



# Accelerating private sector engagement for Faecal Sludge and Septage Management in India

Creating a supportive environment for profitable businesses

November 2020





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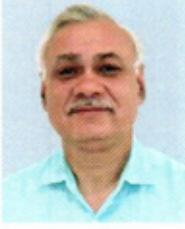
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दुर्गा शंकर मिश्र

सचिव

**Durga Shanker Mishra**

Secretary



सत्यमेव जयते



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## FOREWORD

Sanitation is a critical component in ensuring that India reaches its milestones under Sustainable Development Goals, given its close linkages to human development indicators of gender, health, and environment. It is a key challenge in a country as vast and diversified as India where sanitation standards remain linked to each State's level of growth, resource pool, and capacity to deliver.

Cognizant of this, the Swachh Bharat Mission, has strived to set uniform standards of hygiene across the board, for all States and cities to achieve. Alongside other flagship Schemes like AMRUT has been successful in addressing the need for holistic solutions for sanitation to cater to our unrelenting urban growth. This has resulted in a renewed focus on affordable, sustainable, and scalable solutions such as Faecal Sludge and Septage Management (FSSM) to tackle burgeoning sanitation problem.

Given our aspirations at going from 100% ODF to 100% ODF+ and ODF++, the goals under SBM can only be achieved through a combination of targeted funding and by leveraging the expertise and experiences of the private sector. Nowhere does this hold more relevance than when it comes to the peri-urban areas that lie in close proximity to our urban growth centers, whose growth potential is only matched by an increasing demand for public services, including sanitation.

This publication by EY-ISC is therefore very timely, as it highlights not just the needs and gaps of the FSSM space, but also the opportunities and potential that abounds for the private sector aspirant who chooses to enter and collaborate with the government in its endeavour. Additionally, it doubles up as a compendium of best practices followed across States/ UTs and highlights innovative financing and business models that can be adopted depending on the needs and resources of the local population.

Further, it offers a gentle reminder that while the sanitation sector remains replete with opportunities for the private player, some policy and operational requirements remain to be resolved.

In view of the above, I welcome this Report and am optimistic that it will both help strengthen and deepen private sector and government engagement in this space and accelerate their involvement in the national efforts aimed at achieving safe and sustainable sanitation for urban India.

I hope all stakeholders will make best use of this Report in solving the sanitation issues of faecal sludge.

With best wishes,

(Durga Shanker Mishra)

New Delhi

November 10, 2020



**Naina Lal Kidwai**  
Chair, India Sanitation Coalition

**S** Sanitation is finally centre stage in India. The sector before October 2014 had witnessed a host of centrally sponsored schemes, promising to achieve an Open Defecation Free (ODF) India, however, we did not succeed. It needed the focussed efforts of the government with strong support from the Prime Minister and the top leadership to make this into a jan andolan - a people's revolution. Congratulations are due to the government and the people of India on our achievements through the Swachh Bharat Mission Phase I, both in the urban and rural spaces.

Today, when the fourth edition of the India Sanitation Conclave is conducted, we must celebrate that over 4,000 Urban Local Bodies and more than 6,00,000 villages in rural India have already been declared open defecation free. The coverage status of individual household latrines in the country was a mere 38% when the current programme of sanitation, the Swachh Bharat Mission was launched in October 2014. Today, 6.6 million individual household toilets have been constructed under the Swachh Bharat Mission Urban and over 100 million toilets in the rural areas of India. The country is winning global accolades for the largest ever behaviour change programme attempted, which

in just five years has achieved great outcomes in WASH and open defecation.

A large proportion of the toilets constructed under Swachh Bharat have harnessed onsite sanitation technologies which serve 2.7 billion people worldwide; and the number is only likely to grow to 5 billion by 2030. The faecal sludge accumulated in these systems needs to be periodically removed and treated before it can be safely disposed off in the environment.

Also, we know that sewer-based systems are prohibitively expensive and resource-intensive whereas the cost of decentralized technologies for treating faecal sludge is five times less expensive in urban areas, depending on the local conditions. However, onsite technologies represent viable and more affordable options only if the entire service chain gets managed adequately.

In line with the government's vision of providing sustainable sanitation and water to all, what is now needed is to conserve every drop of water by protecting our water bodies through safe and sustainable faecal sludge management (FSM) and wastewater and grey water treatment and reuse. Effective FSM systems entail transactions and interactions among a variety of people and organizations from the public, private, civil society and government institutions. Moreover, an enforced regulatory framework with incentives and sanctions and regular inspection and maintenance are key to the success of FSM.

At the India Sanitation Coalition, we pursue the agenda of sustainable sanitation by adopting the philosophy of Build Use Maintain Treat. 'Treatment' is

# Preface

our current focus, for ODF sustenance hinges on it. Aligned to 'Treatment', we conceived a thought leadership initiative in partnership with Ernst & Young, focussing on the FSM space, and covering aspects such as the institutional & regulatory architecture supporting FSM in India, key governmental interventions, and the business opportunities and challenges as the nation moves forward in her attempt to achieve ODF sustainability through the ODF + agenda set out by government.

What has resulted is a research-based, written work dealing formally and systematically with FSM, with the potential to influence all those who are already operating in the sector, or wish to do so in the future, with impact and profitability.

I would like to thank the teams at India Sanitation Coalition and EY who have worked to produce this document - I do hope all readers will find this work interesting and useful.

# Message



**Pragyal Singh**  
Partner,  
Ernst & Young LLP (EY India)

**L** Looking at the burgeoning sanitation challenge India faces currently, with only 32.7% of the urban households connected to underground sewerage systems, there lies great opportunities for the private sector to participate in the creation, maintenance and servicing of on-site sanitation facilities and solutions. As per the Census 2011, 48.7% of urban households depend on onsite facilities and it has grown by leaps and bounds as a result of the recent thrust on toilet construction under the Swachh Bharat Mission (Urban and Rural, both). Needless to say, this emphasises the need for implementing FSSM across the sanitation value chain of non-networked households to ensure safely managed sanitation and ensure no indiscriminate disposal into the environment.

The support provided by the Government for the FSSM sector in the form of policy and regulatory guidelines is a step in the right direction. With various Departments coming together and defining the standards governing the stages of FSSM from design and construction to treatment and reuse, the private sector should now leverage the opportunity that FSSM presents and take cue from the viable feasible business models as exemplified by some states such as Andhra Pradesh and Odisha

with support from Bill and Melinda Gates Foundation (BMGF).

I am proud to be associated with the Swachh Bharat Mission and have seen the progress made under the mission closely. The sector showcases phenomenal opportunities for the private sector players and for innovations to happen in this space, be it in business models or innovative finance or private sector players' engagements.

This report is our attempt to showcase some examples of successful business models from across the nation where the private players have contributed in construction of Individual Household toilets, Community Toilets, Public Toilets and Septage Treatment Plants, have been engaged in cesspool operations, and management of infrastructure. Moreover, potential of innovative financing models such as HAM, securitization of bonds, municipal bonds and impact investing are highlighted along with presenting the power of collaborative approaches as followed in the sector at present.

With this in view, I am hopeful that this report becomes a compelling reference document for the private business and community and introduce a transformational change in their approach towards urban sanitation challenges and impact millions of lives across the nation.



**Meenakshi Dewan**

Chief Executive, India Sanitation Coalition

I have noted with interest that SBM Phase II guidelines unambiguously talk of the scalable and commercially viable solutions to make the sanitation economy attractive to private businesses. Shreds of evidence are organically emerging that treatment of faecal sludge, wastewater, biodegradable waste, and plastic waste, including their commercial sale may have the potential to turn sanitation and waste management into a profitable business.

At India Sanitation Coalition (ISC) at FICCI, we have a two-point broad agenda—supporting the unlocking of WASH Financing with a focus on the private sector besides bridging partnerships between the State actors, sanitation entrepreneurs, and financing institutions, leading to the adoption of sanitation as a business.

**“Accelerating private sector engagement for Faecal Sludge and Septage Management in India”** is a thought-leadership initiative under the joint aegis of ISC and EY in pursuit of the latter.

We chose faecal sludge management (FSM), for we know that over a billion people in urban and peri-urban areas of Asia, Africa, and Latin America are served by onsite sanitation technologies.

A large proportion of the toilets constructed under Swachh Bharat too have been constructed making use of the onsite sanitation technologies. It was therefore thought necessary that these onsite technologies get the attention they deserve post creation of these toilet blocks.

This knowledge paper captures institutional and regulatory architecture, private-sector prospects and business challenges, and potential for private sector and community based collaborative approach around the FSM intervention in India. Besides, it clearly delineates the roles that each of the three entities—government, industry, and financing institution—has as the country chooses to progress on its agenda to achieve ODF sustainability.

I hope that all the players in the FSM sector in India and overseas will find the paper useful.

# Message

# Executive summary

India's sanitation story saw us reach a huge milestone when India achieved Open Defecation Free (ODF) status on 2nd October 2019, with over 4,320 cities and towns declaring themselves open defecation free. India today aspires to move from ODF to ODF+ and ODF++, and for that it is important to look for solutions that can help augment India's sanitation story, as well as the partners who can help fast-track the same.

While traditionally, Indian laws and policies have shown an overt preference for improving underground sewerage networks, the rapidly changing urban landscape has shown a greater reliance on on-site sanitation systems, given operational, time and cost constraints. This is made even more difficult by the fact that only 32.7% of the urban households are connected to underground sewerage systems, and a third of the existing Sewage Treatment Plants (STPs) are not operational. The resulting indiscriminate disposal of faecal waste in many areas, has grave health and environmental consequences. However, the successful implementation of Swachh Bharat Mission, and the increased policy thrust in the Indian sanitation space has revealed the presence of practices like Faecal Sludge and Septage Management (FSSM), which offer a systems approach to safe and sustainable process to manage faecal waste, which if practiced correctly, could ensure INR 24,809 billion (US\$347.75 billion) worth of economic damages saved. This in turn represents approximately 8.55% of Gross Value Added (GVA) and 7.74% of Gross Domestic Product (GDP) in 2023-24. This realization has seen an increased policy and budgetary push both at the national and state levels for FSSM.

In such a scenario, FSSM has emerged as a safe, sustainable and economically viable approach that can be harnessed to help drive the urban growth story. And equally, the private sector, with its strong skills and drive to innovate, has emerged as the partner that can amplify and further India's SDG goals with respect to sanitation.

Accordingly, this report explores ways by which private sector engagement in FSSM can be successfully accelerated by looking at potential business opportunities and challenges in FSSM, lessons that can be learned from current FSSM practice and finally, key takeaways for the key stakeholders in the ecosystem. While each of these segments touch upon separate aspects of the FSSM ecosystem, the common thread of how private sector interaction in this space can be improved, will be found across them.

## Business opportunities and challenges

According to 'The Sanitation Economy in India', released by the Toilet Board Coalition in 2017, the sanitation economy was US\$ 32 billion per year market in India in 2017 and is set to double to an estimated US\$ 62 billion by 2021. Government efforts apart, over 90% of companies have at least one CSR programme in WASH, and this is only set to grow.

This is driven by the government's focus on improving sustainability of its sanitation efforts given India's increasing urban aspirations and the limitations of their own decentralized institutional capacities at the local level. It represents a huge opportunity for commercially viable private sector operations to reap benefits of

economies of scale and scope. The government too seeks to incentivize private participation by increased fund devolution, encouragement and engagement from development partners, and by inviting innovative business models in this space. Most recently, the NITI Aayog explicitly welcomed private sector participation in sanitation, particularly highlighting the need for private sector involvement to improve innovation and dignity in the sector.

The various activities that private sector could engage in across the FSSM value chain are construction and refurbishment of infrastructure such as IHHL, CT, PT and SeTPs, O&M of infrastructure created, data collection

from the field, cesspool operations, carrying out awareness campaigns and behaviour change communication, packaging, marketing and sale of treated sludge from SeTPs, and so on.

Regardless of the ripe opportunities available in the FSSM space, private players both big and small face many challenges as they venture into it. These challenges find them both in the pre-contractual space, becoming entry barriers for players, and even the post contractual and implementation phases. The business challenges have been broadly captured below.

Pre-contractual concerns	Post-contractual	Others
 Stringent geographical and technological procurement challenges which make it hard to apply	 Delays in land acquisition and tender and design approvals	 Inadequate advocacy by sector players resulting in low policy thrust for FSSM in states/ at local levels
 Large, established players demotivated by small tender value while new or small players deterred by business turnover pre-requisites	 Inadequate prior assessment of cost and risks requiring multiple contract revisions	 Lack of collaboration at planning stage with ULBs / local bodies, leading to poor uptake of FSSM
 Insufficient funding via government schemes for FSSM	 Poor contracting terms resulting in greater risk to the private sector	 Fragmented institutional and regulatory frameworks resulting in weak monitoring and enforcement
 Limited bank financing for FSSM due to insufficient sector credibility	 Delayed payments to private sector	 Absence of a robust government-driven data collection and MIS which decrease sector credibility
 Inability to easily accommodate technological innovations under existing government schemes and policies	 Information gaps due to lack of a data driven approach	 Inadequate enforcement of FSSM standards by ULBs

## Capturing the peri-urban opportunity

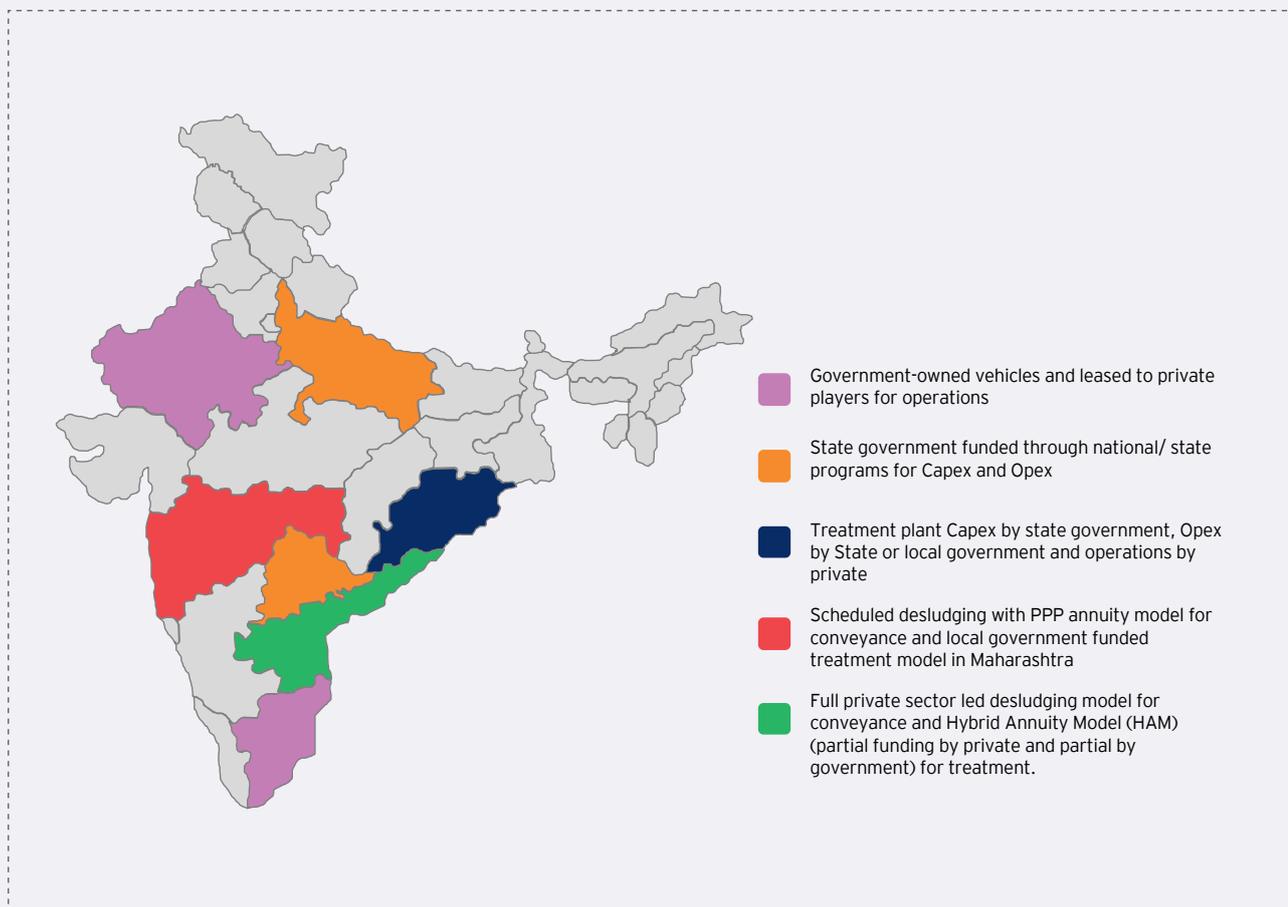
Nowhere is the need for FSSM more apparent than in newly urbanizing spaces and peri-urban areas that lay adjacent to urban ones, defined by (among other things) a high population density and poor maintenance of systems. It is important to consider the strategies by which the private sector can capitalize on the peri-urban opportunity, preferably by integrating urban and rural FSSM systems. However, given the different regulatory and institutional systems governing urban and rural areas in India and the costs associated with the same, it is important to look at ways by which **rural and urban FSSM can be successfully integrated and adopt cluster based regional approaches.**

