

Haryana Fecal Sludge & Septage Management (FSSM) Policy

DRAFT

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Directorate of Urban Local Bodies

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Panchkula

FOREWARD or PREFACE:

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 which create faecal Sludge.

Thus, till the time the Government's vision of 100% sewerage system 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 called **Faecal Sludge and Septage management (FSSM)**

FSSM is a management system that safely collects, transports, and treats fecal sludge (also called Septage) from pit latrines, septic tanks or other onsite sanitation facilities (OSSF). In other words, it deals with the mixture of human excreta and water that is collected in certain types of decentralized toilets and sanitation systems, instead of going into centralized Wastewater systems. FSSM is particularly important in quite densely populated areas where much of the population is not connected to sewerage network, as is the case in most urban areas of developing countries. FSSM is generally carried out as a service by local governments, water authorities, water utilities or the formal or informal private service providers. In many developing countries, however, this service is often not provided at all or not done properly, leading to, among others, surface water and groundwater pollution, spreading of pathogens into the environment, adverse health impacts and relatively high costs to households. In view of this, the Ministry of Urban Development has launched 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. States and cities have been urged to include an FSSM plan as part of their AMRUT State Level Implementation Plans.

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.

Definitions/Terminology:

Faecal Sludge: "Faecal Sludge" is raw or partially digested, in slurry or semisolid form, the collection of excreta and black water, with or without grey water stored or under treatment in septic tanks. It comes from onsite sanitation systems like pit latrines, non-sewered public ablution blocks, septic tanks, aqua privies, and dry toilets. 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 conditions, and intrusion of groundwater or surface water in septic tanks or pits, performance of septic tanks, and tank emptying technology and pattern.

Septage: "Septage" is the liquid and solid material that is pumped out from a septic tank, cesspool, or such onsite treatment facility after it has accumulated over a period of time. It is the combination of scum, sludge, and liquid that accumulates in septic tanks. 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. 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 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.

1. INTRODUCTION

Haryana is one of the fast growing urbanized states in the country. The growth rate of urbanization is quite high as compared to other states. Therefore, the concern over providing civic amenities to the urban population specially the Urban poor is catching up with policy makers.

As per the 2011 census, the total population of Haryana is around 25.4 million of which 8.85 million stay in urban areas. The urban Population is 34.88% of total population, higher than the national average of 30.31 % and it has grown at decadal growth rate of 44.25%. With current growth rate maintaining, by next census of 2021, the share of the urban population to the state's total population is expected to reach more than 45 percent.

Haryana's urban population is spread across 154 cities and towns. It has 80 ULBs (10 Municipal Corporations, 18 Municipal Councils and 52 Municipal Committees).

With day to day increase in the population, there is also constant increase in the production of human waste called excreta. With availability of lot of open space in rural areas the disposal of human excreta poses fewer problems than in the urban areas where besides constraint of space, hygienic conditions also get worsen if such human

waste disposal is carried out in open without any treatment. So a constant and regular up gradation of system for human waste disposal in the urban areas is required. The most popular systems of such disposal are through piped sewers and septic tanks.

As per 2011 census there are around 1.75 million households in urban areas of Haryana and 80.5% of these are having water closet facilities with 54.8% connected with the piped sewer, 23.8% are dependent upon Septic tanks and rest of the 2% have some other system. 9.45% of urban households have Pit and other type of Latrines whereas the rest 10.1 % do not have any such facility. It is possible that these 10 % households having no latrine facility may be either using some public toilet facility or are using open defecation system.

However with Swachh Bharat mission at its peak and people are getting more awareness it is not far away when the 10% households not having any latrine facility will also get one. In fact after 2011 census this percentage is coming down very fast with open defecation is becoming a thing of history only.

In times to come though the Government of Haryana is moving towards creating Piped Sewer Facilities for major urban areas yet the cost factor is likely to create hindrances in early completion of such projects.

So the dependence of disposal and treatment of sewage in Septic Tank system is likely to increase in the days to come when the households with no latrine facility are likely to construct the latrines in their houses along with septic tanks. People with pit type latrines are also likely to construct septic tanks.

