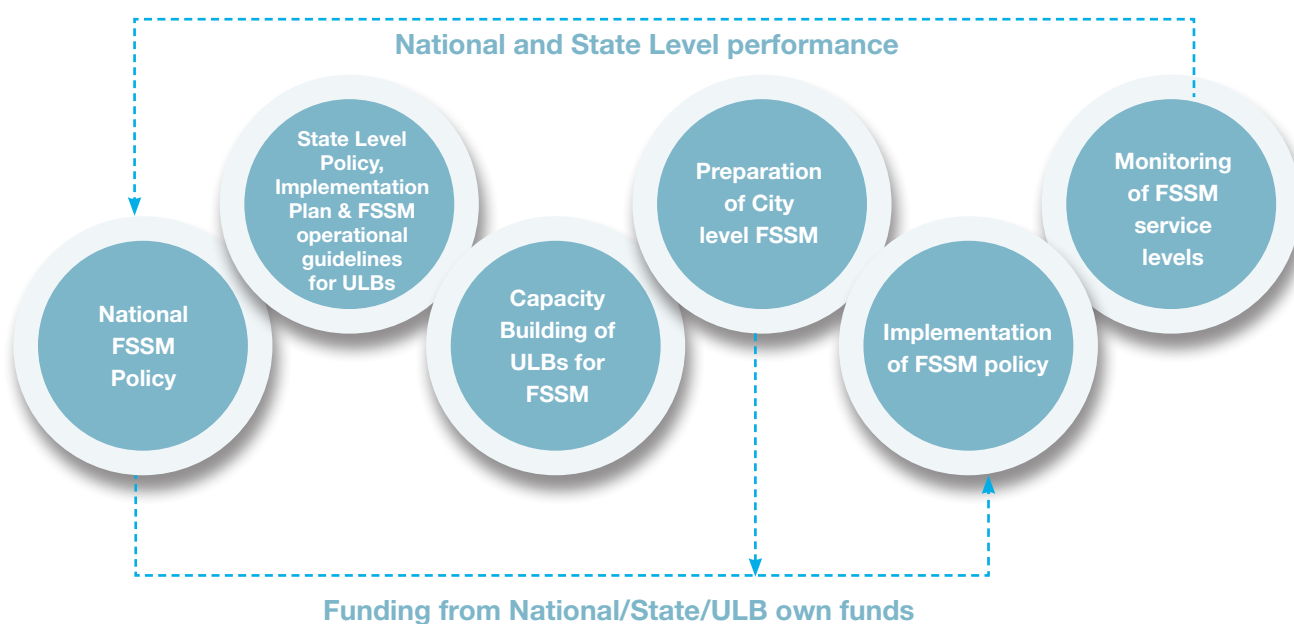
6.1. STATE-LEVEL IMPLEMENTATION STRATEGY

In line with the National FSSM Policy each state is expected to develop and issue an FSSM Implementation Strategy and Plan Guideline. In accordance with State Policy and Plan, the Guidelines should provide an overall state-level framework, objectives, timelines and implementation plans to the ULBs. States such as Maharashtra, Odisha and Tamil Nadu have

already put in place such guidelines. They could be modified, if required, in the context of this FSSM Policy. These existing State-level guidelines provide good examples for other States to prepare their own set of guidelines.

FSSM services are provided by a mix of formal public service providers, contractual operators and informal local service providers, but with very little supervision and control to ensure compliance with environment, health, safety and laws prohibiting manual scavenging. Rules, Byelaws, regulations and operative guidelines for faecal sludge and septage management will address (but not limited to) the following:

FIGURE 2: IMPLEMENTATION PROCESS



- Design of septic tanks, pits etc. (adapted to local conditions), including siting, and methods of approval of building plans, or retro-fitting existing installations to comply with rules and byelaws.
- Delineation of private (individual houses, groups housing, institutions etc.) and public responsibilities (urban local bodies and other local authorities) in relation of faecal sludge and septage management
- Details of the planning and implementation process for carrying out safe and sustainable management of all faecal sludge and septage. This may be integrated with overall city land use planning, with the timelines for holistically addressing waste water management via on-site, decentralised or centralised systems.
- Special provisions for medium and large format real estate developments
- Frequency of desludging, and O&M of installations and the responsibilities of householders (owner/occupant)
- Operating procedures for desludging including safety procedures with an emphasis on the safety, health and dignity of sanitation workers (abiding by the Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013)
- Licensing, record-keeping, monitoring and reporting arrangements for faecal sludge and septage service providers
- Methods and locations of transport (conveyance), treatment and safe disposal
- Tariffs or cess/tax etc. for septage management in the city