A viable model of integration relies on two key aspects, namely, creating an enabling legal framework for integration, and arriving at a workable financial arrangement. This has been explored in the report using learnings from existing practice in Odisha and other state examples. The following is recommended:

1. **Creating a regulatory framework:** Urban Local Bodies (ULBs) and Gram Panchayats (GPs) are the last denominators of de-centralized and representative governance in India but are governed by two separate Ministries. Therefore, it is recommended that the government look at ways to create a single enforcement mechanism that is able to ensure compliance with FSSM norms across local bodies, whether done through the aegis of the Central government or by delegating the responsibility to individual states to come up with state-based legislations.
2. **Operationalizing a regulatory framework:** Treatment plants are set-up within jurisdictions of specific ULBs, who are legally required to service their respective urban population. Therefore, in order to extend these services to rural areas, we recommend that ULBs and GPs be encouraged to enter into Memorandum of Associations and contracts that considers cost variables and institutional responsibilities to allow for sharing of treatment facilities between them.

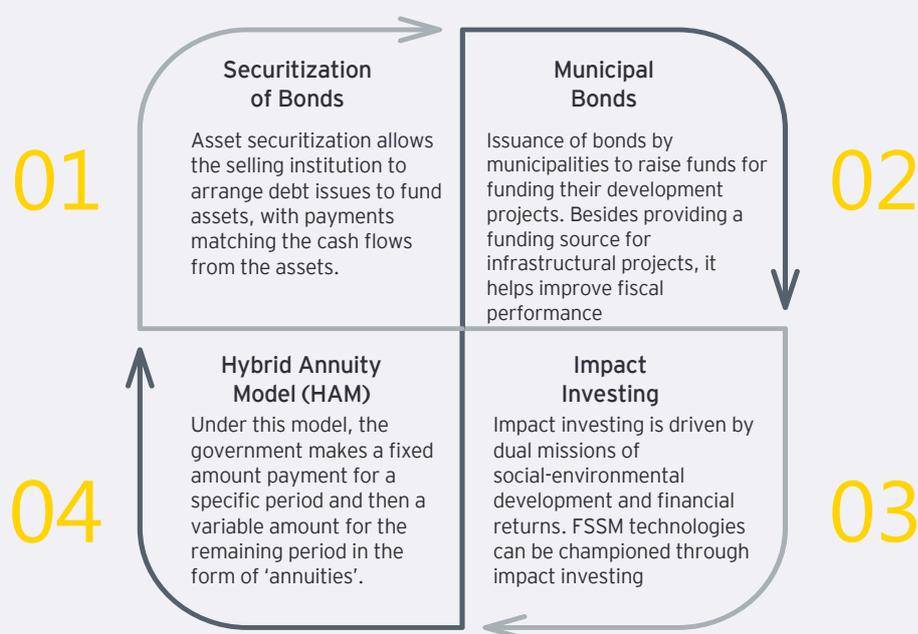
## Lessons from FSSM

The sanitation space elicits great interest from the private sector whose expertise and economic know-how can undoubtedly accelerate the adoption and coverage of FSSM practices across urban and urbanizing areas. Here existing state practice by a few standout states like Odisha, Uttar Pradesh, Andhra Pradesh, Telangana, Maharashtra, Tamil Nadu and Rajasthan like can provide interesting learnings on how private sector engagement can be amplified in ways that incentivize them and ensure the sustainability of the projects.



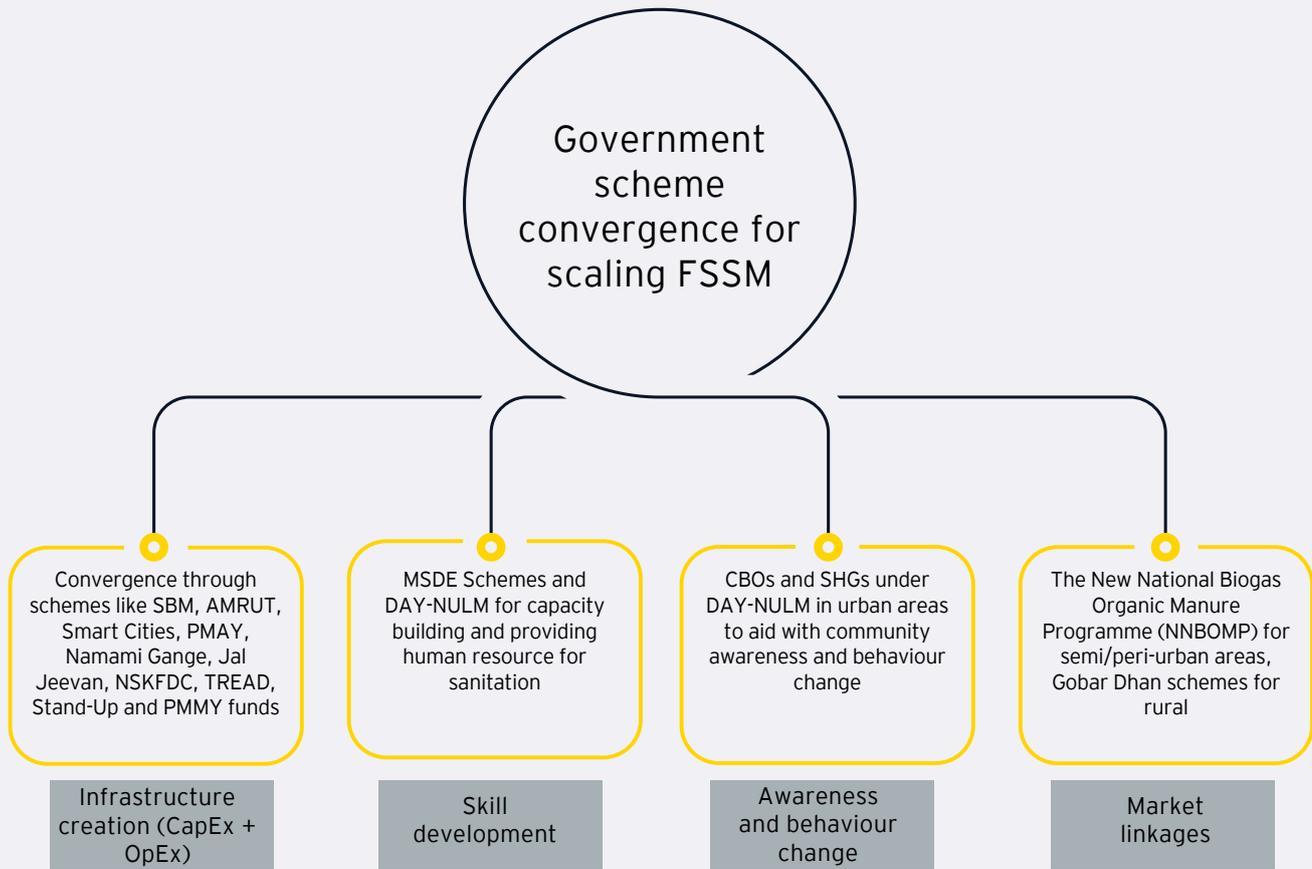
These states not only provide invaluable insights on innovative FSSM business models, but also highlight state-level regulatory norms that improve FSSM compliance, and the ways they have chosen to fund this.

Innovative state practices aside, financing too is an important component of FSSM. While COVID-19 has understandably routed government funds and attention towards battling the transmission, it has also sharpened private sector focus, having brought to light a burgeoning sanitation opportunity, given the stark inequities when it comes to its access. The Center continues to be the largest end-to-end funder in case of FSSM, with state and ULB funds being miniscule in comparison in some if not all states. Therefore, it is important to ensure alternate sources of financial access, which can be leveraged to ensure continued thrust on FSSM. Some innovative forms of funding we have explored, along with lessons from other sectors where they are in use, are as follows:



Last but not the least, scheme convergence is a useful tool in bringing about synergies between different government policies and schemes. It remains an expediter of better planning, financing and implementation. In the area of FSSM, scheme convergence will not only aid in scaling the reach of FSSM practices across the country, but also facilitate sustainable development. Additionally, doing so will also accelerate private sector involvement through every stage of the FSSM value chain.

A diagrammatic representation of the various ways in which government schemes can be converged for FSSM is shown below:



## Way forward

Private sector participation in FSSM offers a lot of benefits in terms of infusion of innovation, as well as higher service levels, financing, and help fast track implementation. Given how private enterprises can clearly add value to the sanitation ecosystem by participating as a key player in the FSSM space in India, it is important that we promote their participation.

However, to do so, it is important for the government to induce their participation by creating a market that is institutionally robust and financially viable for them. On the same note, it is essential for the private sector to continue to strengthen their engagement with the government to deal with any potential trust deficit against private enterprise. Lastly, it is imperative to inspire confidence in donor agencies to also support and strengthen government and private sector engagement.

Therefore, the report concludes by summarizing some of the key asks each stakeholder in the FSSM ecosystem to help accelerate private sector engagement:

Government sector	Private sector	Financing agencies
<p><b>Reducing entry barriers</b> for formal businesses to enter the space and helping informal players to formalize by way of incubation and up-skilling support under government schemes, and by promoting innovations and adoption of disruptive technology.</p> <p><b>Administrative, legislative and regulatory changes</b> to strengthen institutional architecture, including coming out with clear cut guidelines and norms for FSSM application across all states.</p> <p><b>Improve financial resilience</b> by (i) having dedicated funds set aside for FSSM under government schemes which can be easily accessed; (ii) enabling innovative streams of funding like municipal bonds, impact investing, securitization; (iii) encourage increase devolution of funds to ULBs under 15th Finance Commission over 14th FC; (iv) enhance ULB's ability to raise own revenues through state borrowings or property tax is enhanced; (v) Ensuring availability of loans through banks under popular entrepreneurship driving schemes like MUDRA and Start-up India.</p> <p><b>Bettering procurement guidelines and contract management</b> including (i) increasing flexibility when it comes to geographic, technical or business turnover thresholds under contracts to encourage entry of SMEs and smaller players, (ii) transparent and detailed contractual terms to understand costs and risks involved; (iii) implementing service level agreements to reduce risks of delayed payments, and (iv) instituting a proper grievance redressal system to help handle concerns like delayed payments, contract revisions, etc., emerging from the private sector.</p>	<p>Work with the government to <b>help infuse technology, innovation and best practices</b> into the country's FSSM framework</p> <p><b>Engage better with local governments</b> to explore the scope of work for development of appropriate contracts and payment systems, capacity building support, etc.</p> <p><b>Encourage strengthening and buy-in of FSSM services in peri-urban areas</b> through adoption of urban-rural integration models via MoUs and cost-sharing agreements.</p> <p>Support the <b>creation of data driven FSSM practices</b> and help with monitoring through proper record keeping.</p>	<p>Bring <b>international expertise and standard operating procedures</b> to the Indian FSSM ecosystem so as to infuse both innovation in FSSM practices and ensure creation of balanced risk-sharing mechanisms in agreements between government and private sector.</p> <p><b>Champion alternate financing and revenue models</b> for FSSM players, particularly FSTP operators, and help with access to innovative ways of low-cost credit.</p> <p>Help in <b>bridging viability gap funding</b> for financing parts of the FSSM ecosystem, such as FSTP.</p> <p>Work with national and regional financial agencies to help with their <b>capacity building to improve FSSM lending</b>.</p> <p>Help <b>train and embed FSSM consultants</b> who can provide technical know-how, capacity building and ecosystem assistance to help local governments create viable private sector engagement models in FSSM.</p>



# Overview of FSSM sector.

1





### *1.1 Current state*

The implementation of Swachh Bharat Mission-Urban (SBM-U) has resulted in substantial improvements in ensuring access to sanitation facilities for urban households. During 2014-2019, 6 million Individual Household Latrines (IHLs)<sup>1</sup> and 0.5 million Community Toilets (CTs)/ Public Toilets (PTs)<sup>2</sup> have been constructed, resulting in a significant reduction in the proportion of households defecating in the open. Further, India was declared Open Defecation Free (ODF)<sup>3</sup> on 2nd October 2019, with 4,320 ODF cities and towns.

Until recently, underground sewerage systems were considered the dominant approach for wastewater management in Indian cities. However, due to high capital as well as Operation and Maintenance (O&M) costs, only 32.7% of urban households were connected to sewerage systems in 2011<sup>4</sup>. Further, due to poor O&M, one-third of the existing Sewage Treatment Plants (STPs) are not operational<sup>5</sup>. The operational treatment capacity (20,358 MLD) is sufficient to treat only 33% of the total wastewater (62,000 MLD) generated by urban India<sup>6</sup>.

On-Site Sanitation facilities (OSSF) are the primary mode of sanitation system in India<sup>7</sup>. 48.7% of urban Indian households depend on onsite facilities<sup>8</sup> and this proportion is increasing, especially with the rapid pace of construction of individual and community toilets under SBM. Anecdotal evidence indicates that most of the 5.57 million IHHLs constructed under SBM-U are also connected to OSS systems. OSS systems are underground containment structures such as septic tanks and pits that collect, contain and partially treat faecal waste and wastewater.