However the main disadvantage of septic tanks is production of sludge and Septage in large quantities and in the absence of any Septage and Sludge management the same is either released in the open or in the nearby water bodies. Both these disposal methods lead to, among others, surface water and groundwater pollution, spreading of pathogens into the environment, adverse health impacts and relatively high costs to households.

So there is a need to focus on safe disposal of human/animal excreta as essential factors not only for avoiding adverse health impacts but also for safe guarding our natural water resources both surface and underground from getting polluted.

And to achieve the above stated objective there is essential need to prepare a sludge and Septage Management system and make it operational at an earliest.

2 Legislative And Regulatory Context:

2.1 Central Laws and Rules

- a) The legal context for FSSM includes 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 Environment (Protection) Act 1986 and the Water (Prevention and Control of Pollution) Act, 1974 provide a frame work for control of effluent, waste water and Septage discharge. Further, 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 to prevent contamination of ground water, surface water and ambient air. Further, the MSW 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.
- b) 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.

- c) 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 MSW Rules 2016 depending on the mode of disposal.

2.2 State Laws, Rules and Regulations

Though all the central laws and rules as stated above are applicable to the state also, yet as on date there are no specific state level Rules and Regulations for Faecal Sludge and Septage management. 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. So based on the above thinking of GOI, the State is to prepare its own Policy/ Rules and Regulations on FSSM which will become state law once approved by the state legislature. There will always be a scope of further improvement / Changes in this policy based on the state needs. Further amendments in the policy guidelines can be carried out whenever a need is felt.

3.0 Necessity for Faecal Sludge and Septage Management:

With on-site pit latrines and septic tanks { herein called Onsite Sanitation Systems (OSS)} account/going to account in near future for around 40% of households in Urban

Haryana, there is an increasingly need to form Faecal Sludge and Septage management Policy at an earliest to safe guard natural water resources and the general health of the urban population.

As on date 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 their management and safe disposal of faecal sludge and Septage from such septic tanks and pit latrines.

While construction standards for OSS especially the Septic Tanks have been codified by the Bureau of Indian Standards (BIS), the actual construction is largely left to households to manage.

In practice, the installations are subject to local practices at the whims of the masons and considerable variations are practiced. While constructing Septic Tanks guidelines specified by the code are seldom observed and in the absence of proper guidance from the experts, these are constructed in a haphazard manner leaving almost no scope for their cleanliness once these are filled with Septage.

Even the drainage system for sludge is not properly provided in the form of a soakage pit and the sludge is allowed to drain away / dumped in the open drains /open areas running in the streets causing bad odour turning worst during the nights and serious health and environmental hazards in the neighborhood.

In the absence of any guidelines and regulations regarding maintenance and cleaning of Septic Tanks and Pits the use of these system are likely to turn into a serious problem in times to come probably in very near future.

In majority of the cases, households do not report cleaning of septic tanks and pits at all or for a number of years. Even if someone wants to get his septic tank cleaned, limited capacities and resources with Urban Local Bodies (ULBs) result in his efforts turn to naught.

Some ULBs may have desludging equipments or there are private players providing cleaning services but the supply of desludging services is far from adequate.

In majority of cases where cleaning service is done, the same is handled manually by the Sanitary workers who are made to work in hazardous conditions to clean OSS pits and tanks most of the time without adequate protective gear and equipment and on number of occasions resulting in serious accidents/mishaps causing even loss of precious human lives.

With Government of India going all out to ensure success of Swachh Bharat mission, it is high time to address the problem of treatment and disposal of Faecal sludge and Septage / sewerage 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.

Keeping in view the importance of addressing this problem of treatment and disposal of Faecal Sludge and Septage, Government of Haryana is keen to put in place a policy for regulating the provisions of OSS along with their maintenance , cleaning , treatment and disposal of Sludge and Septage in most scientific manner.

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.

4.0 VISION OF THE FSSM POLICY:

The vision of FSSM in Urban Haryana is

1. To achieve Good public health and environmental awareness for all its citizens with a special focus on hygienic and affordable sanitation facilities for the urban poor and women.
2. That all Haryana cities and towns become totally sanitized, healthy and livable.
3. To ensure and sustain good sanitation habits.
4. To ensure safe disposal of the faecal sludge with improved Septage management.

