



SMALL remains BEAUTIFUL

PRIVATE SECTOR PARTICIPATION
IN FAECAL SLUDGE & SEPTAGE
MANAGEMENT

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ABOUT THE POLICY BRIEFS

During the first phase of the Swachh Bharat Mission—Urban (SBM-U) in 2014-2019, toilet construction increased manifold. Resultantly, almost all households in India now have access to a toilet. However, the large-scale toilet construction under the SBM-U has not been matched with a concomitant expansion of the sewerage network, that currently caters to about merely one-third of the Indian households. The remaining households are dependent on On-Site Sanitation (OSS) systems such as septic tanks and pits, that are prone to overflow and require timely desludging. Further, instances of direct disposal of faecal sludge into open drains, either directly from toilets lacking an OSS system, or from malfunctioning OSS systems, manifest adverse environmental and public health impacts. Against this background, Faecal Sludge and Septage Management (FSSM) emerges as a fundamental need to manage the problems associated with collection, treatment and disposal of faecal waste.

Over the past few years, under AMRUT and SBM, the state governments have set up a number of treatment facilities or FSTPs (Faecal Sludge Treatment Plants) to address the issues related to treatment of faecal sludge. However, much less attention has been attributed to the collection and conveyance part of the FSSM value chain, creating a significant service gap, that is unviable to be solely addressed by the public sector. To address the service disparities, a host of private enterprises providing FSSM services has emerged in India, predominantly through an informal, small-scale operation. With an increasing recognition of the fundamental role of the private sector in bridging the gap between the availability and requirement of FSSM services, the launch of the National Faecal Sludge and Septage Management (NFSSM) Policy in 2017 further emphasised the need to redress the informality associated with the sector.

As a part of its research programme on urban sanitation, SCI-FI has been researching the nature and scope of private sector participation in urban sanitation services. Based on SCI-FI's interventions and research, a series of five Policy Briefs has been prepared in an effort to summarise the sector characteristics and the gamut of private participation in the collection, conveyance and treatment part of the FSSM sector. The five policy briefs in the series are titled as follows:



1. **PPP experiences of Key Infrastructure Sectors: Learnings for FSSM**
2. **Designing a Framework to Facilitate Private Investments in FSSM**
3. **Characteristics of the FSSM Sector**
4. **Business Needs and Good Practices in the FSSM Sector**
5. **Framework for Finance Flows in the FSSM Value Chain**



EVALUATING PPP EXPERIENCES OF KEY INFRASTRUCTURE SECTORS: LEARNINGS FOR FSSM



1 BACKGROUND



While the increasing urbanisation has intensified the pressure on the demand for public service delivery, it is seldom matched by concomitant increase in the financial capacity of the public sector to expand service provision. Against such demand and supply disparities, the involvement of the private sector in infrastructure development provides an opportunity to ease the burden on the public sector while also increasing the pace and efficiency of project development. Additionally, the most important incentive for pursuing a Public Private Partnership (PPP) model of business for service provision is that the risks associated with any project are shared between the private and the public sector.

The origins of PPP can be traced back to the early 19th century for development of public infrastructure in North America, in the construction of the country's railway network, among other projects. However, in most developing countries of the Asia and Pacific region, PPP in infrastructure service provision is comparatively a new experience. In India, following the economic reforms introduced in 1991, private investments in key infrastructure

sectors started with projects in natural gas, power and roads, that were developed using PPP business models. With the turn of the century, PPP models started attaining significant traction in these sectors, primarily triggered by the introduction of the National Highway Development Programme in 1997, Electricity Act 2003 and, to some extent, the launch of the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) that ushered major reforms in the water, sewage and Municipal Solid Waste sectors.

Specifically in the sanitation sector, the first PPP model was introduced for a water cum sewerage utility project in Tiruppur, Tamil Nadu, granted by the state government in 2000 as a Management and Lease Contract. The first PPP-led greenfield project was the Alandur underground sewerage project conceived in 2001, that included laying of the main sewer line, branch sewer line and manholes, and the construction of pumping stations and a sewage treatment plant. The latest success in private sector participation is in the Municipal Solid Waste (MSW) management sector, wherein 48 PPP projects were conceived within a span of 10 years between 2008

and 2018. The first such project was the Tamil Nadu State's Madurai City Integrated Municipal Solid Waste Management Facility in 2008.