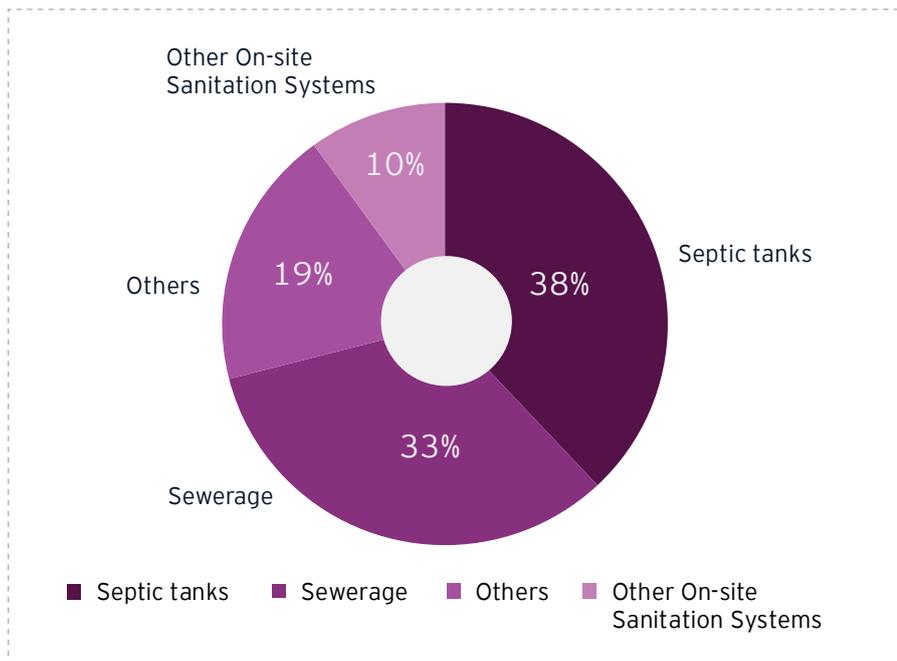
pollutant of water sources in India, causing a host of diseases including diarrhea, agricultural contamination and environmental degradation<sup>13</sup>.

To reduce indiscriminate disposal of faecal sludge, the implementation of Faecal Sludge and Septage Management (FSSM) has been gaining momentum. FSSM is a systems approach towards creating sustainable and environmentally safe infrastructure for all components across the sanitation value chain of non-networked households. FSSM is of prime importance to enable urban

that if India achieves 100% safe fecal sludge management by 2023-24, economic damages saved would go up to approximately INR 24,809 billion (US\$347.75 billion)<sup>14</sup>. Economic damages saved would represent approximately 8.55% of Gross Value Added (GVA) and 7.74% of Gross Domestic Product (GDP) in 2023-24<sup>15</sup>.

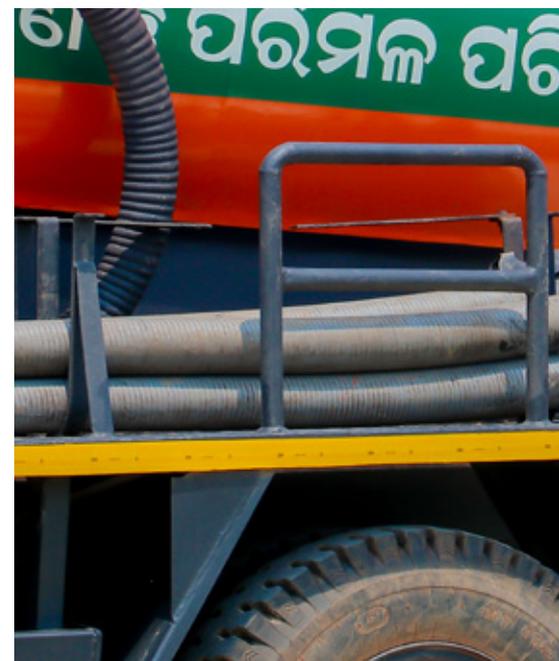
States, including Karnataka, West Bengal, Kerala, Jammu and Kashmir, Tamil Nadu, Odisha, Telangana, Andhra Pradesh, Maharashtra, Uttar Pradesh and Madhya Pradesh are building decentralized FSTPs through private sector partnerships. For further strengthening FSSM operations through the entire sanitation value-chain, the role of increasing private sector engagement has been recognized. Engaging the private sector to address challenges, alongside MoHUA and state governments, can accelerate self-reliance. A market-based approach could support the private sector to develop models that expand sanitation infrastructure and services that underserved customers would previously not be able to access.

**Figure 1: Distribution of urban households as per access to wastewater containment and conveyance systems<sup>9</sup>**



The faecal sludge accumulated in these systems needs to be periodically removed and treated before it can be safely disposed. Due to lack of regulation, the collected faecal sludge is dumped indiscriminately in open areas and water bodies both within and outside cities and towns, leading to environmental pollution<sup>11</sup>. Poor sanitation has significant health costs and untreated faecal sludge and septage from cities is the single biggest source of water resource pollution in India<sup>12</sup>. Human waste has clearly been identified as the leading

areas to move beyond ODF status and introduce ODF++ and city-wide inclusive sanitation (CWIS) practices. With the concerted efforts of the Ministry of Housing and Urban Affairs (MoHUA), State Governments, Urban Local Bodies (ULBs), Central Public Health and Environmental Engineering Organization (CPHEEO), National FSSM (NFSSM) Alliance, Non-Governmental Organizations (NGOs), academia and philanthropic organizations like Bill and Melinda Gates Foundation (BMGF), decentralized sanitation is being strengthened. It has been estimated



## 1.2 Regulatory and Institutional architecture

The Government of India has taken multiple steps in the form of various legislations, policies and programmes to further sanitation in India, within whose larger ambit rests the regulatory and institutional arrangements that govern and guide FSSM in India.

### A Regulatory framework:

From a regulatory standpoint, architecture supporting FSSM in India is fragmented, and anchored by several institutions spread across central and state levels, across multiple legislative and policy frameworks. The federal nature of the Indian governance system places public health and sanitation within the state's purview<sup>16</sup>, though the Centre retains its own responsibilities on aspects such as controlling environmental pollution and preventing socially degrading and unsanitary practices such as manual scavenging<sup>17</sup>. Thus, Center is instrumental in the passage of legislations that impact parts of the sanitation cycle such as the Environment

(Protection) Act, 1986 and the Water (Prevention and Control of Pollution) Act, 1974, as well as those seeking to prohibit manual scavenging, such as the Employment of Manual Scavengers and Construction of Dry Latrines Prohibition Act, 1993, and the more recent Prohibition of Employment as Manual Scavengers & their Rehabilitation Act, 2013.

At the same time, the State List grants states powers to make norms with respect to water and sanitation, in addition to apportioning resources received through various centrally sponsored schemes. On the urban side, the 74th Constitutional Amendment Act of 1993, also known as the Nagarpalika Act, allows states to transfer the discharge of responsibility for water supply and sewerage from state agencies like state departments and parastatal bodies, to Urban Local Bodies (ULBs). These in turn are held responsible for the implementation and monitoring of FSSM projects. Alongside this, statutory/regulatory bodies such as State Pollution Control Board (SPCB) established under specific legislations such as the EPA, 1986 also aid in the enforcement of norms relating to FSSM.

### B Institutional arrangement

From an institutional perspective, FSSM has no single institutional structure. Broadly, at a central level, the MoHUA is seen as the nodal Ministry for formulation of policies, strategies and guidelines with respect to sanitation improvement and in assisting states financially for the development of urban water supply and sanitation schemes in cities and towns, though this responsibility is shared in certain respects, across other ministries like Jal Shakti and Ministry of Rural Development. A detailed break-up of the institutional arrangements can be seen on the next page.



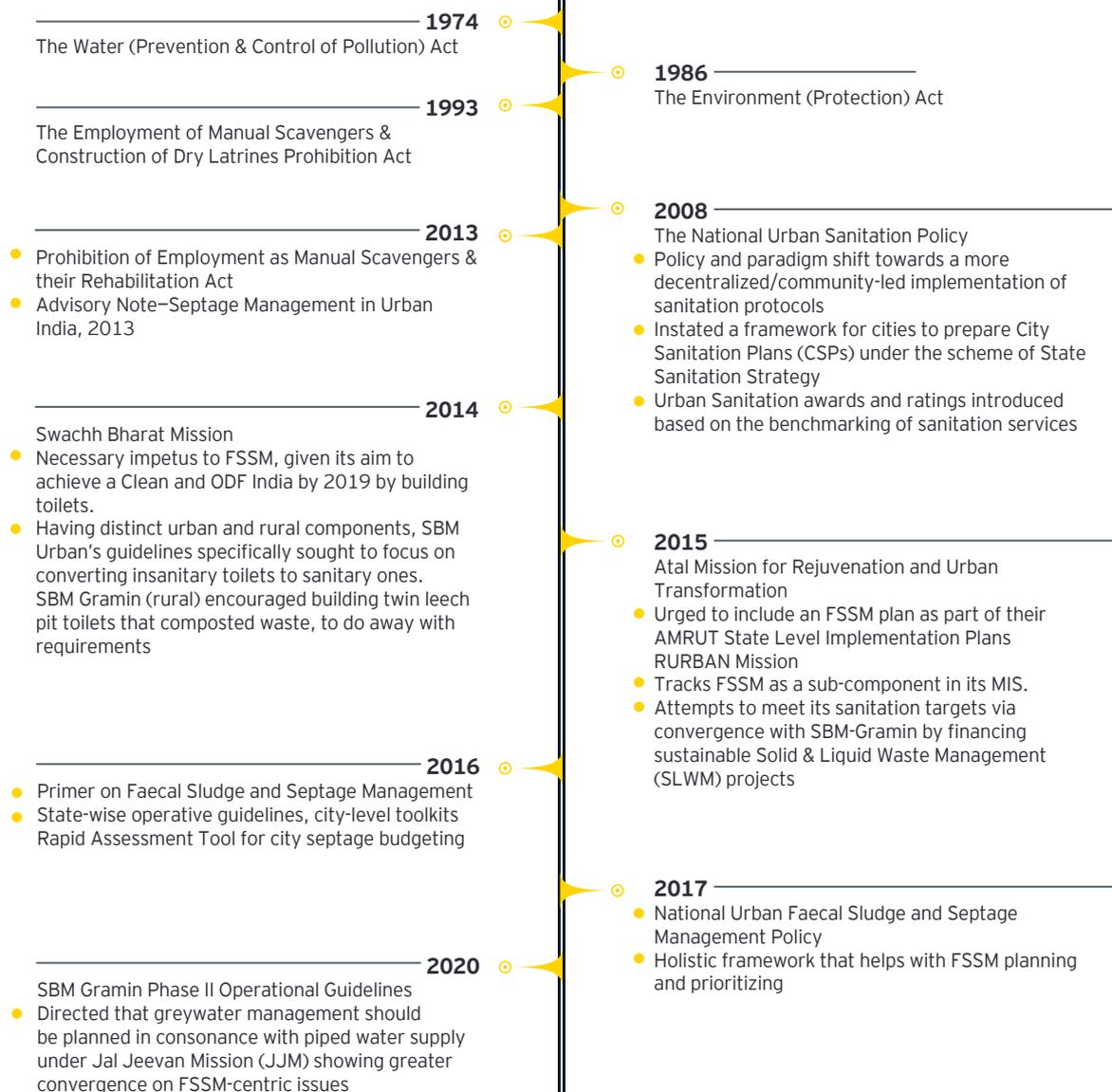
Table 1: The institutional framework for FSSM in urban and rural India

Level	Body	Main Responsibility in relation to FSSM
<b>Central</b>	Ministry of Housing & Urban Affairs	Prioritize, mainstream sanitation and fund FSSM under central schemes like SBM(U), Atal Mission for Rejuvenation and Urban Transformation (AMRUT), Smart Cities, Heritage City Development and Augmentation Yojana (HRIDAY), etc. as well as offer technical assistance, capacity building support and training support to States and ULBs.
	Ministry of Jal Shakti <sup>18</sup>	Anchor ministry for SBM(G) 1.0 and 2.0, which has specifically included Faecal Sludge Management as a key component starting SBM (G) Phase II, and highlighted funding and technology options for the same <sup>19</sup> .
	Ministry of Rural Development	Anchor ministry for RuRBAN Mission 2015 which tracks faecal sludge management as a sub-component in its MIS. Seeks to ensure meeting of FSSM targets via convergence with SBM(G).
	Ministry of Environment	In charge of enforcement of environmental norms under legislations including the EPA, 1986, for the collection, transport, treatment and disposal of faecal sludge and septage.
	Ministry of Social Justice & Empowerment	Anchor Ministry for laws eliminating manual scavenging and rehabilitation of manual scavenger, and monitors progress of implementation.
	National Regulatory Body (CPCB, CPHEEO)	Regulatory bodies like CPCB prescribe standards for permissible discharge of solids, liquids etc onto water or land, and sets out restrictions on when it is not possible. Central Public Health and Environmental Engineering Organisation (CPHEEO) sets standards for containment facilities for wastewater/sewage.
<b>State</b>	State Departments (Urban Development, Public Health, Engineering)	Controls regional development bodies, and coordinates environmental planning, health regulations, urban development at state level. Also aids in allocating resources from national schemes, and external funding agencies, and provides technical and other assistance to local bodies.
	Parastatal bodies (Jal Board)	In-charge of design and execution of schemes relating to sewage services.
	State-level Regulatory Body (SPCB)	SPCB enforces standards set by CPCB, and punishes violators.
	State Urban Development Authority (SUDA)	SUDA is responsible for the proper implementation and monitoring of the centrally assisted programmes for alleviation of property throughout the State
	Mission for Elimination of Poverty in Municipal Areas (MEPMA)	MEPMA has the mandate to empower women and ensure financial inclusion and sustainability through Self-Help Groups. In the context of FSM, MEMPA can help in implementing a gender-responsive and inclusive sanitation agenda across state.
<b>Local</b>	ULBs (Municipal Corporations) & Gram Panchayat	Implementation and enforcement of steps related to FSSM management such as desludging, conveyance, treatment and maintenance of treatment plants, in urban and rural areas respectively.

### 1.3 Key governmental interventions

The Government of India has taken multiple steps in the form of various legislations, policies and programmes to further sanitation in India, within whose larger ambit rests the regulatory and institutional arrangements that govern and guide FSSM in India.

