

**FAECAL SLUDGE & SEPTAGE
MANAGEMENT POLICY (DRAFT)-2019
FOR
GREATER NOIDA INDUSTRIAL
DEVELOPMENT AUTHORITY**



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1 BACKGROUND

Faecal sludge management (FSM) is the collection, transport, and treatment of fecal sludge from pit latrines, septic tanks or other onsite sanitation systems. Faecal sludge is a mixture of human excreta, water and solid wastes that are disposed in pits, tanks or vaults of onsite sanitation systems. Faecal sludge that is removed from septic tanks is called **septage**.

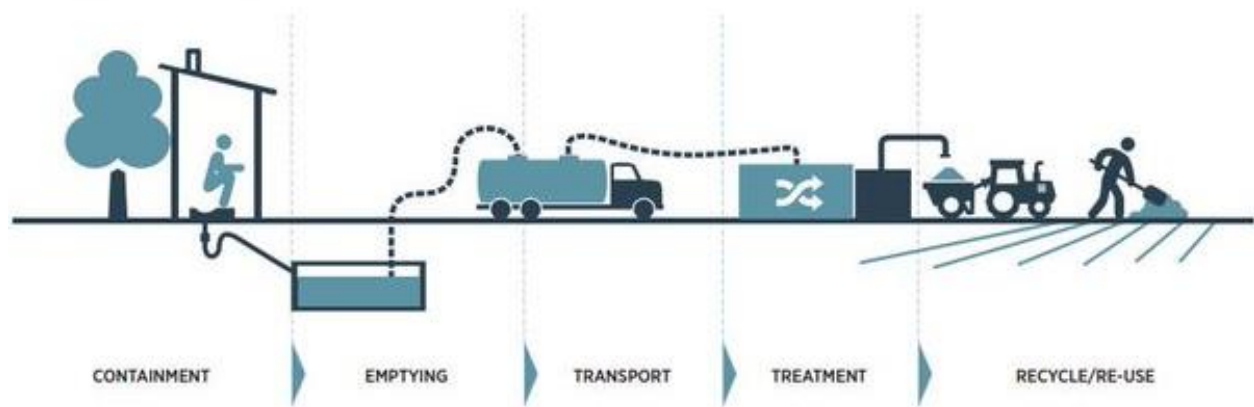
One the major challenges in urban sanitation is the collection, treatment and disposal or reuse of Faecal Sludge and septage. Adequate facilities and services for collection, transportation, treatment and disposal of Faecal sludge do not exist in most Indian cities and towns where 100 percent sewer connection is not there.

In our country most of the on-site sanitation systems (OSS) are emptied manually in the absence of suitable facilities. Ideally, a septic tank system should be cleaned every two to three years as per the Central Public Health and Environmental Engineering Organisation (CPHEEO) guidelines. However, ignorance of maintenance and operational conditions often results in accumulation of organic sludge, reduction in effective volume and hydraulic overloading, which ultimately causes system failure and the release of partially treated or untreated septage from the septic tank. Private operators often do not transport and dispose of septage far away from human settlements. Instead, they dump it in drains, waterways, open land and agricultural fields.

1.1 What Is Faecal Sludge?

Faecal sludge (FS) comes from onsite sanitation technologies, and has not been transported through a sewer. It is raw or partially digested, a slurry or semisolid, and results from the collection, storage or treatment of combinations of excreta and blackwater, with or without greywater. Examples of onsite technologies include pit latrines, unsewered public ablution blocks, septic tanks, aqua privies, and dry toilets. FSM includes the storage, collection, transport, treatment and safe end use or disposal of FS. FS is highly variable in consistency, quantity, and concentration. Faecal sludge from septic tanks is specifically termed as septage.

Effective management of FSM systems entails transactions and interactions among a variety of people and organisations from the public, private and civil society at every step in the service chain, from the household level user, to collection and transport companies, operators of treatment plants, and the final end user of treated sludge. Sewer systems and FSM can be complementary, and frequently do exist side-by-side in low-income countries.