5.0 KEY SANITATION POLICY ISSUES

In order to achieve the above Vision, following key issues need to be addressed:

- 5.1 **Poor Awareness:** Faecal Sludge and Septage management has been accorded low priority and there is poor awareness about its inherent linkages with public health.
- 5.2 **Social and Occupational aspects of Sanitation:** With appropriate Legal frame work, progress towards the elimination of manual scavenging in Haryana has shown good success. However, still much more attention is required to be paid towards the occupational hazards faced by sanitation workers daily.
- 5.3 **Fragmented Institutional Roles and Responsibilities:** There are considerable gaps and overlaps in institutional roles and responsibilities at the national, state, and city levels.
- 5.4 **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.
- 5.5 **Limited Technology Choices:** Technologies have not been focused on and the disposal techniques are not environmental friendly or cost-effective. The sustainable investments for safe management and disposal have not been thought off on a large scale.
- 5.6 **Reaching the Un-served and Poor:** Urban poor communities as well other residents of informal settlements have been constrained by lack of tenure, space and economic reasons in obtaining affordable access to safe Faecal Sludge and Septage management. In this context, the issues of whether services to the poor should be individualized and whether community services should be provided in non-notified slums needs to be addressed. The issue of subsidies in advertently reaching the non-poor should be addressed by identifying needy categories of urban poor.
- 5.7 **Lack of Demand Responsiveness:** Faecal Sludge and Septage management, if at all available at certain places, is being provided by private agencies in a supply-

driven manner with main focus on profiting only, with almost nil/little regard for environmental and health concerns and by applying shortcut methods.

6.0 OBJECTIVES:

The key objective of the FSSM Policy is to set the context, priorities, and directions for, and to facilitate, state-wide 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:

- a) ensure that all benefits of wide access to safe sanitation accrue to all citizens across the sanitation value chain from containment, extraction, transportation, treatment, and disposal / re-use of all Faecal sludge, Septage and other liquid waste and their by products and end-products by the year 2019.
- b) Suggest and identify ways and means, including the methods and resources, toward secretion of an enabling environment for realizing safe and sustainable FSSM in Haryana.
- c) Define the roles and responsibilities of various government entities and agencies and of other key stakeholders such as the private sector, Civil Society Organizations and citizens for effective implementation of FSSM services throughout the state.
- d) Enable and support synergies among relevant Central and State Government Programs such as SBM, AMRUT, Smart Cities Mission, to realize safe and sustainable sanitation for all at the earliest, possibly by the year 2019.
- e) Adopt an appropriate, affordable and incremental approach towards achieving laid out environmental standards for FSSM.
- f) 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.

6.1 SPECIFIC MILESTONES:

- 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.
- 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 endeavors.
- 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.
- 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.
- 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 behavioral 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.
- 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 time based plan of holistically addressing waste water management via on-site, decentralized or centralized systems.
- 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.
- Special provisions for medium and large format real estate developments.
- Periodicity of desludging, and O&M of installations and the responsibilities of householders (owner/occupant).
- Operating procedures for desludging including safety procedures. 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.
- Regular monitoring and evaluation of the entire process of FSSM.
- Training, accreditation, education and awareness programs.

7.0 SCOPE:

This FSSM policy will cover only, onsite sanitation facilities and areas served by such facilities. It does not seek to cover network of conventional sewerage system (including Treatment plants) of waste water/sewage management. However the policy will address synergies between FSSM and sewerage systems or municipal solid waste management to the extent of providing co-treatment of faecal sludge and Septage at sewage treatment plants or co-treatment of Faecal Sludge and Septage with Municipal Solid Waste (MSW) wherever feasible.

- (i) The scope of this Policy extends to all the projects, programs and schemes of the Central / State Government that facilitate and support sanitation services, urban

development and improved delivery of services in urban and peri-urban areas of Haryana.

- (ii) The policy also covers the initiatives undertaken and /or supported by all central and State Government Ministries, Departments, Agencies, and public sector undertakings that have a bearing on sanitation services in urban and peri-urban areas.
- (iii) 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.
- (iv) 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.

8.0 Expected Outcomes:

As this Policy is implemented across the state 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:

- i) Containment of all human waste in 100% of the towns and cities.
- ii) Safe collection and conveyance of human waste to treatment and disposal sites.
- iii) Cost-effective solution for management of human waste through integrated network sewerage, small bore sewerage, and faecal sludge and Septage management.

