

Financing Faecal Sludge and Septage Management (FSSM)

A landscape study of four Indian states

June 2019

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Acknowledgements

Faecal Sludge and Septage Management (FSSM) does not require huge financial resources, yet limited funds are allocated for it in the flagship programs like SBM and AMRUT. While the Swachh Bharat Mission (SBM) focused on toilet construction, other flagship programmes were expected to allocate resources for FSSM. Despite the inclusion of FSSM in AMRUT, there is no specific amount allocated for FSSM. Also, AMRUT covers only 500 large cities leaving out over 4000 small towns.

This study identifies total financing need for FSSM in four states: Maharashtra, Tamil Nadu, Andhra Pradesh and Odisha. It explores potential sources of funds to meet the financing needs for both capital investments and operations and maintenance. It examines role of public finance in supporting and/or leveraging additional finance for FSSM. It also explores a few innovative finance ideas for financing FSSM services.

The study was carried out under the project “Financing Faecal Sludge and Septage Management (FSSM) Services” funded by the Bill and Melinda Gates Foundation. The report is based on studies by the team at Center for Water and Sanitation (C-WAS), CEPT University and initial studies done by the Dalberg Global Advisors for CEPT. The Technical Support Units (TSUs) in the four focus states of BMGF have contributed by sharing data and insights.

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Emerging focus on FSSM in urban India

There is nascent but growing importance accorded to FSSM nationally and in the focus states of Maharashtra, Tamil Nadu, Odisha and Andhra Pradesh

- The traditional importance accorded to sewerage sanitation systems is starting to give way to a preference for non-sewered sanitation systems, particularly since centralized sewerage systems are expensive and long term projects, unviable for smaller urban areas.
- Recognizing the importance of non-sewered sanitation solutions for India, BMGF is supporting initiatives for FSSM in India. The BMGF support to CEPT's Center for Water and Sanitation is focused on FSSM solutions for the states of Maharashtra. BMGF also supports FSSM in Tamil Nadu, Odisha and Andhra Pradesh. These four states have put in place policies focusing on FSSM and have started to explore a range of initiatives along the FSSM value chain.

There is a significant opportunity to systematically develop FSSM solutions through business and operating models

- With the increased recognition of the need for FSSM in policies, opportunity to develop operating models that provide FSSM solutions at scale and initiatives implemented by the government and other actors including foundations and private operators, has opened up.

Study objectives

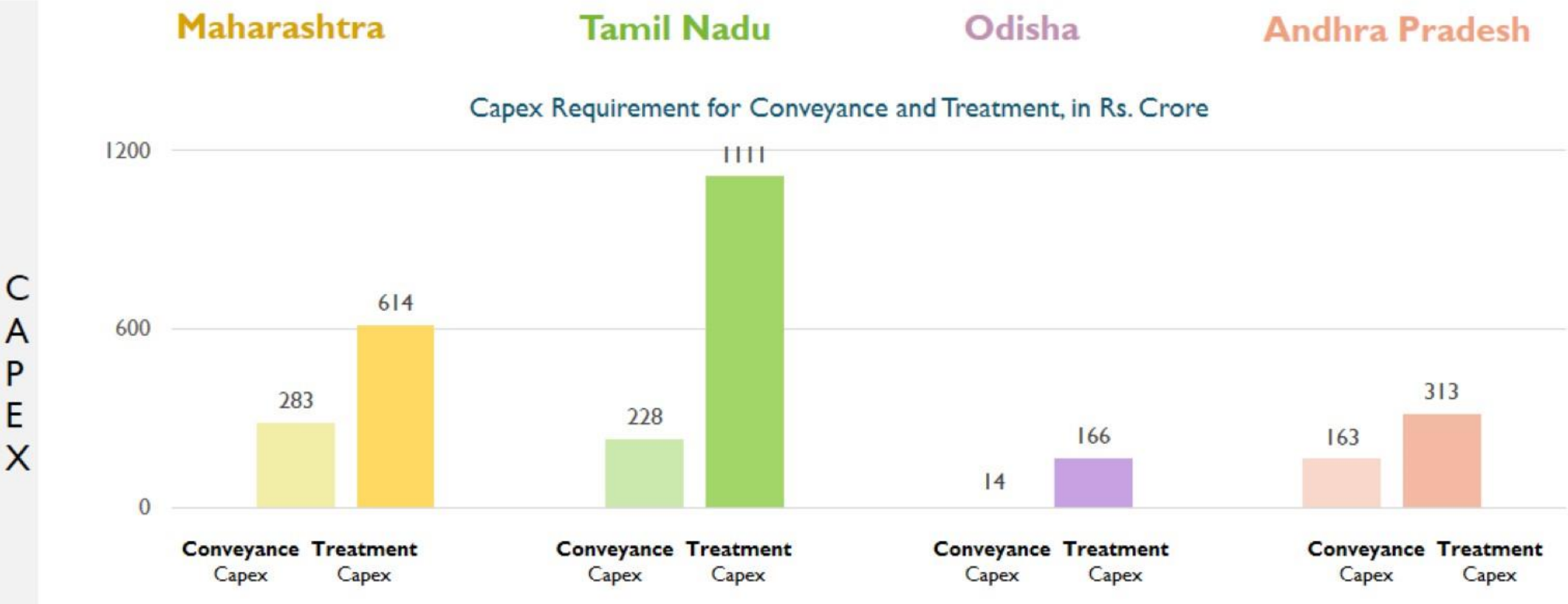
This study explores the financing landscape for FSSM in terms of financing needs, availability of public funding, and innovative models to channel funds towards FSSM solutions. Its scope includes the following key questions:

- What are the financing needs for the envisaged end states for FSSM in the four states?
- What are the sources of funds potentially available for both capex and opex for the full FSSM service chain including conveyance and treatment?
- What innovative financing models are useful to consider for the FSSM sector to leverage resources and improve service performance?

The research is based on an analysis of FSSM funding requirements and past allocations for the urban and sanitation sectors. This was backed by interviews with stakeholders from government, private and non-profit sectors, as well as experts from India and globally. For the four BMGF focus states, Technical Support Units (TSUs) were interviewed and along with field visits.

Though funding needs do exist, these are a small proportion of public expenditure on urban services over the 2018-22 period (1/2)

The funding need for various states over the 2018-2022 period is estimated based on a detailed model. Model assumes that 100% of FSSM needs will be met in 2022 in target states, and that all urban areas in these states would be ODF by then.



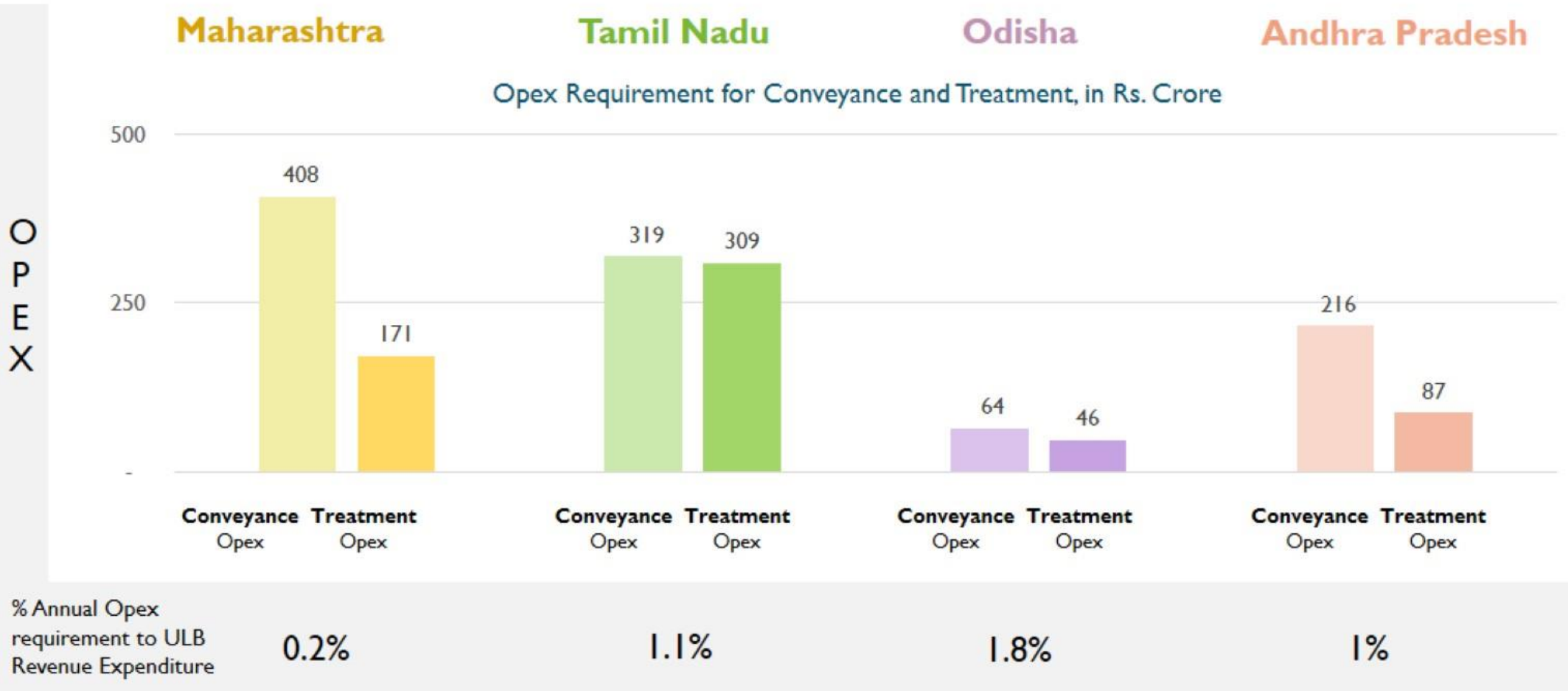
C
A
P
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X

Annual Capex req as a % of annual state UDD/MAWS funds for Capex	1%	1.5%	0.7%	1.1%

Refer slide 70 for detail analysis

Though funding needs do exist, these are a small proportion of sanitation spend over the 2018-22 period (2/2)

The funding need for various states over the 2018-2022 period is estimated based on a detailed model. Model assumes that 100% of FSSM needs will be met in 2022 in target states, and that all urban areas in these states would be ODF by then.



Re-allocating public funds appropriately and leveraging private funds for conveyance will need to be a core aspect of FSSM financing strategy (1/2)

Overall, the capex and opex requirements in each State as compared to the State and ULB funding available for sanitation suggests that adequate funds are potentially available – but will need to be allocated and prioritized.

- The required amounts are a very small proportion of urban development budgets in each state ranging from 0.7 to 1.5%.
- Other funding sources can also be leveraged to reduce the public finance outlay, and the need to reallocate / redeploy public funding. Specifically, for conveyance, there is a greater possibility to leverage private funding.
- **Private funding:** Private funding needs to be explored, especially for conveyance. In states with strong private sector presence in this sector (Tamil Nadu and Andhra Pradesh), almost all the desludging costs are likely to be done by private players. In Maharashtra, there is significant scope to involve private sector in conveyance services – but in some cases local governments also continue to meet the costs of emptying trucks. In Odisha, where there are fewer private sector players, the scope of private funding for FSS conveyance is likely to be low.

Re-allocating public funds appropriately and leveraging private funds for conveyance will need to be a core aspect of FSSM financing strategy (2/2)

Given that public funds are adequate, the key issue is of channeling / re-allocating those funds towards FSSM – which will require:

- Convincing national and state governments to increase share of sanitation/ FSSM in the urban development budget
- Improving allocation of sanitation funds towards FSSM (beyond only toilet access and sewerage)
- Improving efficiency of allocation by identifying appropriate institutional mechanisms
- Strengthening ULB capabilities for seeking and utilizing funding (scheme eligibility requirements, preparing requests for funding, DPR and RFP processes, efficient funds channeling etc.)

Innovative financing mechanisms: There is emerging interest in funding sanitation projects via innovative financing mechanisms to leverage additional funds to enable state or local governments to reduce their initial cash flow for investments.

Equally importantly, such performance based financing can also help achieve greater effectiveness in the use of funds.

Recommendations for state specific strategies emphasize identification of funding pools, and ecosystem actions (1/2)

The key recommendation from a public finance perspective is for all State to have a

**A State-wide FSSM Strategy with a structured and phased plan,
with fund allocation from different pools to cover all cities in the state**

Maharashtra



- Focus on reallocation of 'large urban pools' towards FSSM – key pools to target include: at ULB level: 14th FC funds, ODF Incentive funds and considering FSSM under programs similar to AMRUT; and at the State level: schemes such as Maharashtra Nagarothan Maha-abhiyaan, Vaistah Purna, and exploring possibilities with MUINFRA, a state agency that provides loans to ULBs
 - ULBs have adequate own funds for opex which can be mobilized through sanitation tax or transfers from property taxes .
-

Tamil Nadu



- Refocus existing sanitation pools, specifically for FSSM, to fund capex. Leveraging Integrated Urban Development Mission funds for FSSM.
- Re-allocate minor portion of MAWS sanitation and non-sanitation budget – such budget reallocation can meet the entire FSSM capex requirements
- ULBs have adequate own funds for opex of FSTPs which can be mobilized through transfers from property taxes or other ULB own sources.

Recommendations for state specific strategies emphasize identification of funding pools, and ecosystem actions (2/2)

Odisha



- Expansion of AMRUT funding for FSSM to other cities as possible – Odisha is currently one of the few states utilizing AMRUT funding for FSSM.
- Tap the well-funded District Mineral Funds (where available) to fund FSSM – already utilized to an extent in Keonjhar district of Odisha, and OUIDF funding (funded by KfW) .
- Develop a state-wide strategy, that can also guide the allocation of District Mineral Fund (DMF) and OUIDF funding, to streamline the allocation of funds at all levels. As Odisha has significant gaps in technical and financial capacity at the ULB level – significant capacity building efforts will be needed.

Andhra Pradesh



- Already allocated state budget for one year for FSSM infrastructure to be used for a HAM model for 76 ULBs – funds to be utilized efficiently and continuity of regular allocations in state budget to be ensured for the 10 –year period with performance based funding.
- Need to explore enhanced use of AMRUT funds and potentially tap AIIB funds, which may be available for sanitation.
- All the Capex and Opex funding for FSTPs is expected from the State Government. However, land will need to be provided by ULBs and their technical capacity will need to be strengthened for monitoring performance of private firms over the 10 year period.

Potential exists to utilize public funds to leverage innovative / blended finance to attract private and commercial funds and impact investors

Performance linked Public-Private-Partnerships (PPPs)

Performance linked annuity models for conveyance

Hybrid Annuity Model (HAM) model for treatment facilities

Municipal borrowing for sanitation infrastructure

Municipal borrowing from banks for FSTPs under Priority Sector Lending

Municipal borrowing from institutions for FSTPs

Use of Water Sanitation Pooled Funds for FSSM in TN

Impact investment and CSR

Corporate Social Responsibility Funds

Philanthropy funds

Development Impact Bonds / Social Impact Bonds

It is essential to recognize that public finance, supported by selective private funding in the conveyance space, will be the primary means of funding for FSSM. However, different forms of blended finance should also be explored to leverage private funds and impact investment.

Potential innovative financing options for FSSM

Performance Based Annuity Model

- Performance Based Annuity Models will allow private sector's 'skin-in-the-game' and lead to improved service delivery through performance linked contracts. Annuity payments will be made by the government using a recognized source over a defined time period.
- Maharashtra experience of ULB level performance based annuity model for conveyance and AP experience of HAM for treatment in small cities will provide lessons for other states.
- An escrow account mechanism can be used to mitigate late payment risks of private sector.

Municipal borrowing for sanitation infrastructure

- For capital investment for treatment plant, ULB can borrow from banks under the priority sector lending.
- It is important to make banks aware about the possibility of lending for FSTPs under PSL. Loans for up to Rs. 5 crore for sanitation projects is covered under the priority sector lending (PSL) requirements for commercial banks. This will make it attractive for banks to lend to ULBs for sanitation projects.

Development Impact Bonds

- An impact bond for FSSM can be developed for scheduled desludging of septic tanks and for treatment (FSTP) to attract impact investment in the sector
- Measurable outcomes in them can be: All Households covered for emptying services, especially poor and low income households for desludging of tanks and volume of collected FS that is treated, effluent characteristics of treatment plant meeting the environmental discharge standards for treatment of FS.

Summary recommendations

For FSTPs, financing will mainly need to come from public funds. Advocacy efforts are needed for **SBM-2 and AMRUT-2 to focus on FSSM and on small and medium cities.** Local governments can also fund their share from 14th FC (and hopefully 15th FC in the next 5 years). Each state government will also need to identify budgetary sources for matching funds. For operational sustainability, it is essential **to support ULBs to enhance their own incomes by improving property taxes and revenues from other sources of own income.**

It is possible and necessary to get private sector involved particularly in conveyance. This may be through scheduled desludging (e.g. in Maharashtra), where annuity payments by ULBs through sanitation /property tax. In case of demand desludging, it is possible to let private desludgers operate on payment of a licence fee. This maybe less inclusive and can result in high prices that are unaffordable for the poor and low income groups.

Innovative financing may be adopted to use public and donor funds to leverage private funds and impact investment. While the experiences with PLAM in Maharashtra for scheduled emptying or with HAM for treatment in AP unfold, it is important to explore other potential options to leverage impact investment through appropriate DIB type instruments

There is a need to **increase awareness about the investment opportunities in FSSM** among potential funders, bankers and other lenders, impact investors, and corporates who can support the sector through CSR funding. The focus of this should be on innovative and viable models that will generate adequate return on investments, as well as a clear understanding of risk management possibilities. .



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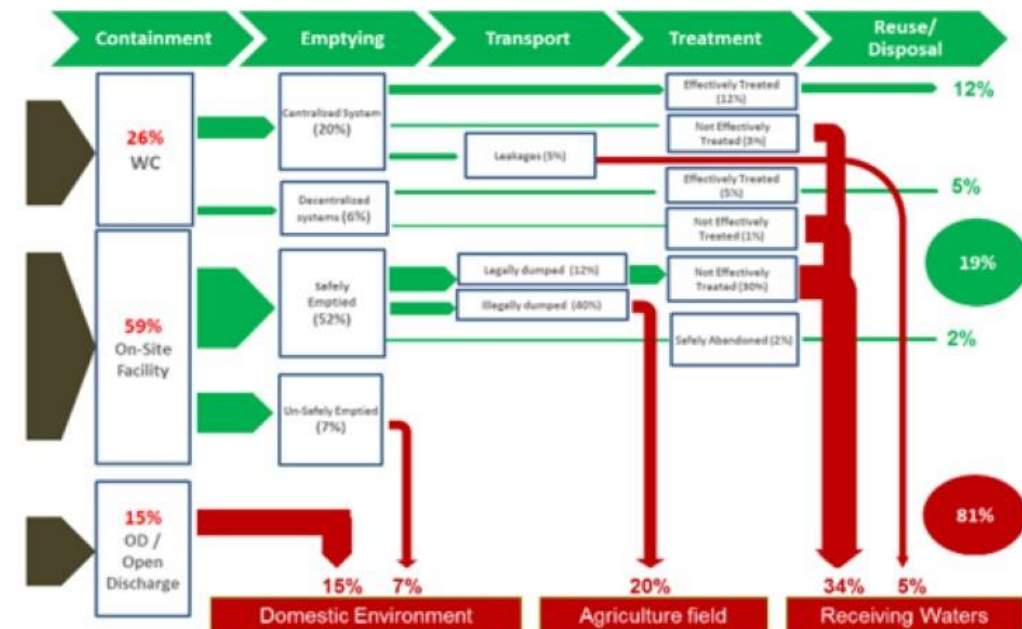
Sustainable Development Goal (SDG) and safely managed sanitation



➤ The SDG 6 is the Water Goal. Target 6.2 states ‘by 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation’. Target SDG 6.3 states that by 2030, ‘improve water quality by reducing pollution, eliminating dumping and minimising release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally’.

➤ The Joint Monitoring Program (JMP) of UNICEF and WHO defines safely managed sanitation as “Use of improved facilities that are not shared with other households and where excreta are safely disposed of in situ or transported and treated offsite”. Due to lack of data, they have been able to estimate this for Urban India.

➤ The Shit-flow diagram (SFD) for India also suggests that 80% of faecal sludge and septage remains untreated.



FSSM did not receive adequate attention in the past in urban policy and programmes in India

- Flagship sanitation programs such as the Swachh Bharat Mission did not include FSSM as a focus area, while under AMRUT and Smart Cities programs city and state governments have usually not sought funds for FSSM
- While various laws and policies did address some components relevant to FSSM (e.g. pollution control norms, septic tank construction guidelines) but the sector in the past did not receive dedicated attention.
- This has changed over the past two years as FSSM has received increasing attention and a national FSSM policy has been adopted. With increasing recognition of the need for FSSM solutions, financing sources and models have become important for planning and implementation.
- The Service Level Benchmark (SLB) indicators of the GOI, which are being used to monitor performance of services also use only sewerage. However, now special San Benchmarks have also been developed by CEPT University which recognize FSSM services as safely managed sanitation.

There is now a greater attention to FSSM in recent government policies

- There is increasing recognition of the importance of FSSM, guidance and funding for FSSM:
 - The National FSSM Policy 2017 has reinforced standards related to FSSM, the Atal Mission for Rejuvenation and Urban Transformation (AMRUT) provides funding for septage management
 - State level policies and initiatives that range from setting up faecal sludge treatment plants (FSTPs) to providing desludging trucks to ULBs
- Government of Maharashtra pioneered the concept of ODF+ and ODF++ where cities can have citywide FSSM or sewerage to become ODF+/++. These concepts are now widely used.
- Swachh Sarvekhsan 2019 had several questions and some weightage on FSSM, with a clear focus on FSSM in ODF++ certification.
- These nascent efforts will need to be augmented at state level based on state specific contexts and requirements.



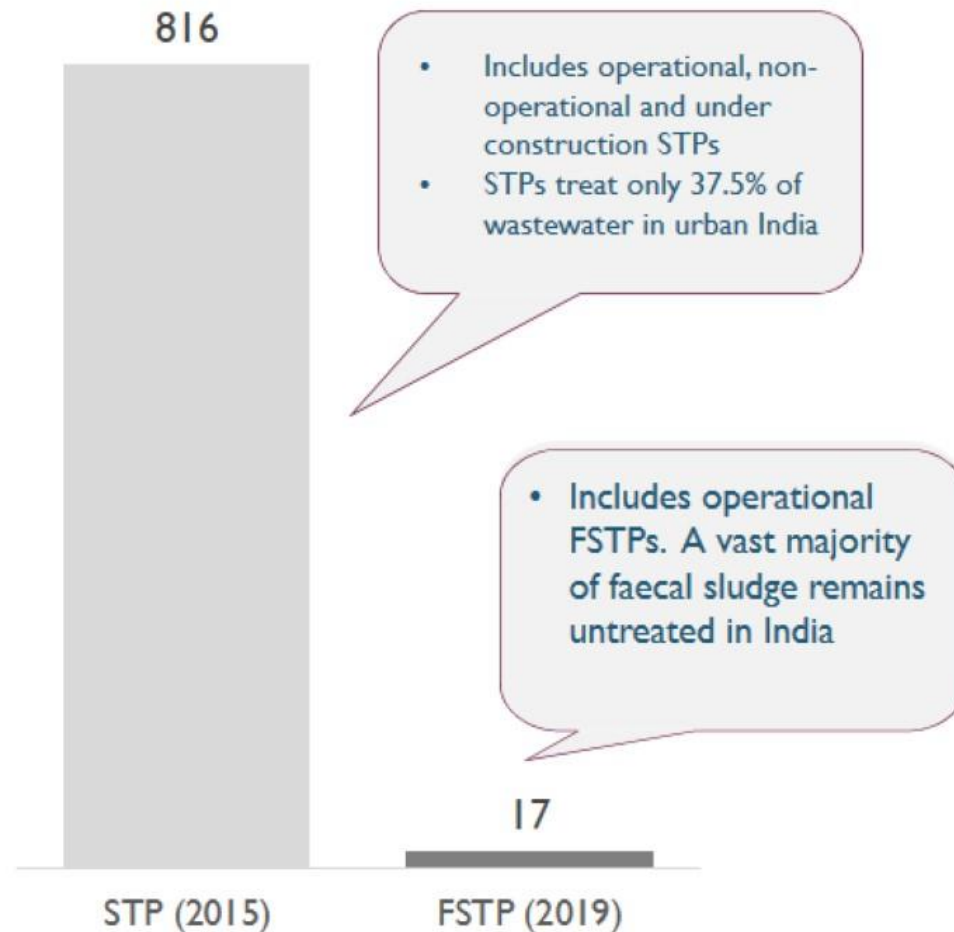
Recent attention on FSSM has still not converted to significant public or private investments

- As FSSM is typically viewed as a public good, public financing will be important – and a range of funds are available for sanitation through national, state or local budgets. However, the predominant focus has been on access to toilets under SBM and on sewerage under other programmes, but funding targeted specifically to FSSM is very low. This is partly due to the lack of government focus in the past and that AMRUT funds for FSSM are only available to larger cities,
- While unorganized private sector participation is prevalent for conveyance (desludging), organized participation is low on both conveyance and treatment. For conveyance, the unorganized nature of work and low return expectations, act as constraints. For treatment a limited understanding of the sector and concerns for payment delays limits the private sector funding. However, some emerging initiatives such as the performance linked annuity model (PLAM) for scheduled desludging in two cities in Maharashtra and the Hybrid Annuity Model (HAM) for clustered treatment projects in Andhra Pradesh and Telangana provide possibilities for getting private sector participation for FSSM.

While sanitation, and sewerage networks have received priority, FSSM has seen relatively low public or private investments in the past

Historical underinvestment in FSSM, as evidenced by low investment in treatment infrastructure

Number of STPs and FSTPs



Key drivers

- Relatively low government focus in policy and funding. Emphasis so far has been on access (toilet construction) and sewerage
- Capacity gaps in implementation e.g. low ULB resources and capacity
- Low understanding of the sector. FSSM is still a nascent sector, with limited understanding of issues and solutions by both ULBs and other stakeholders
- Significant data gaps. Fundamental data is often unavailable, driving many mainstream investors like banks away. Low data intensity also leads to capacity and knowledge gaps, and inefficiency in investment.
- Limited participation by the organized private sector, given low understanding, high perceived risk, lack of self sustaining business case, especially on the treatment side. This is true for both sewerage and FSSM.

Does not refer to other planned FS treatment options such as co-treatment at STPs

Source: Ministry of Urban Development (2017) "National Policy on Faecal Sludge and Septage Management", New Delhi; CPCB (2015) "Inventorization of Sewage Treatment Plants"; Dalberg interviews with state TSUs

The momentum for FSSM is now building up in several states

- AMRUT funds are increasingly being used for FSSM. e.g. to build new faecal sludge treatment plants in Odisha,
- From other states: a) Government of Tamil Nadu has identified funds for FS Treatment facilities from sanitation related allocations; b) Government of Andhra Pradesh has a state wide policy on FSSM and has allocated funds through its budget to the Swachh Andhra Corporation for FSSM under the HAM model; and c) Government of Maharashtra has asked ULBs to use 50% of 14th Finance Commission grants for sanitation, including for FSSM.
- There is emerging interest in FSSM by private sector – a) emergence of large operators on the cleaning and transportation side, (e.g Sumeet Facilities and 3S in Maharashtra), b) presence of private service providers in the treatment sector (e.g. Blue Water Company, Tide Technocrats, 3S and Panse in Maharashtra), and c) increasing interest from private enterprises in solid waste management (e.g. Ramky) to explore FSSM sector.
- There is continued support from the non-profit /philanthropic community – a) BMGF support for construction of FSTPs and state support programs in 5 states and b) CSR grant from HSBC CSR grant for city level FSSM

There is a need for a coherent strategy for financing FSSM

Financing for FSSM will be a critical element of FSSM strategy – and will include an assessment of financing needs, potential available funds from public sources

- FSSM is typically viewed as a 'public good', implying that there is a significant role for public funding in FSSM. The private sector can, however, play a key role in the conveyance part of the FSSM value chain, and also in operations and maintenance across the value chain including treatment.
- An FSSM strategy needs to factor in the financing requirements, available funds, and channels/mechanisms to operationalize funding for FSSM solutions. This includes a consideration of the types of funds needed and the roles of various stakeholders (e.g. government or private sector) in providing these funds.

Potential for developing blended and innovative financing mechanisms should also be explored

- Key reasons for utilizing blended or innovative finance include: a) leveraging public investment to tap other pools of capital, b) bridging the funding need while public finance is mobilized, and c) supporting states where re-allocation of public funds may not be easily possible. But, the most important reason would be to leverage efficiencies and capabilities of the private commercial sector.
- Support from philanthropists and corporate social responsibility can help demonstrate quality enhancements in FSSM services.

Sanitation is an important part of AMRUT, however most of its projects were for sewerage

	Andhra Pradesh (2015-20)	Maharashtra (2015-20)	Odisha (2015-20)	Tamil Nadu (2015-20)
Total size of State Plans (SAAP) (in Rs. crore)	2889	7786	1598	11194
Central share (2015-20) (in Rs. crore)	1087	3563	799	4758
Number of projects on sewerage	50 out of 438 projects (11%)	31 out of 208 projects (15%)	8 out of 206 projects (4%)	21 of 142 projects (15%)
Funding allocated to Sewerage projects (in Rs. crore)**	529 (18%)	3715 (48%)	114 (7%)	5295 (47%)

Source: AMRUT (2017-18) "Maharashtra State SAAP"; AMRUT (2017-18) "Odisha state SAAP"; AMRUT (2017-18) "Andhra Pradesh state SAAP"; AMRUT (2017-18) "Tamil Nadu state SAAP"

***Total project cost excludes AandOE cost

Perception of low returns and high risks for private capital in FSSM

Challenges linked to FSSM

- In the FSSM space, remunerative private sector models exist for conveyance of FSS, however most participants are small and unorganized
- In treatment, STP or FSTP, insufficient market-driven revenue streams exist e.g. revenues from sale of treated water or compost - leading to potential reliance on government / non-profit support for funding both capex and opex. Tipping fees have been successfully used in some countries such as Ghana, but will require strong regulation to ensure open dumping by emptiers.
- Low return potential for treatment makes it unattractive for commercial investments by pools such as PE, VC, impact funds

Significant dependency on Government / non-profit actors

- Given low return expectations, there is significant dependency on the government or non-profit actors to ensure financial sustainability – may be seen as a challenge by investors e.g. challenges linked to cumbersome contracting / red tape, counterparty risk linked to ULBs etc.

Limited understanding of the sector

- Large /medium sized private sector players, banks, CSR providers, investors, are not aware of and/ or do not fully understand the sanitation and FSSM sectors. Investors, therefore, may be unaware of investment opportunities or may view investments as being too risky

Small size / unorganized nature may deter some investors

- FSM treatment technology is still at a pilot stage, as key aspects such as the technology and funding models are still being experimented with across plants. This increases the risk profile of the sector, and may reduce availability of capital
- The smaller ticket size of investments may be seen as a deterrent by large players, who may be unwilling to spend management time on financially small pursuits
- Unorganized nature of the market also raises its risk profile

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Study approach

This study explores the financing landscape for FSSM in terms of financing needs – both capital expenditure (CAPEX) and operating expenditure (OPEX). It explores potential sources of funds to meet the financing need for FSSM. It specifically examines availability of public funding, and explores innovative financing models that use public finance to leverage private funds for FSSM and increase effectiveness.

The basic premise of the study is that FSSM is a public good and need to be financed through public funds, just as sewerage and sewage treatment plants are funded through public funds.. However, it is recognised that FSSM is still not on the agenda of the state and local government and one will have to look at how the limited funds that are likely to be made available for FSSM can be leveraged to bring private capital. In this vein, the study explores a few innovative finance ideas for FSSM.

The study focuses on four states: Maharashtra, Tamil Nadu, Andhra Pradesh and Odisha. These four states were selected as they have active and sustained engagement of BMGF partner agencies.

Four key themes are examined

1

Financing Needs

What are the current and envisaged end state of FSSM and the related financing needs for both conveyance and treatment? A model was developed for this to assess both capital investments required and financing needed for operations and maintenance.

2

Existing FSSM financing landscape

Given that FSSM is typically viewed as a public service, it is expected that public financing will play a key role. The study looks at questions such as: What are the key relevant pools of public finance which can be utilized for FSSM? The possibility of mobilizing these pools and related measures are explored.

3

Landscape of innovative financing models



What are the public, private, blended, and innovative financing models in use in India and globally within sanitation and proximate infrastructural sectors that might be useful to consider for FSSM?

4

Relevant financing models to scale up

Out of the landscape of models, which models are the most relevant for the four States being considered in the study? What are the high level considerations to scale up these models?