FSSM Value Chain

For sustainable implementation and ongoing operation, FSM requires an integrated systems approach incorporating technology, management and planning.

2 WHY FAECAL SLUDGE AND SEPTAGE MANAGEMENT

Faecal Sludge Management (FSM), which has largely been overlooked in the past, it needs immediate attention in order to address the gap that currently exists between sewerage infrastructure and the sewage generated in Greater Noida.

Towards Sustainability: ODF, ODF+, ODF++

ODF	A city / ward can be notified/declared as ODF city/ODF ward if, at any point of the day, not a single person is found defecating in the open
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ODF+	A city / ward / work circle ¹ can be notified/declared as SBM ODF+ city/ SBM ODF+ ward/SBM ODF+ work circle if, at any point of the day, not a single person is found defecating and/or urinating in the open, AND all community and public toilets are functional and well maintained.
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ODF++	A city / ward / work circle ¹ can be notified/declared as SBM ODF++ city/ SBM ODF++ ward/SBM ODF++ work circle if, at any point of the day, not a single person is found defecating and/or urinating in the open, all community and public toilets are functional and well maintained, AND faecal sludge/ septage and sewage is safely managed and treated, with no discharging and/or dumping of untreated faecal sludge/ septage and sewage in drains, water bodies or open areas.
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3 NEED FOR CITY FAECAL SLUDGE MANAGEMENT POLICY

Greater Noida is fast urbanizing and lot of new residential, institutional and industrial development is taking place. Therefore, the concern over providing civic amenities to the all the residents. As per the current estimates the city has a population of 10 lakh approximately. By 2021 the population is expected to rise to 12 lakhs. Apart from the new urban areas the urban villages also form the part of the city area.

There is a need to focus on safe disposal of human excreta as an essential factors for improved health outcomes and improved sanitation facility. For disposal of the human excreta the city is depended upon sewer lines and on septic tanks. To achieve the target of open defecation free ++ city, the human excreta needs to be treated properly so that no sludge is discharged in the open or is let to be released in the water bodies.

The matter becomes more important as many villages are still to be connected with the sewer lines and they are presently depended on the septic tank for faecal disposal. The improper cleaning of the faecal sludge leads to many problem. As the septage and sludge management is absent the disposal of the human excreta from the septic tank is either done in the open or released in the water bodies.

4 KEY SANITATION POLICY ISSUES

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

- i. **Poor Awareness:** Faecal Sludge and septage management has been accorded low priority and there is poor awareness about its inherent linkages with public health.
- ii. **Social and Occupational aspects of Sanitation:** Despite the appropriate legal framework, progress towards the elimination of manual scavenging has shown limited success, little or no attention has been paid towards the occupational hazard faced by sanitation workers daily.
- iii. **Fragmented Institutional Roles and Responsibilities:** There are considerable gaps and overlaps in institutional roles and responsibilities at the national, state, and city levels.
- iv. **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.
- v. **Limited Technology Choices:** Technologies have not been focused on and the disposal techniques are not environmental friendly or cost-effective, neither the sustainable investments for safe management and disposal has been thought off on a large scale.
- vi. **Reaching the Un-served area of the city:** Urban villages or poor communities have been constrained by lack of tenure, space or economic constraints, in obtaining affordable access to safe Faecal Sludge and septage management. In this context, the issues of whether services to the urban villages should be individualised and whether community services should be provided in non-notified slums should be addressed.
- vii. **Lack of Demand Responsiveness:** Faecal Sludge and septage management has been provided by private agencies in a supply-driven manner, with little regard for environmental and health concerns and by applying short cut methods.

5 VISION

Greater Noida becomes totally sanitized, healthy and livable, and to ensure and sustain good sanitation habits, safe disposal of the faecal sludge with improved septage management to achieve good public health and environmental control for all their citizens.