However, the adoption of PPPs in the water and sanitation sector has been comparatively protracted than the others due to the historically poor performance of such projects in India. According to the World Bank's Public Private Infrastructure Database, there were only 6 PPP projects related to the sanitation sector that were launched between the year 2000 and 2018, comprising merely 0.6% of the total PPP-led infrastructure projects undertaken during the same period. The first PPP project in Faecal Sludge and Septage Management (FSSM) was the construction and management of a Faecal Sludge Treatment Plant (FSTP) at Devanahalli, Bengaluru in the year 2017. Since then, different models of PPP have been experimented with across the sanitation value chain, including the cluster based Hybrid Annuity Model (HAM) for FSTP construction and management in Andhra Pradesh, where 76 FSTPs are clustered into 7 packages to promote economies of scale and to attract credible and established operators (Niti_Aayog, 2021)

Owing to the substantial construction of toilets under the First Phase of the Swachh Bharat Mission between 2014 and 2019, almost 100% households have a toilet facility today. However, the sewerage connection remains limited to approximately 30% of households with the rest either being connected to On-site Sanitation Systems (OSS) or with open drainage. Due to the absence of government efforts to secure the entire sanitation value chain, especially FSSM, the business of 'desludging' the OSS systems and the transportation and disposal of faecal sludge has been taken over by a host of private enterprises. The National Faecal Sludge and

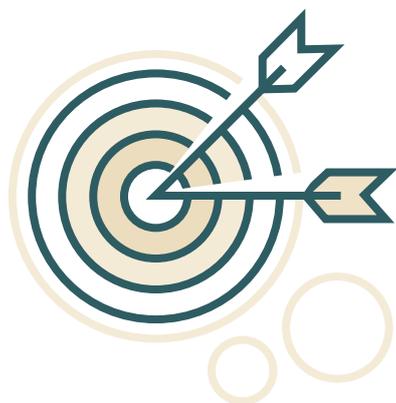
Septage Management (NFSSM) Policy launched in 2017 recognised the fundamental role of the private service providers in bridging the gap between the availability and requirement of FSSM services and emphasised the need to streamline the same.

Despite being in a nascent stage, private sector participation in FSSM is emerging as a reality for India's urban centres. Considering the ample scope for integrated private sector-led service delivery in FSSM, it is crucial to assess the scale and the models of PPP that will ensure optimal service delivery while mitigating the risks of public and environmental health hazards

due to inefficient and inadequate FSSM. An analysis of successful PPP experiences of other sectors that have used PPP to mobilise resources, increase efficiency and ensure high standards of service delivery, can be instrumental in adopting successful models for PPP in FSSM.

In this policy brief, five primary infrastructure sectors are analysed to understand the evolution of PPP in the earliest and most experienced sectors – Power and Roads – and the most recent sectors with mixed success in PPP model of service delivery – Water, Sewage, and Municipal Solid Waste Management.

2 OBJECTIVE



The objective of this policy brief is to review PPP experiences in key infrastructure sectors in India and draw learnings for the FSSM sector.

This policy brief reviews the experience in private sector investment across five sectors,

For simplicity, three periods are analysed, the period till 2000 with limited progress, from 2000 to 2015 with scaled up investments, and the period from 2015 onwards to assess recent interventions.