- iv) Clarity among different stakeholders on identifying and implementing best and economically viable sanitation solutions.
- v) Technical capability among ULBs to effectively implement FSSM
- vi) 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).
- vii) 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.)
- viii) Continuous improvements in efficiency and effectiveness in the entire FSSM chain: containment, collection, conveyance, treatment and disposal
- ix) Preventing Contamination of water bodies and groundwater from human waste (faecal matter) in all the towns and cities across Haryana.
- x) Nuisance from faecal sludge reduced to minimum levels, resulting in nuisance-free living space in urban Haryana.
- xi) 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.
- xii) Drastic reduction in incidences of diseases due to safe & sustainable FSSM services.

9.0 Policy Evaluations:

- Policy may be reviewed as and when required for assessing its effectiveness and making changes if necessary.
- This policy shall come in to force from the date of issue of this resolution.

10.0 Power of the State Government

Notwithstanding anything contained in the foregoing paragraphs of the Haryana Faecal Sludge & Septage Management Policy, 2017 the State Government by issuance of

notification in the official gazette may amend or withdraw any of the provisions and or the schemes mentioned herein above.

Interpretation-Should any doubt arise as to the interpretation of any of the provisions of these Rules, the matter shall be referred to the Directorate of Urban Local Bodies, whose decision there on shall be final.

11.0 ROLES AND RESPONSIBILITIES:

11.1 State Government: the state Government will have the following role and responsibilities in FSSM policy in a LEAD ROLE

- 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 behavior 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

And it will have the following responsibilities in a SUPPORTIVE ROLE

- 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.

11.2 Urban Local Bodies: the ULBs will have the following role and responsibilities in FSSM policy in a LEAD ROLE

- 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 behavior 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

And it will have the following responsibilities in a SUPPORTIVE ROLE

- Create enabling environment for NGOs and private initiatives to achieve safe and sustainable FSSM

11.3 Households : the Households will have the following role and responsibilities in FSSM policy in a LEAD ROLE

- 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.

And it will have the following responsibilities in a SUPPORTIVE ROLE

- Engage with decision makers at state and ULB level to ensure that they receive good quality FSSM services.

12.0 IMPLEMENTATION APPROACH:

Government of India envisages that State-specific FSSM Policy, Strategy and Guidelines conforming to the National Policy will be developed by each state 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 National Policy and Plan, the State hereby issues policy Guidelines to provide an overall state level framework, objectives, timelines and implementation plans to the ULBs.

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.

As per the policy, Rules, Byelaws, regulations and operative guidelines for faecal sludge and septage management will address (but not limited to) the following:

- 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, decentralized or centralized 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 organized 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, will be monitored by the municipal / urban local bodies through a systematic monitoring system.

13.0 FINANACING FSSM:

- A. Financing for FSSM Plans may be available under AMRUT; 14th Finance Commission funds, or under any other scheme. Moreover, the emphasis should be on improving the efficiency of existing sanitation infrastructure and service delivery.
- B. State Government at its own level will prioritize funds through annual budget to implement the FSSM plan at city level.
- C. The ULBs are encouraged to promote engagement of Private sector participation across sanitation services chain through an easy and amenable PPP relationship framework to ensure adequate financing and sustainability of FSSM projects.
- D. ULBs are also encouraged to start levying sanitation tax/user charges to meet the O&M cost for effective FSSM operation at city level.

B . TAX INCENTIVE

The state Government will provide tax incentives to the following:-

All the Individual Households of RWAs who will treat their sludge in a decentralized manner and reuse the recycled water where the system is not connected by the sewer will get the property tax rebate of 50%.

All the new apartments which will be constructed and are not having the sewer lines connection will have to design their own sludge management system and will use the recycled water in their premises. In doing so they will get a rebate of

30% of the construction permit fee or Rs.2,00,000/- (Two Lakh) whichever is less.

All the new malls, big hotels, industries, clubs ,colleges, universities, hospitals, sports stadiums etc. which will be constructed and are not having the sewer lines connection will have to design their own sludge management system and will use the recycled water in their premises. In doing so they will get the rebate of 20% of the construction permit fee or Rs.2,00,000/- (Two Lakh) whichever is less.