The demographic profiles and urbanization levels in the four states point to different needs and contexts for urban FSSM (1/2)

State	Urban profile	Current scenario	Future scenarios
Maharashtra 	<ul style="list-style-type: none"> • 27 Municipal Corporations (population: 360 lakh), • 363 other ULBs (population: 120 lakh)¹ 	<ul style="list-style-type: none"> • ~75% of urban population resides in Municipal Corporations with existing or planned sewer networks. 25 lakh households of this corporations depend on FSSM. Of all FSSM dependent Households ~47% households are in the smaller cities with no current or planned sewerage. • Conveyance: Mix of public and private desludging trucks, with ~56% ULBs owned trucks, and rest with private operator trucks. A move to scheduled desludging in Wai and Sinnar. • Treatment: FS treatment infrastructure in Wai and Sinnar. GR for Co-treatment at own and nearby STPs is passed by the state government. 	<ul style="list-style-type: none"> • Scenarios: Large cities are significant drivers of conveyance needs. GoM envisages scheduled desludging to be taken up statewide. GR for Co-treatment at own and nearby STPs is passed by the government which makes it likely for cities to adopt co-treatment option for FS collected. • State planning to roll out phase-wise strategy for FSTPs in all the cities.
Tamil Nadu 	<ul style="list-style-type: none"> • 12 Municipal Corporations (population: 100 lakh) • 709 other ULBs (population: 200 lakh)¹ 	<ul style="list-style-type: none"> • ~54.7% of the urban population resides in Municipal Corporations or Councils with existing or planned sewer networks. FSSM requirements predominate in smaller cities with no current or planned sewer systems. • Conveyance: Most ULBs have private operators for emptying services. • Treatment: One existing FSTP and two planned. Planning to adopt a cluster based approach for FSTPs 	<ul style="list-style-type: none"> • Scenario: Smaller cities are drivers of conveyance needs, but costs are typically lower in these cities. Setting up new FSTPs, standalone for each ULB or under a cluster approach, is key for smaller cities with no existing or planned sewer networks. Co-treatment can be promoted in other areas

1. Data from Census 2011 unless otherwise noted

2. Estimates refer to total funding needs, whether borne by the government or private players..

The demographic profiles and urbanization levels in the four states point to different needs and contexts for urban FSSM (2/2)

State	Urban profile	Current scenario	Future scenarios
Odisha 	<ul style="list-style-type: none"> • 6 Municipal Corporations (population: 20 lakh), • 107 other ULBs (population: 40 lakh)¹ 	<ul style="list-style-type: none"> • Odisha's urban population is balanced across large and small ULBs. • Conveyance: Private participation has not picked up except in Bhubaneswar, Rourkela, Cuttack. Distribution of state-owned trucks (~86) to ULBs, to spark private sector interest. • Treatment: 6 FSTPs operational and 4 other FSTPs are planned for AMRUT towns. 	<ul style="list-style-type: none"> • Scenario: Conveyance needs are relatively balanced across large and small ULBs. By 2022, it is expected that Municipal Corporations, and a substantial proportion of Municipal Councils would be sewered. FSSM requirements would be driven by smaller cities with no existing or planned sewerage.
Andhra Pradesh 	<ul style="list-style-type: none"> • 15 Municipal Corporations (population: 70 lakh), • 96 other ULBs (population: 60 lakh)¹ 	<ul style="list-style-type: none"> • ~68% of urban households are living in Municipal Corporations. However population dependent on FSSM is largely split across Municipal Corporations with existing or planned sewerage, and smaller cities with no sewerage connections. • Conveyance: Private operators are predominant. • Treatment: STPs in AMRUT cities are being upgraded for FS co-treatment. 78 FSTPs are planned for non-AMRUT cities through Hybrid Annuity Model (HAM). 	<ul style="list-style-type: none"> • Scenarios: Plans for a comprehensive solutions via a hybrid annuity PPP model to fund treatment, with private sector continuing to operate in the conveyance space. By 2022, while sewerage connectivity is expected to increase in large cities, majority of the population is expected to be dependent on FSSM via co-treatment in STPs. • Warangal is planning for scheduling desludging services.

1. Data from Census 2011 unless otherwise noted

2. Estimates refer to total funding needs, whether borne by the government or private players..

The study was conducted through desk research and interviews



1

Desk research

- Accessed various documents - research reports, budget documents of state governments and selected local governments and conducted secondary research.
- Points of enquiry were to understand the sources of funding for FSSM, financing needs along the value chain, and relevant models or linkages among these.

2

Expert interviews

- Interviews with TSUs, investors, funders, private operators, CSOs, and sector experts.
- Points of enquiry were to understand FSSM financing needs along the value chain and for the sector, financing sources, and linkages between sources and needs, different potential models.

3

Interviews with Officials

- In-person meetings with government officials (state and ULB level)
- Points of enquiry were to understand the current and potential sources of financing, and financing needs both across the value chain and for the sector.

A range of stakeholders were contacted and interviewed for this study

Rationale

Examples

Technical Support Units (TSUs)

The TSUs are working closely with State governments in the focus States to support FSSM planning and implementation

- CEPT,- AILSG (Maharashtra)
- IIHS (Tamil Nadu)
- ASCI (Andhra Pradesh)
- EY (Odisha)

Government

Governments in the focus States are fundamental decision-makers and have in-depth insights into current status and envisioned end states for FSSM

- TUFIDCO, TNUIFSL (Tamil Nadu); OWSSB, Bhubaneswar Municipal Corporation (Odisha); Chief Resilience Officer, Pune (Maharashtra); Swachh Andhra Corporation, Director of Municipal Administration (Andhra Pradesh)

Development finance institutions, Investors

Funders focused on development sectors, ranging from impact investors to DFIs, have targeted insights, preferences and experience in funding FSSM or comparable sectors

- Aavishkaar
- Social Finance
- World Bank

CSOs, NGOs

CSOs and NGOs working in the sector have experience and insights into details of cost drivers along the value chain, and funding sources and models that may or may not work

- CDD Society
- Practical Action
- WaterAid India
- WASH Institute

Private operators

Private operators have roles in various parts of the FSSM value chain, are able to take on capex/opex and/ or need/expect funding support in others

- Private operators in Conveyance and Treatment ranging from small local players to large players in FSSM or parallel sectors e.g. 3S/Saraplast, Ramky, Sumeet Group

A detailed list of stakeholders is provided in Annex I



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- Potential sources for financing for Capex requirements
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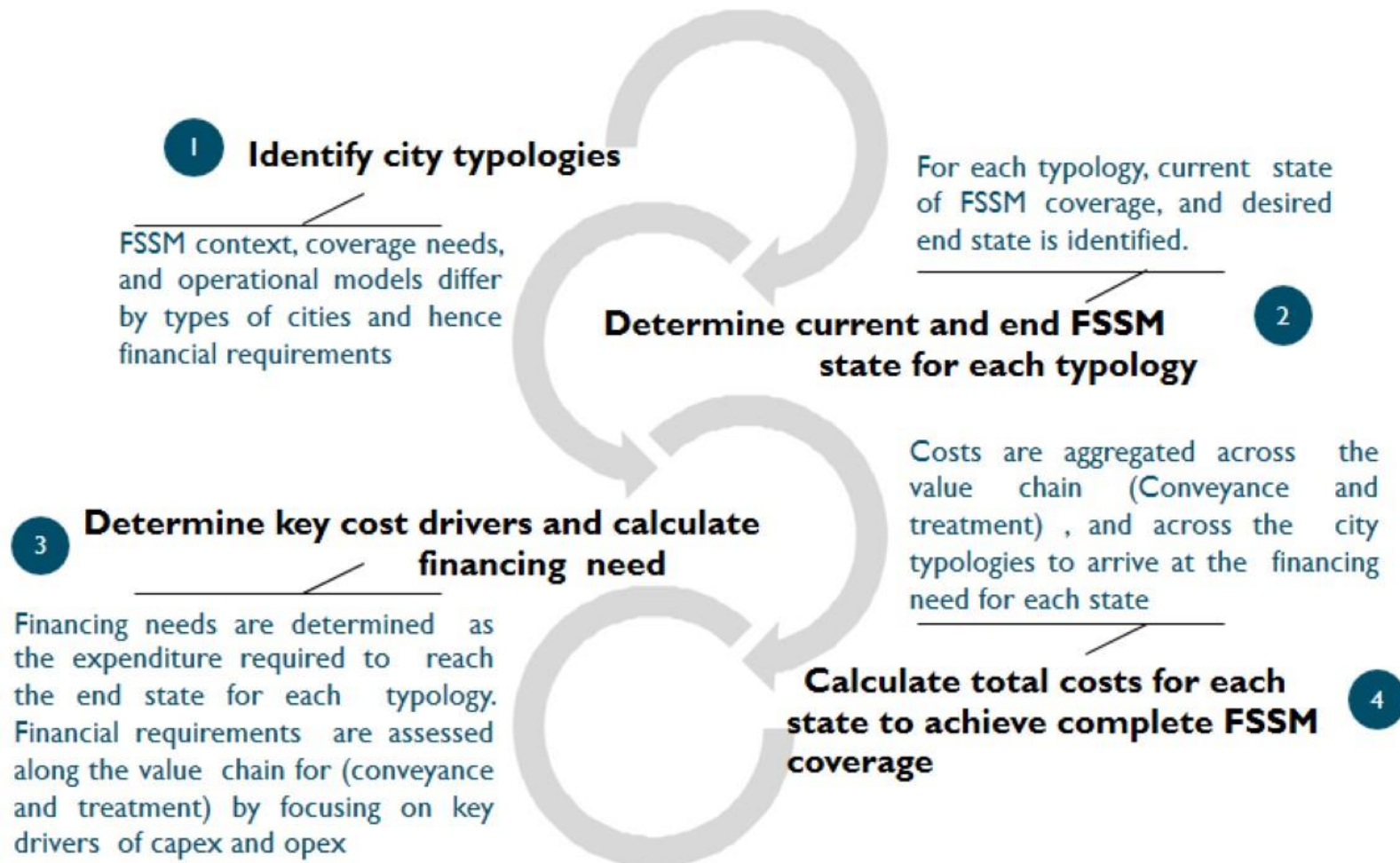
4. Blended and Innovative Financing Options

5. State Specific Options and Recommendations

Annexes

A 4 step approach was used to determine the funding requirement to fully scale up FSSM in **Maharashtra**, **Tamil Nadu**, **Odisha** and **Andhra Pradesh**

Key steps and underlying rationale



To arrive at city typologies, key parameters on need for FSSM and city capacity were considered

In order to arrive at city typologies for which FSSM needs and solutions could be differentiated, we looked at two parameters

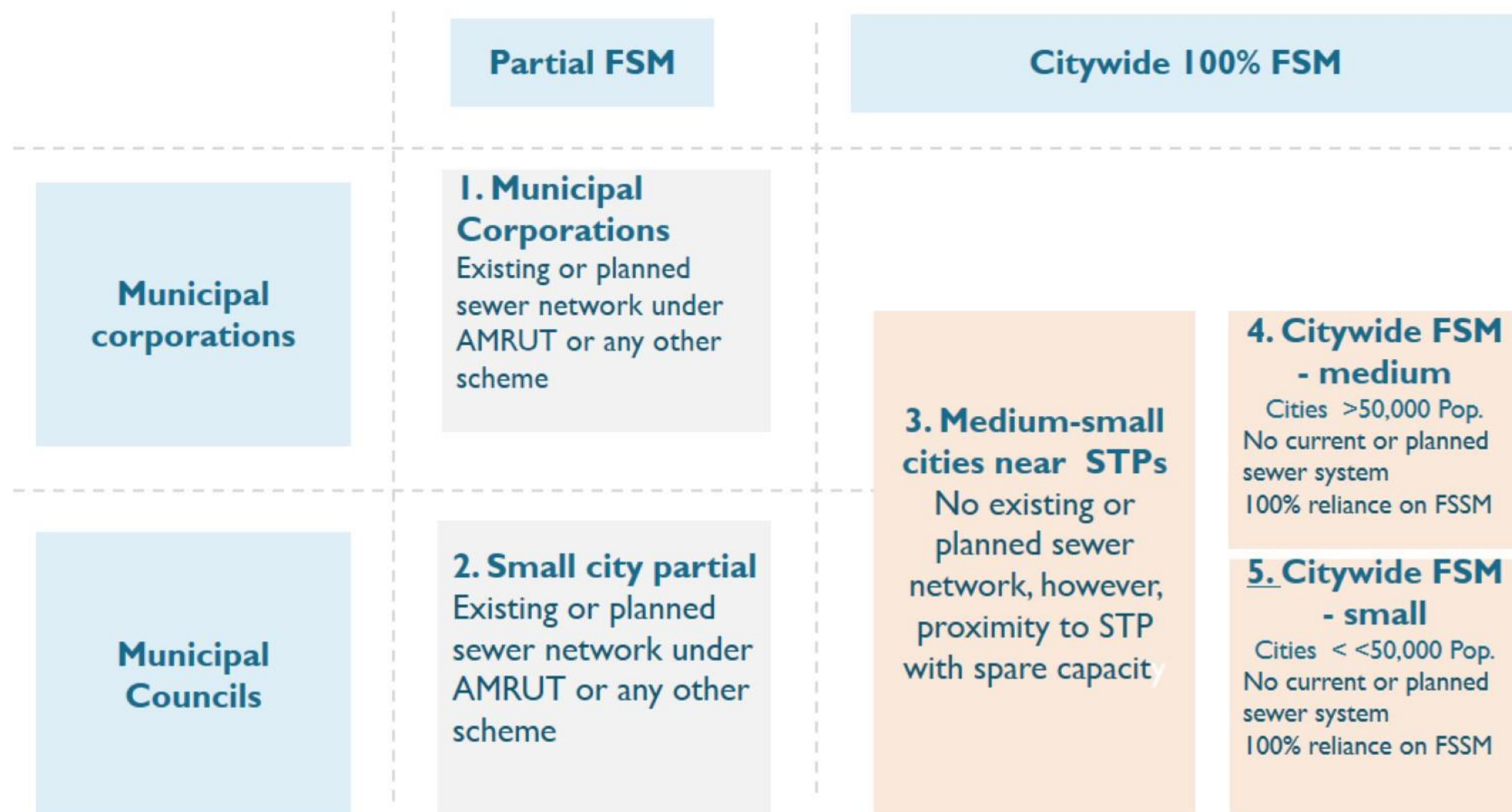
- **Need for FSSM:**

- Assuming that all cities are ODF by the end state, the need for FSSM is determined by plans for sewerage by a particular ULB. If a city has plans for sewerage, that reduces or eliminates the need for desludging operations.
- It eliminates the need for an FSTP even if the sewer networks do not reach a proportion of population, as the FS can be co-treated in the STP.
- The benefit of co-treatment in an STP, and elimination of the need for an FSTP, can also be offered to unsewered cities in close proximity to sewered cities

- **City capacity**

- City size determines the type of governance that a city has, and is used as a proxy for capacity. It is likely that that larger cities typically have more resources at their disposal and greater administrative capacity
- In addition, city size can, by itself, be an important parameter as a large city may be more attractive (vis-à-vis a small city) to private sector investment and operation due to its larger scale – at least partly due to familiarity
- Maharashtra and Tamil Nadu have a large number small towns – Nagar panchayats/Town Panchayats. These towns may have less population and capacity

Five types of cities and their FSM needs



Urban areas assumed to be ODF, with 100% conveyance and treatment of faecal sludge in end-state (year 2022 – India @75)

Assumed End State Scenarios (2022)

Type 1

Existing or planned sewerage, Municipal Corporations



Sewerage to AMRUT / other scheme target levels. If schemes have no stated targets, assumed they cover half the difference between current and 100% sewerage.

Type 2

Existing or planned sewerage, Municipal Councils



100% FS from unsewered areas conveyed by trucks and co-treated in STPs

Type 3

No sewerage, proximity to Type 1 or 2 towns



100% septic tank coverage. 100% FS conveyed by trucks to STPs in nearby cities, for co-treatment

Type 4

No sewerage, 100% reliance on FSSM

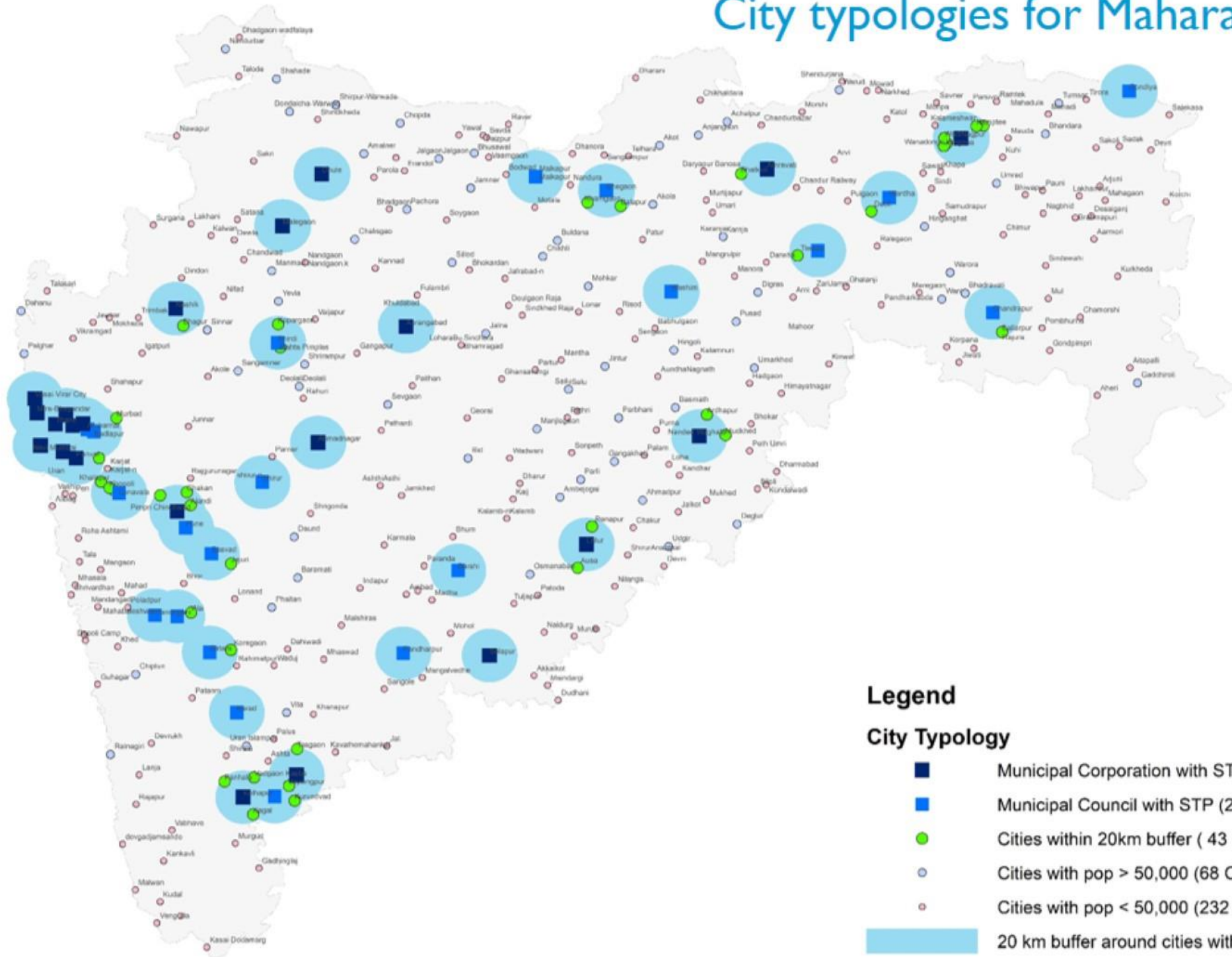


100% septic tank coverage, with 100% FS conveyed by trucks for treatment in city's own FSTPs

Type 5

The end state is taken as 2022. It will be India@75 by then. It is assumed that all the cities in these four states would have implemented FSSM

City typologies for Maharashtra



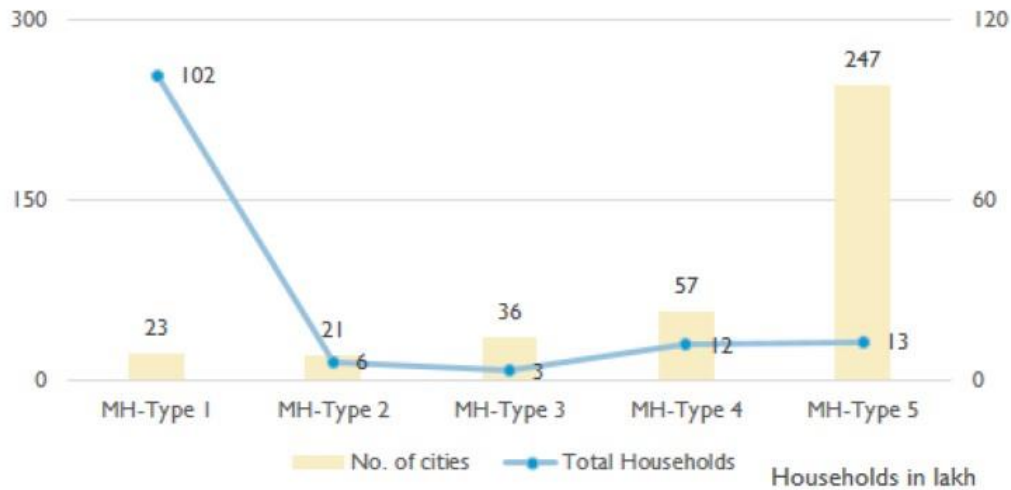
Legend

City Typology

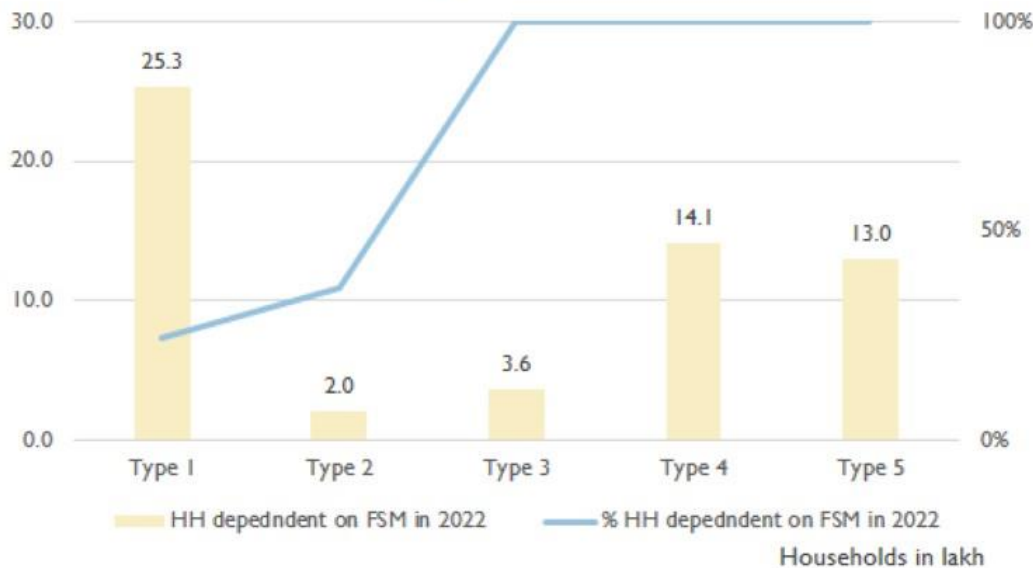
- Municipal Corporation with STP (22 Cities)
- Municipal Council with STP (21 Cities)
- Cities within 20km buffer (43 Cities)
- Cities with pop > 50,000 (68 Cities)
- Cities with pop < 50,000 (232 Cities)
- 20 km buffer around cities with STPs

Maharashtra: Type I cities are expected to have a substantial population dependent on FSSM

No. of cities according to Typology



Households dependent on FSSM in 2022

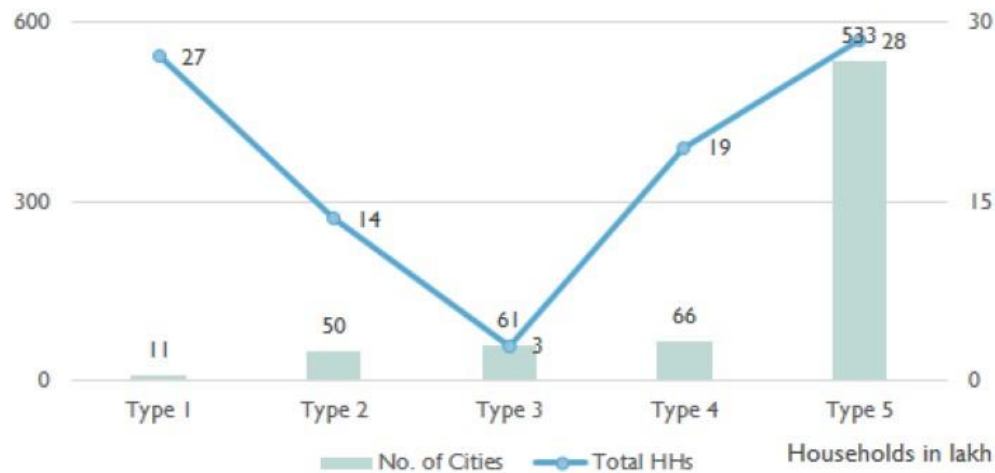


- In Maharashtra 102 lakh households reside in the 23 large, sewerred, type I cities
- However, even in type I cities, 25 lakh (25%) of households are expected to remain dependent on FSSM, given partial sewerage connection
- This trend results in majority of the FSSM dependent population expected to be reliant on co-treatment in STPs in 2022 vis-à-vis establishment of new FSTPs

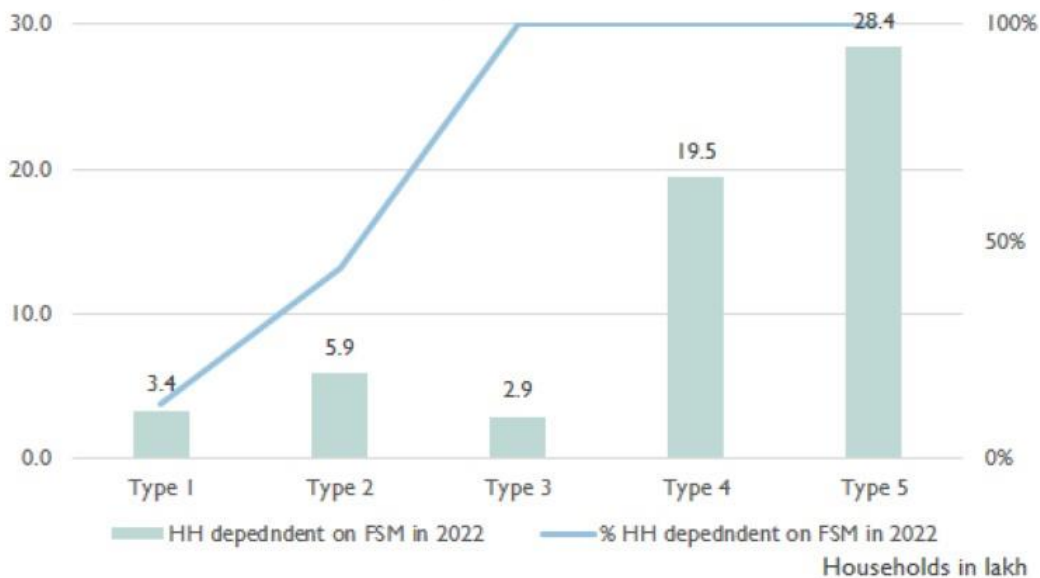
58 lakh households need FSM in Maharashtra

Tamil Nadu: Type 4 and 5 cities are expected to dominate FSSM needs

No. of cities according to Typology



Households dependent on FSM in 2022

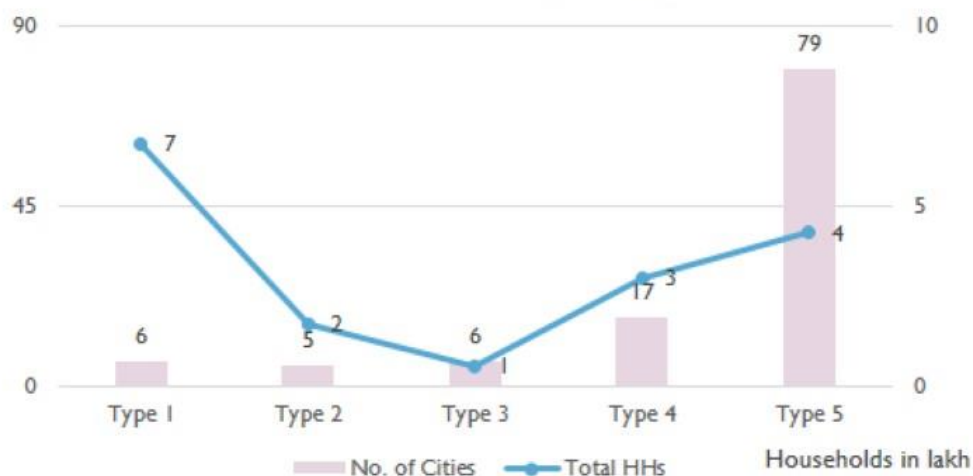


- Tamil Nadu's urban population is divided in two extremes. - type 1 cities with 27 lakh households, and 533 Type 5 cities (small town panchayats) with 28 lakh households.
- Coverage of sewerage in Type 1 cities is high, thus only a small proportion will need FSSM services in 2022
- FSSM requirements pre-dominate in type 4 and 5 cities, where the establishment of new FSTPs is projected to be mandated

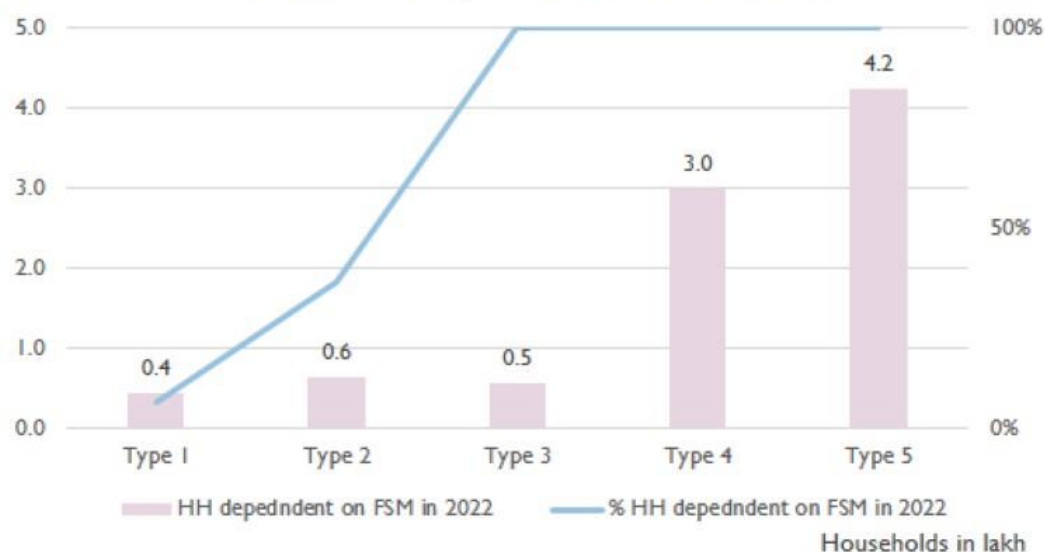
60 lakh households need FSM in Tamil Nadu

Odisha: Type 4 and 5 cities are expected to drive FSSM needs

No. of cities with Typology



Households dependent on FSM in 2022

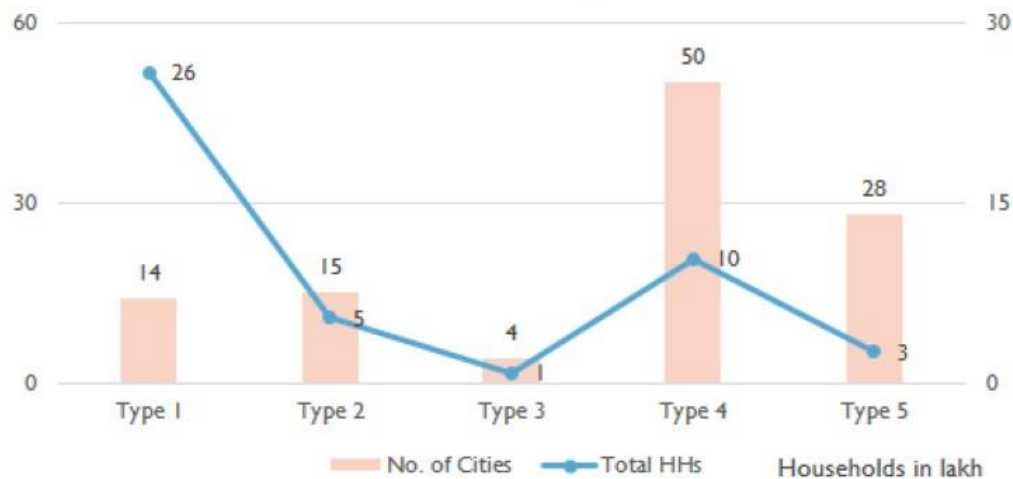


- One-half of Odisha's urban population is in Type 1 cities that have good coverage of sewerage.
- By 2022, it is expected that type 1 cities will be fully sewered, and a substantial proportion of type 2 cities would be sewered as well
- FSSM requirements would therefore be driven by type 4 and 5 cities

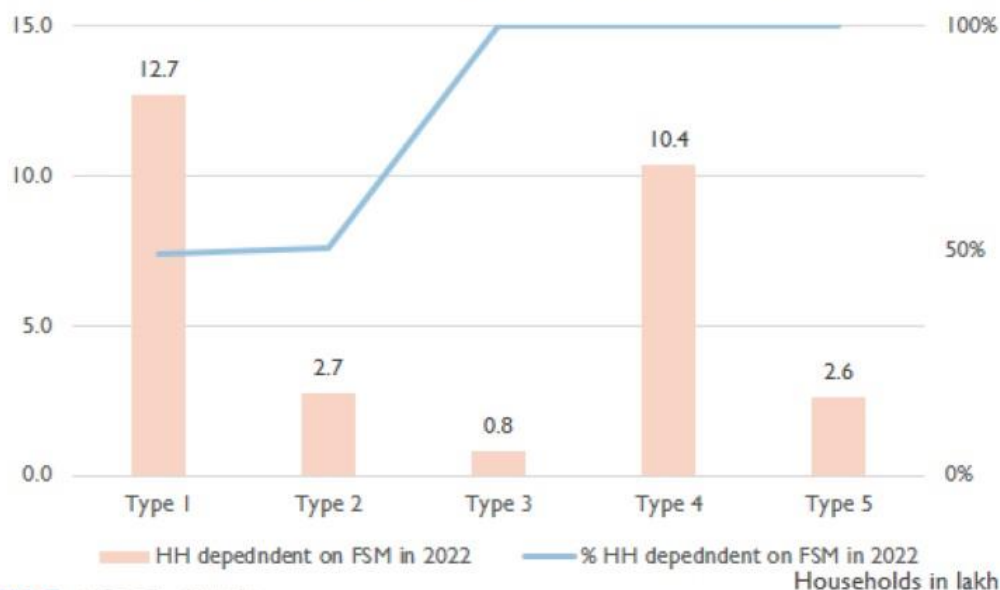
8.8 lakh households need FSM in Odisha

Andhra Pradesh: Type 1 and 4 cities dominate FSSM needs

No. of cities with Typologies



Households dependent on FSM in 2022



- The urban population of Andhra Pradesh is largely in the Type 1 cities
- In 2022, while sewerage connectivity is expected to increase in type 1 cities, majority of the population in such cities is still expected to be dependent on FSSM, via co-treatment in STPs
- Type 4 cities would drive significant investments in FSTPs

29 lakh households need FSM in Andhra Pradesh

Estimated FSM needs across four states – Population and households

MAHARASHTRA: 100% ODF



TAMIL NADU: 100% ODF



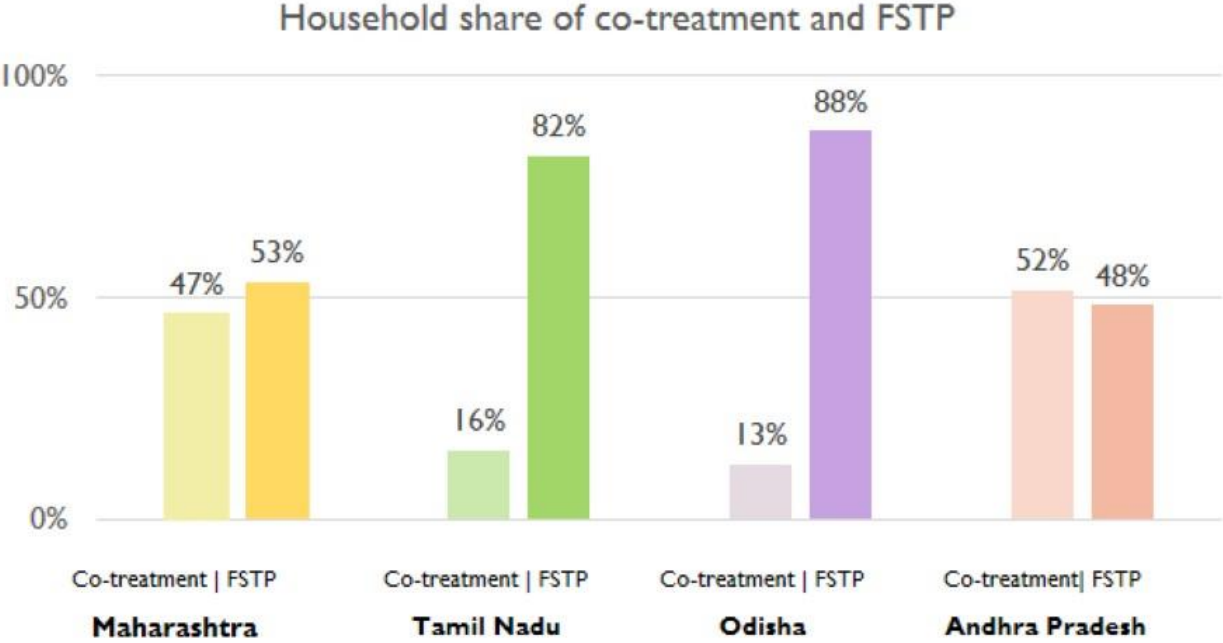
ODISHA: 58% ODF



ANDHRA PRADESH: 100% ODF



Almost fifty percent of households in Maharashtra and Andhra Pradesh can co-treat their FSS at STPs



- Almost fifty percent of households in Maharashtra and Andhra Pradesh can co-treat their FSS at own STP.
- This would reduce the requirement of capital investment of building FSTP for this population.