- Penalty clauses for untreated discharge for households as well as desludging agents and unsafe emptying and handling of faecal waste.
- Regular monitoring and evaluation of the entire process of FSSM
- Training, accreditation, education and awareness programs

All public and private sector staff should adhere to safety norms as provided in the Manual on Sewerage and Sewage Treatment published by the Ministry of Urban Development and such other safeguards under the Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013 and that the ULB may provide under its own rules. For disposal of septage, the ULB will need to follow the standards set out in the Environment (Protection) Act, 1986, and SWM Rules 2016 depending on the mode of disposal.

It is important that all ULBs make provision of land and other infrastructure facilities required for safe treatment and disposal /reuse of human waste generated in their areas. This should go hand in hand with strict enforcement of disposal by desludgers, as well as recognition and partnership with such providers of service. Desludging should be carried out in an organised manner by taking into account of each and every septic tank and its cleaning frequency through a registered agency. Desludgers should be asked to register with the municipal bodies and there should be a strong partnership and dis-incentive to unsafe disposal.

An important part of work on FSSM involves constant and deep engagement with communities, so that they understand and support activities that ULBs will take up. It has been found that communities are reluctant to have faecal sludge

treatment facilities close to their vicinity, but are not as sensitive to faecal sludge that is dumped untreated close to their homes!

Households should also be encouraged to have a regular desludging schedule and this too, should be monitored by the municipal / urban local bodies through a systematic monitoring system. Some good examples are in setting up call centres, and formalizing associations of desludgers and ensuring that households are regularly desludged. A system of incentives (for example, discounts on taxes) and disincentives (penalties) should be set up.

6.2. ULB LEVEL IMPLEMENTATION PLAN

Each ULB is expected to develop a detailed FSSM plan in conformity to the National FSSM policy and respective State guidelines on FSSM. Citywide assessment of FSSM is the key step for FSSM process planning. Such plan should be technically appropriate and financially feasible. Assessment in each area entails review of available information at city level, identifying information gaps, and conducting field studies where necessary.

In addition, adequate attention and focus has to be paid to public outreach and behaviour change communications to ensure timely and necessary participation of all the key stakeholders. The range of stakeholders may include on-site sanitation

system users, NGOs, municipal employees, relevant private sector firms, elected representative and the media.

Each FSSM plan will have a specific monitoring and evaluation framework to continuously gauge implementation progress and document lessons for constant improvement. It is very important that cities work systematically with each group of stakeholders to ensure alignment of goals and adoption. The ownership for all activity relating to FSSM must be driven by the Municipal /ULB Chairperson and Chief Executive concerned.

FSSM plans need to be backed by enabling regulatory and institutional framework. Enforcement of all regulations should be strict, to ensure compliance and also provide the right disincentives. At the same time, timely rewards and incentives should be given to both communities and service providers to encourage positive behaviour.

7 TECHNOLOGICAL OPTIONS

A line diagram and brief write up on dedicated Faecal Sludge Treatment Plant (FSTP) is part of the brief technical note attached as Annexure – III. Whatever the technical options used at

the ULBs level, the treated effluent coming out of the treatment system should meet the CPCB prescribed discharge norms.

8 FINANCING PLAN

The Government of India may provide assistance for funding projects proposed as part of FSM Plans through its ongoing urban development schemes and programs. However, the emphasis will be on improving the efficiency of existing sanitation infrastructure and service delivery.

State Governments should prioritize funds to implement the FSSM plan at City level. They should

promote engagement of private sector participation across sanitation service chain and should encourage ULBs to start levying sanitation tax/ user charges to meet the O&M cost for effective FSSM operations at city level. They should also facilitate the involvement of private sector participation through an easy and amenable PPP relationship framework, to ensure adequate financing and sustainability of FSSM projects.

9 MONITORING & EVALUATION

At the national level, the Government of India is adopting Sanitation Benchmark framework of revised service level benchmarks for sanitation that assess performance of citywide sanitation, capturing on-site sanitation systems and sewage management. Sanitation Benchmark framework for revised Service Level Benchmarks for Sanitation is attached as Annexure 2.