6 POLICY GOALS

The overall goal of this policy is to transform Greater Noida **totally sanitized, healthy and livable city.**

The specific goals are:

6.1 Open Defecation Free City

Achieving Open Defecation Free Cities

All urban dwellers in the city will have access to and use safe and hygienic faecal sludge and septage management facilities and arrangements so that no one spills the faecal waste in the open. In order to achieve this goal, the following activities shall be undertaken:

- a. Promoting access to households with safe faecal sludge and septage management facilities (including proper disposal arrangements);
- b. Promoting community-planned and managed faecal sludge and septage management wherever necessary, for groups of households.

c. Adequate availability and 100 % upkeep and management of Public Sanitation facilities in all Urban Areas, to rid them of open defecation and environmental hazards;

6.2 Integrated City-Wide Sanitation

Re-Orienting Institutions and Mainstreaming Sanitation

- a. 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;
- b. Strengthening city and local institutions (public, private and community) to accord priority to sanitation provision, including planning, implementation and O&M management;
- c. Extending access to proper faecal sludge and septage management facilities to all the urban villages and other unserved settlements;

6.3 Sanitary and Safe Disposal

100 % of human excreta and liquid wastes from all sanitation facilities including toilets must be disposed of safely. In order to achieve this goal, the following activities shall be

undertaken:

- a. Promoting proper functioning of faecal sludge and septage management systems and ensuring proper collection and disposal of the faecal sludge;
- b. Promoting recycle and reuse of treated waste water and the sludge for non-potable applications wherever possible will be encouraged.

6.4 Awareness Generation and Behavior Change

Awareness Generation and Behavior Change

- a. Generating awareness about faecal sludge and septage management and its linkages with public and environmental health amongst communities and institutions;
- b. Promoting mechanisms to bring about and sustain behavioral changes aimed at adoption of healthy sanitation practices;

7 OBJECTIVES AND SCOPE

The key objective of the FSSM Policy is to set the context, priorities, and direction for, and to facilitate, city-wide implementation of FSSM services in all wards 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. Mainstream FSSM by the year 2019, and 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.
- 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 the city
- iii. Define the roles and responsibilities of the department and of other key stakeholders such as the private sector, civil society organisations and citizens for effective implementation of FSSM services.

- iv. Adopt an appropriate, affordable and incremental approach towards achieving laid out environmental standards for FSSM.

Unless otherwise specified, the scope of this Policy extends to all the projects, programs and schemes of the City Government that facilitate and support sanitation services, urban development and improved delivery of services in urban areas and urban villages.

8 POLICY IMPLEMENTATION ROLES AND RESPONSIBILITIES

Responsibility for Establishing Basic Regulatory Requirements for Faecal Sludge Management Rests with GNIDA. The authority will maintain an oversight role and will Integrate and interpret the requirements of the several applicable Federal laws and issue regulations and guidance to ensure that they are applied consistently toward municipal sludge management;

8.1 Establish regulatory requirements that promote beneficial sludge use:

Provide standards that establish contaminant levels and management practices for acceptable sludge use and disposal:

1. Establish minimum requirements for GNIDA city sludge management programs providing sufficient discretionary authority for city to tailor their programs and actions to local variation:
2. Provide guidance and information on sludge treatment technologies and practices and direct technical assistance to the city:
3. Support research and development, and encourage the demonstration of projects to facilitate the advancement and use of new or improved technologies. Responsibility for Ensuring Effective Sludge Management by city rests primarily with GNIDA.
4. GNIDA shall establish and maintain regulatory and oversight program adequate to implement the programme;
5. GNIDA to provide active assistance in implementation by themselves or by private sector participation or on complete Public Private Partnership (PPP) mechanism.

8.2 Responsibility to Operate and Maintain Appropriate Sludge Management Systems Rests with Each Municipality.

GNIDA will be responsible for operating and maintaining sludge management systems which comply with applicable regulatory requirements.