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Access to sanitation trends were explored over time, to understand the context and future scenario for FSSM coverage

We compared access to sanitation in 2011 with projections for 2022, for each State

2011

- Census 2011 data on access to types of sanitation systems was used as the baseline

2022

- 2022 was taken as the end point for achieving FSSM goals (essentially a five year horizon from 2017)
- Projections for 2022 were made based on decadal growth rates for each city typology for each State
- 2022 was selected as the timeline to make a five year action plan and to align with India @ 75 goal.



Key assumptions/calculations for estimating FSSM financing need (1/2)

Population Projections

Sanitation Situation

Others

- Average annual population growth rate is applied by city categories based on annual growth rate from Census 2001-2011 for 2022 population projection
- Census 2011 results are used for piped sewerage coverage for cities having sewerage network.
- End-state sewerage coverage for 2022 is based on available information for sewerage projects under AMRUT, state schemes, etc. If no target % is given, we assume that the scheme increases the city's sewerage by one half of the difference between the city's current sewerage and 100% sewerage. If city does not have a proposed project for sewerage expansion, then sewerage coverage is considered same as per Census 2011 result. It is assumed that remaining households will require FSSM services. We have assumed one septic tank of a standard size per household
- For non-sewerage network cities, it was assumed that all the households will require FSSM service including households that dependent on community toilets.
- It was assumed that the newly constructed toilets will be connected with onsite sanitation system in proportion to toilet facilities connected to onsite sanitation system as per Census 2011 for partially sewerred cities.
- Inflation rate: 5%
- Number of working days: 280

Key assumptions/calculations for estimating FSSM financing need (2/2)

Technical Assumptions for Conveyance

- Two options of 3 and 6 years were considered. For brevity only 3 years desludging frequency is reported here. But the model can incorporate various desludging cycles.
- Existing trucks data is available for Maharashtra and Odisha. For Tamilnadu and Andhra Pradesh it is assumed that each in ULB has trucks (according to 8 year desludging frequency, as reported by partners)
- We assume one truck will desludge one septic tank in one trip.
- Truck Lifespan: 10 years
- INR 20 lakh for 5000 liters capacity of truck
- INR 15 lakh for 3000 liters capacity of truck
- Trucks operations cost estimated according to typology of city (based on number of trips, Average trip distance, staff requirement, etc.).

Cost Assumptions for Conveyance

Technical Assumptions for Treatment

- Considered buffer capacity for FSTP – 20% is added to take care of fluctuations and future population growth
- Assumed that ULBs with existing STPs or ULBs with proposed STP/FSTP under AMRUT/ other government programme would not require independent FSTP.
- For category 3- Co-treatment with nearby STP is considered for ULBs located within 20 km radius from existing STPs for Maharashtra, Andhra Pradesh, Odisha. For TN, list of cities provided in TN FSSM Policy is considered for Co-treatment with nearby STPs.
- INR 6 lakh per KLD.
- Annual FSTP operation cost – 6% of capital cost for construction of FSTP.
- These are derived based on “Details of FSTPs in India” – Compiled by KPMG under NFSSM Alliance as on August, 2018

Cost Assumptions for Treatment

Cost of capex for treatment is assumed on the basis of analysis of average cost across technologies for completed FSTPs

There are significant variations in Capex/Opex across states and technologies

Based on analysis of available data, the average value Rs 6 lakh/KLD was assumed in all states.

The investment requirement will increase if more expensive technology is used or local costs are higher

Sr. No.	States	Number of FSTPs	Capacity (KLD)	Capex (Rs. lakh/ KLD)			Opex (Rs. lakh/year)	Opex per KLD (lakh/KLD)
				Average Capex	Min Capex	Max Capex		
1	Orissa	10	20-75	5.9	2.9	10.5	17-19	0.4
2	Tamil Nadu	3	23-32	14.0	9.1	21.4	10-20	0.6
3	Andhra Pradesh	2	15	5.0	2.0	8.0	10-15	0.7
4	Maharashtra	2	70	2.2	2.1	2.3	8-24	0.5
5	Rest of India	14	6-100	6.3	4.3	33.9	5-30	0.5

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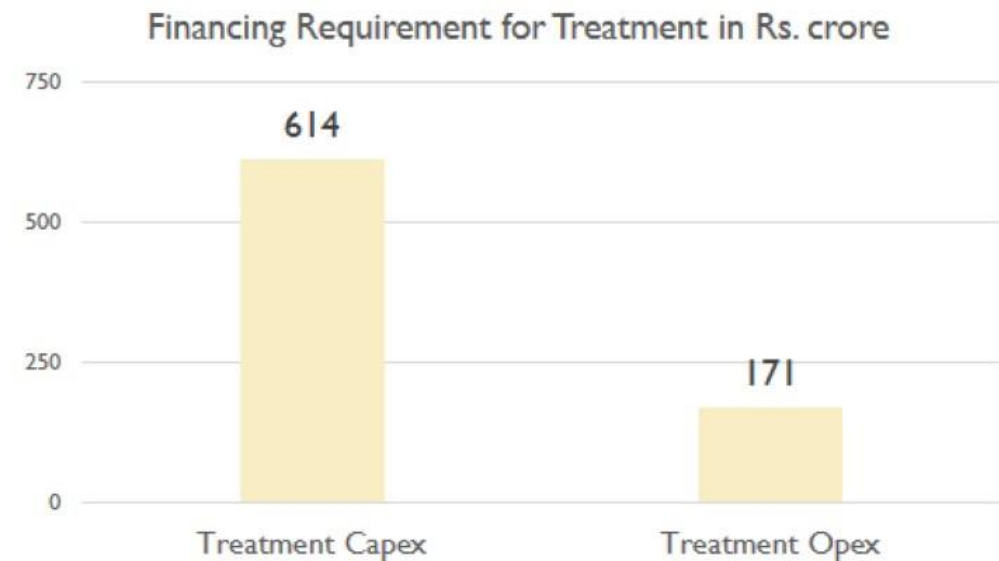
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Maharashtra: Capex is ~ Rs. 1000 Cr while opex is ~ Rs. 550 Cr (1/2)

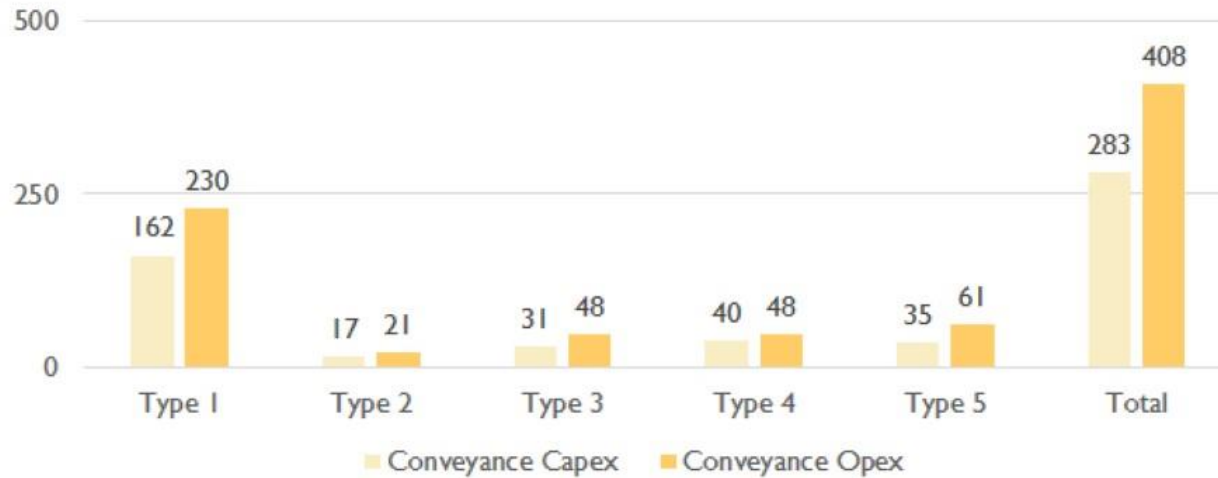


- There are significant FSSM needs in Type I cities in Maharashtra. This is the primary driver of high conveyance opex needs.
- Opex costs are higher in large cities which typically use 5 kl volume trucks, compared with 3 kl trucks typically used in smaller cities.
- However, it is expected that FS will be co-treated at STPs in these cities, reducing the expected need for treatment plants and corresponding operations and maintenance.
- Accordingly the conveyance costs for Maharashtra appear proportionately larger.

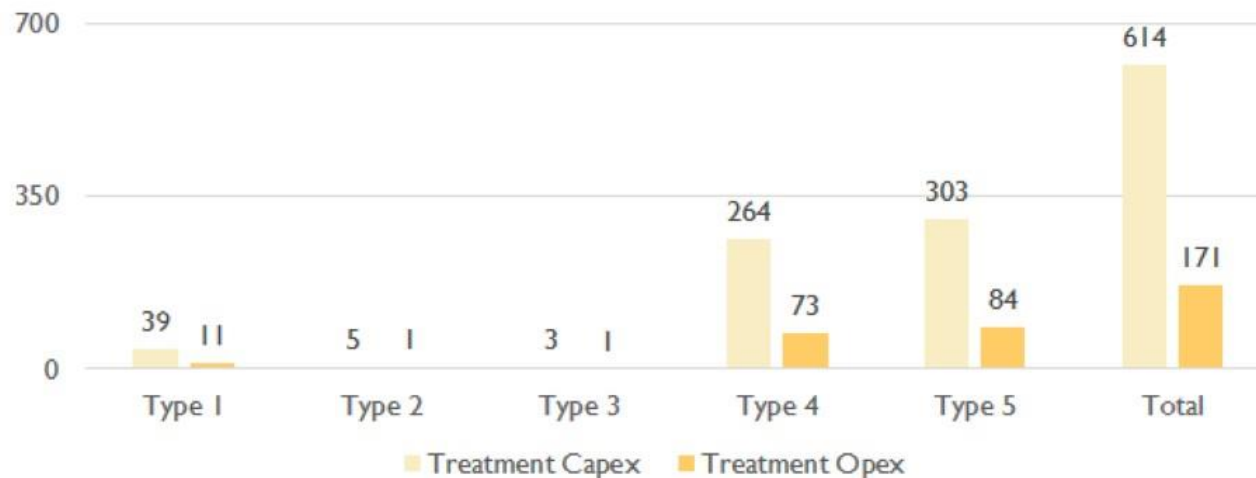
Maharashtra: Conveyance costs are driven by type 1 cities, while treatment costs are driven by type 4 and 5 cities (2/2)



Financing Requirement for Conveyance in Rs. crore

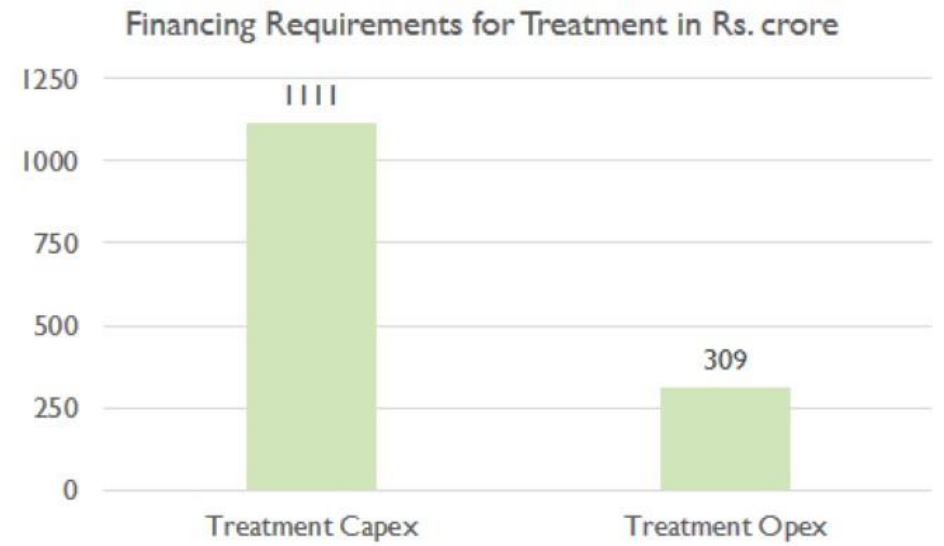
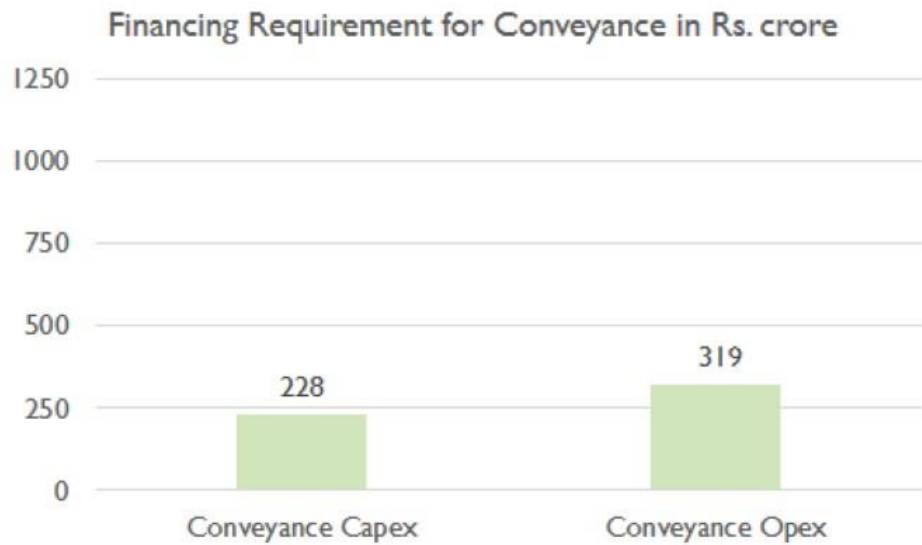


Financing Requirement for Treatment in Rs. crore



- Significant investment needed on for conveyance for type 1 cities, with high operating expenditure.
- Significant treatment capex needed on type 4 and 5 cities.
- There are some FSTP costs for type 3 towns because Wai (a type 3 town) already has an FSTP, so it is assumed that it will operate and maintain that plant.

Tamil Nadu: Capex for conveyance is low, while its high for treatment (1/2)

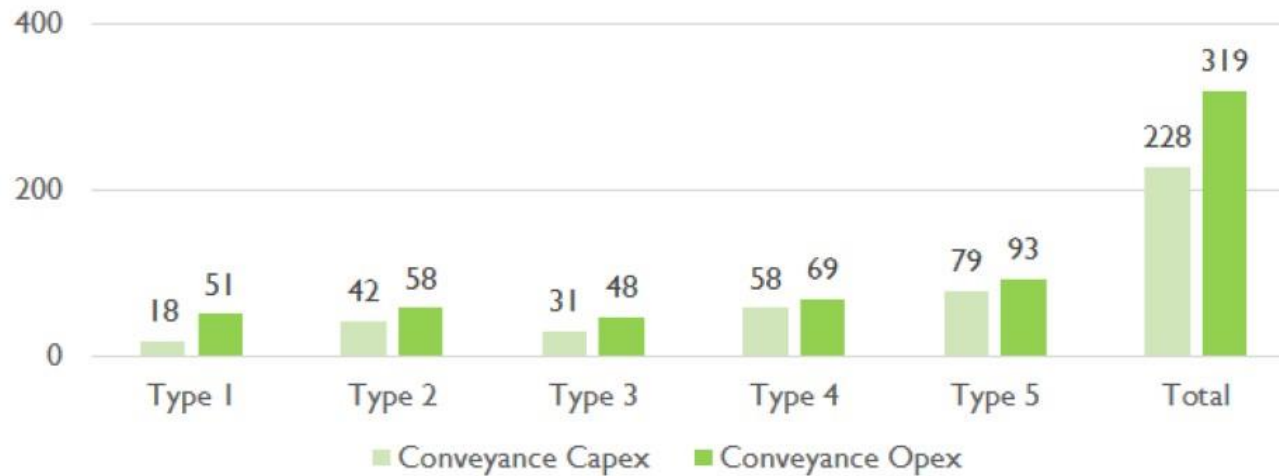


- Conveyance capex and opex costs are quite similar.
- Treatment costs are high due to need for FSTP in Type 4 and 5 cities. Type 1 cities are projected to largely be covered by sewerage, reducing the need for FSSM in those cities. In addition, there are opportunities for co-treatment in Type 1 and 2 cities in Tamil Nadu.

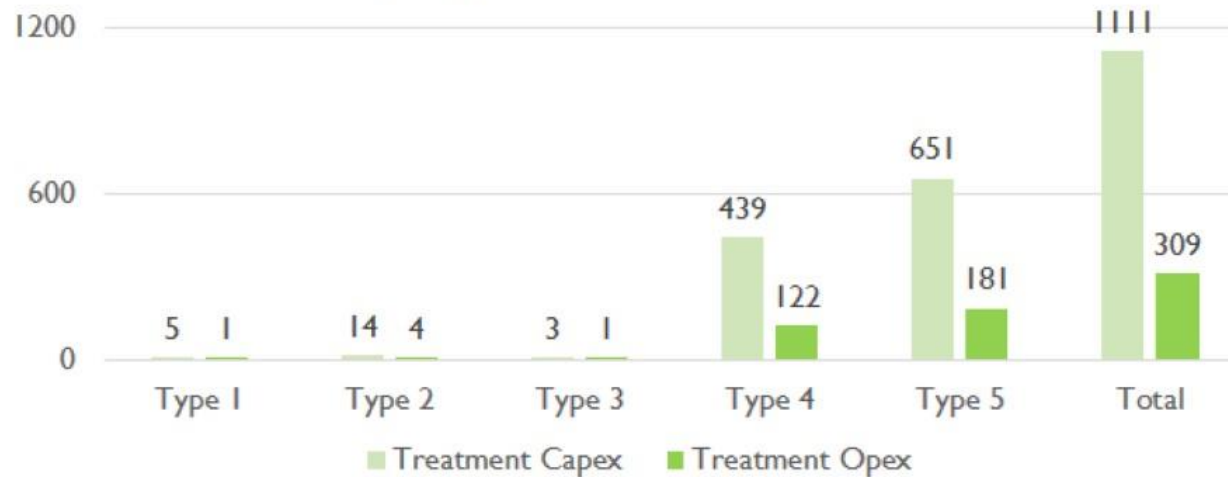
Tamil Nadu: FSSM costs are largely linked to type 4 and 5 cities, where significant share of population resides (2/2)



Financing Requirement for Conveyance in Rs. crore

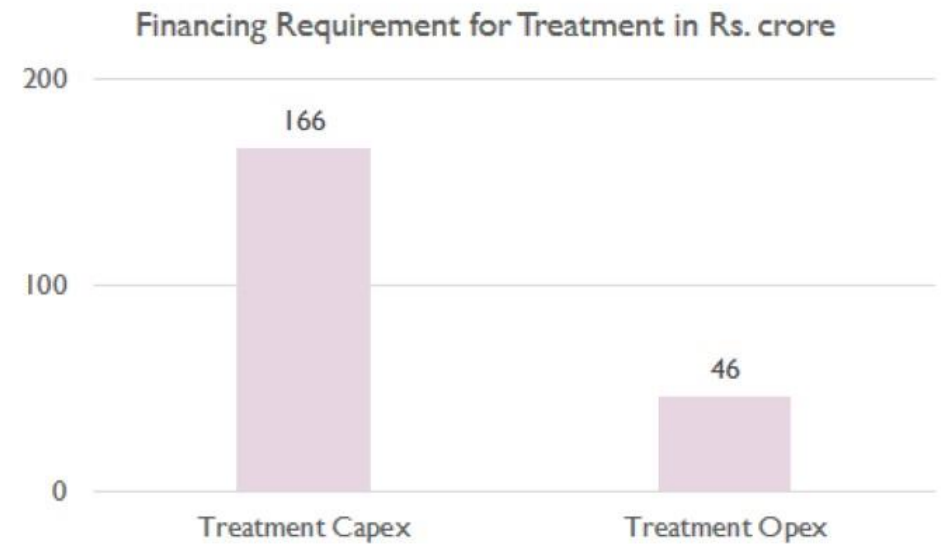


Financing Requirement for Treatment in Rs. crore



- Type 4 and 5 cities will need most support for FSSM investments.
- These cities will have to fund the opex on their own.
- Proper assessment of municipal finances will be needed.

Odisha: Treatment costs are relatively high. With state government providing a truck to many cities, the capex for conveyance is low. (1/2)

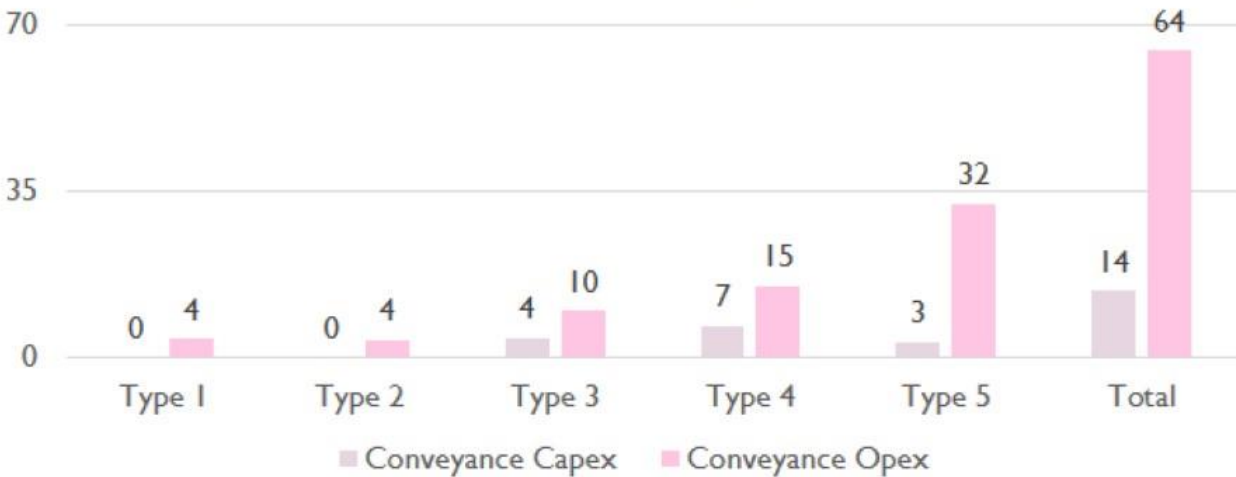


- Overall financing requirements are small compared to other states given much smaller urban population in Odisha.
- Treatment costs comprise a majority of the total funding needs in the state, with capacities to be established to serve significant populations in type 4 and 5 cities.
- Smaller cities typically have lower conveyance costs. In Odisha, FSSM needs are higher in smaller cities, which typically have smaller volume trucks (e.g. 3 kl).

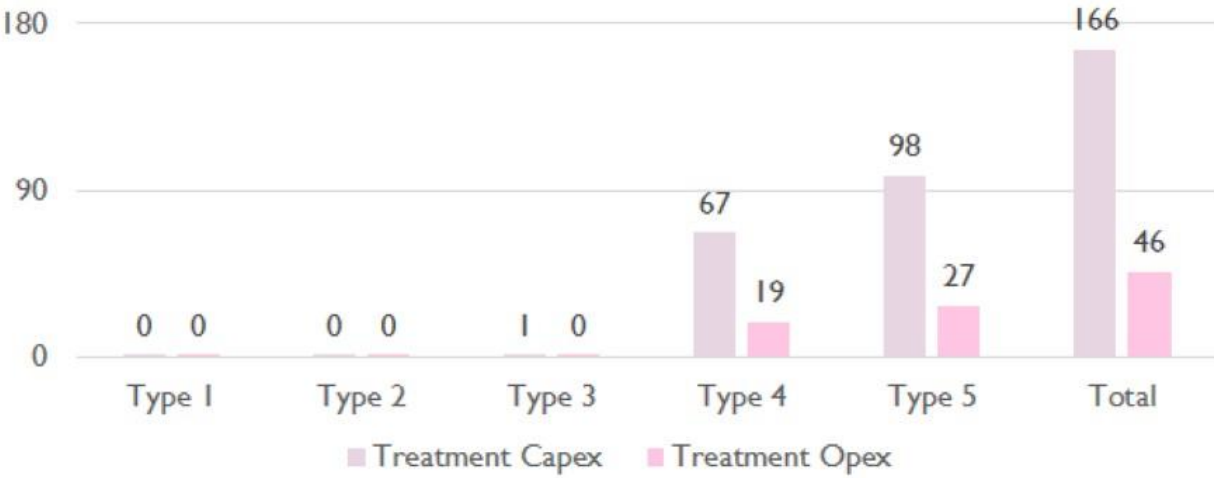
Odisha: Type 4 and 5 cities constitute a majority of the cost burden in Odisha, due to the high sewerage in larger cities (2/2)



Financing Requirement for Conveyance in Rs. crore

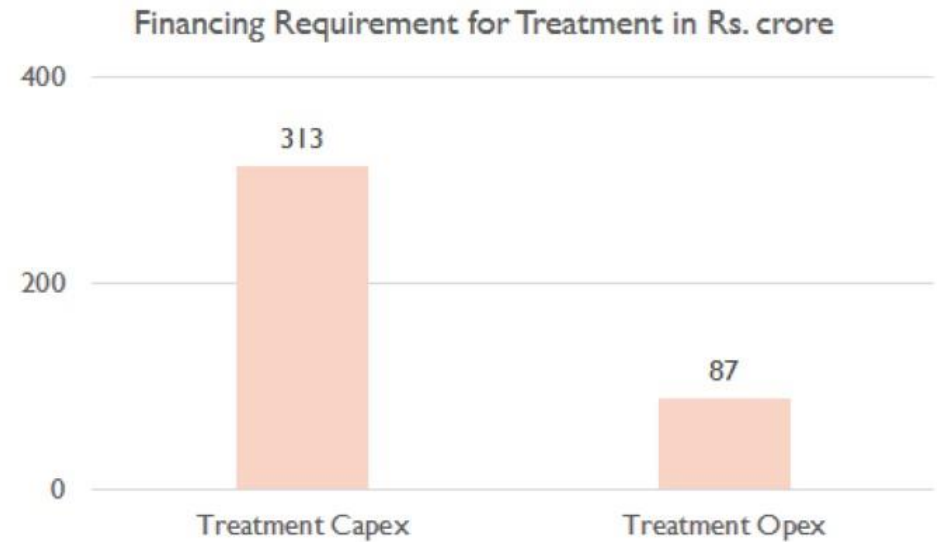


Financing Requirement for Treatment in Rs. crore



- Odisha's Type 1 and 2 cities are projected to have very high levels of sewerage in the future (reaching 100% in Type 1 cities). Thus the portion of FSSM costs attributed to these cities is very low.
- Significant treatment costs expected to be incurred in type 4 and 5 cities.

Andhra Pradesh: Financing requirement for treatment is high. For conveyance, both capex and opex are high (1/2)

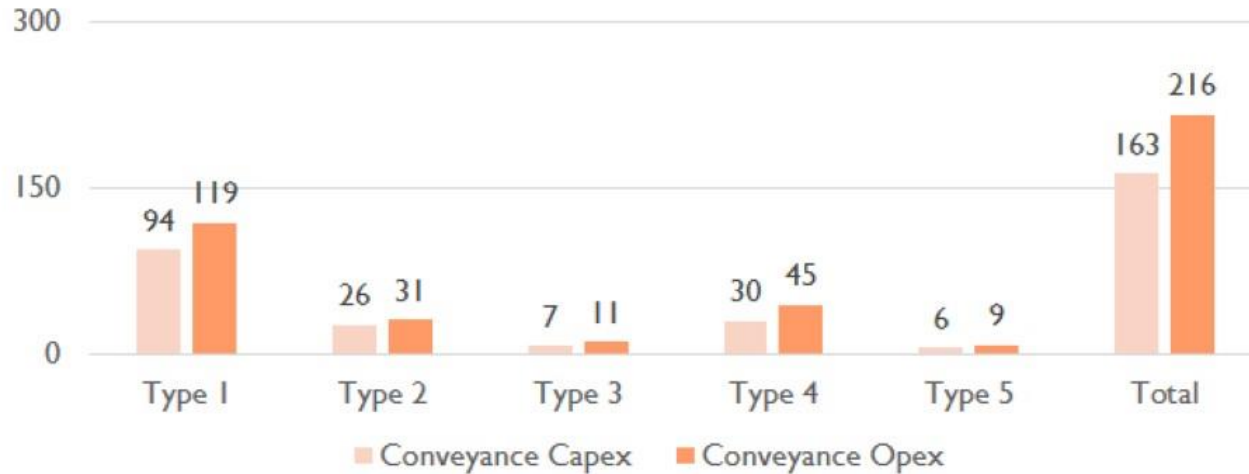


- Financing requirement for FSTP is around Rs. 300 crore. For conveyance, the total capex is Rs. 163 crore.
- The state government is committed to fund the capex for FSTP.