Figure 2: Key government interventions related to FSSM in India

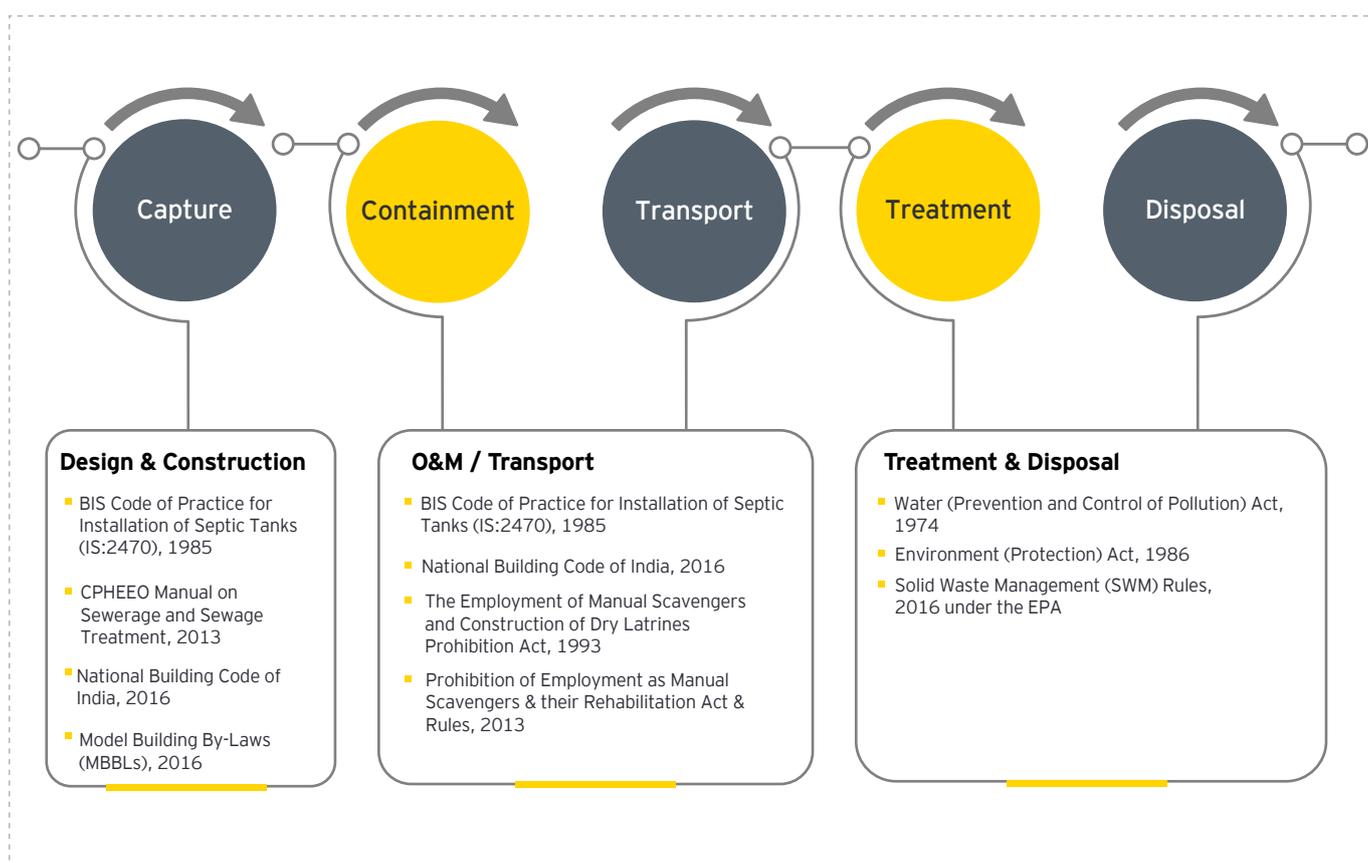


### 1.4 Enforcement mechanisms

The enforcement mechanisms driving FSSM in India are piecemeal, spread across different legislations, by-laws and national codes, though they are expected to work in tandem with each other.

The bulk of the responsibility when it comes to monitoring the capture, containment and treatment of septage fall upon the ULBs who remain stretched in terms of resources. However, the multiplicity of frameworks, accompanied by under-resourced ULBs often make enforcement of norms problematic, and they remain more persuasive than penal, which can be a barrier in private sector engagement.

Figure 3: The varying standards governing the many stages of the FSSM value chain



**Design and Construction:**

The construction of OSS in India is governed primarily by 4 instruments – the BIS Code of Practice for Installation of Septic Tanks (IS:2470), 1985, the CPHEEO Manual on Sewerage and Sewage Treatment, 2013, the provisions of the National Building Code of India, 2016 and the Model Building Byelaws (MBBLs), 2016 framed by the Town and Country Planning Organisation. Though these are national level norms, the enforcement of these standards are integrated into city planning and expected to be implemented by ULBs through licensed masons and plumbers. However exact manner of enforcement is unclear<sup>20</sup>.

**Operations and Maintenance /**

**Transport:** Maintaining OSS systems requires regular desludging to ensure its proper upkeep. The mode and manner of desludging also has set standards, with the BIS Code, CHEEPO etc mentioning the exact intervals between which desludging is mandated, and the Employment of Manual Scavengers and Construction of Dry Latrines Prohibition Act, 1993, read with the Prohibition of Employment as Manual Scavengers & their Rehabilitation Act, 2013, prohibiting manual scavenging. The enforcement, however, depends on the capacity of individual ULBs.

**Treatment and Disposal:**

The manner of disposal of faecal waste has strong repercussions for the environment, and so is expected to be disposed of at designated treatment sites, and to be properly treated before discharge, though Central Pollution Control Board data indicates to the contrary<sup>21</sup>. Improper disposal attracts severe repercussions under both the Environment (Protection) Act, 1986 and the Water (Prevention and Control of Pollution) Act, 1974.



Business opportunities  
and challenges.

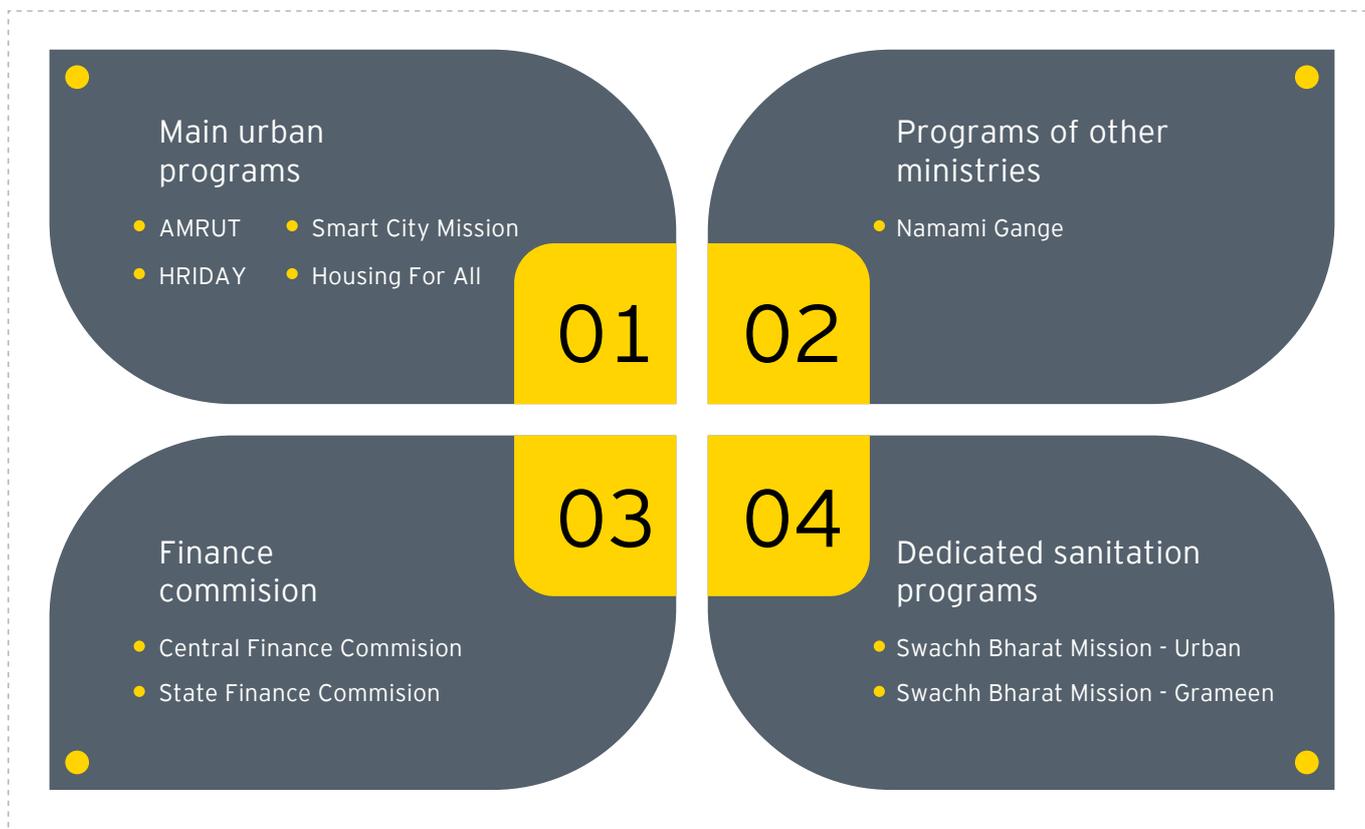
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There is an increasing emphasis in the sanitation sector on determining ways in which different stakeholder groups can work together more effectively to increase uptake of improved sanitation. Towards this end, Government of India (GoI) recognizes the contribution of the private sector towards meeting goals and objectives for sanitation coverage.

Figure 4: Opportunities for funding in decentralized sanitation in government program



The GoI focus is now on ensuring the sustainability of the sanitation effort achieved through business model or convergence with other schemes of Central or State Governments. Funds in this regard can be sought for creating “decentralised sewerage systems.... recycling and reuse of wastewater” through urban programs like, HRIDAY, Smart City Mission, SBM, etc. The 14th Finance Commission, recommends basic grants to ULBs”....with the purpose of providing unconditional support for the delivery of basic services that includes water supply, sanitation including septage management, sewage and solid waste management.....among other services assigned to them under relevant legislature”<sup>22</sup>. There is also a focus of Corporate Social Responsibility (CSR) programmes on the issue of Water Sanitation & Hygiene (WASH) with 90% of companies having at least one CSR programme in WASH<sup>23</sup>. Most recently, the NITI Aayog explicitly welcomed private sector participation in sanitation,

insisting that it was important for them to bring in the best technologies to sanitation sector and help enhance the societal dignity of workers<sup>24</sup>.

Given the ample funding opportunities available, sanitation has been recognized as a lucrative opportunity for different players.

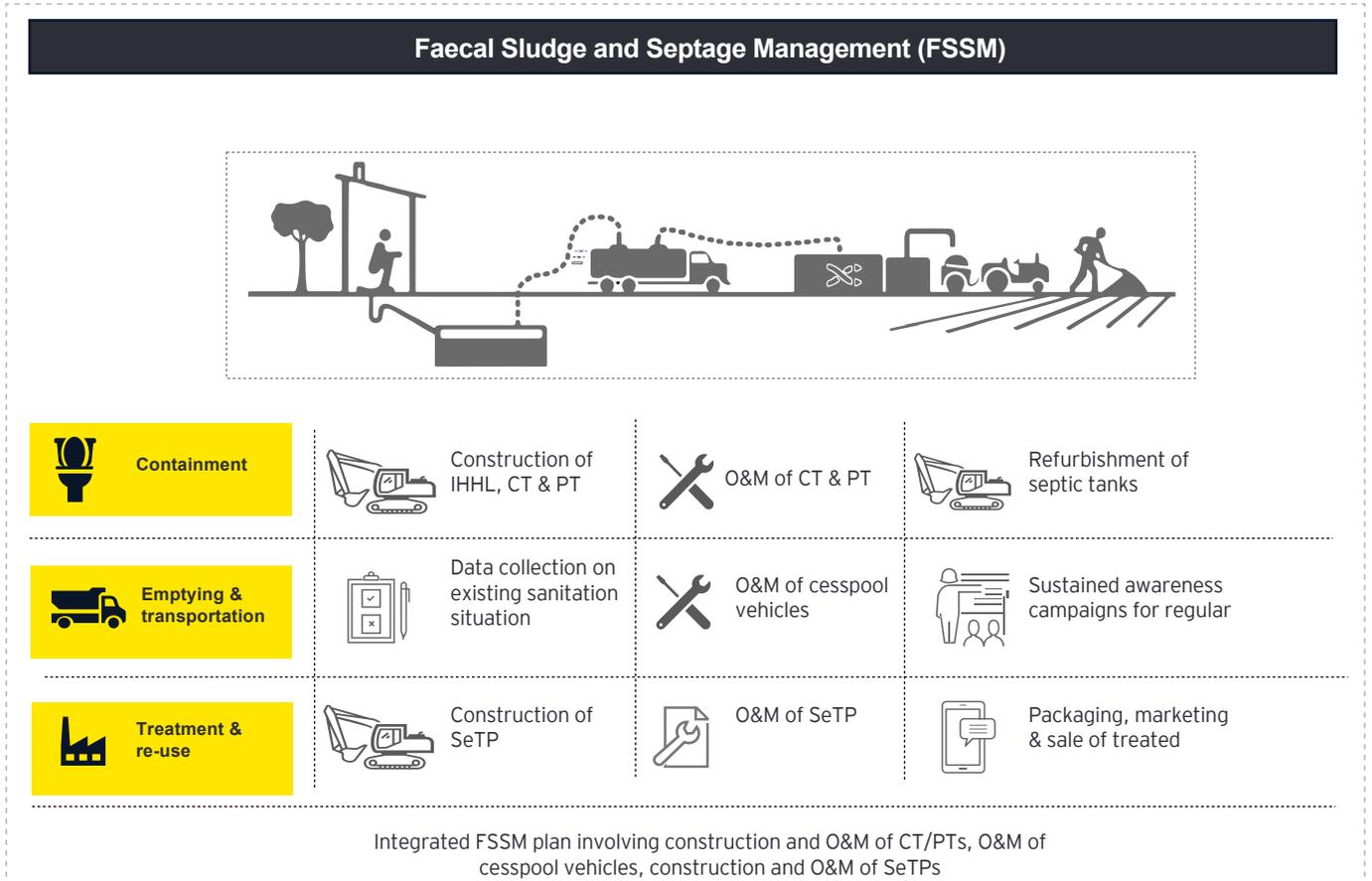
### 2.1 Private sector prospects

Due to flagship programs like SBM, India has managed to eradicate open defecation by driving up the creation of toilets in areas plagued by open defecation, such as informal, peri-urban and rural areas. On the urban front, many urban and peri-urban areas compete for access to public services including relating to sanitation. The absence of public services like centralized sewerage result in such areas being dependent on onsite sanitation services, which are poorly serviced by urban authorities, or are at worst, ignored.

However, in due time, households reliant on on-site sanitation systems will require desludging operations for the upkeep and functional use of their toilet. Such a need brings forth the requirement to provide an affordable means for desludging these units and treating the faecal sludge hence collected<sup>25</sup>. Therefore, there is a need to extend FSSM services to such places and leveraging the private sector across the FSSM value chain will infuse the necessary capacity, technology and funding to help supplement government services.

A summary of the activities that the private sector could engage in given in Figure 5. The private sector can undertake standalone contracts for these activities or take up integrated contracts combining two or more activities.