- i. GNIDA will be responsible for maintaining sludge use and disposal capacity sufficient to meet the needs of their wastewater treatment systems.
- ii. GNIDA will be responsible for controlling the discharge of contaminants into their sewerage systems so that sludge quality is suitable for meeting regulatory requirements and local management

9 WHAT POLICY ENVISAGES

:The policy specifically endorses the following core principles:

- a. To protect public health
- b. To protect the environment and the city and the state's water resources
- c. To promote proper functioning of network based sewerage systems alongwith the septage system and ensure connections of household.
- d. Treatment of sewage and sludge prior to discharge into the environment
- e. Promoting recycle & reuse of treated sewage/septage at city level.

- f. To make sewerage/septage project economical and environmentally sustainable.
- g. Inclusive transparent decision making processes to achieve socio-environmental as well as economic financial objectives
- b. Capacity building for enhanced institutional ability to govern the sector effectively.
- c. Ensuring, protecting and optimizing investments.
- d. Public Private Partnership (PPP) in the most appropriate manner.
- e. Public outreach for environmental and health related outcomes.
- f. Establishment of an efficient, effective, affordable and accountable system for managing urban sewerage and septage management

10 TREATMENT MECHANISM AND METHODS

For treatment of the the faecal sludge any of the following mechanism and methods may be selected depending upon the sludge type and quantity either by the authority, or private sector or on the PPP.

10.1 Mechanism

10.1.1 Physical mechanisms

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

10.1.2 Biological mechanisms

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

10.1.3 Chemical mechanisms

- a. Alkaline stabilisation
- b. Ammonia treatment
- c. Coagulation and flocculation
- d. Conditioning
- e. Disinfection of liquid effluents

10.2 Methods

10.2.1 Established faecal sludge treatment technologies

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

10.2.2 Transferred sludge treatment technologies

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

10.2.3 Innovative technologies for faecal sludge treatment

- a. Vermicomposting
- b. Black Soldier flies
- c. Ammonia treatment

11 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, will be included in the terms of references for the design of each FSTP. Furthermore, the O&M plan will be reviewed and approved along with engineering designs and specifications, including the operation and maintenance cost: In finalization of the cost following parameters will be considered.

- i. location of the FSTP and its proximity to residential areas;
- ii. volumes and schedules of FS collection;
- iii. degree of mechanisation of technologies; and
- iv. final end use or disposal of end product
- v. recovering the money by way of user charges
- vi. running it on PPP mechanism and charging the household on number of trips made by the vacuum suction trucks

12 CITY-LEVEL IMPLEMENTATION STRATEGY

GNIDA will develop and issue an FSSM Implementation Strategy and Plan Guidelines. These Guidelines will provide an overall city-level framework, objectives, timelines and implementation plans to the ULBs. The Implementation Strategy will cover aspects such as implementation targets, framework for engagement of the private sector, training and capacity building, behavior change and social communication, M&E framework, specific roles and responsibilities of various entities, guidelines to develop ULB-level plans, and funding mechanisms.

12.1 Mix of sewerage and faecal Sludge management

The city may have a mix of the sewerage and the septage plan depending upon the population, terrain and available fund and technological options available. In the city a mix of sewerage and septage will be applied.

In the open part of the city and in the plain areas the preference will be given to the sewer lines. In congested area or where there is a problem in laying the sewer lines the septage management may be done.

13 CITY LEVEL IMPLEMENTATION PLAN

13.1 Behavioural Change

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.

13.2 Way to Implement It

Each ward will have an action plan whereby it will be mandatory to clean the septic tanks of individual houses, offices, hospitals, institutions, universities, malls, cinema halls, multiplexes, community and public toilets etc wherever it is applicable, at an interval of two years, the cleaning will be followed for all the properties having septic tank. A data base have to be developed for all such properties having septic tank and will be monitored so that necessary cleaning is done at an interval of 2 years. A MIS will be developed accordingly to monitor the progress.