Power



Roads



Water

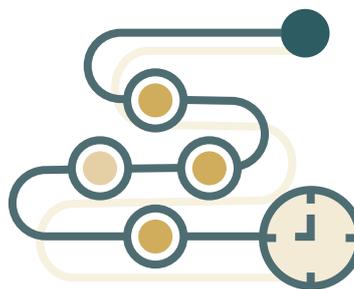


Sewage



Municipal Solid Waste Management

3 PROGRESS AND TIMELINE OF PPP EXPERIENCES



3.1 Progress during 1990s

The earliest efforts in private investment in infrastructure were in the power and roads sector (and also in port and telecom sectors, not covered in this assessment). Private generation was encouraged through a standardized power

purchase agreement, assured rate of return and Government of India counter-guarantee for select large projects. In parallel, privatization of existing State-owned electricity boards was also considered and initiated in Orissa. These efforts failed since the consumer tariff was subsidized and commercial

and technical losses were high. The projects and private investors did not receive the contractually committed returns and projects such as Dabhol Power Project (promoted by Enron) went into dispute and arbitration. The privatisation of electricity board in Orissa also failed.

FIGURE 1 - Summary of experience in private investments in select infrastructure sectors

	1990s	2000s	Now	LEARNINGS FOR FSM
MSW	Low focus	.Landfill and treatment projects .WTE and technology driven .Some JNNURM projects	.SBM Emphasis .Compost and WTE policy .HH level mgmt	<ol style="list-style-type: none"> 1. Asset first approach has not helped 2. Technology has driven decisions 3. Investment models were designed ignoring sector characteristics 4. Benefits to households and changes at household level are critical and difficult 5. Moved from big to "local and small" players 6. Not fixated with private investment 7. Operator fee delinked from household tariff
Sewage	.Scattered public investment .Treatment focus	.JNNURM grants .Investment in network	.AMRUT and Ganga .Hybrid Annuity .House Connection focus	
Water	.Bulk supply projects .Tiruppur	.JNNURM grants .24 x 7 focus .Performance, not investment focussed PPPs	.AMRUT projects .24 x 7 PPPs	
Roads	.Standalone BOT projects .Start of NHAI	.Annuity projects .Toll policy .Viability gap funding .NHAI and State PPP projects .Model concession agreements	.Hybrid Annuity	
Power	.Private Generation .Privatisation	.Electricity Act .SEB reforms .Tariff Regulation .Competition and trading .Distribution franchise .Renewable Purchase	.Renewable thrust .Discom restructuringt	

Note: Text in green represents positive impact for private investments; Text in red represents negative impact for private investments. MSW – Municipal Solid Waste. Source: Authors

In the highways sector, isolated projects were taken up (Rau-Pithampur, Baroda-Halol, Bhiwandi bye pass, bidding for Mumbai-Pune expressway etc). Each of these projects had customized concession agreements and bidding processes. While these projects achieved financial closure and physical completion, the momentum was not commensurate with the needs of the sector; critical weaknesses were uncertainty about acceptance of tariff and lack of a legal framework for tolls.

Some bulk water supply projects were initiated at this time (Hyderabad, Bangalore) but could not progress due to poor creditworthiness of the Government counterparts (water supply boards) and extremely poor cost recoveries in the water supply sector. Tiruppur water supply project was designed as a concession which would subsidise domestic supply with an industrial customer base and the project achieved financial closure.

In the wastewater sector there wasn't enough attention towards investments in general. The case with municipal solid waste was also similar. While private contractors were engaged in collection and transportation of solid waste, these were simple contracts with supply of vehicles and labour; there wasn't any significant private investment.

In summary, the period till the year 2000 witnessed initiatives in private capacity creation (power plants, bulk water supply, road assets). The momentum was low since downstream constraints in the sector on financial viability

negated the prospects of private investment in upstream being viable. The assumption that private assets will improve capacity; and that contractual commitments to private sector will force public sector to improve their operations and financial position, proved incorrect. The investment models (rate of return based for upstream assets) also ignored sector characteristics, where inefficiencies were downstream (high technical and commercial losses, poor tariff). This decade of 1990s was spent in asset creation without resolving sector issues.