C. Septage Tax-

A separate head of the tax namely called 'Septage Tax' will be created which may be levied in the property tax for the operation and maintenance of the septage treatment system.

14.0 MONITORING AND EVALUATION

- At the state level, Haryana Urban Local bodies will adopt Sanitation Benchmark (SAN-BENCHMARK) frame work for revised service level benchmark for sanitation that assess performance of city wide sanitation, which also captures on-site sanitation systems and sewage management. The draft revised San- benchmark as compared to existing bench mark is placed as Annexure-1.
- This will be aligned with the 14th Finance Commission condition of publishing the service level benchmark to avail performance grant.
- A cell will be created inside Haryana Urban Local bodies to monitor and evaluate the faecal sludge management operation. The cell will be created by funds from external agency funding or from the funds of 14th finance commission or through the state budget.
- The created cell will develop a Monitoring and Evaluation (**M&E**) frame work/ Management Information System (MIS) to measure cities performance, and also devise data collection and reporting systems using indicator framework developed for San-Benchmark.

- It will thus develop data base related to on-site sanitation system, robust reporting format to track compliance of households (establishments, etc.) with outcomes and process standards.
- As per the city plan a data base developed by the cities/towns for all such properties having the septic tank in different categories of properties i.e residential, commercial, industrial, intuitional etc. will be monitored on daily basis at Haryana Urban Local bodies level and will be monitored in such a way that necessary cleaning is done at an interval of maximum of 2 years.

15.0 COMMUNITY ENGAGEMENT AND STAKEHOLDER INVOLVEMENT

State will ensure that all the ULBs prepare a time bound plan to engage community and stakeholders in the implementation of FSSM policy effectively.

The range of Stakeholders shall include on-site sanitation system users, NGOs , municipal employees, relevant private sector firms, elected representative and the media. It is very important that cities work systematically with each group of stakeholders to ensure alignment of goals and adoption.

The plan shall also include Setting up call centers, and formalizing associations of Desludgers and ensuring that households are regularly desludged.

A system shall also be placed in operation where cash rewards and incentives are given to both the communities and Service providers to encourage positive behavior. The incentives can be in the form of discounts on taxes. However to safe guard against laxity in the performance of duties some penalties shall also be levied at appropriate situations.

16.0 CAPACITY BUILDING AND TRAINING:

Capacity Building is a very important aspect for the successful implementation of FSSM project.

- The State Government needs to identify agencies that will train its State level and ULB personnel and take up 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.
- ULBs 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.
- Training will also be needed to be imparted to private sector players and NGOs to help them engage and deliver effectively in the provision.

17.0 TECHNOLOGIES FOR IMPLEMENTATION OF FSSM PROGRAM

Whereas Para 1 to 16 above have dealt with the theoretical aspect of FSSM program, the following Paras will deal with the Technology part of FSSM that includes setting up the system, its operation and Maintenance.

17.1 Technology selection

A formal process is needed for making an informed technology selection for the treatment of the fecal sludge. It is usually a collaborative process conducted by stakeholders, consultants, the operator and the future owner of the facility. The process is based on a long term vision planning with stakeholders as part of citywide sanitation planning. The expected waste flows (volume), their strength, characteristics, and variability in each area need to be known. A formal and transparent process for developing appropriate plans and designs for wastewater and septage treatment plants will achieve local buy-in and ownership of technology decisions, which is critical for the long term success and sustainability of the program

17.2 Collection vehicles and equipment

After sitting for years in septic tanks and pit latrines, the accumulated sludge becomes hardened and is very difficult to remove. It is still common that workers enter pits in order to desludge them, even though this practice is

generally unsafe and undesirable. A number of low-cost pumping systems exist to remove this hardened sludge hygienically from the ground surface.

Fecal sludge can also be treated inside the tank or pit as well, by use of the "in-pit lime stabilization process", which treats the waste before it is removed from the tank or pit. Once removed, it is transported to onsite or off site treatment and processing facilities.