State Government will be responsible for Monitoring and Evaluation of its Cities' performance, and hence needs to devise data collection and reporting systems using indicator framework developed for Sanitation Benchmark. ULBs in turn need to develop database, registry of certified on-site sanitation system, robust reporting format to track compliance of households (establishments, etc.) with outcomes and process standards.

10 CAPACITY BUILDING & TRAINING

Government of India will help formulate a strategy on capacity building and training on FSSM to support States and Cities to build their personnel capacities and organizational systems for delivery of sanitation services. Government of India will make effort to integrate the FSSM components in ongoing capacity building programme.

The State Government needs to identify agencies that will train its State level and ULB personnel and orientation of elected representatives on aspects related to FSSM. The States and ULBs need to set up and develop strategies for citizen engagement through city sanitation task forces. These agencies could be specialist agencies of the State

Government, academic institutions and private sector organizations. They also need to focus on capacity building, i.e. not just training but also development of systems and capacities of ULBs in sanitation, in line with the Urban Sector Reforms that the State may be implementing. ULBs will need to provide training on sanitation to their own staff – using the specialized agency selected by State Government. They will need to utilize ongoing Govt. of India and State Government Schemes for training and capacity building in order to achieve this. Training will also need to be imparted to private sector players and NGOs to help them engage and deliver effectively in the provision of FSSM services.

11 EXPECTED OUTCOMES

As this Policy is implemented across the country, it is expected to yield significant benefits in terms of improved public health indicators, reduced pollution of water bodies and groundwater from human waste, and resource recovery leading to reuse of treated waste and other end products. Some key projected outcomes are:

- Containment of all human waste in 100% of the towns and cities
- Safe collection and conveyance of human waste to treatment and disposal sites
- Cost-effective solution for management of human waste through integrated network sewerage, small bore sewerage, and faecal sludge and septage management.
- Clarity among different stakeholders on identifying and implementing best and economically viable sanitation solutions
- Technical capability among ULBs to effectively implement FSSM
- Scheduled emptying of septic tanks or other containment systems at an interval of 2-3 years as recommended by CPHEEO Sewerage & Sewage Treatment Manual and the MoUD Advisory on Septage Management (2013)
- Safe disposal of all collected faecal sludge and septage at designated sites (sewage treatment plants, faecal sludge treatment facilities for safe and scientific disposal, etc.)
- Continuous improvements in efficiency and effectiveness in the entire FSSM chain: containment, collection, conveyance, treatment and disposal
- Preventing Contamination of water bodies and groundwater from human waste (faecal matter) in all the towns and cities across India
- Nuisance from faecal sludge reduced to minimum levels, resulting in nuisance-free living space in urban India
- Maximum reuse of treated sludge as fertilizer in farmlands, parks, gardens and other such avenues, reuse of treated sewage, as source of energy where feasible, and any other productive uses.
- Drastic reduction in incidences of diseases due to safe & sustainable FSSM services.

ANNEXURE – 1:

FRAMEWORK FOR PREPARATION OF STATE LEVEL FSSM PLAN

- i. Cover page containing title of the document; name, address and logo of the issuer of the Policy (Urban Development Department, Municipal Administration Department, etc.)
- ii. Letter – Minister/Secretary, Department of Urban Development, Government of [State name] (Optional)

1. INTRODUCTION

- 1.1. Current sanitation status in the State
[information on toilet coverage, percentages of sewerage and on-site sanitation (OSS), challenges faced]
- 1.2. Definition of faecal sludge and septage; what is faecal sludge and septage management (FSSM)
- 1.3. Sources of faecal sludge and septage
[generated, collected, transported, treated at present, what is not treated and disposed of scientifically, ensuing environmental pollution and public nuisance]
- 1.4. Importance of FSSM [alignment with overall sanitation vision of the State; arising health, social, economic and environmental benefits]

2. OBJECTIVES OF THE FSSM POLICY

- 2.1. Vision [high level purpose of sanitation and FSSM such as clean cities, healthy living, high standards of living, become a preferred state for tourism / business destination, etc.]
- 2.2. Objectives and Scope [why is the State issuing the FSSM Policy, to meet what challenges and what is covered by this Policy (geographically, institutionally, issues)]
- 2.3. Expected outcomes [what benefits for whom State hopes to achieve from effective FSSM]