Each ward level plan will have a specific monitoring and evaluation framework to continuously gauge implementation progress and document lessons for constant improvement. The ownership for all activity relating to FSSM will be driven by GNIDA.

14 FINANCIAL RESOURCES

The emphasis should be on improving the efficiency of existing sanitation infrastructure and service delivery. GNIDA will levy sanitation tax/ user charges to meet the O&M cost for effective FSSM operation. The levy of the sanitation tax/user charges will rest with the Chief Executive Officer (CEO), GNIDA. Further, funding from private sources and operators may also add to the required financial resources.

15 MONITORING & EVALUATION

GNIDA will develop an M&E framework to measure the performance, and also devise data collection and reporting systems using indicator framework developed. GNIDA in turn will develop database related to on-site sanitation system, robust reporting format to track compliance of households (establishments, etc.) with outcomes and process standards.

A cell will be created inside GNIDA to monitor and evaluate the faecal sludge management operation. A Management Information System (MIS) will be developed accordingly to monitor the progress.

16 CAPACITY BUILDING & TRAINING

A regular capacity building and training on FSSM will be carried out for the officers concerned in GNIDA. Authority will identify agencies that will train its officials. These agencies could be specialist empaneled agencies by Central/State government, academic institutions and private sector organizations etc. 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.

17 EXPECTED OUTCOMES

As this Policy is implemented across the city, it is expected to yield significant benefits in terms of improved public health indicators, considerable 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. Safe containment, collection and conveyance of 100% human waste to treatment and disposal sites
- ii. Scheduled emptying of septic tanks or other containment systems at an interval of 2-3 years as recommended by CPHEEO Manual, MoUD advisory on Septage management (2013)
- iii. Safe disposal of all collected waste at designated sites (sewage treatment plants, Faecal sludge treatment facilities, lined pits for safe and scientific disposal, etc.)
- iv. Continuous improvements in efficiency and effectiveness in the entire FSSM chain: containment, collection, conveyance, treatment and disposal
- v. Contamination of water bodies and groundwater from human waste (Faecal matter) reduced to zero level.
- vi. Nuisance from human waste reduced to minimum levels, resulting in nuisance-free living space
- vii. Maximum reuse of treated sludge as fertilizer in farmlands, parks, gardens and other such venues, reuse of treated wastewater, as source of energy where feasible, and any other productive uses.

18 LEGISLATIVE AND REGULATORY CONTEXT

18.1 Central Laws and Rules

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 framework for control of effluent, wastewater 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.

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 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.

18.2 State Laws, Rules and Regulations

The state laws rules and regulation will be framed by Urban Development and Housing Department (UDHD).

18.3 Formation of ULB level Rules and Regulations

It is recommended that Local Authorities will formulate rules and regulations, as well as planning and implementation for Faecal sludge and septage management. This should be supplemented with a review the building regulations to ensure proper construction of adequate onsite facilities for anticipated loads, and for ensuring safe disposal. Sites selected for sludge application by the ULB and by other parties (like residential layouts) would need prior consent to operate from the competent authority [like the State Pollution Control Board].

Rules, regulations and operative guidelines for Faecal sludge and septage management should address:

- a. 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
- b. 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, decentralised or centralised systems.
- c. 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
- d. Special provisions for medium and large format real estate developments
- e. Periodicity of desludging, and O&M of installations and the responsibilities of householders (owner/occupant)
- f. Operating procedures for desludging including safety procedures
- g. Licensing, record-keeping, monitoring and reporting arrangements for Faecal sludge and septage service providers
- h. Methods and locations of transport (conveyance), treatment and safe disposal
- i. Tariffs or cess/tax etc. for septage management in the city
- j. Penalty clauses for untreated discharge for households as well as desludging agents
- k. Regular monitoring and evaluation of the entire process of FSSM
- l. Training, accreditation, education and awareness programs