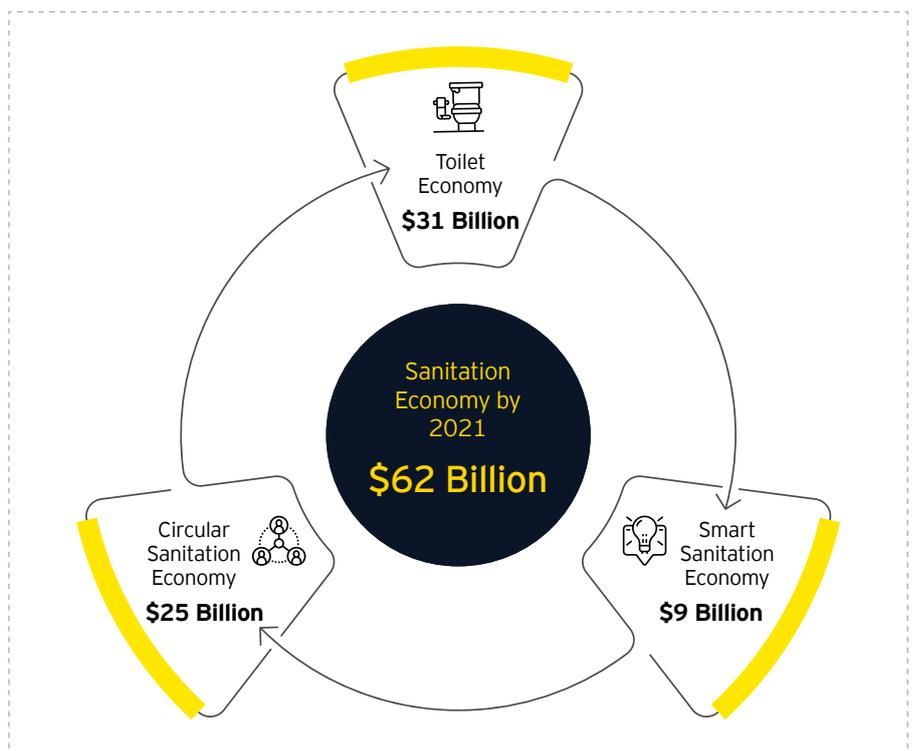
Figure 5: Summary of activities across FSSM value-chain



Several reports have attempted to quantify the value of the overall sanitation sector in India, alongside specific studies capturing financing requirements for an effective FSSM implementation. These findings show that this sector has tremendous potential which the private sector could tap into<sup>26</sup>.

According to 'The Sanitation Economy in India', a thought leadership released by the Toilet Board Coalition in 2017, the sanitation economy was US\$ 32 Billion per year market in India in 2017 and is set to double to an estimated US\$ 62 billion by 2021. Figure 6 depicts the market estimation of the whole sanitation value chain as proposed in the report.

Figure 6: Market estimates of sanitation economy in India by 2021



Macro-level assessments of the overall sanitation economy aside, studies have also attempted to illustrate the financial requirements for driving FSSM in India. The 'Financing Faecal Sludge and Septage Management- A landscape study of four Indian states' jointly put together by the Center for Water and Sanitation (C-WAS), the Centre for Research and Development Foundation (CRDF), and CEPT University, explores the financing landscape for FSSM in terms of costing needs, availability of public funding, and innovative ways to channel funds towards FSSM solutions. The research is based on an analysis of FSSM funding requirements and past allocations for the urban and sanitation sectors.

The study estimates the funding need for various states over a 4 year period of 2018-2022, and is modelled on the assumption that 100% of FSSM needs will be met in 2022 in these target states, and that all urban areas in these states would be ODF by then . The assessment shows that the Capex requirement (for conveyance and treatment) in these four states would be INR 2,892 crores, and the Opex requirement would be INR 1,620 crores over the 2018-22 period. These reports highlight that there exists tremendous opportunity for the development of FSSM services in the country.

## 2.2 Business challenges in scaling up

Private sector entry and engagement in FSSM in India is constrained by several factors, beginning with entry barriers that inhibit private sector participation, to problems faced in the post-contractual state, to challenges in the regulatory and institutional set-up that disincentivize private sector participation in general. This sections sums up these concerns, which have been curated basis stakeholder conversations, particularly with private players.

### a) Pre-contractual concerns:

- i. Stringent geographical and technological procurement challenges that make it hard to apply
- ii. Large established players demotivated by low tender value, while new or smaller players by business turnover pre-requisites
- iii. Insufficient funding via government schemes for FSSM
- iv. Limited bank financing due to insufficient sector credibility
- v. Inability to easily accommodate technological innovations under schemes and policies.

### b) Post-contractual:

- i. Delays in tender, land acquisition and design approvals
- ii. Inadequate prior assessments of costs and risks requiring multiple contract revisions
- iii. Poor contracting terms resulting in greater risk to private sector
- iv. Delayed payments to private sector
- v. Information gaps due to lack of data driven approach

### c) Others:

- i. Inadequate advocacy by sector players
- ii. Lack of collaboration at planning stage with ULBs/local bodies leading to poor uptake
- iii. Fragmented institutional and regulatory frameworks resulting in weak monitoring and enforcement
- iv. Absence of a robust government driven data collection and MIS which decrease sector credibility
- v. Inadequate enforcement of FSSM standards by ULBs





## Peri-urban areas - an emerging opportunity

Peri-urban areas can be described as fringe areas of cities or adjoining rural areas, which are intrinsically linked with the city economy, experience constant transformation, and are characterized by a mix of rural and urban activities. Population relocations driven by economic reasons or caused by land speculation have led to people settling in peri-urban areas (or areas in the periphery of the urban). The in-migration of population and emergence of new activities is transforming such areas, as seen in changes in land use and occupational patterns, reduced farm activities, and growth of built structures.

In India, the increase of 'census' towns in proximity of 'statutory' towns may also be understood as peri-urban growth<sup>1</sup>. India had 3,892 census towns in 2011 with a population of 54 million (or 14% of India's total urban population). Between 2001 and 2011, census towns grew by 186%, as against a 6% decadal increase in the number of statutory towns<sup>1</sup>.

The pace of urbanization in India has been such that public services such as sanitation have struggled to keep pace with growth of such settlements. This has not been helped by the fact that informal settlements adjoining urban areas, and peri-urban regions - which technically fall within the domain of rural local bodies - understandably find themselves excluded from urban planning strategies and legal documents<sup>1</sup>. Therefore, these places differ very much from that of urban areas with sustained urban growth which are backed by prior planning and creation of public service facilities like toilets connected to centralized sewerage. Instead, households in peri-urban areas are dependent on

on-site sanitation facilities. This offers tremendous opportunity to a private service provider to intervene and service these areas.

Opportunities for commercially viable private sector operations in peri-urban arise from the following major factors:

- ▶ High population density
- ▶ Opportunities to reap the benefits of economies of scale and scope
- ▶ Potential for rapid growth
- ▶ Encouragement from development partners
- ▶ Inability of local rural governments to provide WSS services after decentralization
- ▶ Poor maintenance of community-managed systems<sup>1</sup>

Given these factors, ensuring engagement of the private sector for providing FSSM services in peri-urban areas will make it more profitable for these businesses.

## Strategies for extending FSSM services to peri-urban areas

Under normal circumstances, sewage systems are not created in rural areas (which include peri urban spaces) in India because of the low density of population, scattered households, less quantity of sewage generated and high cost<sup>1</sup>. That said, the excessive reliance on OSS systems in rural India makes it imperative to service these areas. However, as the Stanford's Social Innovation Review in Spring 2017 aptly highlights, India's smaller towns and peri-urban settlements cannot afford

to build dedicated treatment systems. This makes for a strong case to catalyze a way by which services provided in urban areas could be extended to cover nearby peri-urban /semi-rural areas in a manner that is cost-effective, as well as sustainable in the long term.

However, given the different/separate regulatory and institutional systems governing urban and rural areas in India and the costs associated with the same, it is important to look at ways by which rural and urban FSSM can be successfully integrated. A viable model of integration relies on two key aspects, namely, creating an enabling legal framework for integration, and arriving at a workable financial arrangement:

**Creating a regulatory framework:** Urban Local Bodies (ULBs) & Gram Panchayats (GPs) are the last denominators of de-centralized and representative governance in India, and so are directly responsible for fulfilling the service needs of the urban and rural population respectively, including those related to sanitation and hygiene. Therefore, preventing the improper disposal of septage or sewage is a key responsibility for both parties. However, given the fragmentary nature of the regulatory and institutional set-up, creating a single enforcement mechanism that is able to ensure compliance with FSSM norms across local bodies, would be desirable, whether done through the aegis of the Central government or by delegating the responsibility to individual states to come up with state based legislations. The government could therefore consider constituting a high-level committee comprised of legal and technical experts to assess the best way to take this forward in a manner that ensures maximum buy-in for states, and ease of doing

**Operationalizing the framework:**

Any legal and regulatory framework incentivizing compliance with FSSM remains incomplete unless the same can be operationalized on the ground, and services can be extended across all local bodies, both urban and rural. Such operationalizing will require taking into account cost variables and institutional responsibilities at the local levels given how currently, treatment plants are set-up within jurisdictions of specific ULBs only, who are legally required to only service their respective urban population. In order to expand their treatment to other areas, including rural ones, requires some level of regulatory interference, such as a Memorandum of Understanding or an undertaking to share costs between different local bodies.

A good example of such a set-up is the state of Tamil Nadu, where the state government, under the aegis of the Municipal Administration & Water Supply Department, by way of G.O (2D) No. 35 dated 15th May 2020, has approved in principle the creation of 49 Faecal Sludge and Septage Management facilities to cover 51 Municipalities and 59 Town Panchayats. To actualize this, they have set aside a total of INR 200 Crore funded through a combination of SBM and Tamil Nadu Integrated Urban Development Mission funds. More importantly, they have also prepared templates for draft MoUs to be entered into by ULBs hosting/constructing FSTPs and co-treatment plants, and those local bodies sharing such treatment facilities. The key aspects of the MoU broadly cover the following:

- ▶ Basic definitional clauses and interpretations relating to the infrastructure, treatment process and parties involved.
- ▶ Obligations of the local body (ULB) hosting or providing CapEx for the

treatment facilities ('the host'), including any including any relating to the operations and maintenance of the facility.

- ▶ Obligations of the local body (ULB) sharing access to such facilities ('the participant') including any relating to the operations and maintenance of the facility.
- ▶ Terms regarding the manner and distribution of payment for the running and/or usage of facilities by parties,
- ▶ Rights and responsibilities of all parties when the treatment facility is temporarily shut down, closed, or if its functioning is suspended for repair or maintenance.
- ▶ A dispute resolution mechanism for settling differences between parties, as well as the mode and manner of doing so.
- ▶ Legalities concerning the review, termination and renewal of the contract between all parties.

The Tamil Nadu model is confined to just urban limits, which makes it an easier task to operationalize. However, the need and sheer diversity of rural habitations makes it hard to extend such service equally to all areas. Therefore, service providers will be forced to narrow their focus to habitations peripheral to or resembling urban areas to keep the service sustainable. The State of Odisha has tried to do this at the Dhenkanal Municipality by attempting to create a framework that will allow Gram Panchayat (GP) clusters adjoining the Municipality to be serviced via the FSTPs set-up at Dhenkanal at extra cost of INR 500 - INR 1000 depending on the distance traversed. This move is both motivated by rural demand, as well as the recently released SBM (G) Phase-2 Operational Guidelines (2020-25), which suggests extending urban FSM services

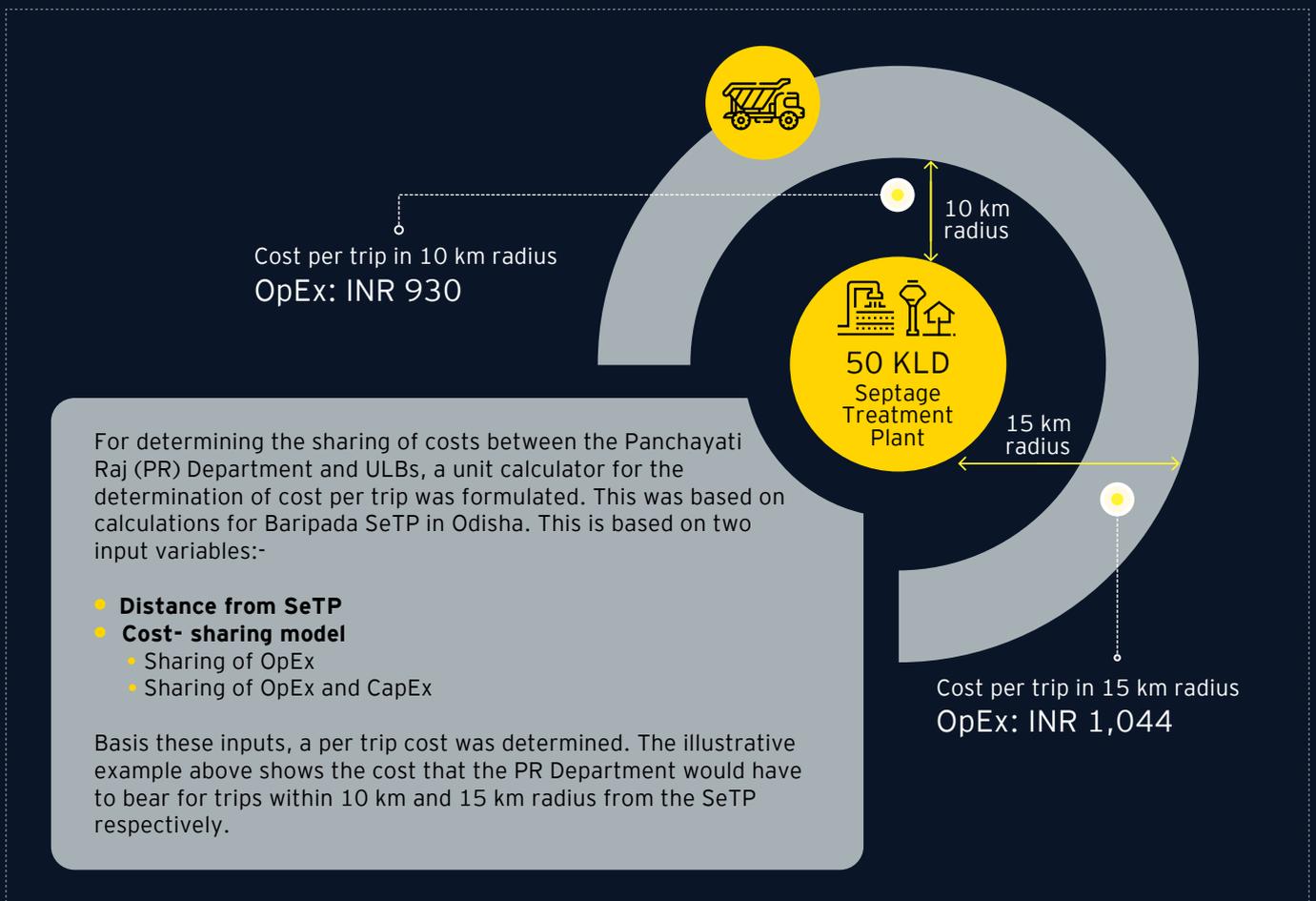
to rural people located within a 10 km radius of the urban local facility. While the MoU signing to actualize this is currently pending, it is expected to take place soon, and provide an impetus to formalize similar arrangements across other ULBs.