3. LEGISLATIVE AND REGULATORY CONTEXT

- 3.1. Central Laws, Rules and Regulations
[Environment (Protection) Act, 1986 and the Water (Prevention and Control of Pollution) Act, 1974 provide a framework for control of effluent, wastewater and septage discharge. The Municipal Solid Waste (MSW) Rules, 2016 under the Environment (Protection) Act apply to the final and safe disposal of post-processed residual faecal sludge and septage to prevent contamination of ground water, surface water and ambient air. Further,

the MSW Rules 2016 will apply to the final and safe disposal of post-processed residual faecal sludge and septage. The Employment of Manual Scavengers and Construction of Dry Latrines (Prohibition) Act, 1993 put a ban on dry latrines, i.e., latrines with no water-seal or flushing mechanism, and the employment of persons for manually carrying human excreta. This was supplemented in 2013 with the Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013 by which “hazardous cleaning” in relation to sewers and septic tanks was also banned. The law now provides that manual cleaning of sewers and septic tanks, if necessary, may be carried out only in very controlled situations, with adequate safety precautions, and in accordance with specific rules and protocols for the purpose. All public and private sector staff should adhere to safety norms as provided in the Manual on Sewerage and Sewage Treatment published

by the Ministry of Urban Development and such other safeguards under the Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013.]

3.2. State Laws, Rules and Regulations [list them out along with their relevance to FSSM]

4. ROLES AND RESPONSIBILITIES [Roles and responsibilities of the State Government, ULB, Private sector, Research organisations, NGOs, external funding agencies, households, service providers such as masons and architects; among others, areas covered should include development of State and ULB level Implementation Strategy and Guidelines on FSSM, formation of rules and regulation on FSSM, awareness generation and behavior change, training and capacity building, funding sources and mechanisms, enabling environment for the participation of the private sector in providing FSSM services,



monitoring and evaluation, and implementation of the FSSM strategy and action plan. Clear delineation of responsibilities for each area at each level (State / City).]

5. IMPLEMENTATION APPROACH [outline of how the State Government plans to operationalize the FSSM Policy]

- 5.1. State FSSM Implementation Strategy and Guidelines [brief on how the State Government plans to develop the Implementation Strategy and Guidelines and then operationalize them]
- 5.2. ULB-level Implementation Plan [what should be the key constituents of such an Implementation Plan by each ULB; details of such a ULB level framework could be seen at: www.ifsmtoolkit.pas.org.in]

6. FINANCING FSSM

- 6.1. Funding options for State and ULBs [Central Government Schemes, 14th Finance Commission funds, State Government schemes]
- 6.2. Other funding models [private sector participation and funding, levying of fees and user charges, CSR funds, funding from external agencies]

7. MONITORING AND EVALUATION [outline plans for development of a robust M&E framework to measure and monitor expected outcomes at State and ULB level; such a framework will form part of the State FSSM Implementation Strategy and Guidelines]

8. COMMUNITY ENGAGEMENT AND STAKEHOLDER INVOLVEMENT [Outline plans for developing a robust community engagement platform for continuous involvement of ULB citizens and support to FSSM activities being initiated by the state. Also, alert citizens to the dangers of untreated FSS in their environment and the need for all to pay for its safe treatment and disposal.]

9. CAPACITY BUILDING AND TRAINING [outline the approach, potential or identified institutional partners, possible sources of funding, key audiences for capacity building and training, what skills need to be built upon for successful implementation of FSSM]

10. ANNEXURES (OPTIONAL) [add any specific Central and/or State Government Guidelines, model implementation plans for ULBs, M&E framework, other relevant documents]

ANNEXURE – 2:

DRAFT SAN-BENCHMARK FRAMEWORK

FOR REVISED SERVICE LEVEL BENCHMARKS FOR SANITATION

Current SLB indicators (Sewerage System)	Proposed Sanitation Benchmark (Sewerage + Onsite systems)
1. Coverage of sewerage network services	1. Coverage of adequate sanitation system
Total number of properties with individual connections to sewerage network as a percentage of total number of properties in the city.	Percentage of households with individual or group toilets connected with adequate sanitation systems (sewer network/ septic tank / double pit system) to total households in the city.
2. Collection efficiency of sewerage network	2. Collection efficiency of sanitation system
Quantum of sewage collected at the intake of the treatment plant to the quantity of sewage generated (as per CPHEEO, 80% of water consumed is generated as sewage).	Weighted average of collection efficiency of each sanitation system, weighted by share of households dependent on each sanitation system.
3. Adequacy of sewage treatment capacity	3. Adequacy of treatment capacity of Sanitation System
Adequacy is expressed as secondary treatment capacity available as a percentage of normative wastewater generation.	Weighted average of adequacy of treatment plant capacity available for each sanitation system, weighted by share of households dependent on each sanitation system.
4. Quality of sewage treatment	4. Quality of treatment of sanitation system
Quality of treatment is measured as a percentage of WW samples that pass the specified secondary treatment standards, that is, treated water samples from the outlet of STPs are equal to or better than the standards lay down by the GoI agencies for secondary treatment of sewage.	Weighted average of quality of treatment of each sanitation system, weighted by share of households dependent on each sanitation system.
5. Extent of reuse and recycling of sewage	5. Extent of reuse and recycling in sanitation system
Quantity of sewage that is recycled or reused after secondary treatment as a percentage of quantity of sewage received at the treatment plant.	Weighted average of extent of reuse of treated wastewater and sludge after adequate treatment as a percentage of sewage and sludge received at the treatment plant, weighted by share of household dependent on each sanitation system.

Source: SAN Benchmarks: Citywide assessment of sanitation service delivery – including onsite sanitation, PAS Project, CEPT University; short URL - goo.gl/Uv7vLW available on website: www.pas.org.in

ANNEXURE – 3:

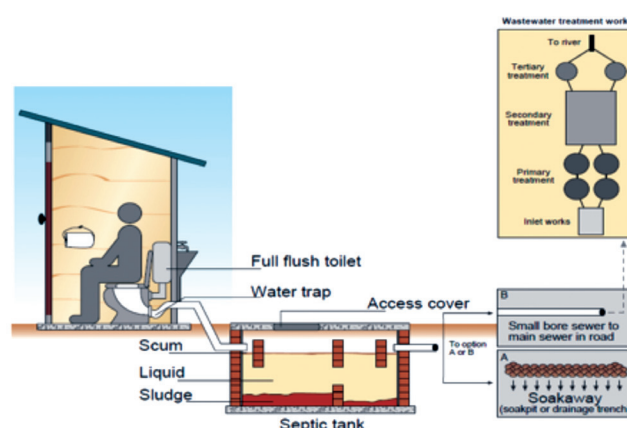
TECHNOLOGICAL OPTIONS

The write-up below provides a brief outline about various technological options practiced in the urban setting.

Septic Tank: A septic tank is a combined sedimentation and digestion tank where the sewage is held for one to two days. During this period, the suspended solids settle down to the bottom. This is accomplished by anaerobic digestion of settled solids (sludge) and liquid, resulting in reasonable reduction in the volume of sludge, reduction in biodegradable organic matter and release of gases like carbon dioxide, methane and hydrogen sulphide. The effluent although clarified to a large extent, will still contain appreciable amount of dissolved and suspended putrescible organic solids and pathogens.

1. SEPTIC TANK WITH DRAIN FIELD

In this modification of septic tank, treatment of sewage effluent occurs in the soil beneath the drain-field, which consists of long underground perforated pipes or tiles connected to the septic tank. The network of pipes is laid filled in gravel-trench or beds in the soil. A drain-field trench is generally 18 to 36 inches wide and up to 100 feet long. Liquid waste flows out of the tank into the drain-field through the piping system and the soil below provides the final treatment and disposal of the effluent. After the effluent has passed into the soil, most of it percolates downward and outward. The soil filters the effluent as it passes through the



pore spaces. Chemical and biological processes treat the effluent before it reaches groundwater, or a restrictive layer, such as hardpan, bedrock, or clay soils. These processes work best where the soil is somewhat dry and permeable, and contains sufficient oxygen for several feet below the drain field.

2. SEPTIC TANK WITH SOAK PIT

Soak pits are cheaper to construct and are extensively used. They need no media when lined or filled with rubble or brick bats. The pits may be of any regular shape, circular or square being more common. When water table is sufficiently below ground level, soak pits should be preferred only when land is limited or when a porous layer underlies an impervious layer at the top, which permits easier vertical downward flow than horizontal spread out as in the case of dispersion trenches.