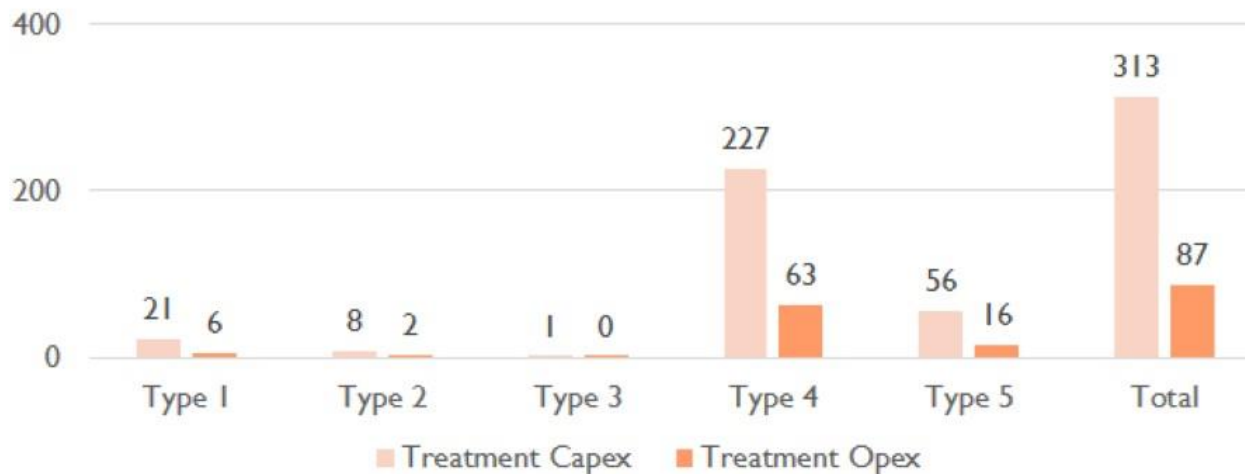
Andhra Pradesh: Costs are concentrated around Type 1 and 4 cities, where most of the population resides (2/2)



Financing Requirement for Conveyance in Rs. crore

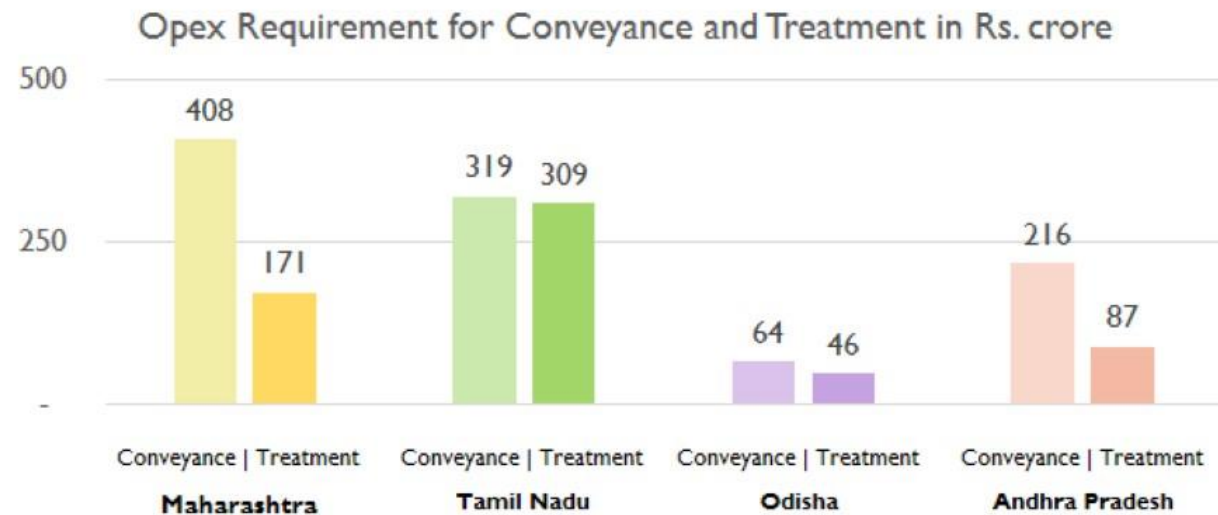
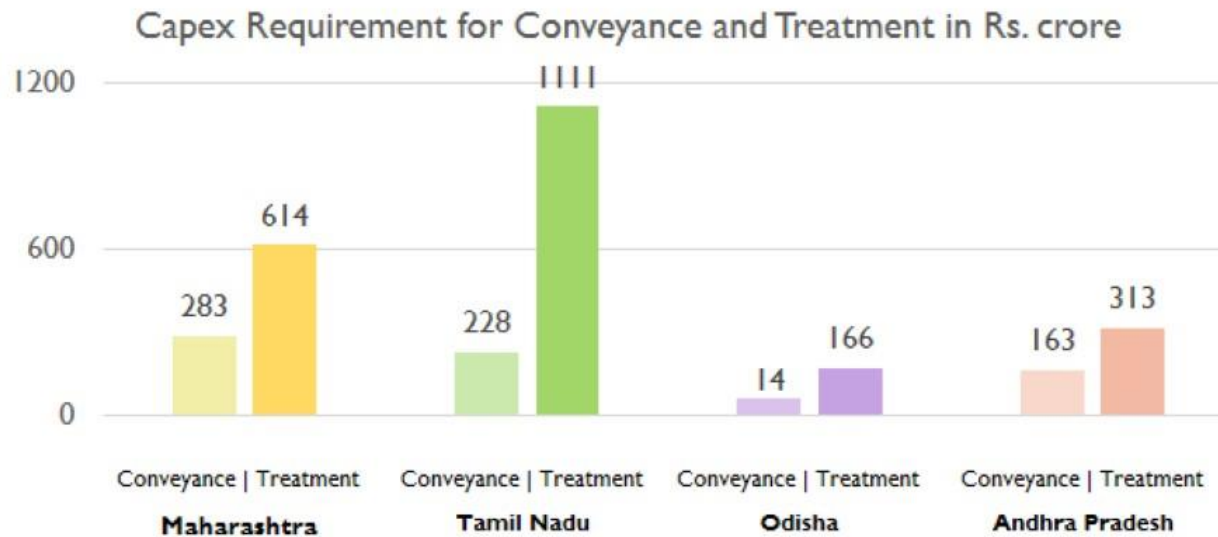


Financing Requirement for Treatment in Rs. crore



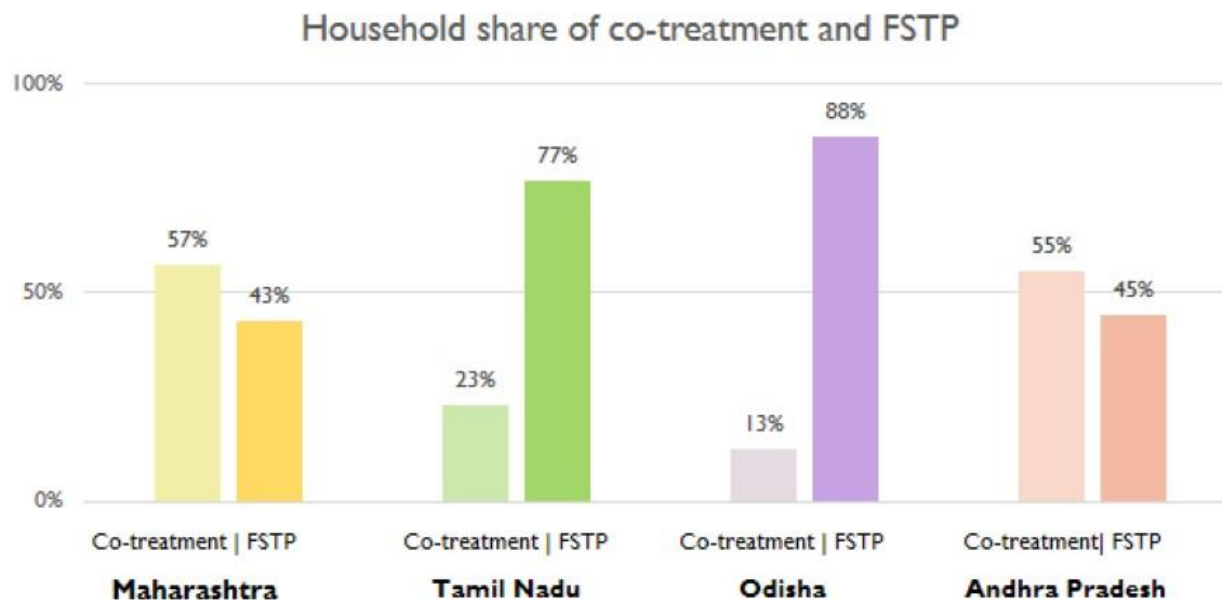
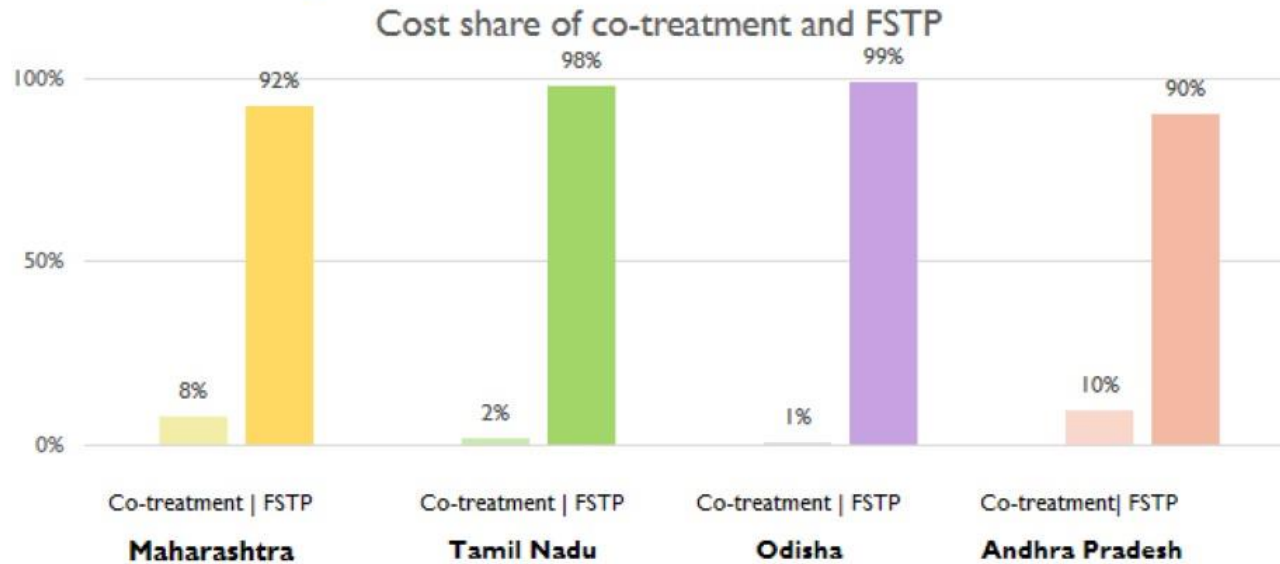
- Most of the FSSM costs in Andhra Pradesh is due to Type 1 and Type 4 cities.
- End state in type 1 cities indicates relatively low levels of sewerage, resulting in significant capex for conveyance.
- In Type 4 cities, requirement for both treatment and conveyance opex is high.

At an aggregate level, TN and Maharashtra will need to plan for large capex for FSSM



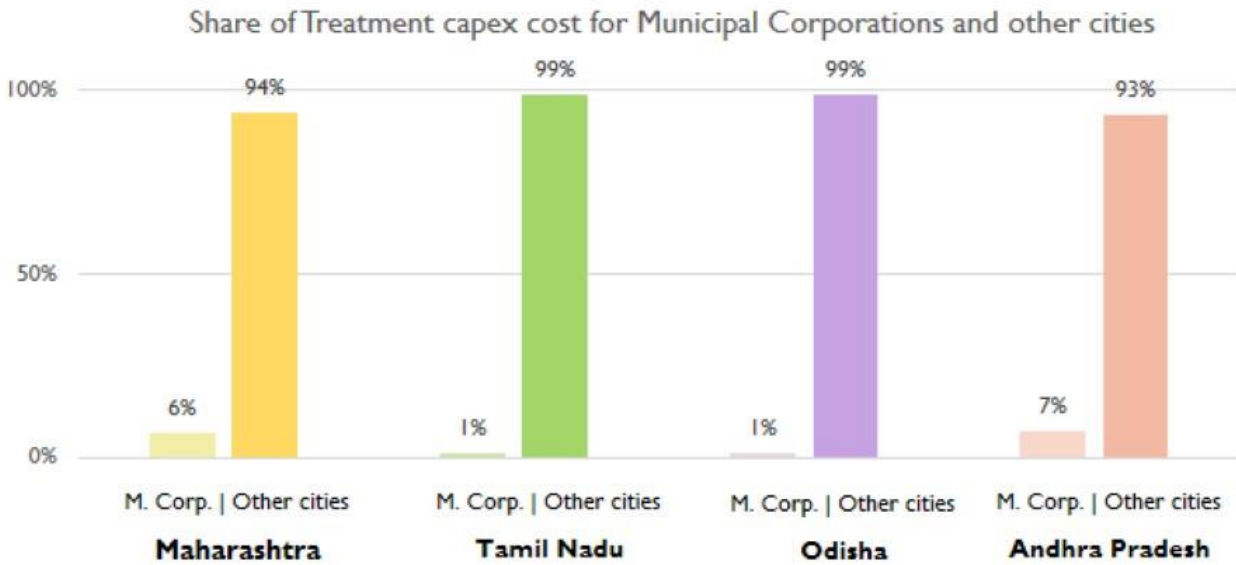
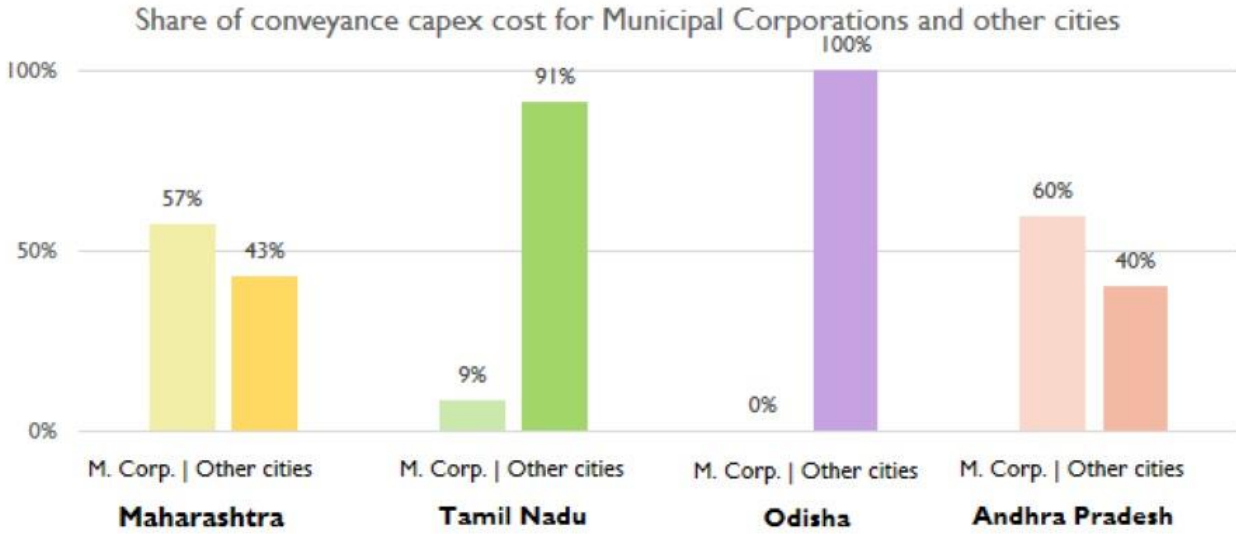
- Maharashtra will require about Rs 900 crore for capex and Rs 550 crore for opex.
- Tamil Nadu will require Rs 1400 crore for capex and Rs 600 crore for opex.
- Compared to these two states, the requirements in AP and Odisha is much less for FSSM services.

Share of co-treatment for cost requirement is very less in comparison to cost requirement for new FSTP creation



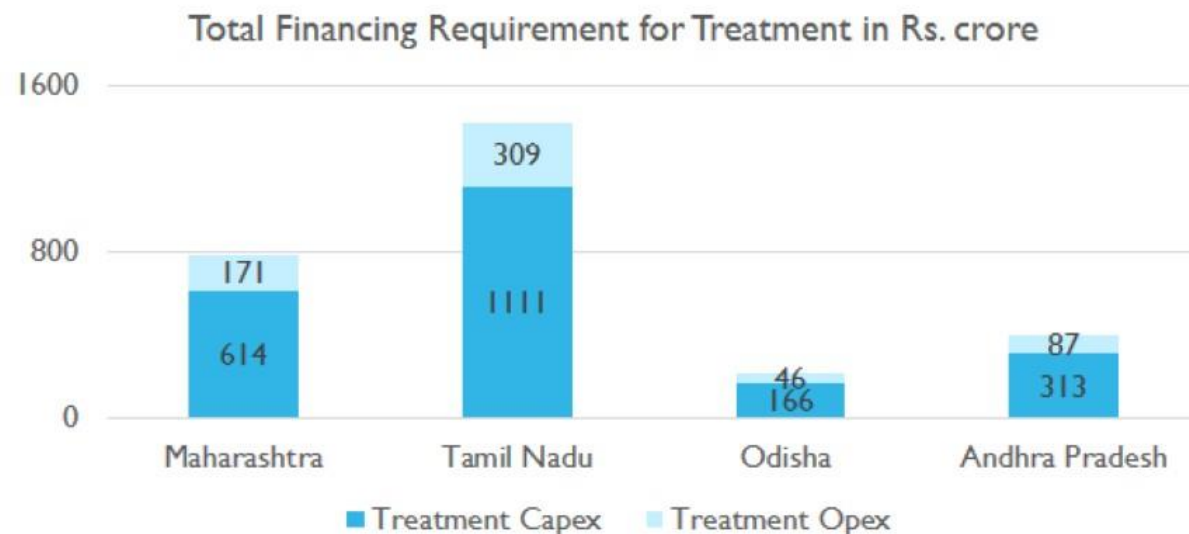
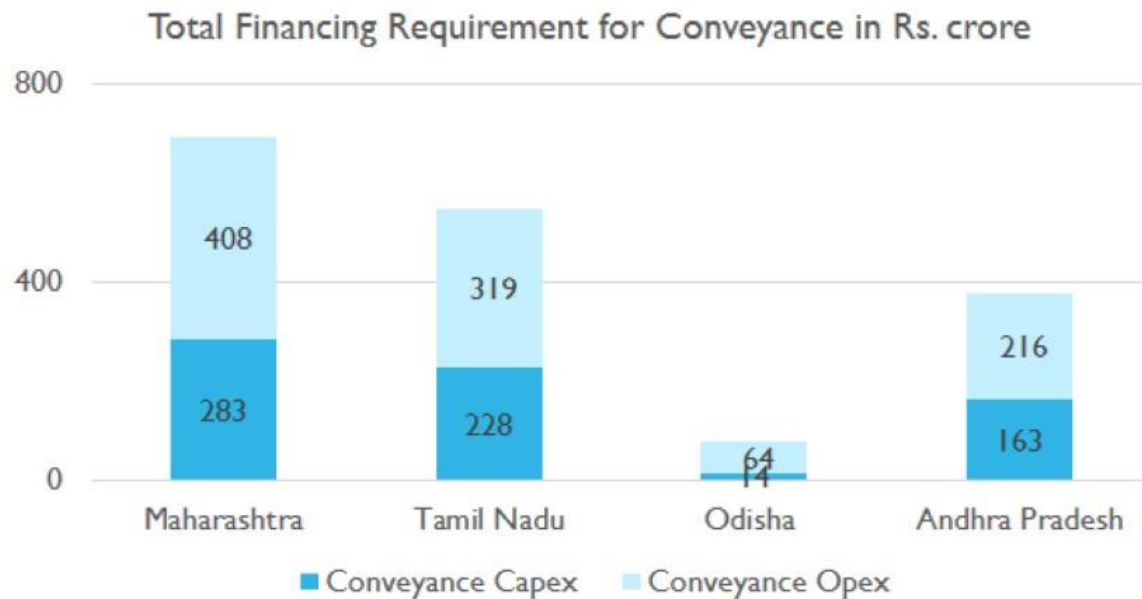
- Almost fifty percent of households in Maharashtra and Andhra Pradesh can co-treat their FSS at own STP/ nearby STP.
- The cost requirement share for co-treatment is very less in comparison to cost for new FSTP creation.
- Co-treatment option thus reduces the capital investment requirement and also serves a large share of population especially in Maharashtra and Andhra.

Share of conveyance and treatment costs for Municipal Corporations and other cities



- Capex requirement for conveyance is high for municipal corporations in Maharashtra and Andhra Pradesh almost 50% of their on-site sanitation dependent households reside in municipal corporations.
- However capex requirement for treatment is higher in other cities as most municipal corporations will co-treat their FSS in their own STPs.

In summary, Tamil Nadu shows the highest Capex requirement for treatment while Maharashtra has the highest capex requirement for conveyance



- It is important to note that for conveyance, the opex is more than the capex.
- This opex for conveyance is typically funded by households through taxes/user charges.
- For treatment facilities, the capex is expected to be financed through grants/transfers, whereas the opex will be funded by ULBs (or by parastatal in case of Odisha).

Using similar approach, the all India estimate for capex for treatment ~Rs. 10,000 crore and opex is ~ Rs. 2,000 crore

All values in Rs. crore.

Capex Requirement

	Conveyance Capex	Treatment Capex
AMRUT cities	2,833	2,903
Non-AMRUT cities	2,453	4,221
Census Towns	1,626	2,928
All India	6,913	10,051

Opex Requirement

	Conveyance Opex	Treatment Opex
AMRUT cities	2,133	808
Non-AMRUT cities	1,846	1,174
Census Towns	1,224	8,14
All India	5,203	2,796

Conclusion: Funding needs are moderate, but funds will need to be channeled through appropriate frameworks

Key factors that determine the quantum of funds required are:

- o FSSM coverage needs mainly differ by city typology
- o Treatment options e.g. utilization of existing STP infrastructure through co-treatment versus building new FSTPs
- o Share of co-treatment reduces the requirement of capex for FSTP.
- o Municipal corporations require conveyance infrastructure for Maharashtra and Andhra Pradesh while Tamil Nadu and Odisha require conveyance infrastructure in other municipal councils and town panchayats.



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Approach to financing FSSM treatment and conveyance

- The basic premise is to mainly focus on public finance particularly for treatment. However, for conveyance private sector funding for capex can be explored through PPP models as well as regular demand based services, along with public funding of emptying trucks.
- For O&M expenditure (opex) for treatment – need to focus on public revenue sources as there is a very low revenue model possibilities from reuse, and there are likely issues with tipping fees. This can be either local taxes or by state budget allocations as under HAM. ULB own income for meeting O&M expenditure is a preferred option.
- For Opex for conveyance – this can be through user charges as prevalent now, but can result in inequitable access and high prices. An option can be ULB own sources such as sanitation or property taxes

The public finance requirements for capex for treatment should mainly be met from funding from the Centre, States and ULBs

Centre

Given the importance of FSSM for achieving safe sanitation in urban areas, a new AMRUT-Plus or a SBM-2.0 can allocate funds for FSTP on similar pattern as followed in AMRUT/SBM

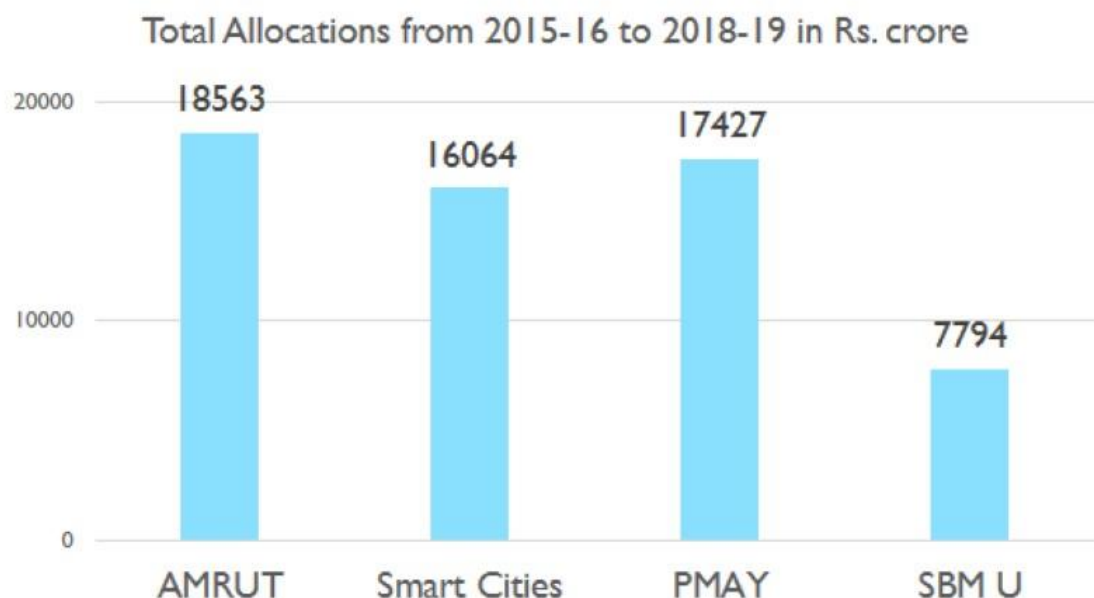
State

Besides meeting its share in central scheme, state government can also have its own scheme (such as the Nagarothan in Maharashtra) or a specific budget allocation (as by GoAP to Swachh Andhra Corporation for FSTPs). The ULB share in such schemes could be between 20-50% depending on city size.

ULBs

Besides meeting its share in central or state schemes, ULBs can themselves fund FSTP construction or purchase of emptying trucks, using their own funds such as the 14th FC grants or own surplus.

Compared to total allocations for urban programs by MOUHA over past 4 years, GOI share for FSTPs in all urban areas would be only 6%



Annual public finance requirement for FSTPs (@ 40% GOI share), is only 6% of annual allocations to GOI urban programmes

At all India level, allocations from GOI budget for key programmes has been nearly Rs. 60,000 crore, or an average annual allocation of Rs. 15,000 crore.

The total requirement for construction of FSTPs in large non-sewered AMRUT cities and in Non-AMRUT cities is estimated to be around Rs. 10,000 crore or **Rs. 2000 crore per annum.**

A new AMRUT+ can easily provide funds for FSTP, at least in AMRUT towns. For non-AMRUT towns, SBM 2.0 can make a special allocation for FSSM.

At the state level only a small share of the State UDD budget is required to meet the capex requirement for all treatment facilities

State UDD budgets are large compared to funding needs for FSSM across the four states

Maharashtra **Tamil Nadu** **Odisha** **Andhra Pradesh**

Annual Capex Requirement for FSSM Treatment Facility in Rs. crore



% Requirement from annual UDD/ MAWS budgets – as per 2017-18 Budget Estimates

1.0%

1.5%

0.7%

1.1%

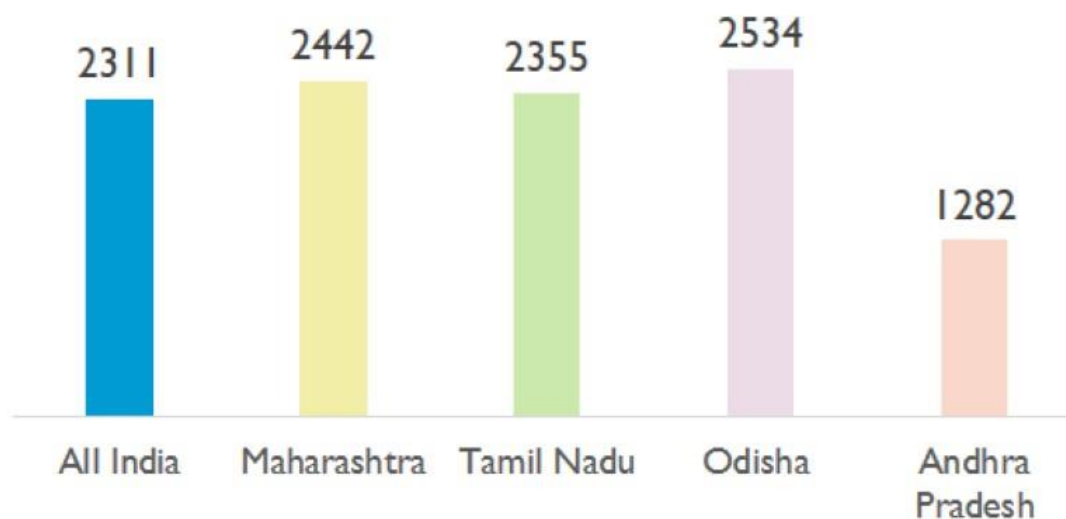
In some states, local or ULB level resources are also important! For example, the 14th Finance Commission grant is also a significant potential source.

		Maharashtra	Tamil Nadu	Odisha	Andhra Pradesh
14th Finance Commission cumulative devolutions (Urban)	In Rs. Crore (covering the period from 2015-2020)	12,413	8,232	1,773	3,636
Financing Requirement for treatment for 2018-22 (in Rs. Crore)		614	1111	166	313

- Maharashtra receives significant amount of 14th FC grants for ULBs and has advised ULBs that 50% should be used for Sanitation.
- The capex requirement for FSSM is around 10% of the 14th FC funds availability in each state. Each state, like Maharashtra may need to make a policy decision on using 14th FC funds for FSSM

Per capita 14th FC grant is low for Andhra Pradesh, while the other 3 states have per capita allocation close to the national average

Per capita 14th FC Grants (Urban)



“The grants provided are intended to be used to support and strengthen the delivery of basic civic services including **water supply, sanitation including septage management**, sewage and solid waste management, storm water drainage, maintenance of community assets, maintenance of roads, footpaths, street-lightning, burial and cremation grounds and any other basic service within the functions assigned to them under relevant legislations.”

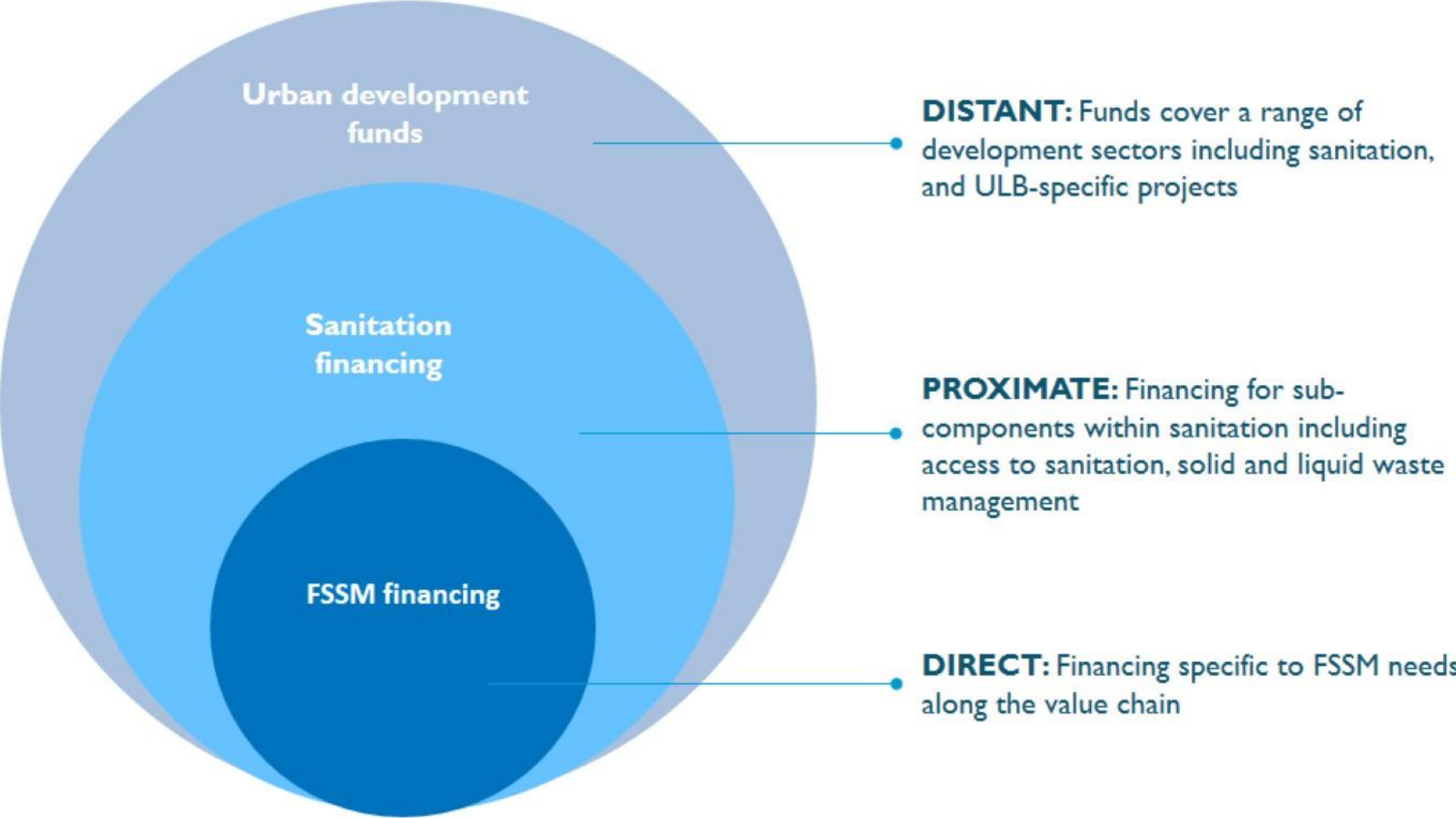
- The FFC has recommended Basic grant to the local bodies with the purpose of providing a measure of unconditional support to Municipalities for delivering basic services.
- Per Capita Urban Grant devolutions based on total urban state population for Odisha, Tamil Nadu and Maharashtra range between 2300-2600 which is near to the national average of 2311.

Ministry of Finance (2015) “Issues for Guidelines for the implementation of the recommendation of 14th FC with regard to local bodies grant”; Indian Finance Commission (2014) “14th Finance Commission Report”, New Delhi; CAG (2017) “Report No. 5-Report on Local Bodies for FY 2016, Government of Maharashtra” CAG (2016) “Report No. 3- Report on Local Bodies, Government of Tamil Nadu”; CAG (2017) “Report No. 1- Report on Local Bodies, Government of Andhra Pradesh”; CAG (2016) “Report No. 8- Report on Local Bodies, Government of Odisha”

State and ULB Level Financing for FSSM - approach

Steps	Approach	Illustrations
1. Identify sources of funding currently or potentially relevant for FSSM or sanitation	<ul style="list-style-type: none"> Identify funding sources at the central, state, and ULB levels 	<ul style="list-style-type: none"> Central govt. schemes e.g. AMRUT, Swachh Bharat Mission State schemes/sources e.g. incentive grants in Maharashtra
2. Classify funding sources as direct, proximate or distant	Classify each type of source of funds based on relevance for FSSM, as direct, proximate or distant (<i>explained subsequently</i>)	<ul style="list-style-type: none"> AMRUT funds are a direct source of funding in Odisha since these are currently being used for FSSM. AMRUT is a distant pool of funds in Tamil Nadu since it is not viewed as a resource for FSSM
3. Determine quantum of funds available for sanitation at the State and ULB levels	<p>State funds</p> <ul style="list-style-type: none"> State level funds state schemes and transfers from the central govt. For each source of funds in step 2, identify the quantum available for sanitation where known or based on assumptions of percentage funds available for sanitation (where precise data is unavailable) <p>ULB funds</p> <ul style="list-style-type: none"> ULB level funds which can be potentially used for sanitation are also assessed. 	<ul style="list-style-type: none"> AMRUT scheme data provides details of exact funding available for sanitation in each State State-level schemes for municipal infrastructure often do not have an exact sector-wise break-up and reasonable assumptions around the quantum available for sanitation needs to be made ULB level funds such as 14th FC funds for each state are identified.
4. Estimate of funds available for capex and opex	For each source of funds, identify if it is available for capex / opex / both and estimate the percentage amount available for capex and opex.	In general, most central and State level schemes are typically available for capex funding, with opex expected to be funded by ULBs.