Some advanced transfer stations and vacuum trucks can dewater fecal sludge to some extent, and this water may be placed in sewer lines to be treated in wastewater treatment plants. This allows more sludge to be dealt with more efficiently and may constitute one of the best cases of co-treatment of fecal sludge in wastewater treatment plants

17.3 Transfer stations

Transfer stations are intermediary drop off locations often used where treatment facilities are located too far away from population centers to make direct disposal feasible. In other locations, traffic concerns or local truck bans during daylight hours may make transfer stations feasible. In addition, municipalities where a significant percentage of homes cannot be accessed by tanker truck should utilize transfer stations. Transfer stations are used if:

- More than 5% of the homes are inaccessible by a vacuum truck;
- The treatment plant is too far away from the homes for transport in one haul to be practical;
- Trucks are not permitted on the streets during the day; or
- Heavy traffic during daylight hours impedes the movement of vacuum trucks.

17.4 Mobile transfer stations

Mobile transfer stations are nothing more than larger tanker trucks or trailers that are deployed along with small vacuum trucks and motorcycle or hand carts. The smaller vehicles discharge to the larger tanker, which then carries the collected sludge to the treatment plant. These work well in scheduled desludging business models.

17.5 Fixed transfer stations

Fixed transfer stations are dedicated facilities installed strategically throughout the municipality that serve as drop off locations for collected septage. They may include a receiving station with screens, a tank for holding the collected waste, trash storage containers, and wash down facilities. These may be more appropriate for FSM programs using the "call-for-service" business model.

While static transfer stations are fixed tanks, mobile transfer stations are simply tanker trucks or trailers that work alongside the SVVs and actually do the longer haul transferring of the waste from the community to the treatment plant. Mobile transfer stations work best for scheduled desludging programs where there are no traffic restrictions or truck bans, and a relatively large number of homes that are inaccessible to the larger vehicles.

17.6 Treatment plants

Fecal Sludge is often processed through a series of treatment steps to first separate the liquids from the solids, and then treat both the liquid and solid trains while recovering as much of the energy or nutritive value as possible. Common processes at fecal sludge treatment plants include:

- Fecal sludge reception - where the truck interfaces with the treatment plant and sludge is unloaded.
- Preliminary treatment - to remove garbage, sand, grit, and FOG (fats, oil and grease);
- Primary treatment - simple separation by physical means, or separation with microbial digestion;
- Liquids treatment - for example by using constructed wetlands, waste stabilization ponds, anaerobic digesters; and
- Solids processing - using the solids resulting from fecal sludge treatment for beneficial use where possible.

Constructed wetlands are gaining attention as a low-cost treatment technology that can be constructed in many instances using local materials

and labor. For sites with enough land and a ready supply of gravel and sand, this technology offers low cost, scalability, and simple operation.

17.7 TREATMENT MECHANISM AND METHODS

For treatment of the faecal sludge any of the following mechanism and methods may be selected depending upon the sludge type and quantity.

17.7.1 Mechanism

A) Physical mechanisms

- a. Gravity separation
- b. Filtration
- c. Evaporation and transpiration
- d. Centrifugation
- e. Heat drying
- f. Screening

B) Biological mechanisms

- a. Metabolism
- b. Temperature
- c. types of micro organisms
- d. Aerobic treatment
- e. Composting
- f. Anaerobic treatment
- g. Nitrogen cycling
- h. Pathogen reduction

C) Chemical mechanisms

- a. Alkaline stabilization
- b. Ammonia treatment
- c. Coagulation and flocculation
- d. Conditioning

- e. Disinfection of liquid effluents

17.7.2 Methods

A) Established faecal sludge treatment technologies

- a. Co-composting of faecal sludge
- b. Co treatment in waste stabilization ponds
- c. Deep row entrenchment

B) Transferred sludge treatment technologies

- a. Anaerobic digestion
- b. Inhofe tank
- c. Sludge incineration
- d. Mechanical sludge treatment
- e. Lime addition

C) Innovative technologies for faecal sludge treatment

- a. Vermi composting
- b. Black Soldier flies
- c. Ammonia treatment

Note : Whatever the technical options used at the ULBs level , the treated effluent coming out of the treatment system should meet the CPCB prescribed discharged norms.

17.8 Emerging technologies

Emerging technologies for fecal sludge treatment include Thermal processes which can achieve cost effectiveness by eliminating the need for separate processes. They convert the fecal sludge along with certain fractions of sewage sludge or municipal solid waste to produce energy or fuel by using certain sewage sludge treatment technologies.