**Cost-sharing model:** With the regulatory framework in place, the next key aspect to consider would be the determination of a cost-sharing model between the ULBs and the Panchayati Raj

Department (PRD) in charge of GPs. Here, the key considerations will be whether the cost-sharing will be done for only the OpEx or both CapEx and OpEx would be shared between the parties. The figure given below captures what the 'per trip' cost will be in both scenarios. If a ULB with a 50 KLD SeTP is catering to the peri-urban areas in a 10 km radius, the per trip cost would be INR 930 if only the OpEx (of cesspool vehicle and SeTP) is being considered, or will have to pay INR 1,326 if both OpEx and

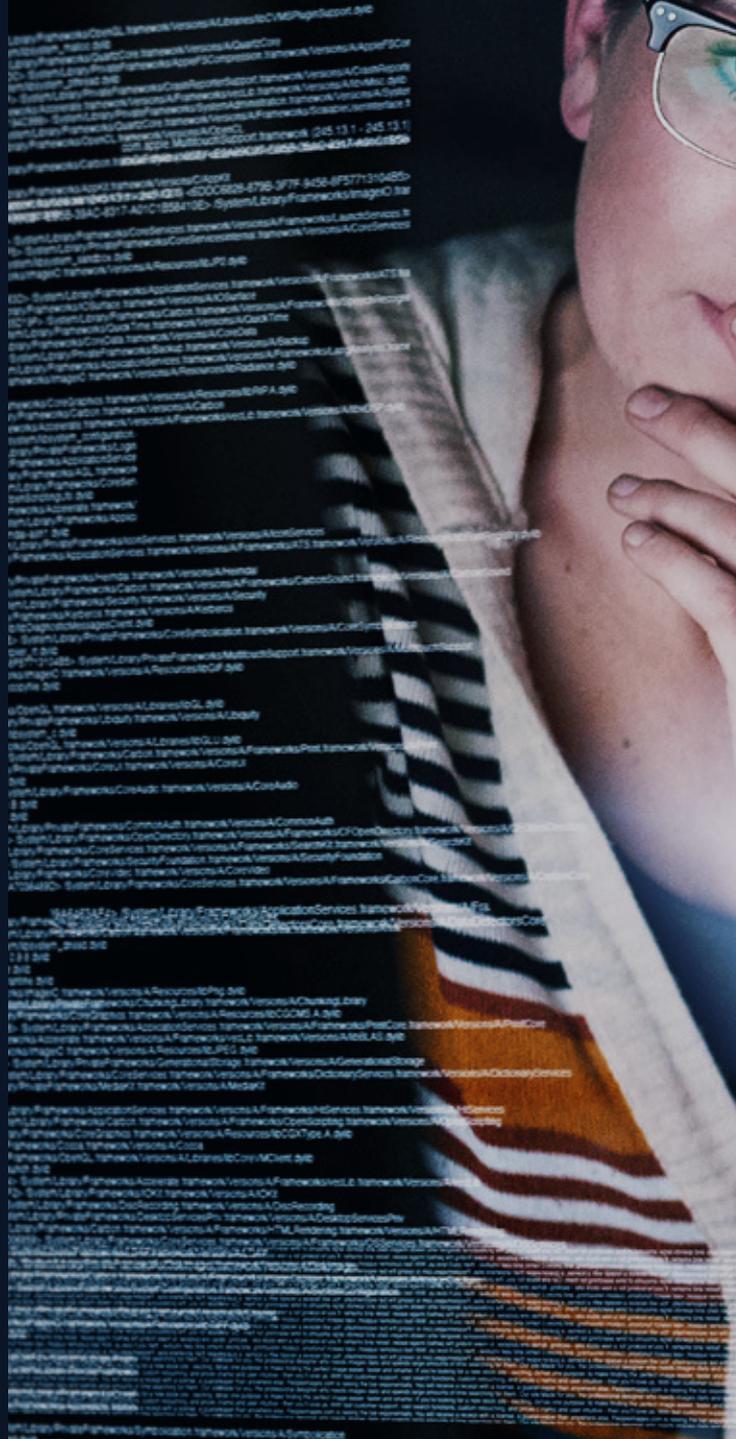
CapEx (of cesspool vehicle and SeTP) are being shared. Similarly, if the ULB is catering to peri-urban areas in a 15 km radius, the same can be determined. These costs could be considered while determining the cost-sharing model with the PRD. This could help in formalizing the market and making essential sanitation services available to these households and open new markets for private players. Refer to Appendix - A for detailed calculations.

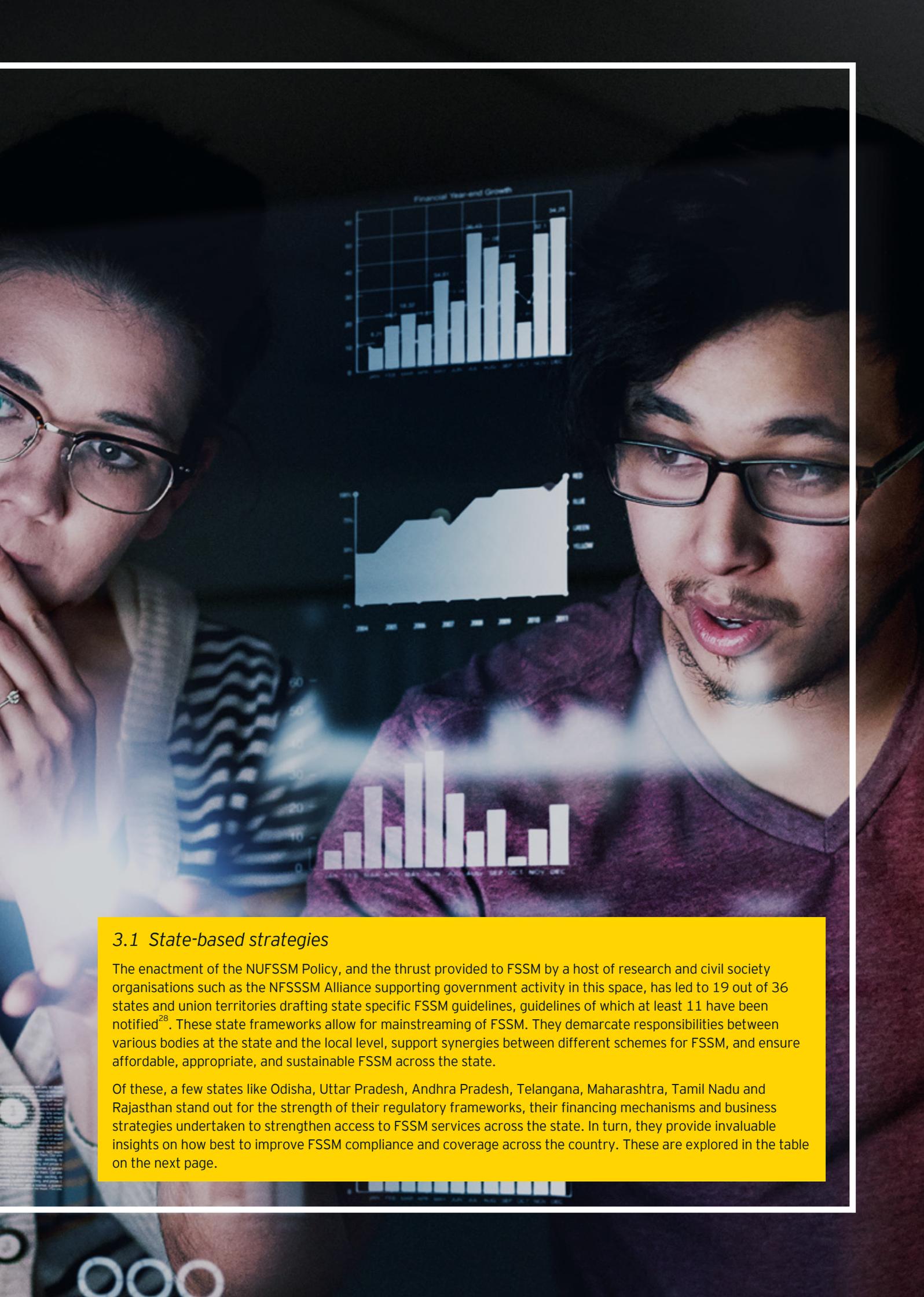
Figure 8: Cost sharing for extending FSSM services beyond ULB limits



However, a key factor to take into consideration while determining a cost-sharing mechanism would be that according to the recent SBM-Gramin (Phase II) guidelines, GPs can only use SBM-G funds for the building of new SeTPs. There is no provision regarding funding sources for the use of existing SeTPs. This might call for GPs to look for other funding avenues.

# Lessons for FSSM





### 3.1 State-based strategies

The enactment of the NUFSSM Policy, and the thrust provided to FSSM by a host of research and civil society organisations such as the NFSSM Alliance supporting government activity in this space, has led to 19 out of 36 states and union territories drafting state specific FSSM guidelines, guidelines of which at least 11 have been notified<sup>28</sup>. These state frameworks allow for mainstreaming of FSSM. They demarcate responsibilities between various bodies at the state and the local level, support synergies between different schemes for FSSM, and ensure affordable, appropriate, and sustainable FSSM across the state.

Of these, a few states like Odisha, Uttar Pradesh, Andhra Pradesh, Telangana, Maharashtra, Tamil Nadu and Rajasthan stand out for the strength of their regulatory frameworks, their financing mechanisms and business strategies undertaken to strengthen access to FSSM services across the state. In turn, they provide invaluable insights on how best to improve FSSM compliance and coverage across the country. These are explored in the table on the next page.

Table 2: Analysis of state-level level policies of FSSM in India

State	FSSM frameworks	Financing Mechanisms (leveraged and envisaged)	Business model and strategies
<b>Andhra Pradesh</b> 	<p>Faecal Sludge and Septage Management: Policy and Operative Guidelines for Urban Local Bodies in Andhra Pradesh<sup>29</sup></p> <p>Andhra Pradesh Government Order 134, March 2017<sup>30</sup></p>	<p>AMRUT and Smart City schemes for select cities and towns.</p> <p>For non-AMRUT towns, projects to be funded by Swachh Andhra Corporation, MA &amp; UD, Government of Andhra Pradesh (GoAP)</p>	<p><b>Business model:</b> Full private sector led desludging model for conveyance and Hybrid Annuity Model (HAM) (partial funding by private and partial by government) for treatment.</p> <p><b>Prominent private players:</b> Arvind Envisol Ltd and Tide Technocrats</p> <p><b>Strategies:</b></p> <ul style="list-style-type: none"> <li>▶ Conveyance for septage is being carried out by private sector players through on-demand desludging. This is expected to continue.</li> <li>▶ GoAP has set-up Swachh Andhra Corporation (SAC), which is expected to also undertake FSSM planning. SAC has issued tenders to set up FSTPs under a Hybrid Annuity Model (HAM) with 50% capex through private and 50% capex through government</li> <li>▶ FSSM helpline to aid ULBs in operationalizing government orders on septage management</li> <li>▶ Encouraging tripartite agreement between ULB, state and private operator for non-AMRUT cities</li> <li>▶ Creating new STPs &amp; co-treatment at existing STPs</li> <li>▶ CBO participation to strengthen FSSM lifecycle</li> </ul>
<b>Maharashtra</b> 	<p>Guidelines for Septage Management, 2016</p>	<p>Has asked ULBs that 50% 14th FC funding be used on sanitation, including FSSM<sup>31</sup>.</p> <p>Largest source of funding is AMRUT, but yet to be leveraged as of June 2019.</p> <p>State looking to harness a combination of AMRUT, 14th FC funds, ODF Incentive funds &amp; state schemes like Nagarothan Maha-Abhiyaan, Vaistah Purna;</p> <p>Exploring possibilities with MUINFRA, a state agency that provides loans to ULBs as well as via sanitation tax to be levied by ULBs<sup>32</sup>.</p>	<p><b>Business model:</b> Scheduled desludging with PPP annuity model for conveyance and local government funded treatment model in Maharashtra</p> <p><b>Prominent private player:</b> Sumeet Group</p> <p><b>Strategies:</b></p> <ul style="list-style-type: none"> <li>▶ The emerging experience of the cities of Wai and Sinnar in Maharashtra in providing citywide scheduled services using a PPP model with a performance linked annuity based on an open bidding process, has helped address concerns of both equity and affordability.</li> <li>▶ Performance-linked payments to private companies based on targeted number of septic tanks emptied and compliance to standards</li> <li>▶ 'Sanitation tax' levied on all properties in the city through which the private companies are paid</li> <li>▶ ULB empowered to monitor to ensure standards and norms are met</li> <li>▶ Standardized practices for private sector participation</li> <li>▶ Government of Maharashtra (GoM) has also asked ULBs to use 50% of 14th Finance Commission grants for sanitation, including for FSSM.</li> </ul>

State	FSSM frameworks	Financing Mechanisms (leveraged and envisaged)	Business model and strategies
<b>Odisha</b> 	<p>Odisha Urban Sanitation Strategy</p> <p>Odisha Urban Sanitation Policy (2016) &amp; ULB's regulation (2018)<sup>33</sup></p>	<p>Integration of several national urban programs (SBM, AMRUT, Smart City, NUHM and NULM) and state finances.</p> <p>INR 388 cr provided under 'Scheme for Special Assistance to States for CapEx' issued October 2020, by Center for any state project that is new or already initiated which will finish up by 2021<sup>34</sup>.</p>	<p><b>Business model:</b> Treatment plant Capex by state government, Opex by State or local government and operations by private</p> <p><b>Strategies:</b></p> <ul style="list-style-type: none"> <li>▶ A strong regulatory framework that grants monitoring and enforcement provisions to ULBs allowing for standardization of norms</li> <li>▶ Strict enforcement of FSSM Regulations to ensure safe disposal of septage and non-spillage</li> <li>▶ ULB empowered to monitor to ensure standards and norms are met</li> <li>▶ Extensive CBO engagement throughout the FSSM value-chain. Incentive-based system for demand generation</li> <li>▶ Standardized practices for private sector participation</li> <li>▶ ICT-enabled cesspool emptier vehicle monitoring</li> </ul>
<b>Rajasthan</b> 	<p>Draft Policy on FSSM, 2017<sup>35</sup> &amp; State FSSM Guidelines for urban Rajasthan, 2018<sup>36</sup></p>	<p>Funding for sanitation over a five-year period beginning in March 2015, funded by ADB via a sector development program (SDP).</p> <p>A recent \$300 million loan to finance inclusive and sustainable water supply and sanitation infrastructure by the Asian Development Bank (ADB), across 14 secondary towns of Rajasthan starting 2020<sup>37</sup>.</p> <p>Also envisages leveraging PPP, CSR funds, Guarantee funds, crowdfunding, donor grants, Social and Development Impact Bonds, ULB Incentive Fund etc<sup>38</sup>.</p>	<p><b>Business model:</b> Government-owned vehicles and leased to private players for operations</p> <p><b>Strategies:</b></p> <ul style="list-style-type: none"> <li>▶ Mandates licensing of private sector players and allowing them to negotiate rates with those HHs not opting for municipal services.</li> <li>▶ Recommends cluster-based approach by having a dedicated treatment facility (FSTP/STP).</li> <li>▶ Upcoming treatment units to be shared among a large beneficiary group within 20 kms to decrease cost on ULBs and increase the functionality of the plant operations<sup>39</sup></li> </ul>