FSSM financing available presently and potentially, classified as direct, proximate, and distant sources for four states



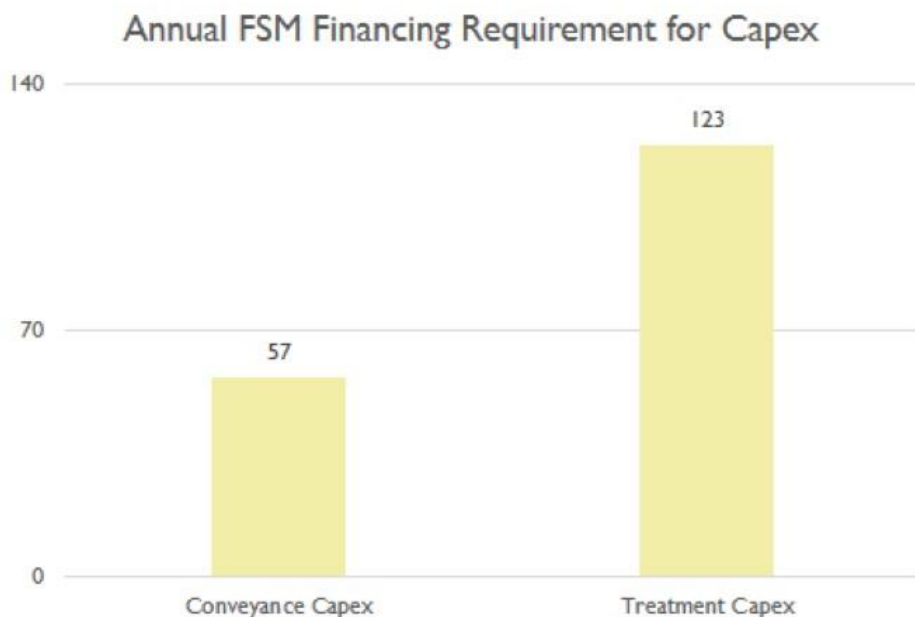
We looked beyond core FSSM financing to identify relevant other potential capital pools that can be deployed for FSSM

There are these pool of funding that can be used to finance FSSM in the four states

	<u>Direct Pools</u>	<u>Proximate Pools</u>	<u>Distant Pools</u>
Maharashtra	<ul style="list-style-type: none"> • 14th FC funds • Incentive scheme for ODF cities 	<ul style="list-style-type: none"> • AMRUT • SBM • Maharashtra Nagarothan Maha-Abhiyan • Special grant to municipal councils 	<ul style="list-style-type: none"> • Provisions for development of basic amenities • Schemes for urban infrastructure (typically focus on roads, transport)
Tamil Nadu	<ul style="list-style-type: none"> • SBM unutilized funds • CMA funding for decanting stations • IUDM 	<ul style="list-style-type: none"> • SBM • EAPs (through TNUDF) • Grants to O & M gap funds 	<ul style="list-style-type: none"> • Incentive to ULBs • 14th FC • Chennai Mega City Dev. Mission
Odisha	<ul style="list-style-type: none"> • AMRUT • District Mineral Fund • UNNATI Funds 	<ul style="list-style-type: none"> • SBM • Special grants to municipal councils • OUIDF 	<ul style="list-style-type: none"> • 14th FC funds • SFC funds • ADB funds • JICA
Andhra Pradesh	<ul style="list-style-type: none"> • AMRUT • Swachh Andhra Corporation • AP Urban water supply and Septage Improvement Project 	<ul style="list-style-type: none"> • AIIB • SCP • SBM 	<ul style="list-style-type: none"> • 14th FC • SFC • APMDP • Infrastructure facilities for SC/ST • Assistance for development works

Maharashtra has already advised ULBs to use 50% of 14th FC funds for sanitation, other significant funding for sanitation is potentially available

All numbers in Rs. crore.



Potential pool of funds for FSSM (Rs. In crore)

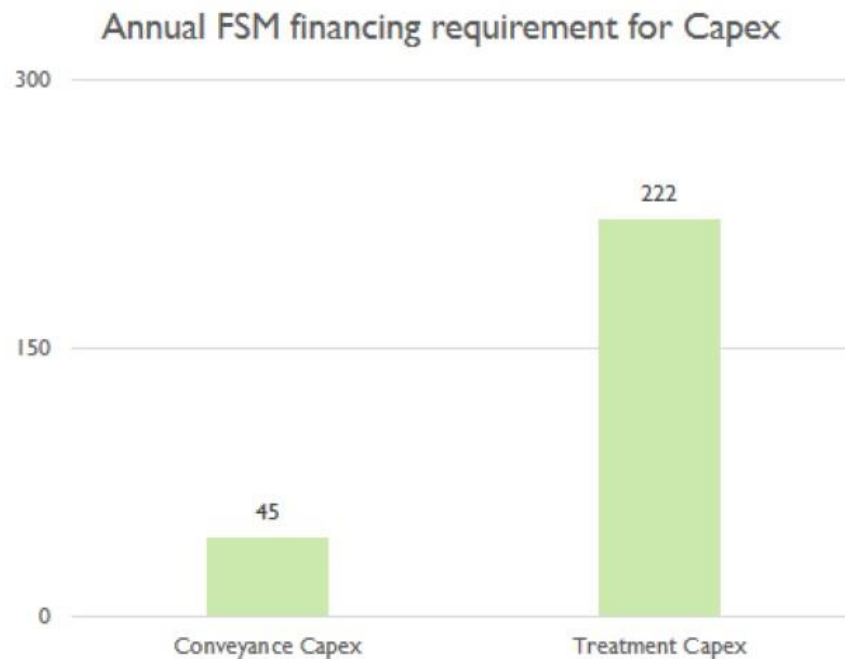
- 14th FC: 1228
- Incentive grant to ULBs: 408
- SBM: 1605
- Maharashtra Nagarothan Scheme for Municipal Corporations: 550
- Maharashtra Nagarothan Scheme for Municipal Councils: 550
- Vaisistpurn Yojana (Distinctive work) for Municipality: 573
- Assistance to ULBs for the provision of Urban Facilities for newly formed NPs/ MC & newly added areas in Municipal Corp. and Nagarpalikas: 355

Source: Maharashtra Urban Development Department budget, 2017-18

- The state has advised the ULBs to use 50% of 14th FC grants for sanitation. These are the largest standalone source of funds for sanitation in Maharashtra.
- Other significant sources of sanitation funding that can be leveraged particularly for FSSM are incentive grants available to ODF cities.
- The state can cultivate some of its Nagarothan funds (funding for innovative projects) towards FSSM activities.
- AMRUT is a large source of funding for sanitation but has so far not been leveraged for FSSM in Maharashtra.

Tamil Nadu spends significantly on sanitation, state funding for sanitation is driven by availability of AMRUT funds and IUDM

All numbers in Rs. crore



Potential pool of funds for FSSM (Rs. In crore)

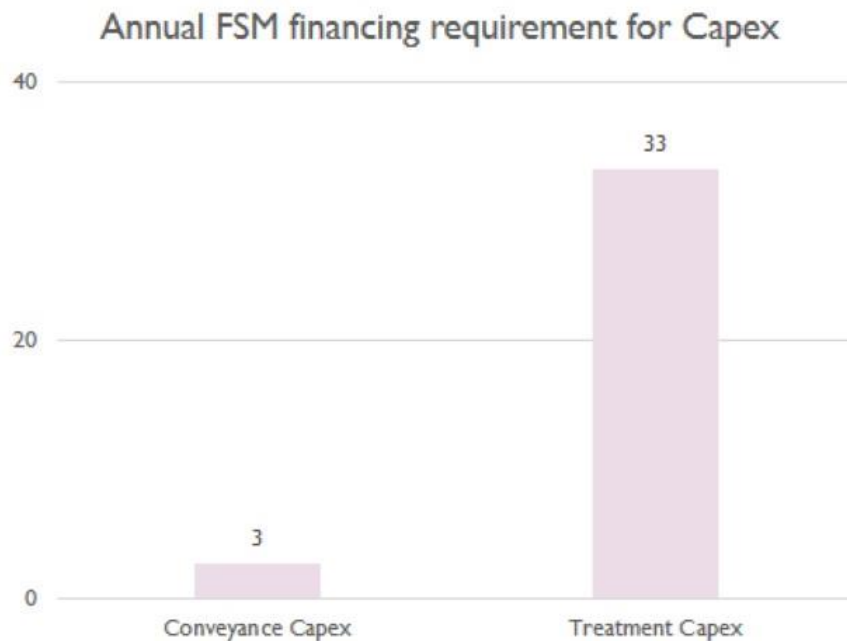
- SBM (33% share for FSTPs) : 66*
- IUDM (2018-19): 750 (200 crore already allocated for 49 FSTPs)*
- Loans to Water Supply and Sanitation Pooled Fund under KfW line of credit: 10
- Capital fund grants from EAPs: 450
- 14th FC: 1628
- Chennai Mega City Dev. Mission: 400

Source: Tamil Nadu MAWS budget estimate 2017-18; MAWS, Govt. of Tamil Nadu (2018) "In principle approval for creation of 49 numbers of FSSM treatment facility to cover 51 municipalities and 59 town panchayats"

- The state is funding its treatment plants for FSSM mainly from the Integrated Urban Development Mission (IUDM) funds.
- State funds include a high proportion of external assistance for urban infrastructure, relative to the other focus states.
- These funds can be utilized for FSSM activities apart from only sewerage projects.
- The outlay for AMRUT funding is 1400 crore (2017-18) which is relatively higher to other states, attributed to the state's higher level of urbanization and related urban sanitation funding needs for AMRUT cities, but these funds are not utilized for FSSM activities.

In Odisha, SBM, SCP, District Mineral Funds are the most significant sources of sanitation funding

All numbers in Rs. crore



Potential pool of funds for FSSM (Rs. In crore)

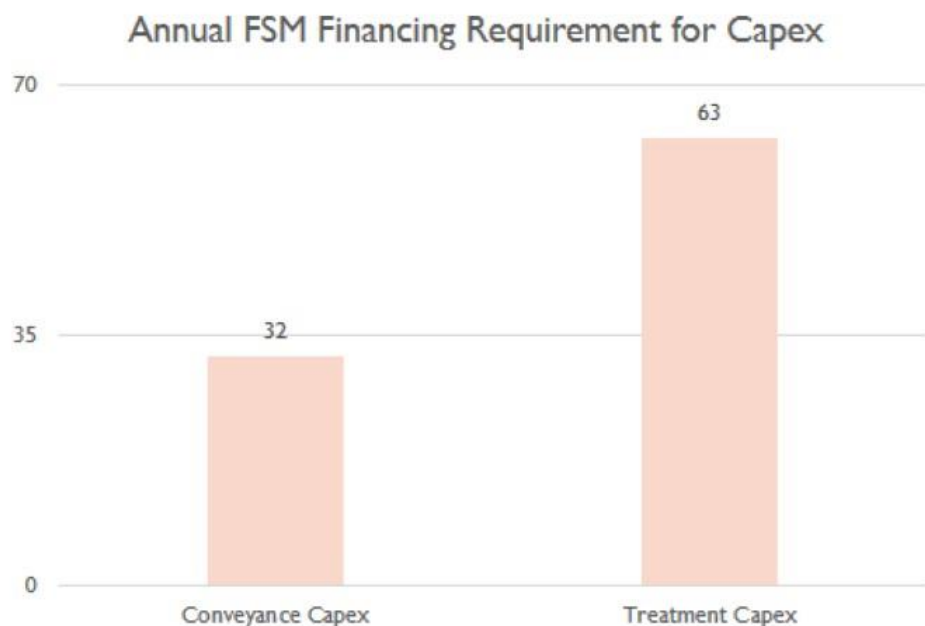
- AMRUT: 30 (for FSSM treatment projects)
- SBM: 186
- DMF: 1432 (32* has been already used in sanitation)
- OWSSB: 53 (11 crore funds for buying cesspool trucks)
- Urban sanitation: 10
- 14th FC: 271
- OUIDF (EAP assisted by KFW German) : 120
- Unnati: 303

Source: *EY (2017) "A note on unlocking funds under District Mineral Foundation for FSSM"; Odisha Housing and Urban Development Department budget 2017-18

- AMRUT funds are being used to fund FSTPs in 9 cities at an estimated cost between Rs. 30 crore.
- District Mineral Funds (DMF) are a direct source of funding in Odisha, Keonjhar district has used ~ Rs. 20 crore of its DMF on FSTPs for five ULBs and six cesspool trucks. Similarly the remaining DMF of other districts can be targeted for FSSM.
- OUIDF has indicated that they would be interested in funding FSTPs in all non-AMRUT cities.

In Andhra Pradesh, AMRUT funds, and state budget allocations for FSSM provide a significant pool of funding

All numbers in Rs. crore



Potential pool of funds for FSSM (Rs. In crore)

- AMRUT: 60 (for STP projects)
- Swachh Andhra Corporation: 40
- AP Urban water supply and Septage Improvement Project: 101
- Remodeling of existing sewerage systems and STPs: 100
- SBM: 32
- 14th FC: 558
- AP municipal development project: 100

Source: Andhra Pradesh MA and UD budget 2017-18

- Under Swachh Andhra Corporation, 40 Cr has been allocated which will focus on FSM activities.
- The state has already allocated, within its budget, a significant direct source of funding for FSSM, ~INR 101 cr under AP urban water supply and septage improvement project.
- There is also some utilization of AMRUT funds for FSSM, with ~28 sewage treatment plants being upgraded for co-treatment of FS at a total cost of ~INR 2.8 cr.
- Andhra has implemented treatment of FSS for 76 ULBs by Hybrid Annuity model by involving private sector participation.

Apart from public funds for treatment, models for private sector funding through PPPs may also be explored 1/2

Privately funded treatment plant

- The private operator can build the treatment plants and can recover their cost (capital and O&M):
 - Integrating conveyance and treatment services
 - User fees can vary from residential area to commercial and industrial
 - Levy tipping fees on depositing of FS in its treatment plant.
 - Recover from sale of the treated FS as compost/fertilizer.
- An option can be explored where, land can be provided by the local government and the construction and operations of the FSTP can be done by the private sector.

Leverage partial private funding for FSTPs

- In the partial private funding, the private sector capex cost will be repaid by the government in the form of annuity payment over the O&M period.

Leh

The private operator in Leh has designed, financed, built and now operates the FSTP. They also carry out conveyance services for hotels and residential properties.

Vietnam

Treatment plant is owned and run by the Hoa Binh fertilizer company. Charges the conveyance operators tipping fees for depositing FSS in their treatment plant.

Thailand

Thongthawil Service Co. Ltd (TSCL) provides services for septage desludging and treatment in **two municipalities** and **8 sub-district organizations**. Company collects a license fee for providing treatment services. TSCL charge only industrial domestic waste for providing treatment services under Factory act.

Hybrid Annuity Model in Andhra Pradesh

- Private companies - undertake construction, operation and maintenance on a DBOT basis. Cost is determined by bidding.
- CapEx – 50% by government, 50% by private company
- Annuity payments cover a) Capex repaid through annuity payments over contract period, b) and Opex
- 76 FSTPs are to be built under this model in Andhra Pradesh

CSR and philanthropy funding can be used for piloting treatment projects

- **Philanthropic funders or CSR funds support capex requirements, typically for pilots of treatment technologies or models.**
- **Philanthropic / non-profit support is best suited for the nascent phase** of piloting technologies.
- Various examples of philanthropy and CSR funds are implemented in Wai, Devenahalli, Coimbatore, Warangal, Narsapur, etc.

- **Devenahalli-** used a mix of funds, including capex funding and one year opex from CDD and BMGF.

Wai - Plant capex funded by BMGF. A private player design, build and operate the plant (DBOT).

Plant O&M is planned to be funded through sanitation / property tax in future.

- **Coimbatore-** Plant capex is funded by BMGF and constructed by a private player.

- **Warangal and Narsapur-** BMGF has provided grants to private service providers for the FSTP.

There is significant private participation in conveyance in all states, though its extent varies

Maharashtra

- Mix of public and private desludging services are observed in Maharashtra.
- There are ~170 private service operators in Maharashtra.
- For Two cities of Wai and Sinnar, a private service provider has been contracted for citywide scheduled desludging based on an open bidding process.

Odisha

- Limited private participation is observed in Odisha.
- ULBs across the state own 209 trucks. Recently, the state government offered incentives by buying and leasing trucks (~86 trucks) for 57 ULBs.
- Presence of private service providers is found only in 6-7 Municipal Corporations (Bhubaneswar shows maximum presence of private operators with about 40 trucks).

Tamil Nadu

- Presence of private service providers is common in many ULBs of Tamil Nadu.
- Most trucks are operated by small scale private providers who previously engaged in non-mechanized desludging but have now upgraded to mechanized vehicles.

Andhra Pradesh

- Predominance of private service providers across most ULBs in the state. Most players are small and unorganized. Enterprise size ranges from small (2-3 trucks) to larger players (~12 trucks).
- Players use own funds or loan from financing companies to buy trucks.

Many ULBs involve private operators in conveyance using different mechanisms

- **On-demand desludging through private operators** is a common practice in all the states.
- Opex is recovered through user charges from households.
- Private service providers to be registered/licensed to desludge the septic tanks.
- Innovative mechanisms are also present to involve private service providers in Wai, Sinnar, Leh.

PPP Performance based Annuity model for Scheduled desludging in Wai and Sinnar, Maharashtra

- Private service provider bring trucks and operate through a performance based contract to carry out scheduled desludging set by local government.
- Fees as per the bid are paid to private operators per septic tank emptied.
- The city collects a sanitation tax from the households for providing this service.

PSP Annuity model in Leh, Jammu and Kashmir

- Private service provider leases or operates local /state government trucks and carry out desludging operations on a performance based contract.
- Fees determined as per the bid. to private operators per trip emptied.
- User charges are levied for cost recovery through scheduled emptying (hotels at Rs. 3500 per trip and residential properties at Rs. 1000 per trip)



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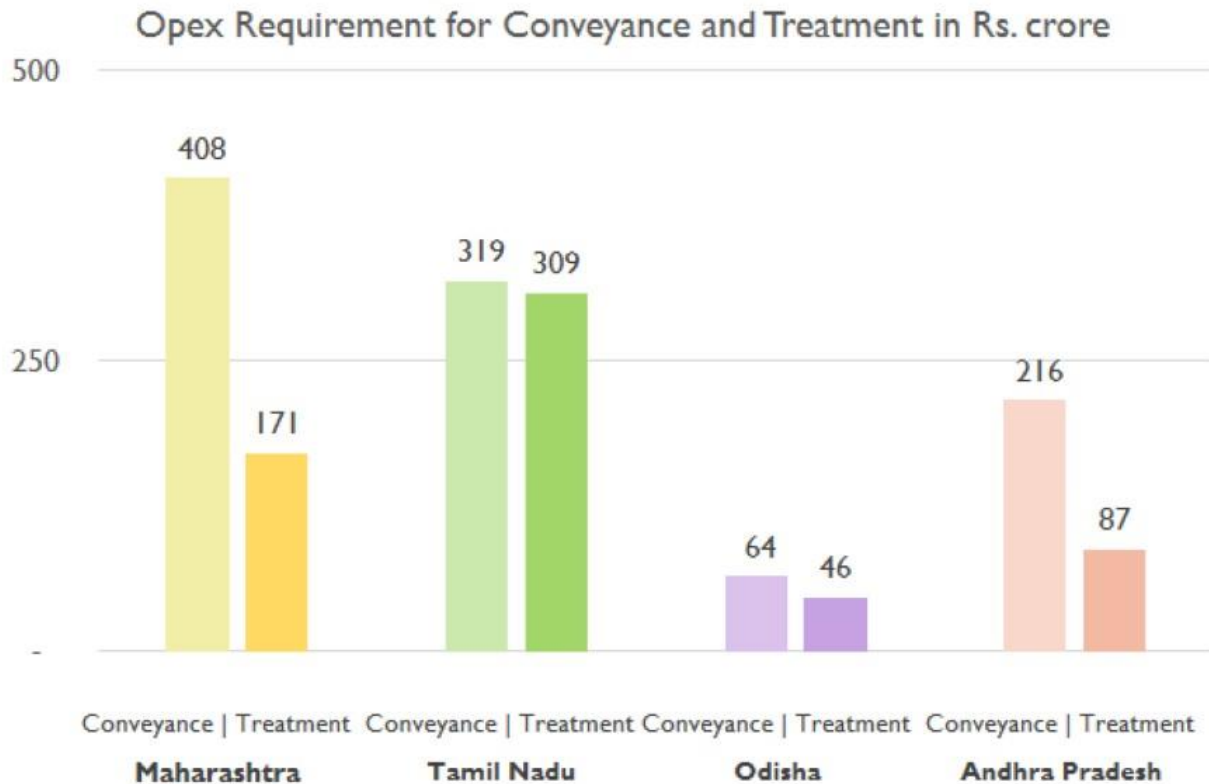
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Opex requirement for Conveyance and Treatment



- Opex includes operating costs, depreciation and replacement costs.
- The conveyance opex is higher for Maharashtra and Tamil Nadu compared to other two states.
- In Maharashtra, this high opex is in Type I cities where a large number of trucks are needed for conveyance.
- In Tamil Nadu, the high opex cost is due to requirements of a large number of trucks in type 5 cities.
- Often user charges and/or taxes can help recover some of the opex cost.

Operations and maintenance are important to sustain the services

- The spectre of non-functioning STPs across India is often due to inadequate funds for operation and maintenance of the plants.
- A study by CPCB shows that majority of State Govts./implementing agencies are not able to provide sufficient and regular funds for O&M of STPs resulting in their unsatisfactory performance.
- To avoid a similar situation for FSTPs, it is critical to ensure adequate funding for opex for FSTPs before the projects are taken up.
- FSSM is generally the responsibility of local governments and therefore the onus is on them to ensure proper O & M of FSTPs.

Responsibility of Opex is mainly with Urban Local Bodies (ULBs)

- In most states, **ULBs** are required to operate and maintain **FSSM** infrastructure and services.
- Thus while national flagship programmes like **AMRUT** may provide funds for capital investments, it is important to ensure that these investments will be maintained and operated adequately by **ULBs**.
- Hence it is important to assess **ULB's** financial capacity to sustain operation and maintenance costs of all infrastructure, before any major capital expenditure in a **ULB** is incurred.
- Strengthening of **ULB** finances is important – especially to enhance their own sources of revenue and reduce their dependence on grants and transfers from state and national governments.

Potential sources and approaches for recovering operating expenses of FSTPs

Reuse Market

Resource recovery acts as source of fund for recovering the operating expenses of FSSM. Products having higher market value in the region must be considered as a by-product of the faecal sludge.

Reuse of FS is being practiced to produce compost, energy (bio-gas), etc. However the revenue generated from these by-products is not sufficient enough to run all the operations of the plant. More advocacy and innovation is needed to develop these markets.

Eg: Nashik, a city in Maharashtra is producing 2,500m³ biogas and subsequently 3,300 kWh of electricity is produced per day from 10 to 15 tons of food and vegetable waste from approximately 500 restaurants and 10 to 20 tons of septage from 400 community toilets

Tipping Fees

Private entities are charged disposal fees for disposing FS at the treatment plant. This service would be used to run the treatment plants.

However disposal fees can work as a disincentive for private operators. In developing countries, where monitoring of disposal of sludge is weak, illegal and unsafe disposal of sludge into open lands, storm water drainage or into the sewerage network is common.

Eg: In Bekasi in Indonesia, tipping fees are paid by the private operators to dispose the FS into the treatment plant which is run by the ULB. The tipping is collected as a part of user charges from the households by the private operators.

Sanitation Tax/Other Taxes

There is need to focus on public revenues for O&M of FS services. These can be either local taxes or by state budget allocations, ULB's own income is a preferred option as it ensures the sustainability of running the services.

Sanitation tax is an option amongst ULB's own income which can be levied to recover the operating expenses of FSSM services. Apart from sanitation tax, it is also possible to allocate a percentage of property tax or any other tax for FSSM O & M expenses.

These service would be used in making payment to the operators for emptying (if private sector involved) as well as for operating the faecal sludge treatment plant.

Eg: Wai and Sinnar, two cities in Maharashtra have implemented sanitation tax in their cities to recover the operating expenses for conveyance and FSTP plant.

Provision for Sanitation Related Taxes and Fees in Municipal Legislations in the four states

State	Provisions for taxes and Fees related to sanitation services	Provision for Sanitation Tax
Maharashtra	<ul style="list-style-type: none"> • Conservancy tax • Imposition of compulsory and voluntary taxes including a general sanitary tax, a special latrine tax, Sewerage benefit tax • Special sanitary tax • Sewerage User Charges • Drainage tax to provide for expenses connected with the construction, maintenance, repair, extension or improvement of drainage works. 	<ul style="list-style-type: none"> • Special sanitary tax on private latrines, premises or compounds cleansed by municipal agency
Tamil Nadu	<ul style="list-style-type: none"> • Pipe line service charges • Sewerage Cess as a percentage of the water bill* 	<ul style="list-style-type: none"> • Sanitation tax • a scavenging tax to provide for expenses connected with the removal of rubbish, filth or the carcasses of animals from private premises.
Andhra Pradesh	<ul style="list-style-type: none"> • Pipe line service charges • Sewerage Cess as a percentage of the water bill* 	<ul style="list-style-type: none"> • drainage tax to provide for expenses connected with the construction, maintenance, repair, extension or improvement, of water or drainage works. • a scavenging tax to provide for expenses connected with the removal of rubbish, filth or the carcasses of animals from private premises
Odisha	<ul style="list-style-type: none"> • **Fixed Monthly Water Charges (per connection) • Monthly Sewerage Connection charges 	<ul style="list-style-type: none"> • a latrine tax on the annual value of holdings • a water tax on the annual value of holdings • a drainage tax on the annual value of holdings

*The above two are applicable for areas served by Hyderabad Metropolitan Water Supply and Sewerage Board only; ** Government Resolution dates 30th June 2005, Orissa Water Works (Urban Local Bodies) Rules, 1980

Sources of municipal revenue

Own income

Own sources are the sources such as taxes and charges which a municipality can collect.

Own Tax Revenue

Property Tax, sanitation tax, conservancy tax, vacant land tax, taxes on carriages and carts, advertisement tax

Own Non-Tax Revenue

Municipal fees, sale and hire charges, user charges, rental and lease income

Assigned Revenue

Profession Tax, surcharge on stamp duty, entertainment tax, motor vehicles tax

Grants and transfers

Grants and contributions from state and central governments form the other source of revenue income for municipalities.

Tied Grants

These include grants provided by the state / central governments for specific functions such as census grants, education grants, library grants, health grants, minority welfare grants, salary grants, etc.

Tied Grants

General assistance grants such as octroi compensation grants which can be applied by the municipality at its own discretion (untied grants).

Borrowing

Loans undertaken by the local authorities for capital works, etc.

Across the 4 states - Opex Requirement for FSM ranges between 0.2% - 1.9 % of ULB Revenue Income or 0.2% - 1.8% of municipal expenditure

Maharashtra Tamil Nadu Odisha Andhra Pradesh

Annual Opex Requirement for FSM in Rs. crore



% Annual Opex requirement to ULB Revenue Income

0.2%

1.9%

0.3%

0.9%

% Annual Opex requirement to ULB Revenue Expenditure

0.2%

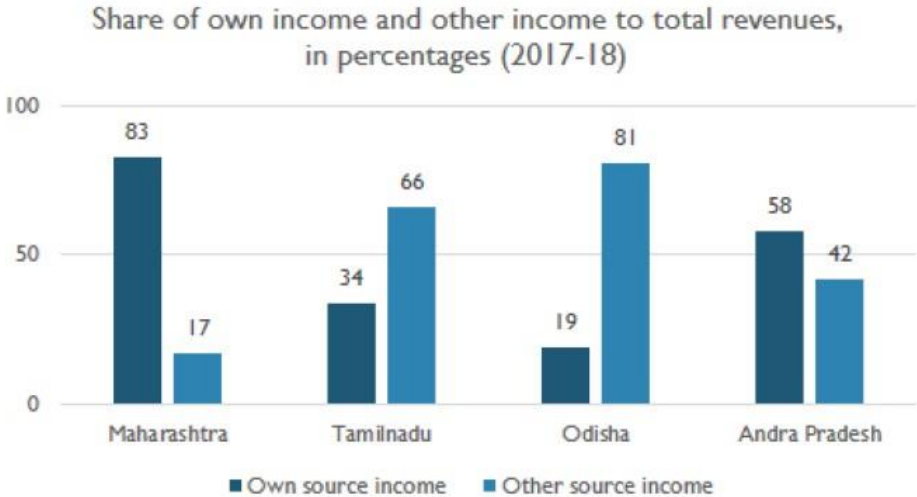
1.1%

1.8%

1.0%

It is possible to meet this additional requirement from municipal revenues, especially improving property tax collection efficiency and ensuring that all new properties come under the municipal property tax net.

Among the focus states, ULBs in Maharashtra and Andhra Pradesh have a higher proportion of 'own income' relative to income from other sources

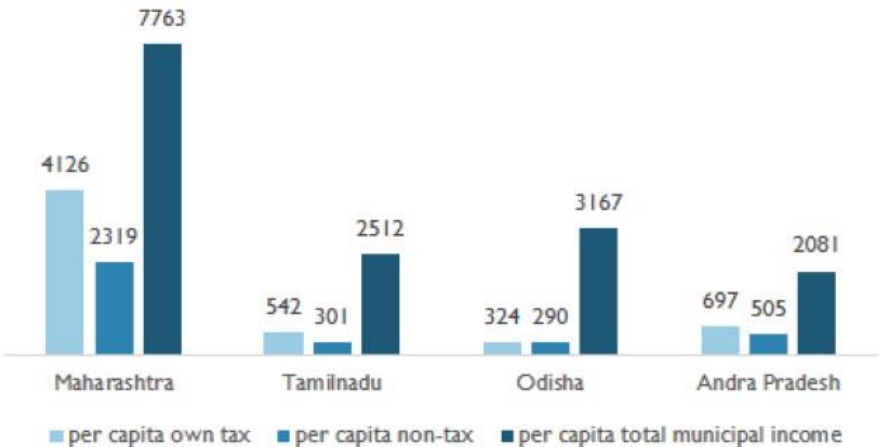


In Maharashtra, ULBs are able to generate over 80% of its revenue through own sources – taxes, fees, user charges, rental income, etc.

In AP, cities are able to generate about 50% of the revenue through own sources.

Both Odisha and TN cities depend more on grants and transfers

Per Capita Municipal Income (2012-13), in Rs.

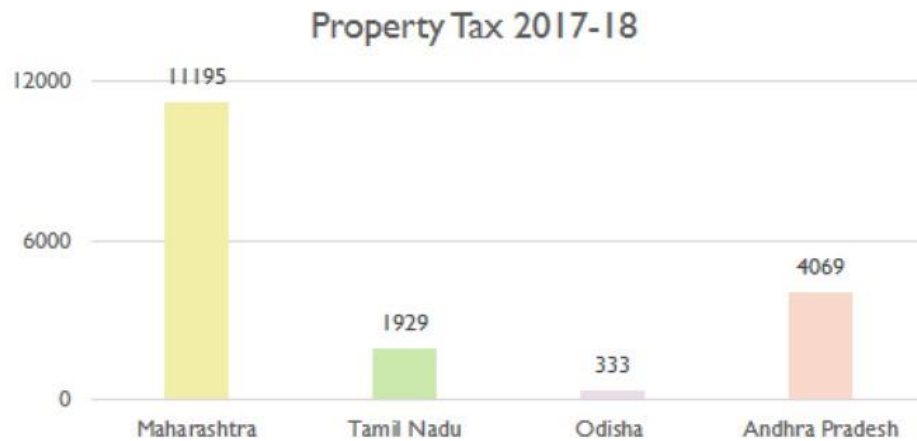


This suggests that it will be easier for ULBs in Maharashtra and AP to meet the Opex requirements of FSSM from their own sources. In TN and Odisha, cities may need to depend on state governments for additional grants

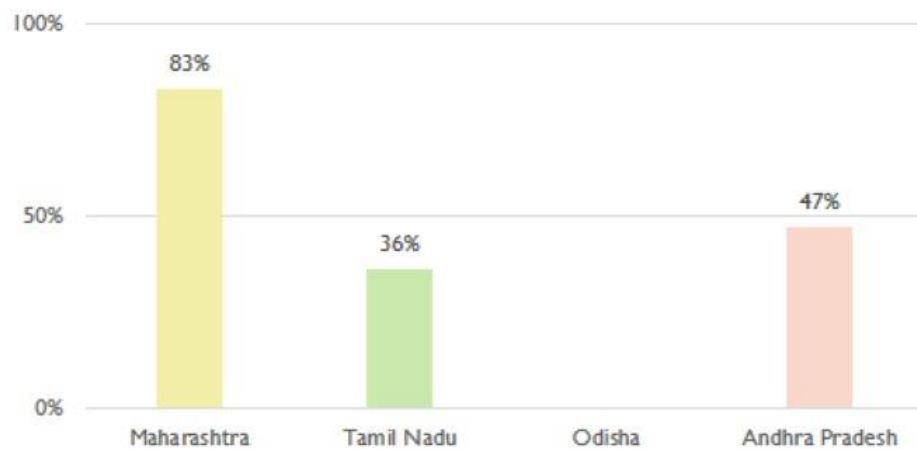
Property tax is a major source of own income for ULBs

Municipal revenue from property tax, 2017-18

In Rs. crore

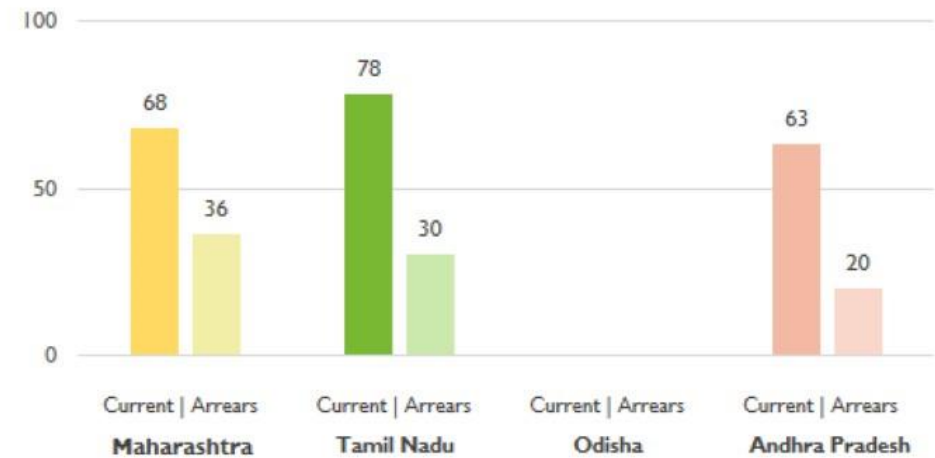


ULBs own revenue as a % to total revenue (2017-18)