3.2 Years 2000-2015

Momentum in power and roads sectors rapidly increased during this period. In the power sector, it was enabled by Electricity Act 2003, which opened the sector for trading, dilution of State monopoly over consumers and strengthening of regulation. This was accompanied by reform and unbundling of State owned entities. A new model for private investments in distribution, without excessive exposure to market risk – distribution franchise was introduced. Purchase of renewable energy was encouraged and made attractive with concessions. These increased investments in all segments of power sector – generation, transmission and distribution. The regulatory actions decreased cross subsidies between consumers and gradually increased efficiencies. A key privatisation attempt in Delhi has yielded results; and private investment through the distribution franchise model increased significantly during this period, with a mix of success and failures, but with an overall positive impact.

In the roads sector, a strong Government of India backed program (National Highways Development Program) was introduced backed by a tool policy and model concession agreements. This increased the attractiveness of road projects to private investment. The Government also announced private investment as the default mode of implementation. A new subsidy program, called Viability Gap Funding, also provided grants to private road projects to bridge shortfalls in project viability. This was a major step towards making road projects attractive to private sector. Subsequent to the success of the Gol program and acceptance of tolling, several States also launched highway development programs with private sector involvement either through a BOT or annuity or construction models. The scale of private investment in the sector increased significantly during this time; and several domestic players and new entrants became successful infrastructure developers.

In the water and sewage sectors, private investment continued to be low. A national grant program (Jawaharlal Nehru National Urban Renewal Mission) was launched to provide grants to cities for creating urban infrastructure. A few cities (Mysore, Nagpur, Khandwa, Aurangabad) initiated projects with partial private investment by providing the private investors the grant from Gol (and State Govts) as city grant contribution. Success has been mixed since the underlying sector issues (poor tariff, inability of city Governments to meet capital expenditure contribution, etc.) as well as excessive risk to investors (increase in contract scope, etc.).

However, a positive shift that was achieved during this period was the focus on distribution improvements as compared to focus on bulk water supply in the earlier years. Further, projects with private sector management, but without private sector investment were also piloted successfully (Karnataka). This pattern at least started directing private sector to where the inefficiencies actually lay in the sector.

The Supreme Court ordered rapid improvements in the municipal solid waste management (MSW) sector in response to a public interest litigation. This increased private sector interest in the MSW sector. However, lack of project preparation capability in cities resulted in excessive focus on technology led solutions; and a preference for extreme risk transfer to investors (treatment plants which will recover costs through electricity generation or waste recovery). Several projects were implemented which failed (Waste to energy plants in Lucknow and Delhi, several compost plants due to lack of quality and off take; integrated contracts in Uttar Pradesh etc) due to excessive focus on technology led solutions and the inability of city Governments to meet the cost of treatment.

In summary, shift towards addressing key sector constraints (toll, consumer tariff, viability gap, competition and access to customers, focus on efficiency improvements) helped scale up private sector investments significantly. Where projects ignored sector characteristics (MSW, water) or focused excessively on technology instead of benefit to customers (MSW), success was scarce.

3.3 Present trends

The power sector has built on the framework developed after the Electricity Act. The thrust on renewables has increased. Supportive policy measures have rapidly increased private investment in renewable energy. The financial position of state owned distribution companies had not improved to the extent anticipated; and follow up measures to improve the health of these companies have been introduced (UDAY).

In the roads sector, several private road projects faced stress of debt servicing; and promoters who had overleveraged where unable to scale up equity commitments to fresh projects. Unrealistic bidding during the peak of highway development is considered as one of the key reasons for this. As a result, investor capability for fresh investments decreased and the hybrid annuity model was introduced to address this issue. The model decreases the quantum of investment as well as the commercial risk taken by the private investors.

In the water sector, a second national grant program prioritizing water supply and sewage (AMRUT) was launched which scaled up public investments in the sector. Few projects with private investment (Coimbatore) were taken up. There is no marked increase in private investments in the water sector. A Desalination plant that was implemented in Chennai with private investment could not be serviced and successor projects reverted to a Design-Build-Operate model. However, private sector management is being encouraged with projects

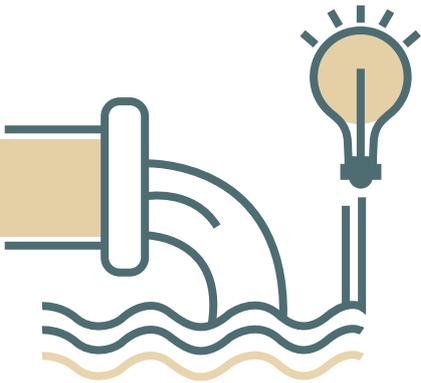
being bid out on Design-Build-Operate model with a mandatory operations period, for both water distribution improvements and water treatment projects.