State	FSSM frameworks	Financing Mechanisms (leveraged and envisaged)	Business model and strategies
<b>Tamil Nadu</b> 	Tamil Nadu Septage Management Operative Guidelines, 2014 <sup>40</sup>	Strong state presence in funding. CapEx of FSTPs funded through its Integrated Urban Development Mission funds and SBM funds, with OPEX left to ULBs <sup>41</sup>  Water & Sanitation Pooled funding + AMRUT + Externally Aided projects envisaged for future FSSM <sup>42</sup>	<b>Business model:</b> Government-owned vehicles and leased to private players for operations  <b>Strategies:</b> <ul style="list-style-type: none"> <li>▶ In Tamil Nadu, the state government has adopted a cluster-based approach for treatment i.e. a common FSTP for a cluster of cities. To optimize investments the cluster approach is divided into 5 phases.</li> <li>▶ On-demand desludging, with heavy private participation and Opex recovery from user charges is the prevalent model.</li> </ul> Use of innovative pooled funds like Water and Sanitation Pooled Fund: the pooled bond mechanism has been successfully used by the TNUDF over the past 15 years for mobilizing market resources for water and sanitation investments by smaller ULBs in Tamil Nadu <sup>43</sup>
<b>Telangana</b> 	The 2018 State Faecal Sludge and Septage Management (FSSM) <sup>44</sup>  Request for Proposals for FSTPs in 72 more urban areas <sup>45</sup> .	Envisages using SBM funds, ULB Seed funding of INR 25 Crore for Sanitation Hub <sup>46</sup>	<b>Business model:</b> State government funded through national/ state programs for Capex and Opex  <b>Strategies:</b> <ul style="list-style-type: none"> <li>▶ Empowering desludging operators and issuing licenses, to have them maintain records.</li> <li>▶ Unlicensed/refusing to get registered have their vehicles seized<sup>47</sup>.</li> <li>▶ State also planning an Urban Centre in water, sanitation, solid waste management and wastewater recycling areas<sup>48</sup></li> </ul>
<b>Uttar Pradesh</b> 	Draft State for FSSM Policy, 2019 <sup>49</sup>	INR 450 Crore for FSSM under AMRUT  Allocations under Namami Gange for setting up FSTPs <sup>50</sup>  Allocations via 14th FC leveraged by certain ULBs.  Funds to be allocated from the State Budget since Septage Policy has been approved by Cabinet <sup>51</sup> .	<b>Business model:</b> State government funded through national/ state programs for Capex and Opex  <b>Strategies<sup>52</sup>:</b> <ul style="list-style-type: none"> <li>▶ Uttar Pradesh Jal Nigam appointed as the Nodal Agency for Implementation of FSTPs in the State to help with planning &amp; coordinating.</li> <li>▶ Urban Local Bodies to levy Septage Fee.</li> <li>▶ An Independent Engineer whose cost is to be shared between the authority &amp; bidder - to be appointed to monitor FSTP implementation.</li> <li>▶ Minimum Guarantee payment of 50 HHs cleaning per month to private sector.</li> <li>▶ Price adjustment based on CPI index</li> </ul>

### 3.2 Innovative financing models

Traditional sources of funding for FSSM run the gamut from scheme-based funding (such as AMRUT, Smart Cities), to funds provided by state urban development bodies, to those devolved under 14th FC to ULBs, with a few external assistance/donor funded projects. The FSSM space is very much nascent in India, and the Center continues to be the largest end-to-end funder, with state and ULB funds being miniscule in comparison.

However, in the light of rapid urbanization, increased thrust on preventing ODF, accompanied by major re-routing of government funds due to COVID, it is important to ensure alternate sources of financial access, which can leverage to ensure continued thrust on FSSM in the country. While implementing some of these unique sources of financing would require inspiring a mindset change, accompanied changes in reporting and compliances, creating such an alternate finance ecosystem could help free up banks - currently the largest source of infrastructure funding - to instead lend to the retail sector, thereby improving liquidity in the market, rather than having their funds tied up in asset creation<sup>53</sup>.

A few best practices that can be borrowed from other sectors include the following:

**Hybrid Annuity Model (HAM):** The HAM model has become well known since its introduction by the government to revive PPP (Public Private Partnership) in highway construction in India. Under the model, the government makes a fixed amount payment for a specific period and then a variable amount for the remaining period in the form of 'annuities'. States like Andhra Pradesh and Telangana have adopted HAM in building FSTPs, since it provides opportunities to leverage public resources to bring in private sector funding for treatment, while reducing

the burden of initial public investments<sup>54</sup>. The HAM model is also linked to the performance, and is expected to help improve efficiency and effectiveness in operations<sup>55</sup>. The Andhra and Telangana experience can offer lessons to other states looking to leverage innovative financing mechanisms.

**Securitization of Bonds:** In 2019, Grameen Impact Investments India (GIII) and Acumen together raised SDG bonds to on-lend to social enterprises involved in training and skill development to meet the UN's Sustainable Development Goals (SDG)<sup>56</sup>, throwing light on an alternate source of funding to finance critical infrastructure<sup>57</sup>. Often financial institutions in India are plagued by asset-liability mismatches when it comes to lending to the infrastructure sector in India. Asset securitization allows the selling institution to arrange debt issues to fund assets, with payments matching the cash flows from the assets<sup>58</sup>. Securitization could therefore potentially provide an avenue for small scale infrastructure projects within the FSSM value chain like FSTPs, to attract investments from investors who are well aware of the risks and rewards of taking on such a project.

**Impact Investing:** Impact investing is often driven by dual missions of social-environmental development and financial returns<sup>59</sup>. Impact investing is very prevalent in a number of sectors in India, such as housing and microfinance, with a recent interest in renewable energy<sup>60</sup>. Many impact investors fund companies and sectors whose business models take time to mature, prove sustainability, and grow to scale. FSSM technologies, particularly those offering integrated solutions at scale across a number of ULBs, can be championed through impact investing because the latter offers patient capital, and because FSSM can show rigorously measured outcomes that attract potential investors<sup>61</sup>.

**Municipal Bonds:** Recently, over eight local bodies in India, including Ahmedabad and Pune have raised

Rs 3,390 crore via municipal bonds, and the same is expected to get a thrust under Smart Cities Mission<sup>62</sup>. This is because the Securities and Exchange Board of India (SEBI) Regulations, 2015 allow municipalities that have not defaulted loan repayments the last year, and which do not have any negative net worth over 3 preceding years, to issue bonds to raise funds for funding their development projects<sup>63</sup>. Not only are default rates low, but it has proven to be successful in countries like the US, where 2/3rd infrastructure projects are funded via municipal bonds<sup>64</sup>. This is thus a great way to raise finance for modest municipal infrastructural projects like setting up FSTPs, and to encourage better city fiscal performance.



### 3.3 Convergence of government schemes

Scheme convergence is a useful tool in bringing about synergies between different government policies and schemes, and is an expediter of better planning, financing and implementation. In the area of FSSM, scheme convergence will not only aid in scaling the reach of FSSM practices across the country, but also facilitate sustainable development. Additionally, doing so will also accelerate private sector involvement through every stage of the FSSM value chain.

#### Infrastructure funding:

##### I. Urban

- ▶ On the urban side, the NUFSSM Policy already drives convergence of FSSM under a number of mission programs like SBM-U, Smart Cities Mission (SCM), AMRUT, etc. These schemes of the Ministry of Housing & Urban Affairs, both incentivize the adoption of FSSM as a way to meet sanitation targets and sets aside a dedicated amount for funding interventions under this.
- ▶ Schemes like HRIDAY, and PMAY, which address city augmentation and housing needs respectively, highlight the need for proper sanitation facilities/toilets at a city and household levels, thereby indirectly reinforcing the need for FSSM.

##### II. Rural

- ▶ The new SBM-Gramin 2.0 operational guidelines released in July 2020 suggests extending urban FSM services to rural people located within a 10 km radius of the urban local facility.
- ▶ The Ministry of Panchayati Raj highlights the roles and responsibilities of gram panchayats in rural India with respect to FSSM, as part of its 'Sujal & Swachh Gaon' strategy. The 14th FC funds works related to sanitation, and SLWM in such areas.
- ▶ SBM-G, the rural counterpart of SBM-U, under the Ministry of Jal Shakti, emphasizes ODF behaviours and focuses on providing interventions for the safe management of solid and liquid waste in villages, particularly those on the banks of the Ganges<sup>65</sup>.
- ▶ Namami Gange, an integrated conservation project that seeks to improve river health, requires STPs to be designed to accommodate FSSM practices, as part of its plan to prevent untreated waste from being released into the river Ganga<sup>66</sup>.

##### III. Others:

- ▶ Schemes like TREAD<sup>67</sup>, Stand-Up India<sup>68</sup>, and Pradhan Mantri MUDRA Yojana (PMMY)<sup>69</sup> also offer last-mile financing capabilities, particularly of interventions in the non-farm sector. Both Stand-Up & PMMY make specific provisions to include women, whereas TREAD is dedicated towards only helping women micro-entrepreneurs via SHGs. All 3, in varying capacities can help finance FSSM interventions by private persons across urban and rural India.

### Skill Development:

- ▶ The National Skill Development Corporation, under Ministry of Skill Development and Entrepreneurship provides support in terms of capacity building for FSSM<sup>70</sup>.
- ▶ Skilling schemes under Ministry of Skill Development and Entrepreneurship as well as the Deendayal Antyodaya Yojana-National Urban Livelihoods Mission (DAY-NULM) under MoHUA, can also be leveraged to provide skilled workforce and field functionaries to fulfil the demands in the urban sanitation space<sup>71</sup>.

### Awareness & Behavior Change:

SBM already has behaviour change as a key component of their program. Additionally, schemes like the DAY-NULM can also be leveraged to use community organizations and self-help groups as vehicles for driving awareness on FSSM and to push for behavior change.

### Market Linkages:

- ▶ The New National Biogas Organic Manure Programme (NNBOMP) of the Union Ministry of New and Renewable Energy (MNRE) funds production of biogas from sanitary toilets linked to cattle dung based biogas plants, as a way to both provide households access to a clean energy source and to improve sanitation in rural and semi-urban areas<sup>72</sup>. This offers great thrust for households to adopt FSSM solutions<sup>73</sup>.
- ▶ SBM(G) Phase 2 guidelines incentivize the setting up of biogas plants under their Galvanizing Organic Bio-Agro Resources (GOBAR) Dhan Schemes, powered by biowaste, including human excreta, both at individual household and community levels<sup>74</sup>.
- ▶ These are great ways to generate economic value from FSSM, while aiding in sanitation



### 3.4 Emerging opportunities through health- and COVID-focused programs

Globally, there are over 55.8 million COVID-19 cases as of now<sup>75</sup>, of which over 8.9 million are India based<sup>76</sup>. The rapid spread and mode of transmission of the virus has brought to light both the importance of sanitation, and the inequities when it comes to its access. While India has prioritized sanitation, over the last decade, there still remains a lack of adequate access to toilets, despite efforts of schemes such as SBM Urban & Gramin, and Pradhan Mantri Awas Yojana (PMAY) to improve coverage. Open defecation (OD) continues to be a concern, and many places such as slums and informal settlements rely on community toilets where sanitation systems for individual households cannot be accommodated. Both OD and community toilets increase human proximity to liquid waste and run counter to social distancing norms, thereby increasing chances of community transmission of the COVID virus. The same goes for untreated or partly treated sludge released into lakes and rivers which in turn pollutes over 60% of India's available water resources<sup>77</sup>. Such situations throw open the need for state and the central government to change their existing strategies with respect to sanitation, to ensure access to adequate facilities without having to compromise on the health of those seeking access to it.

In particular, this requires the central and state governments to realign their overall sanitation priorities in line with access to health and hygiene, given how indispensable proper sanitation is to ensure a safe and disease-free environment. This is significant, given how the advent of COVID has seen a re-routing of almost all viable sources of government funding, as well as donor and philanthropic efforts towards health programs to the exclusion of sanitation ones. But when it comes to the demographic most in need of health services, and those most under-

served by access to public services like sanitation, there is a definite overlap. This makes this demographic doubly vulnerable - both to environment hazards as well as the health crisis generated by the ongoing pandemic. Hence, the government must look to strengthen the overall WASH ecosystem and ensure a greater synergy between its various schemes dealing with health, sanitation, drinking water and hygiene.

Some potential opportunities for convergence between sanitation, health and water programs include:

1. Make sanitation programs COVID resilient by making necessary changes to ODF/ODF++ guidelines, so as to highlight the problems of, and to staunchly discourage open defecation.
2. Increase funding for overall sanitation schemes like SBM (urban and rural), and encourage convergence with schemes like AMRUT and RURBAN to improve FSSM in the country.
3. Use housing schemes like PMAY to seek greater thrust on ensuring access to individual toilets for every households, and slowly move away from reliance on community toilets.
4. Ensure increased access to piped water under schemes like Jal Jeevan Mission so as to reduce dependency on community water sources, and to encourage creation of/reliance on household toilets.
5. Expand focus on funding river rejuvenation schemes like Namami Gange and improving their coverage, to ensure setting up of adequate FSTPs for treating waste that will be discharged into rivers, and to improve monitoring and enforcement of norms related to treatment and disposal of liquid waste.

In addition to converging efforts via different schemes, it is also important

for the government to ensure business continuity of on-going sanitation programs and projects, including existing engagements by the private sector working in FSSM. This means allowing the safe and continued functioning of, and ensuring regular payments to, private sector players, including local sanitation workers. Additionally, it is important to encourage further private sector involvement to both help augment government capacity in tackling COVID, and in creating COVID resilient infrastructures.

### 3.5 Potential for private sector and community based collaborative approach

Robust community engagement is a key aspect of ensuring successful implementation of FSSM in urban, per-urban and rural areas. Embracing a collaborative approach involving the local community will ensure greater willingness on their behalf to co-opt FSSM technologies and increase awareness on the need to do so. Such an approach will go a long way towards ensuring buy-in from the local community towards adhering to norms such as building codes and regarding regular desludging, and increase their willingness pay the private sector for transport, treatment and disposal services. Additionally, if community-based organizations also have an economic stake/ownership in the FSSM intervention as a result of being employed through it, then they are doubly incentivized to ensure its continued application.

In recognition of this, some states have already harnessed grassroots level network of CBOs under collective action schemes like the National Urban Livelihood Mission (NULM) to increase FSSM sensitization and awareness, and to encourage community ownership of the process at all levels.

# Case study 1

## Community-led sanitation in Odisha

An example of a successful social entrepreneurial activity undertaken with respect to FSSM is by Odisha, where the state has leveraged NULM to engage women SHGs in the O&M of community toilets (CTs). Several cities like Berhampur, Balasore, Bhadrak, Bhubaneswar and Cuttack have initiated inclusive sanitation. In Bhadrak, for example, an SHG of sanitary workers from a vulnerable community is engaged for O&M of cesspool emptier vehicles in the municipal corporation.