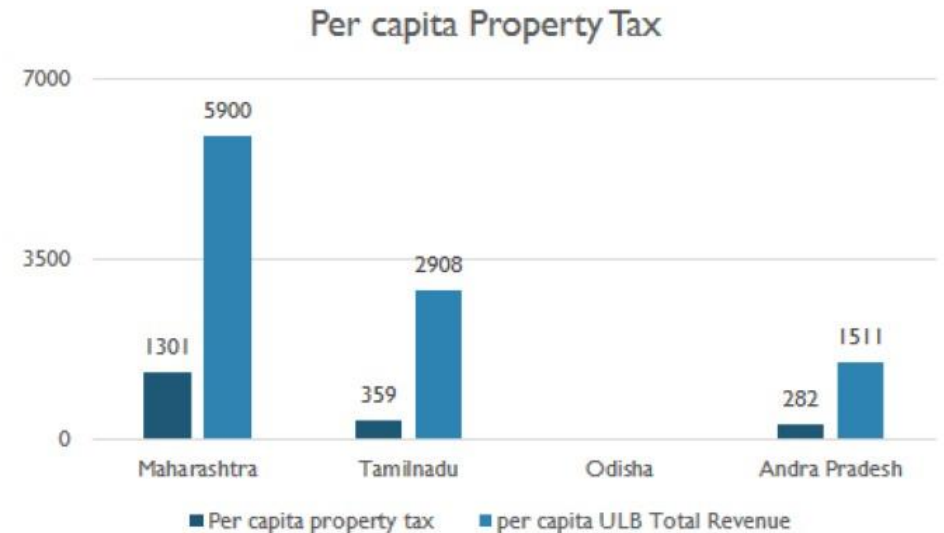
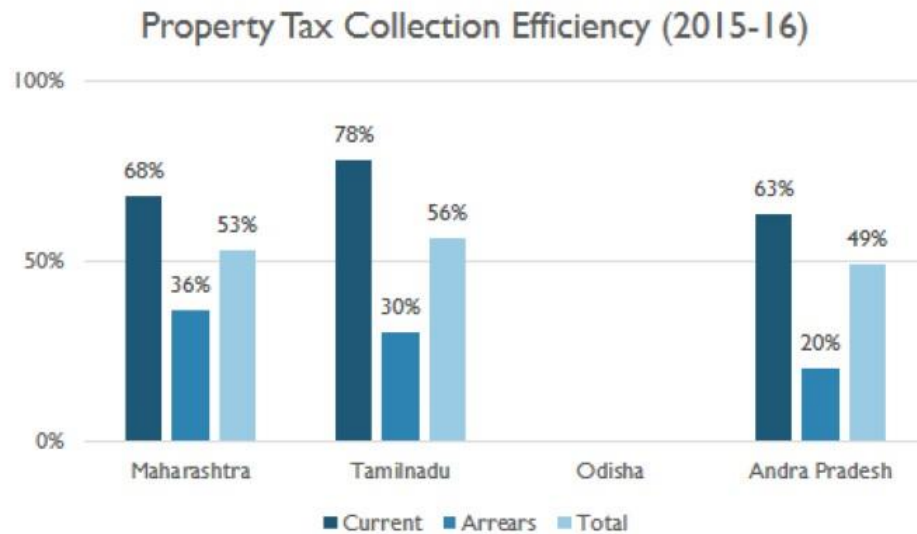
In Percentage

Collection Efficiency of Property Tax (2017-18)



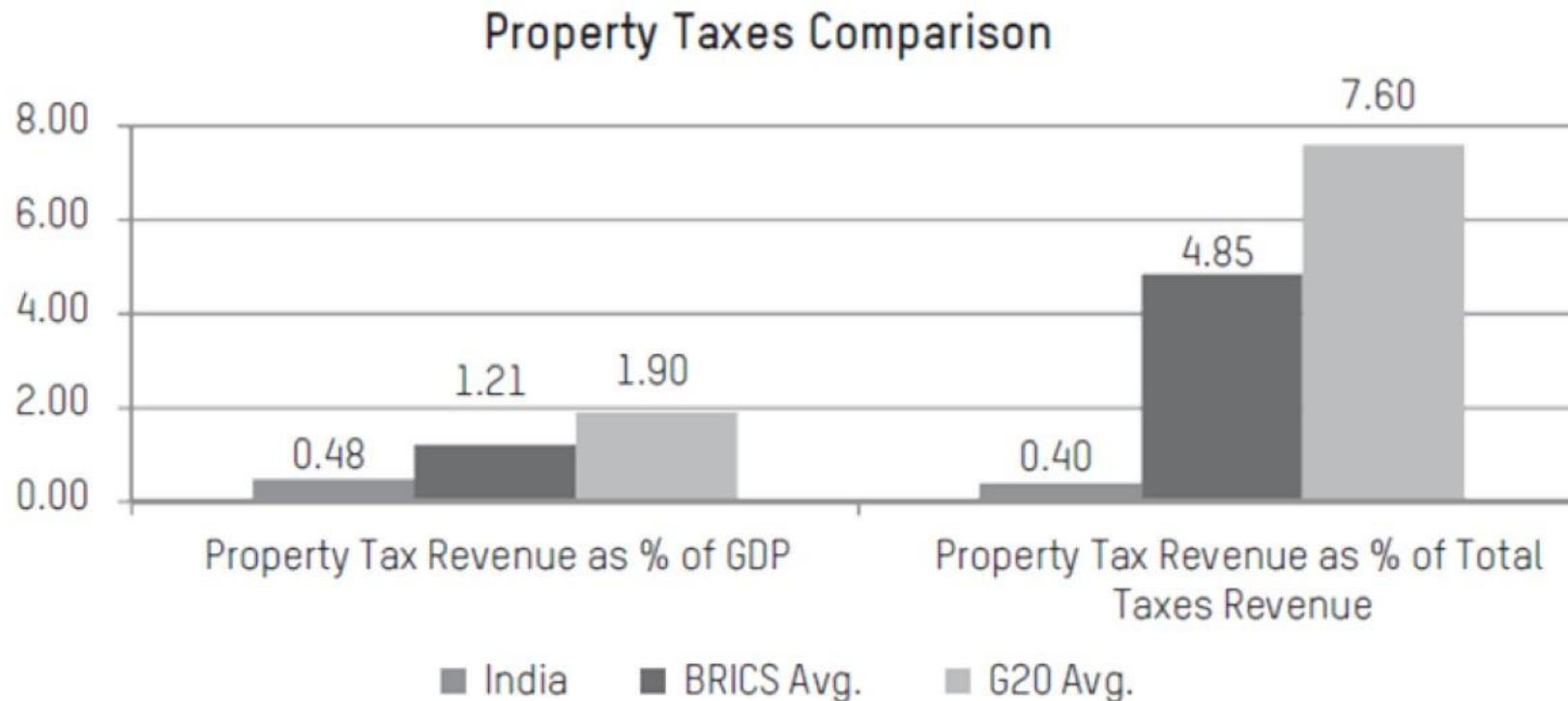
- Own income sources are higher in Maharashtra and Andhra Pradesh due to higher share of property tax to municipal revenues.
- Collection efficiency of property tax is in the range of 60-70 % for the 3 states except Odisha (data for Odisha is not available).

Property tax – volume and collection efficiency



- Per Capita Property Tax is the highest in Maharashtra. This is most likely due to Mumbai, where property taxes are higher. This is reflected in the ULBs' Own Income in Maharashtra.
- ULBs in Tamil Nadu have significant dependence on State Transfers; this is partly due to timely composition and devolutions from SFC.
- In Andhra Pradesh and Tamil Nadu, property tax is a small proportion of ULB's total revenue.
- Overall Property Tax Collection efficiency is comparable for all 3 States – 49%-56%.

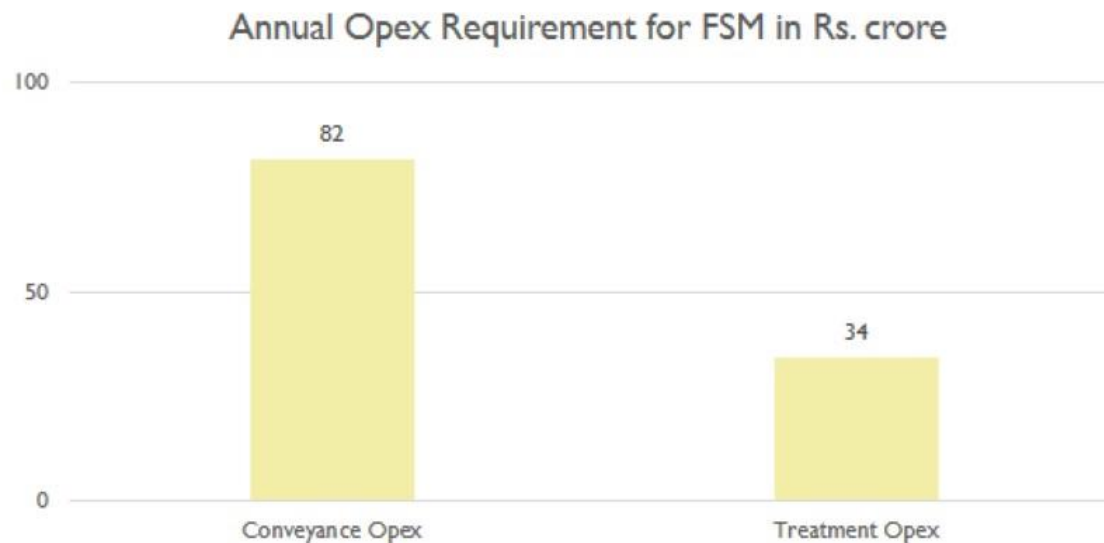
Property Tax potential for Indian cities is enormous



- Property tax has significant potential to contribute to own (tax) revenues but problems of low coverage and low collection efficiency are typical obstacles
- In a survey of 31 municipalities in the India Municipal Finance Study, ADB corroborated 13th CFC observations and indicated that 28.6% of properties were not on the house tax register of the municipalities, and 53.9% of tax demanded was not collected.

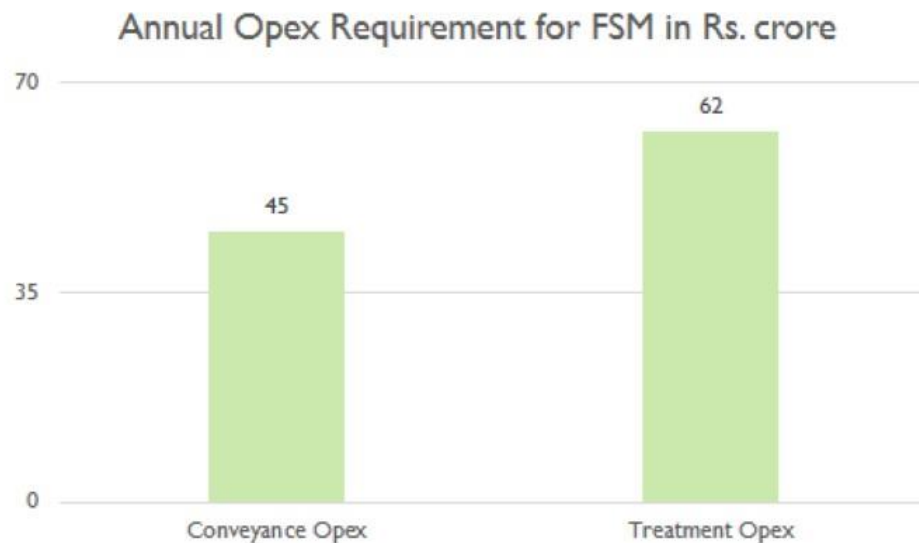
Source: Prakash P (2013) "Property taxes Across G20 countries: Can india get it right?" Oxfam India working papers series January 2013.

In Maharashtra, 14th FC funds can be utilized for FSSM; sanitation tax is introduced in two cities to fund Opex of FSSM services



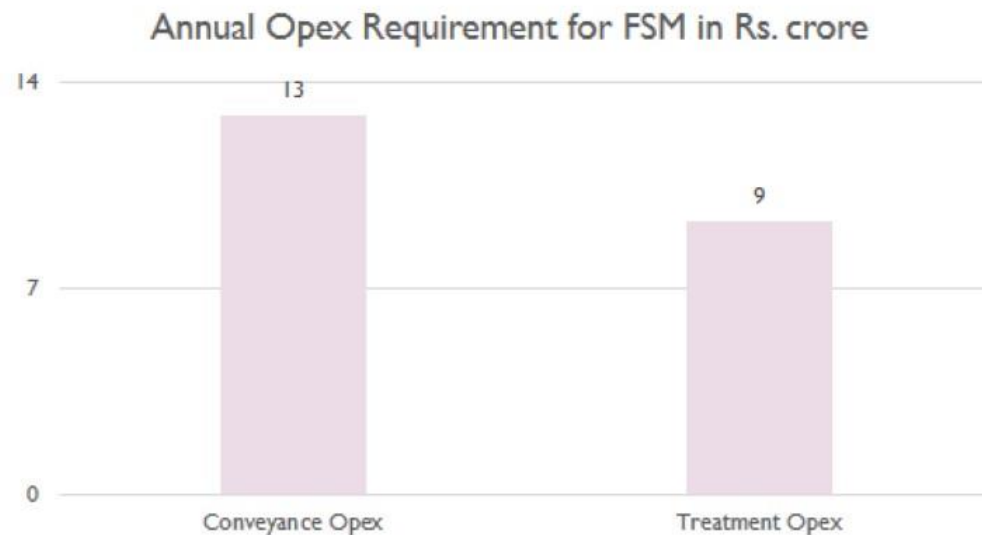
- ULBs own income is the major source for funding these operations.
- 14th FC funds and incentive grant for ODF cities are sources which can be used for operations and maintenance of these services (but sources needs to be identified after these funds).
- In Wai and Sinnar, sanitation tax as a part of property tax has been introduced to fund the operations and maintenance of FSSM services.

In Tamil Nadu, treatment plants are to be handed over to ULBs after construction for operations and maintenance



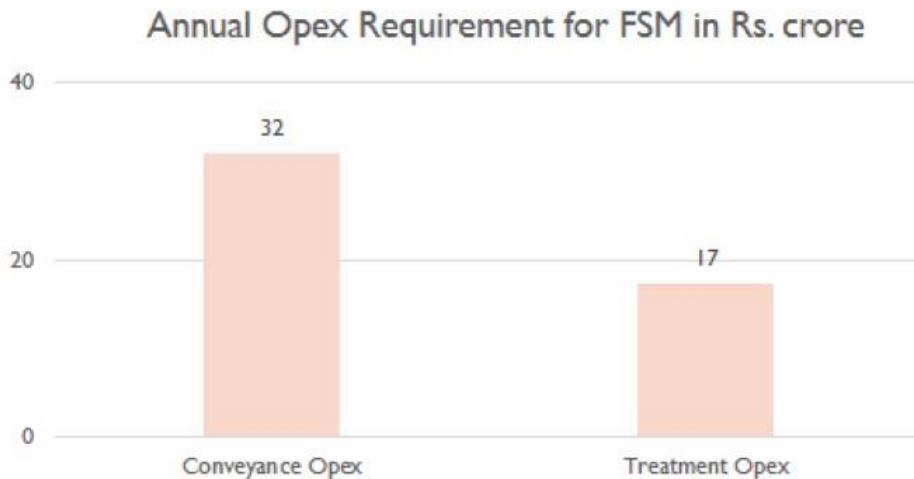
- Public funding needs to be materially lower considering strong private ecosystem for conveyance within the state.
- The treatment plants funded by the state government are to be handed over to the ULBs. The ULBs need to plan for the operations funds of these treatment plants.
- TUFIDCO's O and M gap filling funds are also thought as an option when any ULB is not able to run the FSTPs.

In Odisha, AMRUT funds are allocated for operations and maintenance of FSTPs for 3 years



- In Odisha, AMRUT funds are being used to fund operations of 9 FSTPs for 3 years.
- OWSSB may run the FSTP's once the AMRUT funds are over. There is no assured sources of funds for operating these services.
- Odisha's ULBs need to increase their technical and financial capacity to sustain these services. They need to identify potential and continuous sources of funds for sustaining the services.

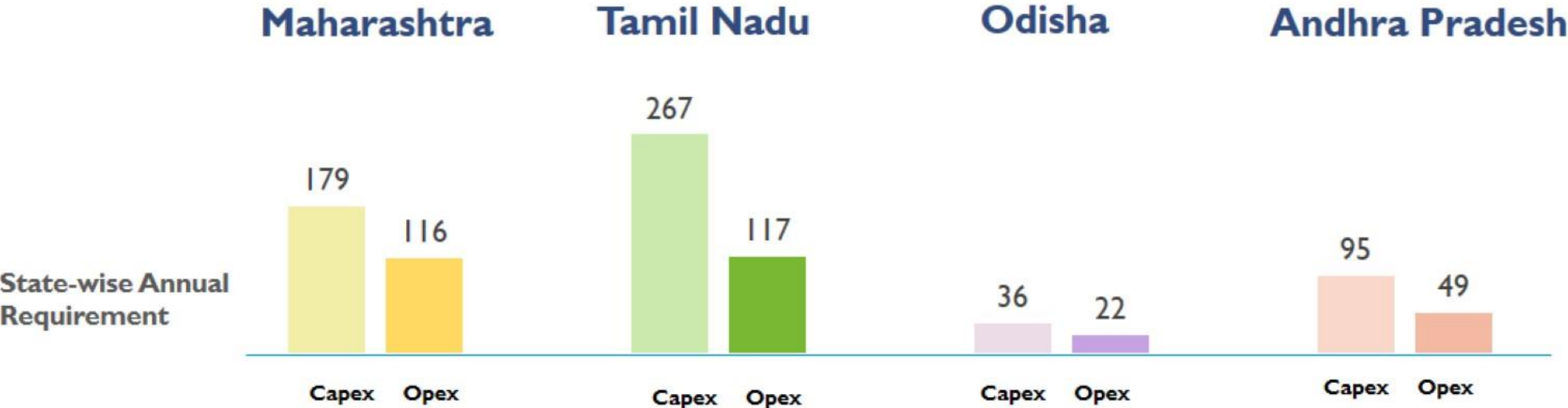
In Andhra Pradesh, state is going to fund the operations and maintenance of FSTPs



- Public funding needs to be materially lower considering strong private ecosystem for conveyance within the state.
- Private service providers are also encouraged to provide treatment services by HAM adopted by the state. The state has already allocated funds for FSSM, earmarked for treatment. Therefore the operations funds for these FSTPs is going to be funded by the state government.
- As such, to ensure availability of funds and de-risk perceptions around ULB financial capacity, ULB revenues are not identified as a funding source for ongoing implementations

Considering the available and potential funds for FSSM, the annual requirement for FSSM is very less

All numbers in Rs. crore



Major Sources	State Funds	ULB Funds
	<p>Maharashtra: SBM, Nagarothan Scheme</p> <p>Tamil Nadu: SBM, IUDM, Capital Fund Grant, EAPs, state schemes</p> <p>Odisha: AMRUT, SBM, Unnati, DMF, OUIDF</p> <p>Andhra Pradesh: AMRUT, SAC, AP Urban water supply and Septage Improvement Project, SBM</p>	<p>Maharashtra: 14th FC, Incentive grant to ULB</p> <p>Odisha: 14th FC</p>

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Maharashtra emerging FSSM Strategy for Treatment

**Category A cities:
ULBs with STPs**

Co-treatment at own STP
and accept FS from nearby
cities

77 ULBs have functional or
proposed/under
construction STPs.

**Category B cities:
Co-treatment at nearby
STPs**

Co-treatment at nearby
STPs within 20 km

64 ULBs will co-treat at
nearby STPs

**Category C cities:
Independent FSTPs/ Co-
treating at nearby FSTPs**

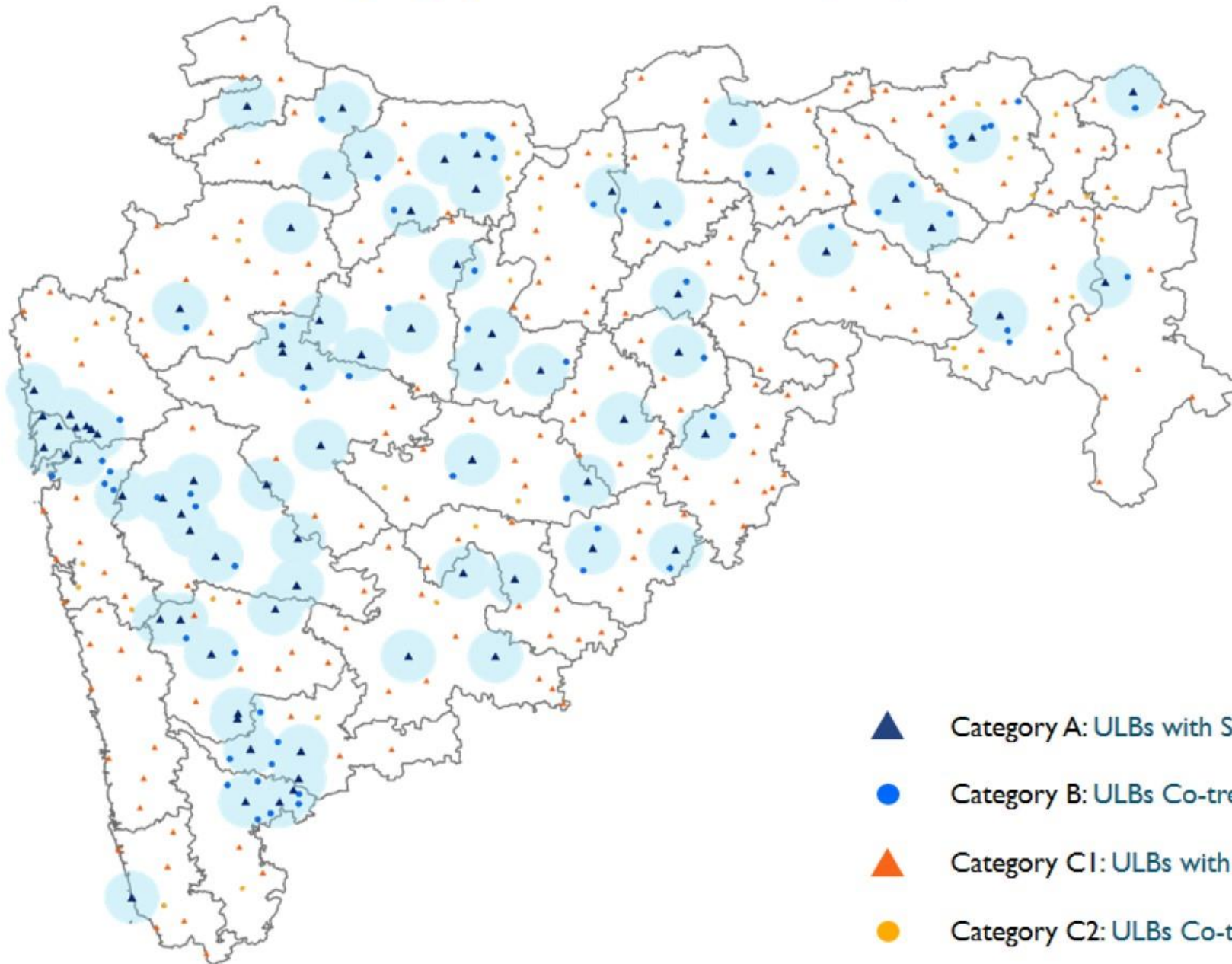
ULBs entirely dependent on
on-site systems and do not
fall in co-treatment buffer

C1- 218 ULBs need to
construct independent FSTP
C2- 34 NPs which should
co-treat at nearby FSTP.

Maharashtra scaling-up plan for FSTPs (1/2)

	No. of ULBs	CapEX (Rs Crore)	5 years OpEX (Rs Crore)
Category A			
ULBs with STPs	77	8	-
Category B			
ULBs Co-treatment at Nearby STPs	64	-	-
Category C			
- C1- ULBs with own FSTP	218	166 - 270	70 - 180
- C2- ULBs Co-treating at nearby FSTPs	34	-	-
Total	393	236 - 450	

Maharashtra scaling-up plan for FSTPs (2/2)



- ▲ Category A: ULBs with STPs
- Category B: ULBs Co-treatment at Nearby STPs
- ▲ Category C1: ULBs with own FSTP
- Category C2: ULBs Co-treating at nearby FSTP

TN state strategy is exploring cluster based approach for setting up FSTPs across all cities using government funds

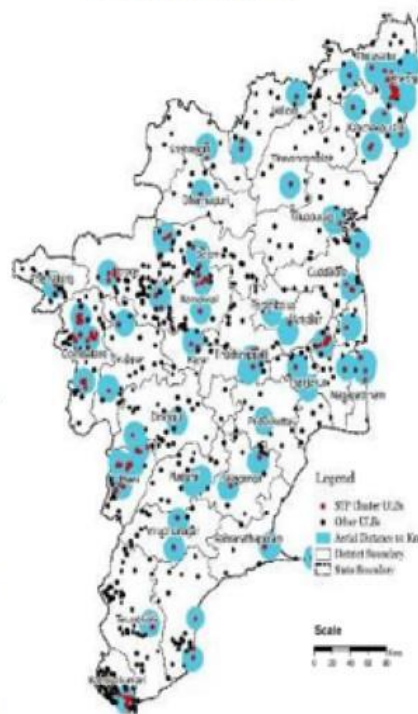
Tamil Nadu- clustering Approach for FSTPs

- Conveyance for septage is considered to be carried out by private sector players.
- Treatment plants are to be established based on cluster based approach.
- The funding for these FSTPs is planned to be given by the state government.

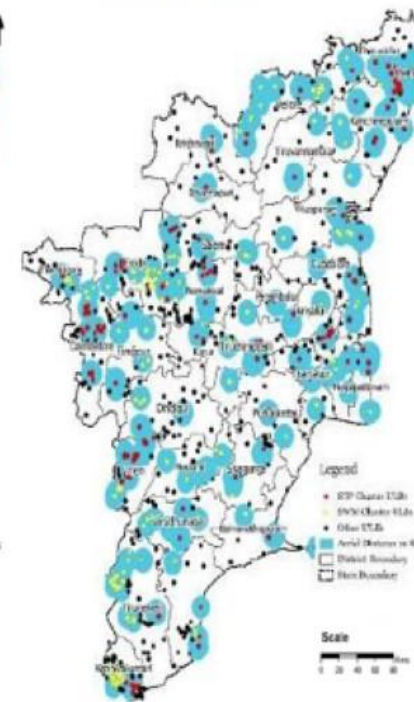
Suggested phase wise coverage of ULBs for FSM

1. Phase I and II co-treatment at STPs in all ULBs.
2. Phase III Municipalities with Solid Waste Management (SWM) sites.
3. Phase IV Town Panchayats land secured within Resource Recovery Parks (RRP).
4. Phase V ULBs not falling in any of the above clusters.

Phase I and II



Phase III



Phase IV



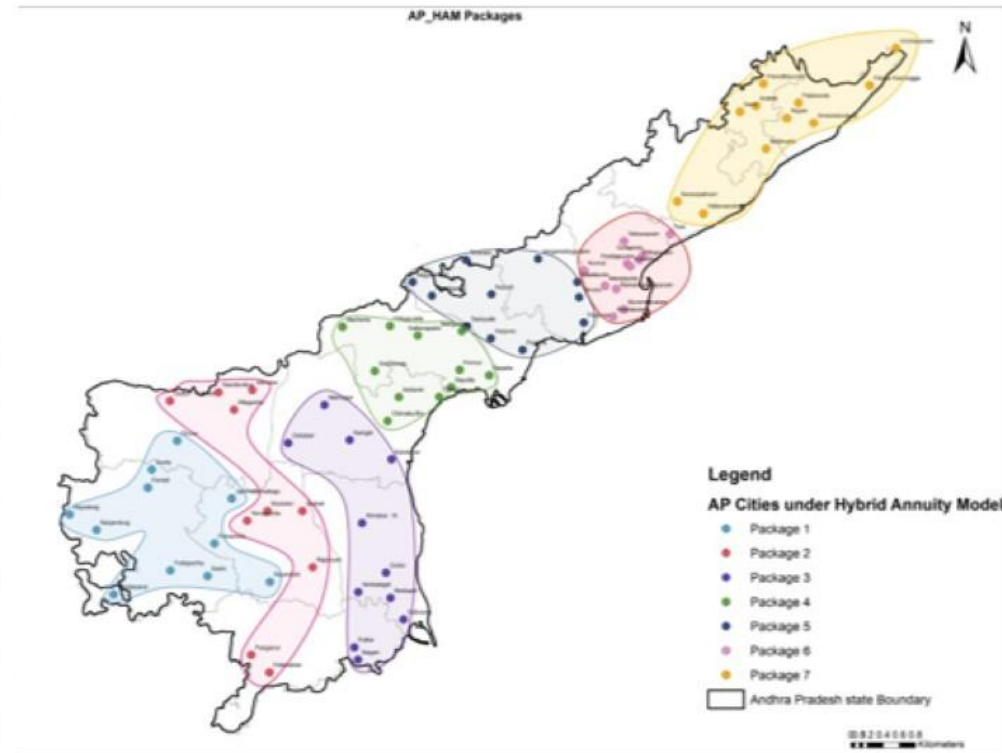
	STP Cluster ULBs		Other ULBs		SWM Clusters		RRP Clusters
	Aerial Distance 10 km		District Boundary		State Boundary		

Odisha has funded its FSTPs under AMRUT

- Odisha follows a state led approach and State (OWSSB) to finalize implement and monitor project
- State allocated CaPex funds for trucks procurement; Treatment plant funded through AMRUT Program grants (50% Centre and 50% State)
- State procure emptying vehicles and OWSSB to award the contract for construction of treatment plant.
- OWSSB to monitor construction, OandM and performance of FSTPs.
- The role of ULB is to provide land for FSTP. ULB plays a very small role in the overall process. Majority of the functions are state led only.

Andhra Pradesh has adopted Hybrid Annuity Model approach for building FSTPs by clustering cities

- Conveyance for septage is considered to be carried out by private sector players.
- GoAP has planned to set up cluster-based Faecal sludge and Septage Treatment Plants (FSTP) in their 76 ULBs. These FSTP's are to be funded under a Hybrid Annuity Model.
- Under this model, government is expecting 50% of capital investment from private sector, who will Design, build and operate the FSTP for the next 10 years. The government will payback remaining 50% of the capital investment to the private sector over the 10 years of OandM period in the form of annuities (plus reduced interest rate) along with fixed OandM cost.



- Swachh Andhra Corporation has awarded the contracts.
- Swachh Andhra Corporation to monitor construction, OandM and performance of FSTPs
- The role of ULB is to provide land for FSTP. ULB plays a very small role in the overall process. Majority of the functions are state led only.

State Governments play a critical role in FSSM across cities – though the nature of their roles vary across states



Maharashtra:

- The State Government supporting the cities with wider policies (such as the ODF sustainability charter highlighting FSSM and the ODF+ approach, government resolution on co-treatment) and capacity building support for planning and preparing detailed implementation plans including preparation of Detailed Project Reports (DPRs).
- However, it is recognised that FSSM is essentially a local government service, as are water supply and sanitation. This means that ultimately the ULBs will need to plan, finance, implement and manage these services.



Tamil Nadu:

- The State Government has funded the FSTPs through its Integrated Urban Development Mission funds and SBM funds.
- Thus the capex is funded by the state government, the opex of the FSTPs are to be managed by the ULBs.



Odisha:

- The State Government has funded both treatment facilities and purchase of septic tank emptier trucks.
- AMRUT funds are also allocated for operations and maintenance of these FSTPs for 3 years.
- However, it will be important to build ULB capacity in Odisha to operate and manage the FSTPs and trucks, either on their own or through appropriate contracts with private sector operators.



Andhra Pradesh:

- The State Government has played an important role in funding of FSTPs in 78 ULBs through a hybrid annuity model (HAM).
- The state government budget allocation will help cover both upfront capital costs as well as O&M costs and annuity payments to repay the private investments.
- With this approach the role of ULBs may be minimized as the private sector operators will report to and be funded through Swachh Andhra Corporation, a state government entity.

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Need for innovative finance

- There are three key objectives to explore innovative financing mechanisms
- First, public funds can be used to leverage additional private sector or commercial funds. Besides additional resources, this would help in bringing great efficiencies of private sector operations, or scrutiny from commercial lenders.
- Second, emphasis on innovative models is also to provide incentives for improved performance and effectiveness by using performance linked approaches., particularly for public-private partnership (PPP) models
- Finally, there is emerging interest globally on impact investing for funding activities which can have considerable social and environmental impacts. The innovative financing mechanisms will help leverage this new and potentially large funding source to demonstrate more effective models and over time help mobilize additional resources.

Identifying and exploring innovative financing options

Three approaches have been identified to explore innovative financing for FSSM:

- 1. Performance linked Public-Private-Partnerships (PPPs):** emphasize performance and leverage private sector investment. Two models are identified and assessed for conveyance and treatment. Both are essentially performance based annuity models. The performance linked payment also helps to strengthen performance monitoring systems.
- 2. Municipal borrowing for sanitation infrastructure:** explore possibility of leveraging commercial funds from institutions (banks or municipal development funds) or directly from capital markets through municipal bonds or pooled bond issues for smaller municipalities.
- 3. Impact investment and CSR:** given the social and environmental benefits of FSSM, impact investment funds can be leveraged through appropriate instruments such as a Development Impact Bond (DIB). CSR funds can support innovations and DIB development.

Options of innovative financing mechanisms

Performance linked Public-Private-Partnerships (PPPs):

Performance linked annuity models for conveyance

Hybrid Annuity Model (HAM) model for treatment facilities

Municipal borrowing for sanitation infrastructure

Institutional and Market Borrowing for Capital Investments

Municipal borrowing from Banks under Priority Sector Lending

Water Sanitation Pooled Funds

Impact investment and CSR

Corporate Social Responsibility Funds

Philanthropy funds

Development Impact Bonds

Performance linked annuity models for conveyance in Wai/Sinnar, India

Two ULBs in Maharashtra – Wai and Sinnar Municipal Councils – have contracted a private company to provide citywide services, and with performance linked payment – based on number of septic tanks emptied.

1. Scheduled emptying

- Private company selected through bidding process
- All septic tanks in the city to be emptied once in 3 years – 1/36 each month



2. Performance based fixed monthly payments

- Penalties deducted for non-compliance
- Payment linked to number of tanks emptied – Receipts signed by households
- Ensuring safe emptying – receipts signed by FSTP official
- No spillage
- Use of safe methods – e.g. PPE for workers

3. Sanitation Tax

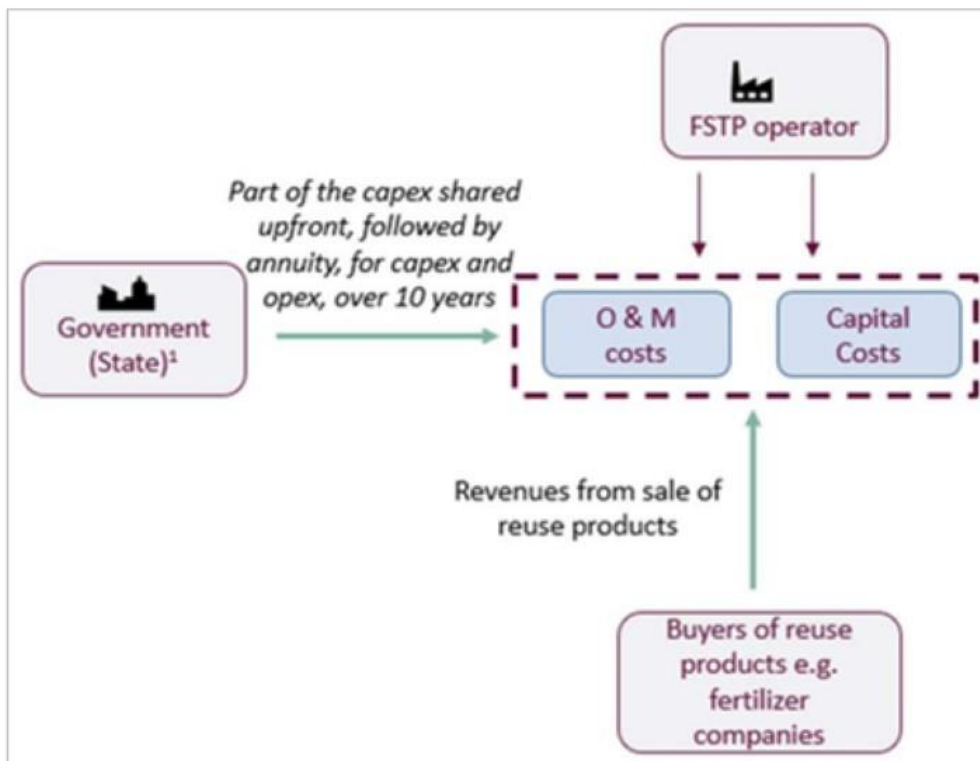
- Each household pays a small fixed amount as sanitation tax, and Sanitation tax + property tax used to pay private company
- Emptying provided without “per-emptying” fee
- Sanitation tax much less than the cost incurred per household previously for emergency emptying

- As no permit will be given to another private operator, there will be an assured market for the contracted player.
- It also ensures that the households will be willing to empty their septic tanks as no user charge is paid at the time of emptying.