Sewage sector had a pattern of investments similar to the water sector under AMRUT with Design-Build-Operate contracts, especially for wastewater treatment. In addition, the Namami Gange project promoted wastewater investments (treatment and network) under the Hybrid Annuity model. Payment security was assured through guaranteed funds flowing from Government of India and this resulted in successful award of projects.

Municipal Solid Waste was given a priority under the Swachh Bharat Mission. In addition to increasing attention on collection and transportation of waste, efforts were also made to increase attractiveness of investments in treatment. State supported arrangements were created for purchase of compost by fertilizer companies and power generated from waste to energy projects by power distribution companies. Private investment in technology based projects in waste to energy or composting had a mixed bag of success and failures.

In summary, the present trend is towards more moderate expectations in private sector involvement (in roads, water, sewage or MSW); more attention to private sector involvement to improve efficiency (water, sewage and MSW) and attention to payment security, sector viability and other fundamental issues.

4 LEARNINGS FOR THE FSSM SECTOR



following are the key learnings for the FSSM sector:

1. A focus on asset creation (power generation, bulk water, treatment) with private investment has not been helpful; if the service delivery or other sector requirements were left to be dealt with by the public sector itself.
2. Undue attention was given to promoting technology focused projects (desalination, MSW) which have not been successful
3. Sector characteristics and constraints have to be addressed and cannot be by passed while promoting private investment (viability of tariff, payment security etc)
4. Private investment should include service delivery improvements to the customer (water sector) and these are difficult to achieve.
5. Domestic and smaller private investors and operators emerge (power, roads) as the sector scales up opportunities.
6. Private efficiency can be as useful as private investment in achieving sector requirements (water supply, wastewater treatment)
7. There are several models where the revenue model to the investor is delinked from tariff collected by the household with the public sector assuming the revenue risk (hybrid annuity, Design-Build-Operate for water and sewage).
8. Sectors have scaled up private investment after creating a political and policy priority for private investment (roads, power), bankable revenue model (roads) and standard frameworks for private investment (power, roads). Creating well developed projects (power, roads) and addressing implementation bottlenecks have also been important.
9. Sectors have failed to scale up due to the absence of a bankable structure (water supply) or poor frameworks for bidding and contracts (MSW, water) or due to lack of political and policy priority (water).

5 CONCLUSION



A comparison with the five selected primary infrastructure shows that the size of the FSSM business size relatively small. Typically, private FSSM businesses (in desludging and/or treatment) are operated by a single person or within a family, where the scope for formalised business operations is modest. Given the small-scale of the sector and its informality-laced operations, complex PPP models such as Hybrid Annuity, escrow account, etc., which have been successful in the five sectors

analysed here, are impracticable for FSSM, and therefore, cannot be replicated for this sector. Further, learning from the other sectors, there is scope for course-correction in FSSM. The current stage of the sector enables it to potentially avoid oversights experienced in other sectors, that focused mainly on asset creation in the beginning and spent several years before refocusing on service delivery.

The FSSM sector also have scope to provide service delivery beyond

building emptying and treatment infrastructure as the only business opportunities. Public health concerns demand attention to overflow of septic tanks, septic tank quality, behavior of bulk customers, and data on FSSM value chain. The ULBs should create business opportunities in each of these areas, for example, engaging a single person on a contractual basis (single person business) with clear service standards outlined to address these issues. Improving the dignity and aesthetics of FSSM profession should also be a priority.

Building on the learnings for FSSM from a comparison with other sectors achieved in this policy brief, the next policy brief will demonstrate a potential framework to create a sustainable business environment for private sector participation in FSSM service delivery.



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