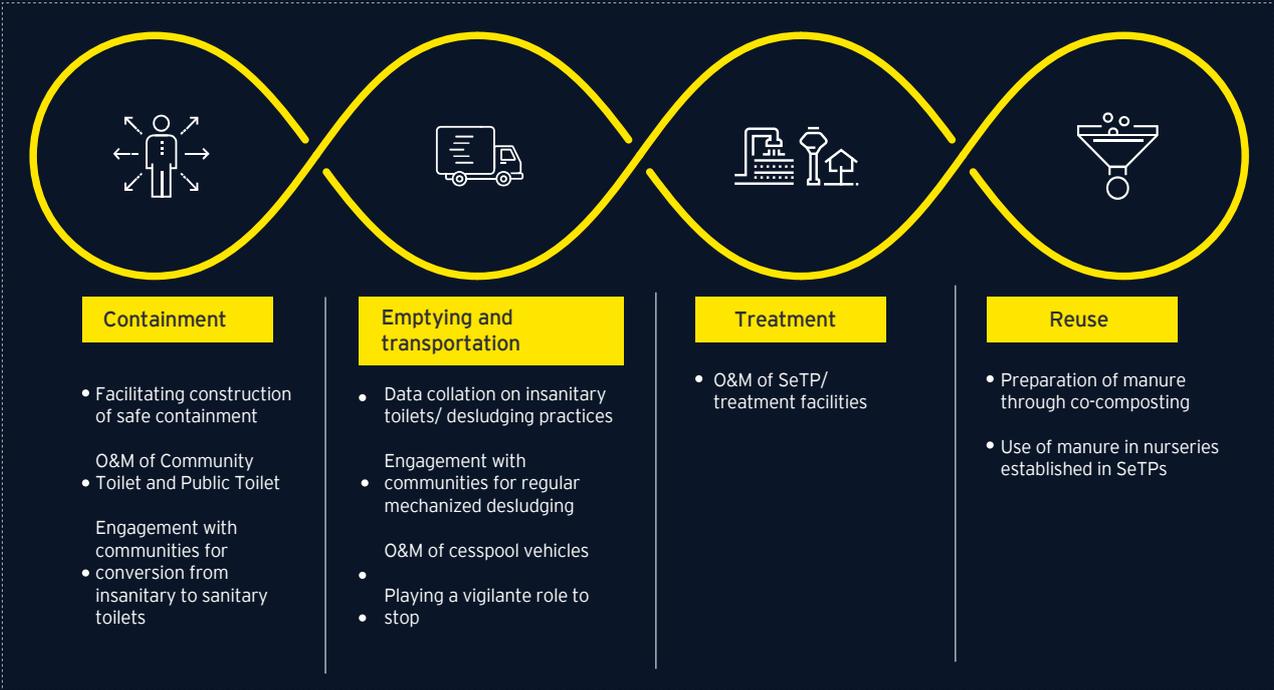
In yet another path-breaking decision towards women empowerment and inclusive sanitation, the Government of Odisha handed over the Operation and Maintenance (O&M) of four Septage Treatment Plants (SeTPs) to Self-Help Groups (SHGs) in the state. The treatment facilities were handed over to women SHGs in Berhampur, Baripada and Sambalpur and to a transgender SHG in Cuttack. Besides these current four cities, SHGs are also to be engaged in the other functional as well as future SeTPs. The SHGs will now be responsible for the daily O&M of the SeTPs which includes - managing everything from the entry of all cesspool vehicles for discharging faecal sludge at the plant, to regular treatment, to minor repairs and upkeep of the plant, and management of the staff etc.



Member of Bahuchara Mata Transgender SHG engaged in O&M of SeTP in Cuttack

The involvement of such vulnerable groups has helped the government to improve on-ground sanitation services through a linkage between livelihood and efficient FSSM services. In addition, it boosts confidence and dignity of the group members, who are looked upon as role models in their community. This has been done with constant support from BMGF.

Figure 7: Current engagement of CBOs throughout the sanitation value-chain in Odisha



## Case study 2

### Business model of Gramalaya

Gramalaya, established in 1987 is an NGO dedicated to promote water, sanitation, hygiene and overall improvement of the rural, urban, coastal and tribal population in India. Gramalaya's approach involves entrusting communities to work on projects by being part of its implementation process.

The business model in Tiruchirapalli, Tamil Nadu which has impacted over 375 slums features

1. **Gender mainstreaming** - Local women's self-help groups manage all aspects of community toilets, from operation and maintenance to financial supervision, helping to empower local women and engage communities.
2. **Capacity building** - Gramalaya or a local NGO builds the infrastructure and provides training to women's self-help groups on how to operate the structure, after which ownership is transferred to the community.
3. **Accountability** - Women from the same community manage the complete operations of toilets, which leads to improved ownership and accountability toward maintenance of the toilets.



Through their model, Gramalaya has been addressing several constraints like

- ▶ **Covering O&M:** Pay-per-use is working as a financially viable revenue model to cover operation and maintenance costs. As a community-led initiative, monthly meetings are held, and financial accounts are checked regularly through social auditing to ensure funds are accounted for.
- ▶ **Keeping toilets clean:** By engaging women to manage the toilets and applying social-auditing principles, the toilets are routinely cleaned and kept to a high standard of cleanliness.
- ▶ **Creating awareness and generating demand:** During community mobilization, issues such as open defecation, health, and hygiene are addressed using social and behavioural change communication.

Source: Business model insights for Community and Public toilets In India, Sanitation Technology Platform (STeP), February 2019

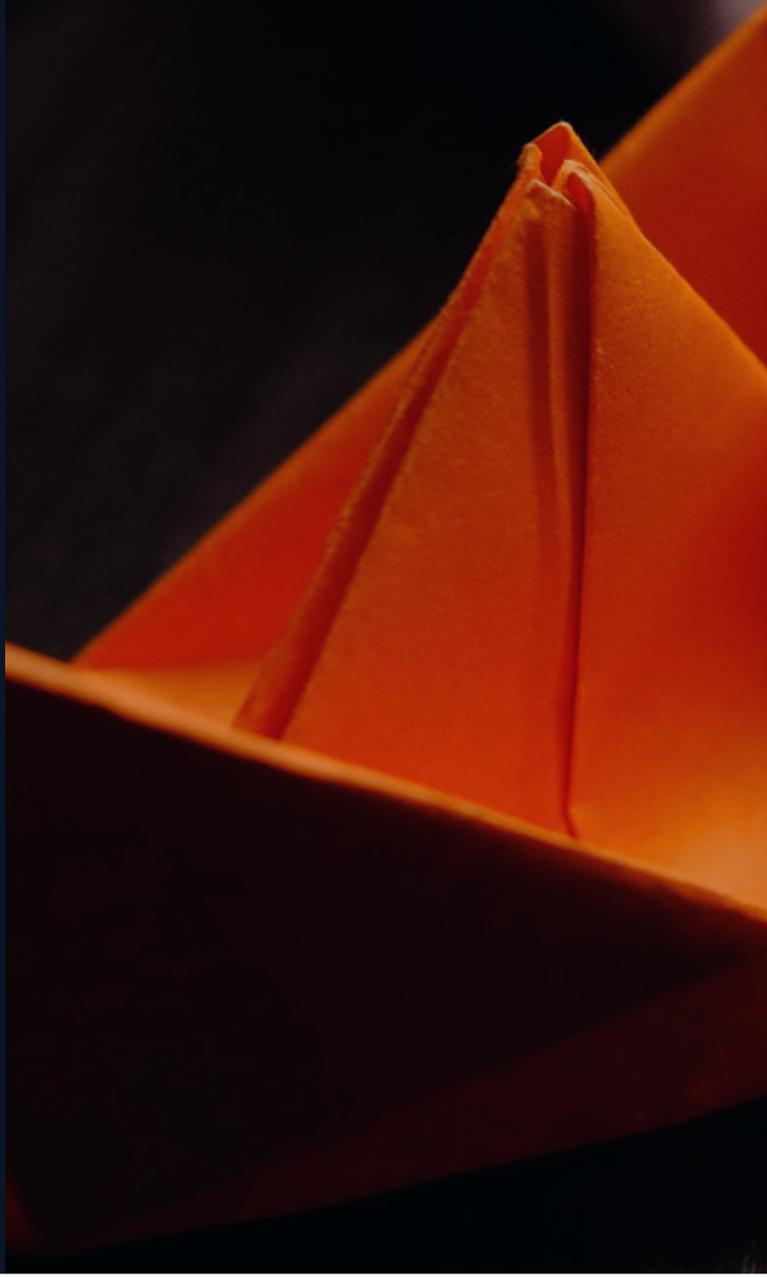
Some key positives that emerge from private sector co-opting CBOs in their work are as follows<sup>78</sup>:

- ▶ CBOs act as facilitators for encouraging by-in of private sector services in FSSM by the local community
- ▶ Employment of community members in the FSSM value chain improves institutional arrangements with ULB / local governments, such as contractual clauses, payments, licensing norms et al, given the community stake in the project.
- ▶ Most CBOs/SHGs are set-up under government frameworks, and their presence could add credibility to private sector enterprises, helping them gain easier access to finance and funding, thereby helping them scale.
- ▶ Better enforcement of, and adherence to standards and norms can be expected from the community due to CBO involvement.



# Way forward

4





It is apparent that private enterprises can clearly add value to the sanitation ecosystem by participating as a key player in the FSSM space in India. They provide greater technical expertise and innovation, as well as higher service levels, infuse finance, and help fast track implementation. In doing so, they not only improve access to public delivery systems, but also reduce the burden for ULB staff, and help bring about positive behavior change in the community, with respect to sanitation.

However, for them to do so, it is important for the government to induce their participation by creating a market that is institutionally robust and financially viable for them. On the same note, it is essential for the private sector to continue to strengthen their engagement with the government to deal with any potential trust deficit against private enterprise.

Lastly, it is imperative to inspire confidence in donor agencies to fund such projects alongside the government and private sector, by demonstrating a continued commitment towards sanitation, and by instituting strong data backed monitoring mechanisms that help identify gaps and opportunities.

#### 4.1 Call for action: Government

Some steps the government can take in order to incentivize private sector participation can be summarized as -

**Reducing entry barriers** for formal businesses to enter the space and helping informal players to formalize by way of incubation and up/skilling support under government schemes, and by promoting innovations and adoption of disruptive technology.

**Administrative, legislative and regulatory changes** to strengthen institutional architecture, including coming out with clear cut guidelines and norms for FSSM application across all states.

**Improve financial resilience** by (i) having dedicated funds set aside for FSSM under government schemes which can be easily accessed; (ii) enabling innovative streams of funding like municipal bonds, impact investing, securitization; (iii) encourage increase devolution of funds to ULBs under 15th Finance Commission over 14th FC; (iv) enhance ULB's ability to raise own revenues through state borrowings or property tax is enhanced; (v) Ensuring availability of loans through banks under popular entrepreneurship driving schemes like MUDRA and Start-up India.

**Bettering procurement guidelines and contract management** including (i) increasing flexibility when it comes to geographic, technical or business turnover thresholds under contracts to encourage entry of SMEs and smaller players, (ii) transparent and detailed contractual terms to understand costs and risks involved; (iii) implementing service level agreements to reduce risks of delayed payments, and (iv) instituting a proper grievance redressal system to help handle concerns like delayed payments, contract revisions, etc., emerging from the private sector.

Government schemes for FSSM across ministries need to **set funds out not just for creation of new infrastructure,**

**but also for ensuring refurbishment and use of existing infrastructure.** This becomes particularly relevant in the peri-urban context or business models calling for urban-rural integration.

#### 4.2 Call for action: private sector

Some steps the private sector can take to ensure their own participation in the FSSM space, include -

- ▶ Work with the government to help infuse technology, innovation and best practices into the country's FSSM framework
- ▶ Engage better with local governments to explore the scope of work for development of appropriate contracts and payment systems, capacity building support etc.
- ▶ Encourage strengthening and buy-in of FSSM services in peri-urban areas through adoption of urban-rural integration models via MoUs and cost-sharing agreements.
- ▶ Support the creation of data driven FSSM practices and help with monitoring through proper book and record keeping.

#### 4.3 Call for action: financing agencies

Some steps financing institutions and donor agencies can take in order to incentivize private sector participation are -

- ▶ Bring international expertise and standard operating procedures to the Indian FSSM ecosystem so as to infuse both innovation in FSSM practices and ensure creation of balanced risk-sharing mechanisms in agreements between government and private sector.
- ▶ Champion alternate financing and revenue models for FSSM players, particularly FSTP operators, and

help with access to innovative ways of low-cost credit.

- ▶ Help in bridging viability gap funding for financing parts of the FSSM ecosystem, such as FSTP.
- ▶ Work with national and regional financial agencies to help with their capacity building to improve FSSM lending.
- ▶ Help train and embed FSSM consultants who can provide technical know-how, capacity building and ecosystem assistance to help local governments create viable private sector engagement models in FSSM.

# Appendix

## Cost-sharing for peri-urban and urban convergence in FSSM

The per trip has been determined by taking up the example of the SeTP constructed at Baripada, Odisha. The figures included are based on actuals, which have been collected from the Technical Support Unit (TSU) FSSM based in Odisha.

The per trip cost would vary basis two critical factors:

- i. Distance per trip
- ii. Whether Opex or Opex + Capex recovery is being targeted

The calculations have been done by taking the following costs into consideration:

- i. Capex of SeTP
- ii. Capex of cesspool vehicle
- iii. Opex of SeTP
- iv. Opex of cesspool vehicle

These costs have been further used to determine the SeTP Opex cost for 3 KL or one trip. Similarly, the vehicle Opex cost per km for 3 KL has been determined.

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# Abbreviations

AMRUT	Atal Mission for Rejuvenation and Urban Transformation
BEMC	Berhampur Municipal Corporation
BIS	Bureau of Indian Standards
BSUP	Basic Services for Urban Poor
BWC	Blue Water Company
CAPEX	Capital Expenses
CBOS	Community based organizations
CPCB	Central Pollution Control Board
CPHEEO	Central Public Health and Environmental Engineering Organization
CSPS	City Sanitation Plans
CSR	Corporate Social Responsibility
CT	Community Toilet
DAY-NULM	Deendayal Antyodaya Yojana-National Urban Livelihoods Mission
DWSSA	Dhaka Water Supply & Sewerage Authority
EPA	Environment (Protection) Act
FC	Finance Commission
FSSM	Faecal Sludge and Septage Management
FSTPS	Faecal Sludge Treatment Plants
GDP	Gross Domestic Product
GII	Grameen Impact Investments India
GOAP	Government of Andhra Pradesh
GOBAR	Galvanizing Organic Bio-Agro Resources
GPS	Global Positioning System
GVA	Gross Value Added
HAM	Hybrid Annuity Model
IHHL	Individual Household Latrines
JNNURM	Jawaharlal Nehru National Urban renewal Mission

JSM	Jal Shakti Mission
LMC	Leh Municipal Committee
MBBLS	Model Building By-Laws
MEMPA	Mission for Elimination of Poverty in Municipal Areas
MIS	Management Information system
MLALADS	Member of Legislative Assembly Local Area Development Scheme
MOHUA	Ministry of Housing and Urban Affairs
MOSJE	Ministry of Social Justice and Empowerment
MPLADS	Member of Parliament Local Area Development Scheme
NBC	National Building Code
NGOS	Non-Governmental Organizations
NSKFDC	National Safai Karamcharis Finance and Development Corporation
NUFSSM	National Urban Faecal Sludge and Septage Management
NUHM	National Urban Health Mission
NULM	National Urban Livelihood Mission
NUSP	National Urban Sanitation Policy
O&M	Operation and Maintenance
OD	Open defecation
ODF	Open Defecation Free
OPEX	Operating Expenses
OSSF	On-Site Sanitation facilities
PMAY	Pradhan Mantri Awas Yojana
PMMY	Pradhan Mantri MUDRA Yojana
PPE	Personal Protective Equipment
PPP	Public-private partnership
PR	Panchayati Raj
PSP	Private sector participation
PT	Public Toilet
RAY	Rajiv Awas Yojna
SAC	Swachh Andhra Corporation
SBM-G	Swachh Bharat Mission- Gramin
SBM-U	Swachh Bharat Mission-Urban
SDGS	Sustainable Development Goals
SEBI	Securities and Exchange Board of India



SLWM	Solid & Liquid Waste Management
SPCB	State Pollution Control Board
STPS	Sewage Treatment Plants
SUDA	State Urban Development Authority
SUY	Swachhta Udyami Yojana
UIDSSMT	Urban Infrastructure Development Scheme for Small and Medium Towns
ULBS	Urban Local Bodies
USAID	United States Agency for International Development
WASH	Water Sanitation & Hygiene
WSUP	Water and Sanitation for the Urban Poor

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