Hybrid Annuity Model (HAM) model for treatment facilities

- In this framework the Government pays 40% of the capital cost of the project upfront during the construction period and 60% of the payment is paid as annuities along with interest over the operation period.
- The use of hybrid annuity model for FSTPs, provides opportunities to leverage public resources to bring in private sector funding for treatment. This also helps to reduce the initial public investments, though the private sector must be repaid through annuities using public funds.
- However, unlike roads, where there is a clear revenue stream of tolls from users that is used for annuity payments by governments, in FSTP, there are no clear revenue streams. So government will have to budget for this payment. The bidders are likely to add their cost of debt and returns on equity and this may raise the total cost of project as compared to an EPC contract.
- The advantage of this model is that since the annuity payment is linked to the performance, it will also help to improve efficiency and effectiveness in operations.
- However, given the higher cost of debt for private sector and their high return expectations on equity, the total investment requirement is likely to increase.

Hybrid Annuity Models for FSTPs in Andhra Pradesh, India; STPs under National Mission for Clean Ganga

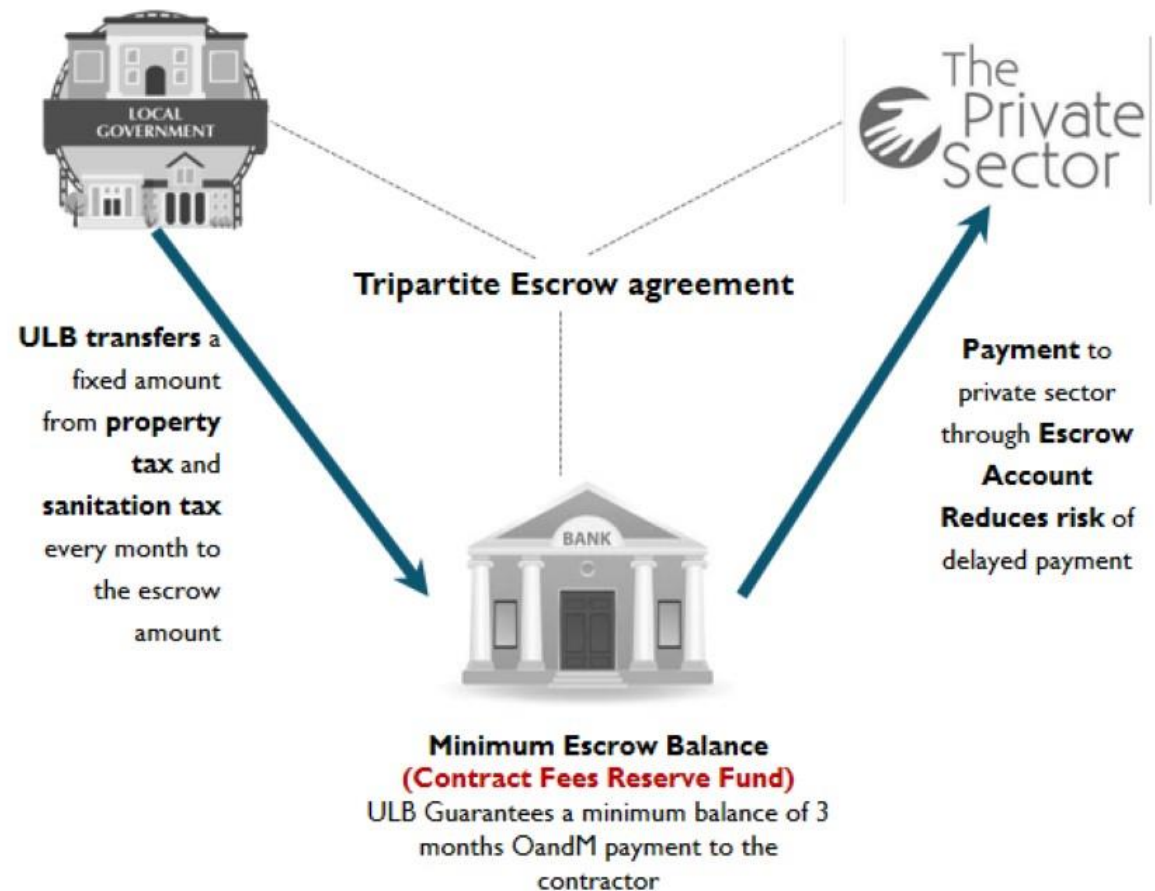


- AP has launched HAM for FSTP, through Public Private Partnership (the “PPP”) on Design, Build, Operate and Transfer (“DBOT Hybrid Annuity”) basis for 76 town for which 7 packages are created.
- Private companies - undertake construction, operation and maintenance on a DBOT basis. Cost determined by bidding
- CapEx – 50% by government , 50% by private company
- Annuity payments cover a) CapEx by private company repaid through annuity payments over contract period, b) and OpEx
- Funding by State government alleviates concerns around individual ULB financial capacity and payment risks
- Private player clustering approach (multiple ULBs per partner) to achieve scale economies and a large contract
- Private player responsible for selling soil conditioner/bio-fertilizer/biogas and recycled wastewater. In the long term, part opex recovery planned through user charges

Risk management through escrow account mechanisms

By most private sector companies delayed payments by state or local governments or their entities is the major risk factor. To manage this risk better, an escrow account mechanism can be used in annuity-based models for private sector investments in both conveyance and treatment.

- Tripartite Escrow agreement between government, private sector and bank.
- Payments to private operators made through an Escrow account by the Government.
- Government to maintain 3 months' payment in account at all times
- Mitigates late payment risk for private operator
- Escrow will be funded by sanitation and property tax.



Risk management through escrow account mechanisms

- Risk management also necessitates that the contracts are bid out and processed through normal government procedures.
- This would ensure that transfer of key officials or a change in government will not put the project in jeopardy and its continuance and timely payments are insured. Institutionalizing all these aspects is very important.

Examples: Escrow account mechanisms in conveyance and treatment:

- In case of annuity-based models for conveyance used in the cities in Maharashtra, a risk reserve fund of three months of payments has been made through an escrow account. This is further backed by a council order to pay direct monthly allocations to the escrow account. All aspects have been passed under general body meetings and a GR has been passed. Because of all the documentation and GRs, these activities have sustained in Maharashtra.
- An escrow account mechanism has also been proposed for the AP HAM for treatment facilities.

Strong monitoring systems for performance linked annuity models

Performance linked annuity models requires strong and sustainable monitoring systems.

It requires performance assessment in terms of services delivery.

- For conveyance contracts, performance is easier to assess as number of septic tanks emptied, though attention will have to put on ensuring that all contract clauses are followed.
 - Two contracts in Maharashtra for Conveyance, are strengthening their monitoring through online GPS and app-based systems.
 - Implementation of scheduled desludging, backed by a concurrent monitoring system, will provide an opportunity to create a database on existing septic tanks which has otherwise been very difficult.
- In the case of HAM for treatment in AP, monitoring systems will need to assess treatment performance as well as a proper assessment of actual capital costs incurred. As the project is being implemented by a state entity, appropriate mechanism for participation of local governments will need to be developed.

Credit Guarantee Fund Trust for Small and Medium Enterprises (CGTSME)

Government of India and SIDBI have recently set up CGTSME fund to strengthen credit delivery system and facilitate flow of credit to the SME sector.



UDAAN

(Credit Guarantee Fund Trust for Micro and Small Enterprises
Set up by Govt. of India and SIDBI)

- It has introduced a "Hybrid Security" product allowing guarantee cover for the portion of credit facility not covered by collateral security.
- In the partial collateral security model, the lending institution will be allowed to obtain collateral security for a part of the credit facility, whereas the remaining part of the credit facility, up to a maximum of 200 lakh, can be covered under Credit Guarantee Scheme of CGTMSE.
- **Under the two annuity linked models discussed above, private sector enterprises will need to mobilize funds for either emptying trucks for the conveyance contracts or for meeting their share of treatment costs in a HAM.**
- As commercial borrowing would be needed by private sector, most of whom are likely to be of the SME category. It would thus be useful to explore credit guarantees through this fund.

Municipal borrowing for sanitation infrastructure

For some ULBs access to additional resources maybe needed to meet the capital investments for FSSM. One option can be debt mobilization by ULBs, through borrowing from banks and government institutions or through the capital market in the form of bonds.

Following options are available for municipal borrowing:

Scheduled Commercial Banks	<ul style="list-style-type: none">• Private sector banks• Public sector banks
Sector Specific Municipal Development funds	<ul style="list-style-type: none">• Tamil Nadu Urban Development Fund (State Specific)• Pan India Pooled Municipal Debt Obligation Facility (PMDO)
Capital marketing	<ul style="list-style-type: none">• Municipal Bond
Government Institutions	<ul style="list-style-type: none">• Housing and Urban Development Corporation (HUDCO)

Institutional and market borrowing for capital investments

- Institutional and market borrowing will require a rigorous assessment of municipal finances.
- It would be easier in states such as TN as the ULBs have credit history through the TNUDF operations, or in Maharashtra where the ULBs have high own income through sources such as property and sanitation tax, as well as various land value capture mechanism such as betterment levy, Transfer of Development Rights (TDR), etc.
- Till recently, the Municipal Corporations also enjoyed a very buoyant source in Local Body Tax (LBT).
It is worth noting that in Maharashtra share of own income in total revenue income of ULBs is high at 50% and property tax comprises only 30% of own income.

Municipal borrowing from banks under Priority Sector Lending (PSL)

RBI “Priority Sector Lending- Targets and Classification”

Priority Sector includes the following categories:

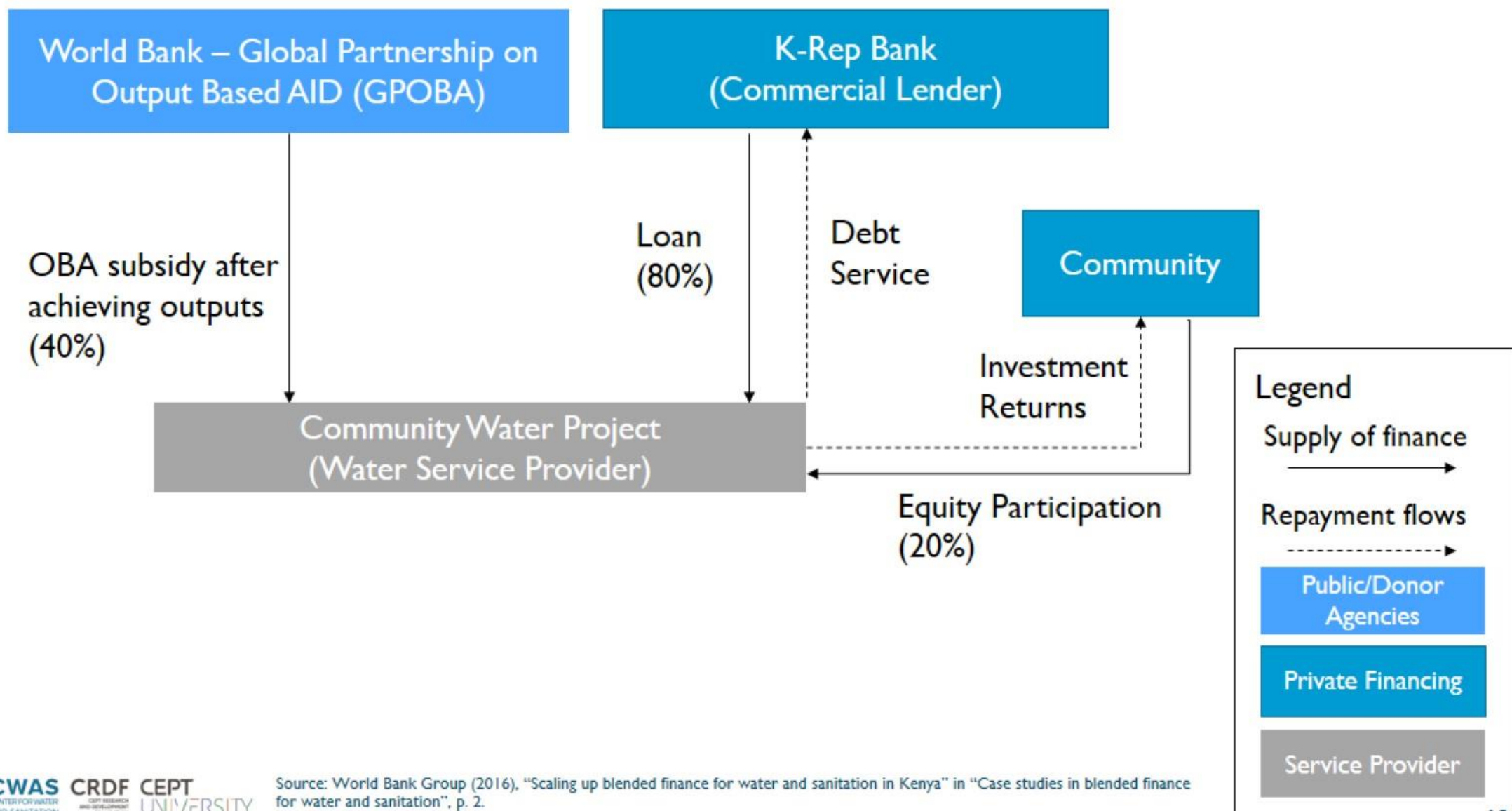
- (i) Agriculture
- (ii) Micro, Small and Medium Enterprises
- (iii) Export Credit
- (iv) Education
- (v) Housing
- (vi) Social Infrastructure
- (vii) Renewable Energy
- (viii) Others

“Bank loans up to a limit of Rs. 5 crore per borrower for building social infrastructure for activities namely schools, health care facilities, **drinking water facilities and sanitation facilities** in Tier II to Tier VI centres.”

- ULBs can borrow from various banks – ranging from scheduled commercial banks, small finance banks to urban cooperative banks.
- Bank loans will be available for ULBs at relatively good terms though tenor will be short of up to 5 years.
- It is important to point out that most banks may not have realized that lending for FSTPs of up to Rs. 5 crores will also be covered under the priority sector lending (PSL) requirements for commercial banks. This will make it attractive for banks to lend to ULBs for sanitation projects.
- However, this requires awareness generation for both banks and ULBs. It will also require rigorous assessment of municipal finances to ensure their repayment capacities. It would be useful to explore pooling of a few smaller ULBs that are interested to borrow from banks. This will help reduce their costs and make it attractive for banks to consider a larger project. Any borrowing from banks will also require permission from the State Government as per most state Municipal legislation.

Blended Finance: Mobilizing commercial finance with partial subsidies

Scaling up Blended Financing for Water and Sanitation in Kenya: Maji ni Maisha Financial Structure



Source: World Bank Group (2016), "Scaling up blended finance for water and sanitation in Kenya" in "Case studies in blended finance for water and sanitation", p. 2.

Borrowings from Municipal Development Funds

- ULBs can also borrow from the State level Municipal Funds (MDFs).
- Of the four states, TN, Maharashtra and AP have such funds.
- However, besides TNUDF, the MDFs in other states have not provided credit effectively to ULBs. For TNUDF, it would be good to explore their interest in FSSM and support development of pilots.
- The MUNIFRA in Maharashtra does not have a strong and effective portfolio. However, loans for those ULBs that are unable to meet their contributions for treatment facilities maybe able to approach MUNIFRA for loans.

Municipal bonds

- Though the idea of municipal bonds in India was introduced more than 20 years ago, despite the initial flurry of bonds, ULBs have not used this route.
- Recent issuance of municipal bonds by a few ULBs such as Pune, Hyderabad and Indore have raised interest in this. However, so far it is generally the large ULBs, mainly municipal corporations that have raised funds via this route, and for FSSM they are not likely to require funds for treatment as they can use co-treatment. Also, the costs of preparing for such debt mobilization are high and the smaller ULBs may find it difficult to use this route.

Pune Bond:

- First Municipal Corporation to successfully raise Rs.200 crores on the BSE BOND platform!
- PMC Bonds received overwhelming response with 6 times of oversubscription.

Indore Bond:

- First Municipal Bond to be listed on Debt Market platform of NSE
- IMC Bonds received overwhelming response with an oversubscription of 1.26 times

GHMC Bond

- GHMC has become the second ULB to raise Rs.200 crores on the BSE BOND platform
- GHMC Bonds received overwhelming response with 2 times of oversubscription.

Municipal bonds of Pune, Indore and Hyderabad

City	Type	Bond size	Guarantee	Interest rate	Tenure periods	Credit Rating	Escrow	Purpose	Remarks
PMC	Unsecured Redeemable Listed Taxable Non Convertible Debentures	200 Cr.	No	7.59%	10 year	AA+	Revenues of the PMC	24 x 7 Water supply	Credit rating Agencies: India Ratings and Care Payment of Interest : Half yearly
IMC	Secured, Non convertible, Redeemable bonds in the	100 Cr. with Green Shoe	No	9.25%	7 Years	AA	Revenues of the IMC	Water supply	Credit rating Agencies: Brickwork, SMERA Payment of Interest : Half yearly
GHMC	Unsecured Listed Taxable Non-Convertible Redeemable Bonds	200 Cr.	No	8.90%	10 years	AA	-	Strategic road development programme.	Credit rating Agencies: India Rating, CARE Payment of Interest: Half yearly

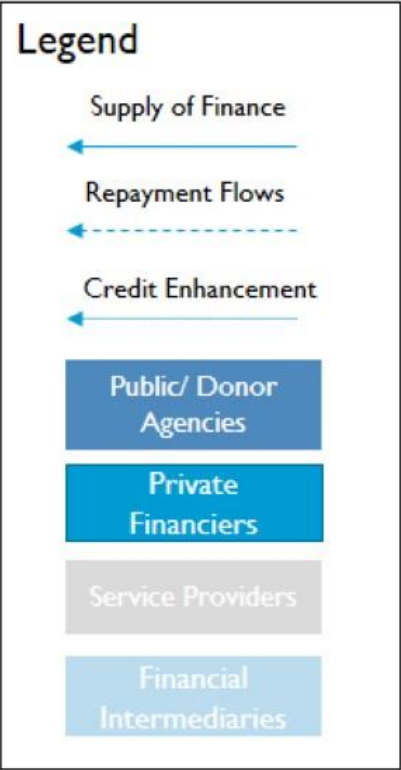
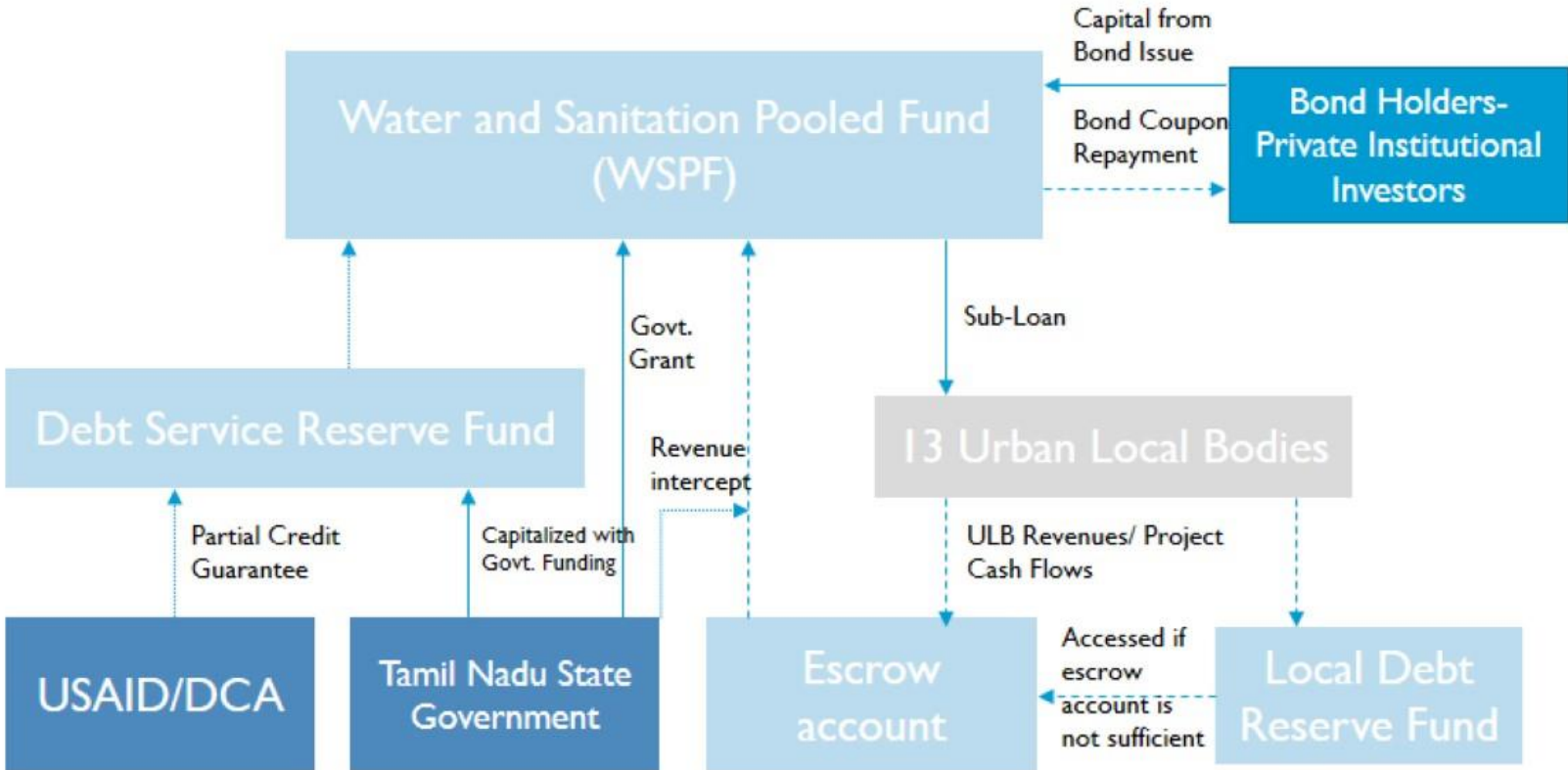
Source: Pune's Path Breaking success in municipal bond: www.pmc.gov.in, <https://www.financialexpress.com/market/rs-2264-cr-pune-municipal-bond-issue-without-maharashtra-government-backing-munibonds-face-testing-times/716782>, https://www.nseindia.com/content/press/PR_cc_05072018.pdf, Draft Information Memorandum on IMC Bond, <https://www.bseindia.com/markets/marketinfo/DispMediaRels.aspx?page=9def1d-8c50-4dbc-9efe-7ef2eb8f036c>, <https://www.bseindia.com/markets/MarketInfo/DispNoticesNCirculars.aspx?Noticeid=%7BCB94CDB2-F97E-4430-950C-1CA3435E9995%7Dandnoticeno=20180221-26anddt=02/21/2018andicount=26andtotcount=32andflag=0>

Water and Sanitation Pooled Fund – Tamil Nadu 1/2

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.

- The WSPF is one of a two innovative pooled funds in Tamil Nadu, the other one being TNUDF.
- The WSPF issues bonds to commercial investors, with these bonds guaranteed by state government funds in an escrow account and a partial credit guarantee from USAID, in addition to a intricate web of credit enhancements.
- Money is lent out to small and medium sized ULBs.
- The fund has become a model and has inspired other such structures, such as the Karnataka Water and Sanitation Pooled Fund Trust.
- This approach allows small and medium sized ULBs with poor credit ratings to access debt markets. Potential to crowd-in otherwise risk-averse private capital.
- However, this will require supporting TNUDF which has experience in this route, to consider FSSM projects within this. There is also a need for some regulatory clarity as TNUDF has not been to use this route under the new SEBI regulations for municipal bonds.

Water and Sanitation Pooled Fund – Tamil Nadu 2/2



Water and Sanitation Pooled Funds (WSPF) in India

State	Institution	Yr	Type of Bond	Amount	Interest Rate	Tenor years	Guarantee	Purpose	No of ULBs participating
Tamilnadu	TNUDF / TNUIFSL	2002	Taxable bond	30.41	9.20%	15	USAID	Refinancing loans for water and sanitation projects of 13 ULBs	13
		2008	Tax-free bond	6.70	7.25%	10			5
		2010	Tax-free bond	83.19	7.50%	10			7
		2012	Tax-free bond	51	10.60%	10			10
		2013	Tax-free bond	51	8.71%	10			10
Karnataka	KUIDFC	2005	Tax free bond	100	5.95%	15	USAID	Water supply component of a greenfield project for 8 ULBs, Greater Bangalore Water Supply and Sanitation project (GBWASP)	8

- In 2006, the Central Government approved the Pooled Finance Development Fund (PFDF) Scheme.
- 5 percent of PFDF was allocated for project development and 95 percent would be contributed towards Credit Rating Enhancement Fund (CREF) to improve the credit rating of the Municipal Bonds to investment grade.
- Bonds issued under PFDF are tax-free. However, interest and dividends received from investment in the CREF corpus are taxable in nature.

Source: <http://documents.worldbank.org/curated/en/702211472040099035/Pooled-municipal-bond-issuance-in-Tamil-Nadu-India>, <http://tnuifl.com/wspf.asp>, [http://www.brickworkratings.com/Admin/PressRelease/Water-Sanitation-Pooled-Fund-Bonds-102Cr-Reaffirmation-Rationale-21July2017%20\(1\).pdf](http://www.brickworkratings.com/Admin/PressRelease/Water-Sanitation-Pooled-Fund-Bonds-102Cr-Reaffirmation-Rationale-21July2017%20(1).pdf), [http://www.brickworkratings.com/Admin/PressRelease/Water-Sanitation-Pooled-Fund-Bonds-102Cr-Reaffirmation-Rationale-21July2017%20\(1\).pdf](http://www.brickworkratings.com/Admin/PressRelease/Water-Sanitation-Pooled-Fund-Bonds-102Cr-Reaffirmation-Rationale-21July2017%20(1).pdf), <http://documents.worldbank.org/curated/en/702211472040099035/Pooled-municipal-bond-issuance-in-Tamil-Nadu-India>, http://www.bseindia.com/BSEdata/ipo_downloads/IM-KWSPF-030602005.pdf, <http://indianexpress.com/article/india/pmc-raises-rs-200-cr-from-municipal-bonds-at-7-59-4712540/>, <http://www.moneycontrol.com/news/business/real-estate/first-municipal-bond-under-nda-flagged-off-pune-to-raise-rs-200-crore-list-on-bse-on-june-23-2303493.html>

Institutional borrowing from HUDCO

Housing and Urban Development Corporation (HUDCO) provides loans to public agencies and private sector for urban infrastructure. State Governments and ULBs can borrow from HUDCO to finance their FSSM related capital investments.

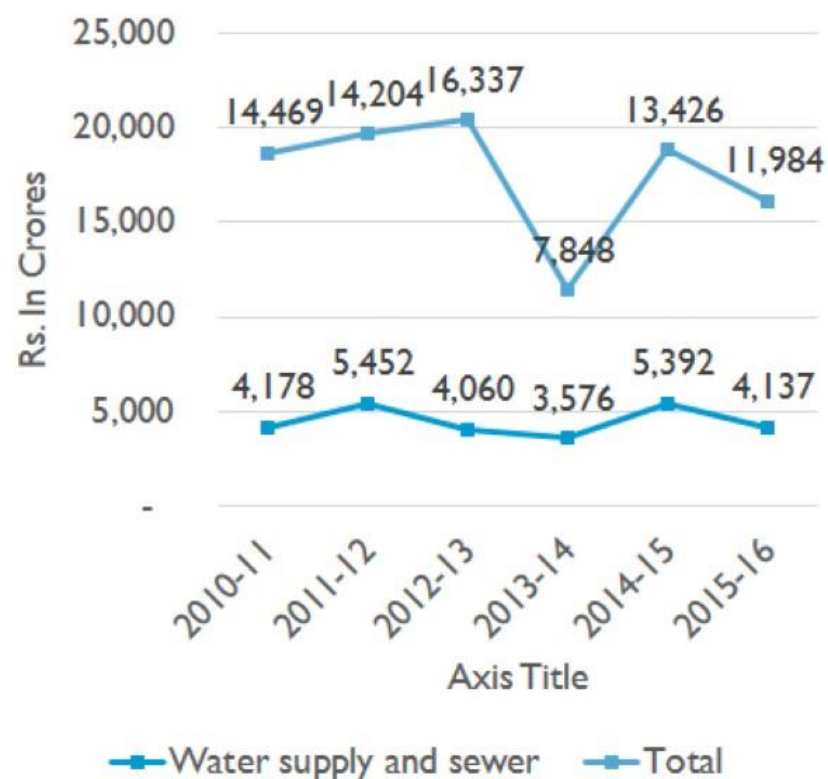
- HUDCO offers loans at competitive terms and can be a good source for ULBs for urban infrastructure as FSSM can be included in this.
- In 2015-16, it disbursed loans worth Rs. 8,250 crores for urban infrastructure and over the 6 years period from 2011 to 2016 it released loans worth Rs. 14000 crore per annum.
- HUDCO's loans provide a good option for ULBs. The interest rates are about 10.35% and the loan tenor ranges from 7 to 15 years depending on the types of projects.
- However, HUDCO requires a state government guarantee for lending to urban local bodies, which may become a constraint as such guarantees affects contingent liability of state governments. Also, under the new Fiscal Responsibility and Budget Management Acts of different state governments, many have a ceiling on total guarantees.
- Of the four focus states of except Maharashtra all other states have such stipulated limits. However, HUDCO funding can be explored for treatment facilities by private providers in a PPP arrangement for FSSM services, if it is competitive as compared to other options for them.

HUDCO assistance to Water and Sewer Projects in comparison with total assistance

HUDCO Assistance (Rs. crore)

Year	Water supply	Sewerage, Drainage and Solid waste	Transport	Area dvnt.	Social infrastru cture	Others	Total
2010-11	2,721	1,457	3,263	115	176	6,737	14,469
2011-12	2,606	2,845	2,510	-	647	5,595	14,204
2012-13	3,089	972	4,925	-	2,202	5,149	16,337
2013-14	1,812	1,764	2,121	-	154	1,997	7,848
2014-15	4,919	473	3,787	-	213	4,034	13,426
2015-16	2,425	1,713	4,782	-	1,239	1,826	11,984
Total	17,573	9,224	21,389	115	4,631	25,337	78,268

HUDCO assistance to Water and Sewer Projects in Comparison with total assistance



CSR, philanthropy and social impact investment

- While both public finance and possible commercial resources are important, FSSM financing can also come through other emerging innovative mechanisms including CSR, philanthropy and funding by social impact investors.
- This may comprise grants or loans depending on the specific sources. While the CSR and philanthropy funds will largely be as grants and project support, the social impact funds can be either as grants or loans, depending on the specific mechanisms used.
- For both corporates and philanthropists, while sanitation has gradually emerged as an important area, there is little understanding of FSSM and the need to look beyond toilets to making cities ODF+ by ensuring safely managed sanitation.
- **Philanthropy has helped to fund a few pilot FSTPs such as those in Devanhalli in Karnataka, Wai in Maharashtra, Trichi in Tamil Nadu, Warangal in Telangana and Narsapur in AP.**
- These have showcased new technologies and made it possible to make these concepts popular. However, it can be argued that this is not a sustainable source beyond initial demonstration of technologies.

Mobilizing CSR funds for FSSM

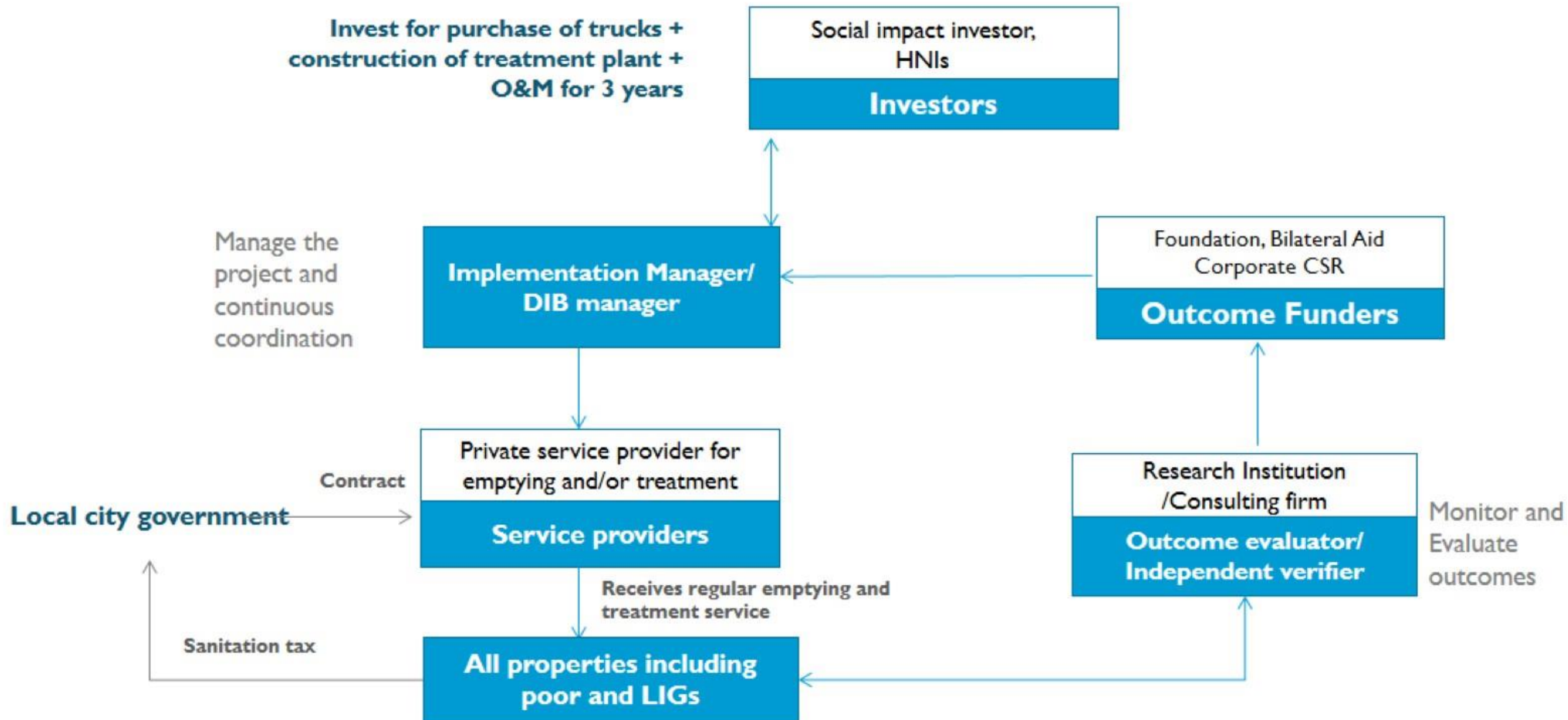
- There is a possibility of mobilizing corporate funding using CSR for large companies as the Companies Act, 2013 mandates that large companies spend 2% of their three-year average annual profit towards CSR.
- There may be possibilities of mobilizing CSR funds to support FSSM for different activities that would help the quality and effectiveness of investments. For example, CEPT university has mobilized CSR funding from HSBC for Sinnar, a small city in Maharashtra. This supports activities related to ODF sustainability and for making the city ODF+. CSR funds can also be mobilized for other such activities such guarantee funds to back up escrow accounts being used for annuity models. This arrangement would give private players greater comfort and would help in reducing bid prices.