- Biodiesel can be manufactured by using fats, oils and grease as feedstocks. Research is being conducted to use fecal sludge for biodiesel production

- Electricity can be produced by thermal processes that burn fecal and solid waste together to maintain stable combustion and the heat is used to make steam that drives generators.

17.9 Treatment products and reuse options

Composting is a process whereby organic matter is digested in the presence of oxygen with the byproduct of heat. For fecal sludge, the heat deactivates the pathogens while the digestion process breaks down the organic matter into a humus-like material that acts as a soils amendment, and nutrients that are broken down into a form that is more easily taken up by plants. Properly treated fecal sludge can be reused in agriculture.

Bio solids from septage are rich in nitrogen. When they are mixed with materials that are rich in carbon, such as shredded crop wastes, the composting process can be maximized. Proper mixture to achieve a ratio of 20 to 1 to 30 to 1 of carbon to nitrogen is best.

Biogas is a byproduct of the anaerobic digestion process.

Treated effluent can be used for agricultural or landscape irrigation.

18.0 OPERATION AND MAINTENANCE

There are several important factors that need to be considered when planning FSTPs which will have a direct impact on O&M and monitoring. Since O&M aspects are important for the overall long-term success of the programme, O&M planning, including the financial provision of funds, should be included in the terms of references for the design of each FSTP. Furthermore, the O&M plan should be reviewed and approved along with engineering designs and specifications, including the operation and maintenance cost:

- locations of the FSTP and its proximity to residential areas;
- volumes and schedules of FS collection;
- degree of mechanization of technologies; and
- final end use or disposal of end product
- recovering the money by way of user charges

- running it on PPP mechanism and charging the household on number of trips made by the vacuum suction trucks

19.0 The ownership for all activity relating to FSSM must be driven by the Municipal / ULB Chairperson and Chief Executive concerned.

20.0 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.

21.0 A brief write up outlining various technological options practiced in Urban areas for treatment of sewer effluent in onsite conditions is attached as Annexure-2.

Annexure – 1: San-Benchmark Framework

Current SLB indicators (Sewerage System)	Proposed sanitation Indicators (Sewerage + Onsite System)
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 Gol 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.

ANNEXURE-2

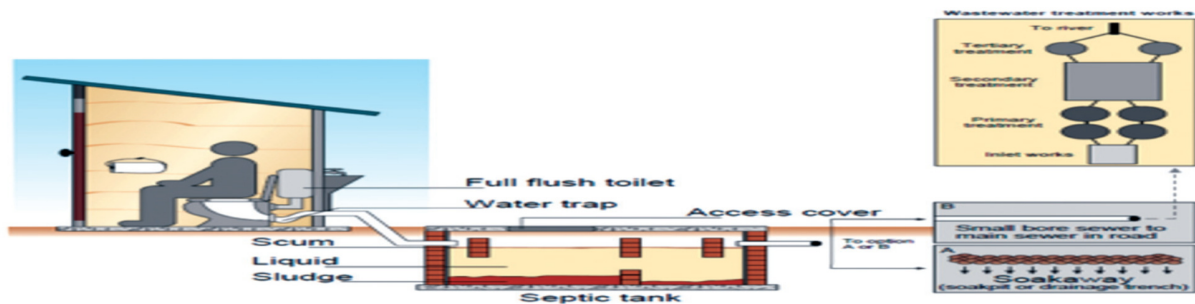
The write-up below provides a brief outline about various technological options practiced in the urban setting.

1. 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.

2. 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 ground water, 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.



3. 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.