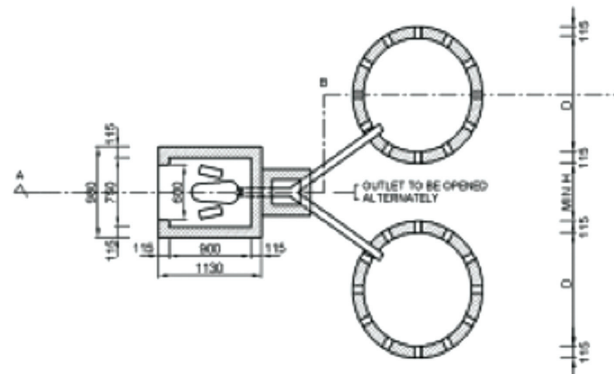
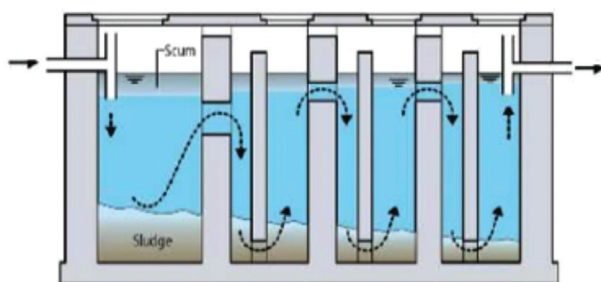
Minimum horizontal dimension of soak pit should be 1 m, the depth below the invert level or inlet pipe being at 1 m. The pit should be covered and the top raised above the adjacent ground to prevent damage by flooding.

3. SEPTIC TANK WITH SMALL BORE SYSTEM:

An in-house toilet discharging to a septic tank (or on-site digester) with liquids disposal via a small diameter sewer to a central collection sump or existing sewer system.

4. SEPTIC TANK WITH BAFFLES:

An anaerobic baffled reactor (ABR) is an improved septic tank, which, after a primary settling chamber, uses a series of baffles to force sewage to flow under and over them as it passes from the inlet to the outlet. The sewage is introduced into the chamber at the bottom, leading to an enhanced contact with the active biomass which results in an increased retention and anaerobic degradation of suspended and dissolved organic pollutants. ABRs are robust and can treat a wide range of sewage, but both remaining sludge and effluents still need further treatment in order to be reused or discharged properly.



5. TWIN PIT POUR FLUSH LATRINE

Pour-flush leaching pit latrines were first developed in India in mid-forties with a single leach pit and squatting pan placed over it. When the pit in use gets filled up another pit is dug and the squatting slab is removed and placed over the new pit. The first pit is covered with earth and the excreta is allowed to digest. After one or two years, the digested excreta is used as manure. To overcome this shortcoming, the Twin Pit Water Seal Toilet design was introduced and in this case when one pit is full, the excreta is diverted to the second pit. Both pits are connected with a junction chamber at one end. Pit walls have a honeycomb structure. The bottom of the pit is not plastered and is earthen. Depending on the number of users of toilet, size of the pit varies. The filled up pit can be conveniently emptied after 1.5 to 2 years, when most of the pathogens die off. The sludge can safely be used as manure. Thus the two pits can be used alternately and perpetually.

This is a suitable on-site sanitation measure for houses where the water table is sufficiently deep to avoid ground water pollution.

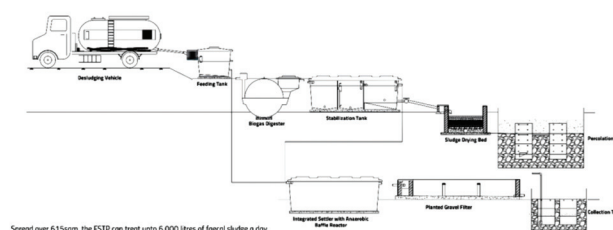
Leach pits serve a dual function of (a) storage and digestion of excreted solids and b) infiltration of the waste liquids and are therefore, to be designed on

the basis of the following parameters:

- Sludge accumulation rate
- Long term infiltration rate of the liquid fraction across the pit soil interface
- Hydraulic loading on the pit
- Minimum period required for effective pathogen destruction
- Optimal pit emptying frequency.
- FSTP to FSM - a Case Study

6. FAECAL SLUDGE TREATMENT PLANT (FSTP)

Where there is no sewerage / underground drainage (UGD) system, most of the households depend on septic tanks for sewerage disposal. The collected faecal sludge from these septic



tanks / pit latrines can be treated by using “Faecal Sludge Treatment Plant”. FSTP is designed to be aesthetically pleasing with no odor so that it could be located close to the town, hence keeping distances low for desludging operators to dispose. The plant runs on gravity (No electricity) with very little mechanical equipment that does not require skilled operators thus keeping operational expenditure low. These features enable the FSTP to be financially sustained through their own funds.

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