4. Twin pit pour flush latrine

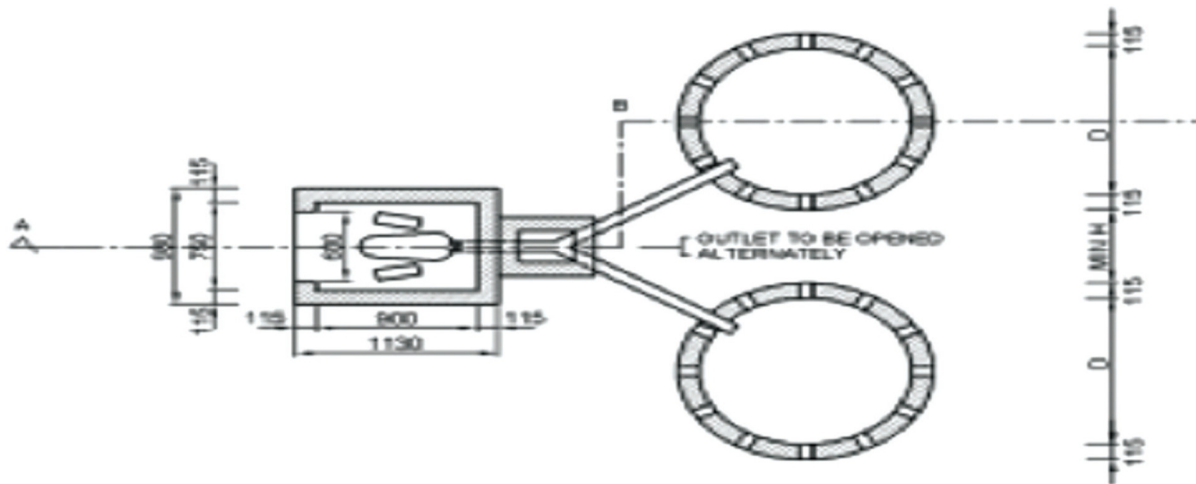
Pour-flush leaching pit latrines were first developed in India in mid-forties with a single leach pit and squatting pan placed over it. When the pit in use gets filled up another pit is dug and the squatting slab is removed and placed over the new pit. The first pit is covered with earth and the excreta 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.

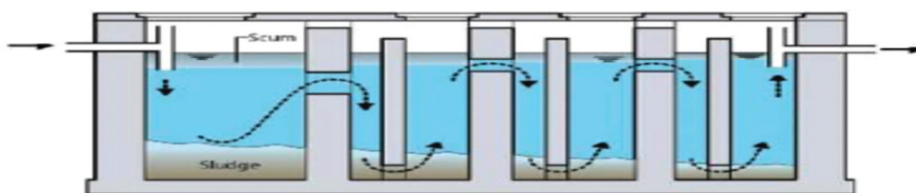


5. Septic Tank with Small bore system:

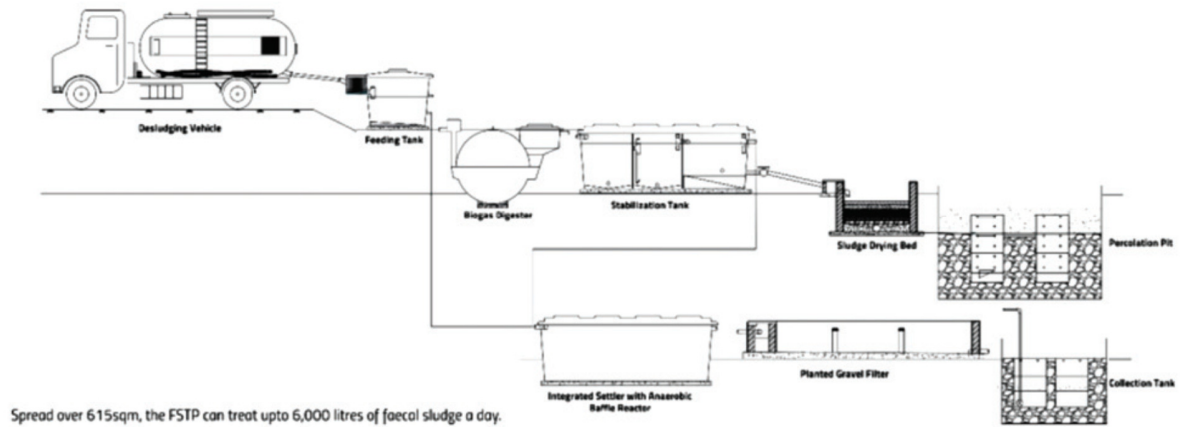
An in-house toilet discharging to a septic tank (or on-site digester) with liquids disposal via a small diameter sewer to a central collection sump or existing sewer system.

6. 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.



7. 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.