Development Impact Bonds (DIBs)

DIBs act as an upcoming instruments to attract social impact investors to the sanitation sector. A DIB can be explored for FSSM to facilitate a new technology or business model linked to specific outcomes related to either social / equity impacts or environmental impacts such as safely disposal after treatment.

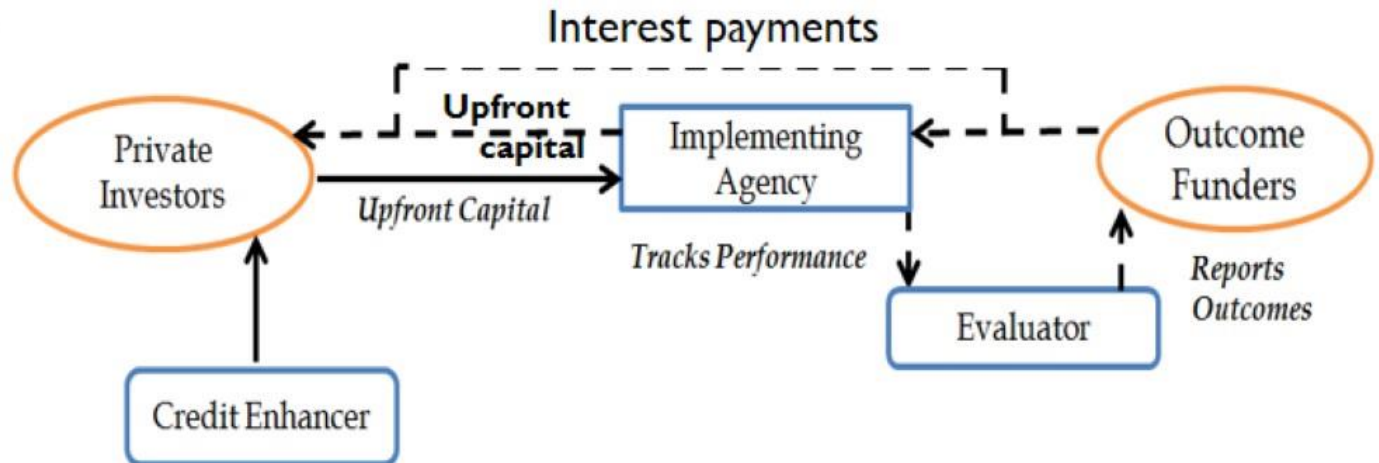
- DIB is an Outcomes based financing model – investors generate a return if specific social targets are met.
- Social Finance, in partnership with USAID, is developing a **WASH Development Impact Bonds (DIB)**, in Rwanda and Senegal.
- WASH DIB to improve safe collection and conveyance of faecal sludge.
- Safe collection and conveyance of faecal sludge from low- income households the key outcome variable based on which investors make a return.
- Social Finance is currently assessing the feasibility of this approach.
- One can develop similar structure for a pilot project in India.
- Strong monitoring of improved quality of treated waste water or citywide sludge collection monitoring systems will be needed to measure impacts of the FSSM activities for this approach. Wai, in Maharashtra has planned the GIS based monitoring of both conveyance and disposal, similar monitoring system can aid towards monitoring for DIBs.

Exploring a contract structure for a urban sanitation/ FSSM DIB



Grameen capital DIB structure

Development impact bond in form of interest rate subvention could be another form of DIB which could be explored where for-profit organizations are involved as an implementing agency.



- In this DIB model, investors will provide upfront working loans to for-profit implementing agency and thereafter approach outcome funders to either waive off or reduce their interest rate/payment.
- An independent Evaluator would track the performance of the Implementing to quantify the impact and showcase progress of the Bond.
- Outcome funders based on the feedback from the independent evaluator, would serve the financial interest of the bond in case the implementing agency is a for-profit social enterprise. The for-profit social enterprise itself would be liable to pay back the upfront capital to the Private Investors.
- This may provide access to funds for private enterprises.

Lessons from case studies of blended finance

- There are only limited examples of use of blended finance to leverage private and/ or commercial resources. Amongst WASH, there are less examples for sanitation so far.
- When designed properly, there are opportunities for scaling up as illustrated by the K-Rep Bank case in Kenya. For this, it is important to align these approaches with the prevailing institutions in both water and sanitation as well as in the finance sector.
- The level of development of the financial sector and capital markets will determine the extent of opportunities for water and sanitation. Strengthening links to financing institutions and capital markets is critical.
- Special measures such as escrow account can help mitigate risks for the private sector and help bring down costs.

Pilot/demonstration for innovative finance

- Each of these innovative finance schemes has been implemented in India or globally in WASH sector or in other sectors.
- Annuity Models: Maharashtra experience of ULB level performance based annuity model for conveyance and AP experience of HAM for treatment in small cities will provide lessons for other states
- It would be useful to assess interest of corporates to fund products like guarantee fund as a back up for ULB-private sector Escrow Accounts through CSR route.
- For other models, it is possible to develop pilot projects for conveyance and/or treatment in the focus states
- It is important to recognize and tap the new sources of funds such as from social investors and from the domestic lenders and capital markets.
- For this use of results based funding (RBF) mechanisms will be key as funders look to ensure outcomes.
- While exploring private and commercial funding sources is an old story from 1990s, water and sanitation sector has lagged behind other infrastructure sectors. The renewed emphasis and emerging approaches of blended finance will need to be carefully designed and aligned with domestic institutions to show results at scale.

Potential innovative financing options for FSSM

Performance Based Annuity Model

- Maharashtra experience of ULB level performance based annuity model for conveyance and AP experience of HAM for treatment in small cities will provide lessons for other states.
- An escrow account mechanism can be used to mitigate late payment risks of private sector.

Borrowings from Institutions/ Banks

- For capital investment for treatment plant, ULB can borrow from banks under the priority sector lending.
- Most banks may not have realized that lending for FSTPs of up to Rs. 5 crores will also be covered under the priority sector lending (PSL) requirements for commercial banks. This will make it attractive for banks to lend to ULBs for sanitation projects.

Development Impact Bonds

- An impact bond for FSSM can be developed for scheduled desludging of septic tanks and treatment of FS.
- Measurable outcomes in them can be: All Households covered for emptying services, especially poor and low income households for desludging of tanks and volume of collected FS that is treated, effluent characteristics of treatment plant meeting the environmental discharge standards for treatment of FS.



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Available sanitation and urban development funds should be better leveraged to fund FSSM

Increasing the FSSM financing pie



- Funds allocated for sanitation are typically adequate for FSSM. However most are already earmarked for various activities, including sewerage.
- Increasing the overall pool of funds for sanitation, by advocating for reallocation of urban development funds (highlighted in state wise slides earlier) will make available additional funds for FSSM, without compromising on other sanitation needs.
- This is particularly relevant for states with capacity to deploy additional funds and/or where FSSM funding needs are significant

Improving the allocation (across city types)



- A detailed evaluation should be carried out by states to arrive at a more appropriate allocation of sanitation funds, within which FSSM finds its due importance.
- Across the states, FSSM funding needs range from 7% to 31% of states' sanitation funds.
- Funds earmarked for expansion of sewer systems can be prioritized for re-allocation to less expensive FSSM systems, which may be more appropriate for typology 4 and 5 towns
- At the scheme level, a portion of funds for access to sanitation (e.g. toilet/septic tank construction) or treatment systems, can be earmarked for FSSM systems.

Improving efficiency of allocation



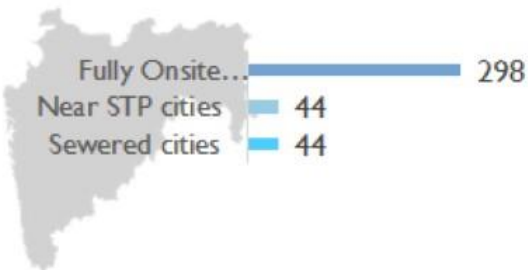
- A direct allocation from the state budget offers a single source of funds to implement a targeted objective. Andhra Pradesh's allocation of funds for 78 FSTPs is an example.
- ULB-led initiatives should be used where relevant schemes to fund ULB projects already exist and can plug gaps for ULB-specific requirements.

Institutionalizing capability



- Designated state agencies can provide technical support to guide ULBs on scheme eligibility requirements, preparing requests for funding, and efficient project implementation.

For Maharashtra, sources are 14th FC funds, Incentive funds....



Key pools that are present for FSM:

- **14th FC funds**- 50% of 14th FC funds are advised to be utilized for sanitation by GoM.
- **ODF incentive funds**- These funds can be directed to be used for FSSM.

Other Proximate Pools

- **Maharashtra Nagarothan Maha-abhiyan**- A significant pool of capital that does fund UWSS sector. The Maharashtra government could add FSSM to its mandate and allocate a fixed minimum percentage.
- **MUINFRA** – Maharashtra Urban Infrastructure Development Company. It provides support for Project Development and Project Finance

Supporting Activities

Strengthening the state-wide FSSM strategy

- Articulation of a coherent state-wide strategy, including business and financing models, would help in the identification of amounts to be sourced from each pool.
- Involving private sector in these activities would support the ULBs.

TN is exploring unutilized SBM funds and own funding through state budget for implementing FSSM

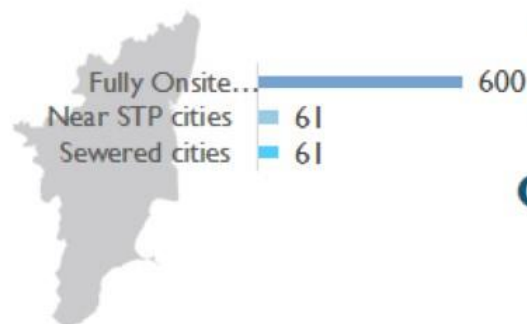
Key pools that are present for FSSM

- **Using State Grants:** Tamil Nadu has used state level grants to build FSTPs in the state.
- **Unutilized SBM funds-** Unutilized SBM funds are used for implementing FSM activities.

Other Proximate Pools

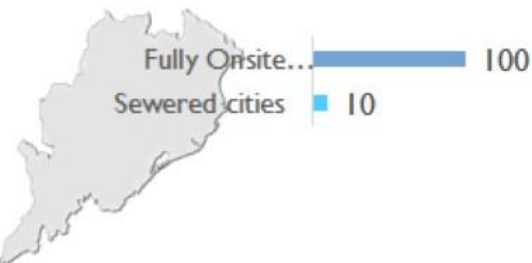
- **Reallocation of funds from MAWS budget-** MAWS should reallocate a minor part of their non-sanitation budget towards FSSM – only a reallocation of 2-3% of MAWS' non-sanitation budget can meet the entire FSSM need
- **Tamil Nadu Urban Development Fund-TNUDF-** TNUDF provides financial assistance for urban infrastructure project. FSSM can be included in their portfolio
- **Utilization of externally aided programs-** EAPs have been extensively used to fund municipal infrastructure projects, such as funds from KfW and the World Bank channeled through TNUDF, similar approach can be explored for FSM projects too.
- **Water and Sanitation Pooled Fund (WSPF)-** It can mobilize resources from the capital market and finance urban infrastructure projects. This Fund can be used for raising funds for FSSM activities

- Considering responsibility of the ULBs to sustain the FSSM services.
- Licensing/ monitoring of the private players.



Supporting Activities

Odisha funding FSTPs through AMRUT Program, district mineral funds are potential funds which can be utilized for FSSM



Key pools that are present for FSSM

- **Expansion of AMRUT funding for FSSM-** Odisha has already begun utilizing AMRUT funds for FSSM at a significant scale. AMRUT funds of around INR 30 Cr. have been used for FSTPs in 9 cities. AMRUT funds should continue to be leveraged for FSSM financing needs, including for desludging and treatment. Odisha Water Supply and Sewerage Board (OWSSB) to carry out design, manage construction and OandM contracts for these FSTPs.

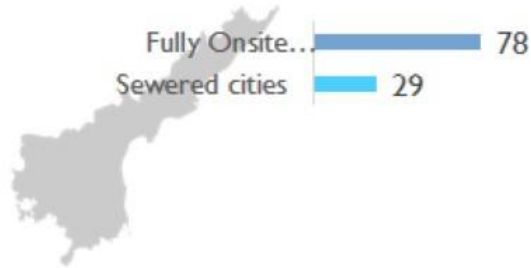
Other Proximate Pools

- **Utilization of DMFs and OUIDF funds-** DMF has a significant fund which acts as a potential fund for FSSM conveyance and treatment. OUIDF, which is funded by KfW, can also be approached for funding towards FSSM.
- **15th FC Funds-** The state government has made a representation to the 15th FC and indicated a demand of Rs. 340 Crore for statewide FSM coverage.

Supporting Activities

- Articulation of a coherent state-wide strategy, including business and financing models, would help in the identification of amounts to be sourced from each pool.
- Knowledge and Capacity building of ULBs and state institutions
- Enhancing ULBs' knowledge of the issues linked to and solutions for FSSM will help get their buy in, drive implementation, and convince ULBs to allocate / apply for funds for FSSM. Supporting ULBs to improve their own revenues.

For Andhra Pradesh, state budget funds plus minor reallocation of AMRUT funds would meet FSSM needs



Key pools that are present for FSSM

- **Swachh Andhra Corporation and AP Water Supply and Septage Improvement Project-** GoAP has made a specific budget allocation of Rs. 40 crores and Rs. 101 Cr respectively for this in its 2018-19 budget. These funds should be utilized efficiently and continuity of funding through the budget line item should be ensured. Although funds under AP water supply and septage improvement project are mainly used for water supply projects, these can be earmarked for FSSM projects in future.
- **Utilization of AMRUT funds-** Andhra Pradesh is already utilizing AMRUT funds for co-treatment of FS. It has planned co-treatment with STP in their AMRUT projects in which STPs are built. These funds should continue to be leveraged for FSSM financing needs, and their use expanded in the future through advocacy with ULBs.

Supporting Activities

- Aligning fund allocations with state-wide FSSM strategy
- Considering responsibility of the ULBs to sustain the FSSM services, increase the role of ULBs.

Summary recommendations

For FSTP, financing will mainly need to come from public funds. Advocacy efforts are needed for **SBM-2 and AMRUT-2 to focus on FSSM and on small and medium cities.** Local governments can also fund their share from 14th FC..(and hopefully 15th FC). Each state government will also need to identify budgetary sources for matching funds. For operational sustainability, it is essential to **support ULBs to enhance their own incomes by improving property taxes and revenues from other sources of own income.**

It is possible and necessary to get private sector involved particularly in conveyance. This may be through scheduled desludging (e.g. in Maharashtra), where annuity payments by ULBs through sanitation /property tax. In case of demand desludging, it is possible to let private desludgers operate on payment of a licence fee. This maybe less inclusive and can result in high prices that are unaffordable for the poor and low income groups.

Innovative financing may be adopted to use public and donor funds to leverage private funds and impact investment. While the experiences with PLAM in Maharashtra for scheduled emptying or with HAM for treatment in AP unfold, it is important to explore other potential options to leverage impact investment through appropriate DIB type instruments.

There is a need to **increase awareness about the investment opportunities in FSSM** among potential funders, bankers and other lenders, impact investors, and corporates who can support the sector through CSR funding. The focus of this should be on innovative and viable models that will generate adequate return on investments, as well as a clear understanding of risk management possibilities. .



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- References
- Abbreviations
- Annex-1: List of interviews
- Annex-2: Discussion during workshops and meetings with various stakeholder
- Annex-3: Examples of Innovative financing mechanisms

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World Bank Group (2016), "Scaling up blended finance for water and sanitation in Kenya" in "Case studies in blended finance for water and sanitation", p. 2.

Abbreviations (1/2)

AIIB	Asian Infrastructure Investment Bank
AMRUT	Atal Mission for Rejuvenation and Urban Transformation
BMGF	Bill and Melinda Gates Foundation
Capex	Capital Expenditure
CSR	Corporate Social Responsibility
C-WAS	Center for Water and Sanitation
DMF	District Mineral Funds
EAP	Externally Aided Program
FFC	Fourteenth Finance Commission
FSS	Faecal Sludge and Septage
FSSM	Faecal Sludge and Septage Management
FSTP	Faecal Sludge Treatment Plant
Gol	Government of India
GoAP	Government of Andhra Pradesh
GoM	Government of Maharashtra
GoO	Government of Odisha
GoT	Government of Tamil Nadu
JMP	Joint Monitoring Program
KLD	Kilo Liters per Day

Abbreviations (2/2)

MAUD	Municipal Administration and Urban Development
MAWS	Municipal Administration and Water Supply
MoHUA	Ministry of Housing and Urban Affairs
MUINFRA	Maharashtra Urban Infrastructure Development Co. Ltd.
ODF	Open Defecation Free
Opex	Operation and Maintenance Expenditure
OUIDF	Odisha Urban Infrastructure Development Funds
SAAP	State Annual Action Plan
SAC	Swachh Andhra Corporation
SBM	Swachh Bharat Mission
SDG	Sustainable Development Goal
SLB	Service Level Benchmark
STP	Sewage Treatment Plant
TSU	Technical Support Unit
UDD	Urban Development Department
ULB	Urban Local Body
UNICEF	The United Nations Children's Fund
WHO	World Health Organization

Anne-1: List of interviews: Experts, staff of technical support units, government, funders, civil society and private operators

#	Name	Organization
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Maharashtra

1	Dinesh Mehta, Meera Mehta, Dhruv Bhavsar, Aasim Mansuri, Jigisha Jaiswal, Dhvani Shah, Utkarsha Kavadi	CWAS, CEPT University (TSU of Maharashtra)
2	Utkarsha Kavadi	Director - RCUES, AILSG
3	Mahesh Harhare	Chief Resilience Officer, Pune

Tamil Nadu

4	Gayathri, Kavita Wankhade, Srinithi Moopanan, Niladri Chakraborti	IHS (TSU of Tamil Nadu)
5	Suresh Kumar, Rajesh, Vinitha	Keystone Foundation
6	R Murugan	TUFIDCO
7	Executive Officer of PNP and implementation staff at NNP near Coimbatore	
8	Site visit to the FSTP near Coimbatore and discussion with the site engineer and his staff	
9	K. Santoshkumar	Coimbatore City Health Officer
10	D. Rajendiran	TNUIFSL Senior Assistant VP

#	Name	Organization
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Odisha

11	Bhawna Prakash, Sarith Sasidharan, Pritesh Nanda, Amol Nawathale, Avik	EY (TSU of Odisha)
12	Labanya Sabar	CFO Bhubaneswar Municipal Corporation
13	R Manivannan	OUIDF
14	PK Mohapatra	OWSSB
15	Sangramjit Nayak	SBM(U) Mission Director

Andhra Pradesh

16	Dr. Malini Reddy, Prof. S. Chary, Manoj Mavuduri	ASCI (TSU of Andhra Pradesh)
17	D. Muralidhar Reddy	Swachha Andhra Corporation
18	Kanna Babu	Director of Municipal Administration, MD of APUFIDC

PMU/Government

20	Jyoti Dash, Depinder Kapur	NIUA
21	Saket Kumar	KPMG

List of interviews: Experts, staff of technical support units, government, funders, civil society and private operators

#	Name	Organization
DFIs, funders		
22	Raghava Neti	World Bank
23	Dr. Christoph Kessler	KfW
24	Janavi Papriwal and Disha	Aavishkaar
25	Dominique Carrie	Social Finance
26	Jack Robinson	Sorenson Impact
CSOs/NGOs		
27	Sujatha Srinivasan	IFMR
28	A. Kalimuthu	WASH Institute
29	VK Madhavan	WaterAid India
30	Shubhagato Dasgupta	CPR

#	Name	Organization
31	Dr. Hrudanand Mohanty, Rafiul Islam	Practical Action (India and Bangladesh)
32	Sasanka Velidandla	CDD Society
33	Paul Gunstensen	Stone Family Foundation
34	Chaitanya Krishna Rao	IWMI
35	Tom Outlaw	Clearwater Strategy Consulting
36	Foort Bustraan	Development Alternatives Incorporated
37	Stanzin Tsephel	BORDA
38	Sanjay Singh	PSI

List of private players interviewed across four states - a mix of conveyance players and treatment players

State	Large/medium-direct	Large-proximate	Small-direct
Maharashtra	<p>Conveyance</p> <ul style="list-style-type: none"> • 3S/Saraplast • Sumeet Group • KK All Services • Kam Avida <p>Treatment</p> <ul style="list-style-type: none"> • Panse Consultants • Tide Technocrats • Shivam Water Treaters 		<p>Conveyance</p> <ul style="list-style-type: none"> • Govind Cleaning Services • Kadam Enterprises
Tamil Nadu	<p>Conveyance</p> <ul style="list-style-type: none"> • Moorthy Septic Tank Cleaning <p>Treatment</p> <ul style="list-style-type: none"> • Shivam Water Treaters • AIGA Engineers 	<p>Treatment</p> <ul style="list-style-type: none"> • Kings Industries 	<p>Conveyance</p> <ul style="list-style-type: none"> • Individual with own business in Coimbatore
Odisha	<p>Conveyance</p> <ul style="list-style-type: none"> • Om Construction • Two individuals businesses – one with 10 trucks and capacity to expand from to other ULBs; other with 4 trucks but multiple businesses e.g. SWM in Odisha and elsewhere <p>Treatment</p> <ul style="list-style-type: none"> • Mother Blessing Construction 	<p>Conveyance</p> <ul style="list-style-type: none"> • Vedika Resources <p>Treatment</p> <ul style="list-style-type: none"> • Bhawani Enterprises • Health and Care Enterprises 	<p>Conveyance</p> <ul style="list-style-type: none"> • Himalaya Clean and Care
Andhra Pradesh	<p>Conveyance</p> <ul style="list-style-type: none"> • Shiva Sai Septic Tank Cleaners <p>Treatment</p> <ul style="list-style-type: none"> • Tide Technocrats 	<p>Treatment</p> <ul style="list-style-type: none"> • Ecoicons • Mahindra & Mahindra 	<p>Conveyance</p> <ul style="list-style-type: none"> • Mudavat Srinu Septic Tank Cleaner • One individual with own business in Vijayawada

Annex-2: Discussion during workshops and meetings with various stakeholder

1

One workshop was held on 14th February 2018 in partnership with the Finance Task Force. Of the NFFSSM Preliminary findings from study of private providers and potential business models for FSSM services were shared with teams from the four State TSUs as well as other members of the Finance Taskforce.

[Link](#) to the detailed workshop report.



2

Maharashtra State level stakeholder workshops held for 130 cities– 8 divisional level stakeholder workshops were conducted

Ideas accepted by cities for implementation

- Scheduled emptying 3 year cleaning cycle
- Some cities have shown interest for gradual approach of emptying (Strengthening with demand based and then going for Scheduled emptying)
- Idea of levying Sanitation tax



3

Workshop with private players involved in sanitation business in Pune on 22-23rd October, 2018. The main objectives of the workshop were to sensitize the private sector regarding the potential scale of FSSM market ; to understand their interest and readiness to take up opportunities; discuss FSSM business models and to understand their risk and challenges.

[Link](#) to the detailed workshop report.



Annex 3- Examples of innovative financing mechanisms

I. Additional Public Finance Mechanisms (India): Interesting models for inviting public, and private sector participation in projects

1

Beneficiary capital contribution | Bangalore

- Greater Bangalore Water and Sanitation Project was started in 1998 to distribute water from the Cauvery river to the outskirts of Bangalore
- In addition to state grants and debt, project also received upfront beneficiary capital contributions from citizens/consumers. These contributions funded over 35% of the total cost of the project
- Key drivers of interest and relevance for FSSM
 - Upfront beneficiary contribution indicates strong demand and stakeholder buy in
 - Upfront funding of FSSM projects possible, awareness creation to drive demand may be necessary
 - Potential applicability to relatively capex heavy treatment sector

INR 156 crores

Capex (with opex bundling if possible)

2

Swiss challenge system | MoRTH - India

- The Ministry of Road Transportation and Highways is considering implementing a “Swiss Challenge System”
- Allows private sector investors to bring offers for new infrastructure projects to the government.
- There is a period of time in which third parties can make counteroffers, essentially instituting a sort of bidding system
- Key drivers of interest and relevance for FSSM
 - Interesting competitive bidding system which can help uncover private sector participation opportunities, especially in a low data environment
 - System could be used to ensure competitive bids, and accelerate speed

Goal: INR 360,000 cr

Capex

I. Additional Public Finance Mechanisms (India): Potential to unlock funding from existing pools of money (road fund, and real estate pool)

3

Central Road and Infrastructure Fund | India

- Central Road and Infrastructure Fund is funded through collections of taxes on petrol and diesel
- Fund has been largely run by the Ministry of Road Transport and Highways, which has allocated funding to various highway projects.
- Starting 2018, the fund will have an expanded objective and be able to fund other infrastructure projects, including sanitation projects
- Key drivers of interest and relevance for FSSM
 - Potential immediate opportunity and additional source of funding for FSSM
 - Money from CRIF can directly be funneled into FSSM infrastructure – both transport and treatment stages

NA

Capex

4

Cauvery Water Cess | Tamil Nadu

- In order to finance a water supply project to bring Cauvery water to Bangalore, the government of Karnataka charged a Cauvery water cess
- Cess charged on land in which development permissions or change of land use (eg. Zoning types) was being sought
- These funds were transferred to the Bangalore Water Supply and Sewerage Board (BWSSB).
- Cess disputed in a 2012 Supreme Court case and discontinued
- Key drivers of interest and relevance for FSSM
 - ULBs may be able to charge developers for building in areas that receive services from new FSTPs or other FSSM services

INR 35 cr between 1988 and 2005

Can be used for capital or operating expenses

II. Additional Public Finance Mechanisms (International): Both mechanisms offer ability to fund projects tied to local context and needs

5

Clean Water Revolving Funds | USA



- The EPA's Clean Water State Revolving Fund provides grants to all American states, matched by state grants, to fund state revolving funds.
- These funds make low interest loans for water infrastructure projects
- The funds have autonomy over types and structuring of debt, and can also be used to guarantee local loans
- Key drivers of interest and relevance for FSSM
 - Structure could be considered for existing central and state schemes in India.
 - Autonomy for states will help drive more contextually relevant funding decisions
 - Can help finance both treatment and transport, especially in smaller cities.

\$119 B since 1987 (over all state funds)

Capex

6

Community Infrastructure Levy | UK



- Since 2010, new developments in the UK have been charged a Community Infrastructure Levy (CIL), collected by local government councils
- The levy is generally allocated for new infrastructure necessitated by the new projects
- In certain cases, can be used to maintain existing infrastructure, if maintenance needs are greatly impacted by the new development
- Key drivers of interest and relevance for FSSM
 - Innovative way of privatizing and clubbing infrastructure costs with new developments
 - Equity to be considered while deciding levy
 - Can raise money for FSSM infrastructure, especially in peri-urban areas

Expected to have raised GBP1 B by 2016

Focused on Capital Expenditures

II. Additional Public Finance Mechanisms (International): Funding of social infra to fulfil planning obligations, or once benefits are realized

7

Planning Obligations | UK



- Planning obligations are conditions a city may require a developer to fulfill for a certain plot of land - obligation tied to the land, not developer
- Obligations may stipulate certain properties of the development (eg. low income housing) or can require the developer to compensate the city for damages caused by the development (eg. loss of open space)
- Key drivers of interest and relevance for FSSM
 - Innovative way of privatizing and clubbing FSSM service delivery costs with new developments
 - Equity to be considered

N/A

Capex

8

Betterment Levies | Colombia



- Colombia charges a betterment levy on land that has gained value due to infrastructure projects that have already been implemented
- The betterment levy is often criticized as regressive, as poorer cities and areas will have lower abilities to pay the levy and will therefore have poorer infrastructure
- Key drivers of interest and relevance for FSSM
 - If health and environmental indicators in a neighborhood improve after FSis handled effectively, betterment levies could fund FSSM infrastructure and services to that area.

USD2 Bworth of projects financed through the levy

Capex / Opex

II. Additional Public Finance Mechanisms (International): Ability to raise funding through a new instrument

9

Sanitation levies | Zambia



- Lusaka Water and Sewerage Company charges customers both a sewerage tariff (if connected to the sewer network), and a sanitation levy that is 3-4% of their water bill (roughly USD 1.5/month).
- Levy is fed to a sanitation fund intended for sanitation improvements in low income areas
- The fund has so far constructed 100 on-site sanitation facilities, and is now helping finance a sewer system
- Key drivers of interest and relevance for FSSM
 - Unlocking funding through an additional instrument
 - Could fund FSSM projects in the periphery of large cities thus freeing up Central and State transfers for smaller cities.

Has raised \$2 MUSD

Capex + Opex

Blended and Pooled Finance (India): A variety of pooled fund mechanisms with significant private capital participation are noticed

	<u>OVERVIEW and RATIONALE</u>	<u>RELEVANCE</u>
Water and Sanitation Pooled Fund (Tamil Nadu)	<ul style="list-style-type: none"> Innovative pooled fund – issues bonds to commercial investors supported by a range of credit enhancements by public / non profit actors. Money lent to small / medium ULBs Crowds in commercial capital which is otherwise inaccessible to small / medium ULBs due to creditworthiness concerns 	<ul style="list-style-type: none"> Key objective: Make commercial financial pools accessible to small and medium sized ULBs while efficiently managing risk through the support of public / non profit funds FSSM Value Chain relevance: Can be targeted at both desludging and treatment capex
India Infrastructure Project Development Fund	<ul style="list-style-type: none"> Set up to support project development of various ministries Support project development during the feasibility / pre-feasibility stage to create bankable projects which can access other capital pools 	<ul style="list-style-type: none"> Key objective: Support the creation of high quality bankable projects that are able to crowd in a variety of funding pools depending upon need FSSM Value Chain relevance: Relevant for both desludging and treatment capex, albeit early stage / project development activities
Pooled Municipal Debt Obligation Facility	<ul style="list-style-type: none"> Facility funded by 15 banks and FIs, to offer loans to ULBs, SPVs, concessionaires, developers etc, in exchange for certain credit enhancement conditions Significant private fund available, the success of which can provide a demonstration effect 	<ul style="list-style-type: none"> Key objective: Provide access to targeted private pools of capital, in addition to building the capacity of private funders to understand the risk parameters of the FSSM sector, in order to arrive at appropriate financing products FSSM Value Chain relevance: Can be targeted at both desludging and treatment capex
Renew Power Investment Project	<ul style="list-style-type: none"> Pooled financing round with ADB, JICA, Goldman Sachs and Renew Power Ventures investing US\$ 500 mn to create a renewable energy platform Blending of low / no cost capital with commercial capital helps keep cost low for investee while helping investors meet their return targets 	<ul style="list-style-type: none"> Key objective: Explore multi-stakeholder blended models to catalyze funding for potentially return generating activities FSSM Value Chain relevance: Capex can be targeted, with a bias towards the desludging sector given its strong economics

Blended and Pooled Finance (International): A wide variety of pooling mechanisms are utilized internationally, implying significant innovation

	<u>OVERVIEW and RATIONALE</u>	<u>RELEVANCE</u>
Aid-Microfinance Blend (Bangladesh)	<ul style="list-style-type: none"> Blending of World Bank output based aid with microfinance loans to fund sanitation activities, at a below-commercial cost Reduce the cost of capital for service providers by pooling together capital with different risk / return profiles 	<ul style="list-style-type: none"> Key objective: Pool in non-public capital by identifying and assigning roles to public / non profit actors to enhance creditworthiness of the investment FSSM Value Chain relevance: Can be targeted at both desludging and treatment operations and capex
Second Tier Lending (Colombia)	<ul style="list-style-type: none"> Government owned 2nd tier lender, lending to commercial banks to catalyze funding for ULBs and service providers Reduce risk perception of FSSM for commercial investors, by providing 2nd tier funding 	<ul style="list-style-type: none"> Key objective: Enhance availability of private / commercial capital at reasonable rates by backstopping loans disbursed FSSM Value Chain relevance: Can be targeted at both desludging and treatment operations and capex
Convergence Platform and SDIP Blended Funds (Global)	<ul style="list-style-type: none"> Platforms designed to help connect public, private, non-profit and other funders for the formation of consortia for investment Online platform facilitating formation of funding consortia substantially reduces transaction and search costs for each investor, leading to greater incentive to create such consortia. Ability to attract funders across borders and profiles 	<ul style="list-style-type: none"> Key objective: Create a funding marketplace that helps enhance access to customized individual / blended, large funding sources depending upon specific needs of specific investees / regions. FSSM Value Chain relevance: Can help create funds targeted at both capex and opex
IFC Debt Syndication Program (Global)	<ul style="list-style-type: none"> Debt syndication program that allows 3rd party lenders to invest in IFC's future loans. IFC has exhibited willingness to provide credit enhancements such as first loss guarantee Crowds in various pools of capital by utilizing IFC's credit enhancement offerings, track record, and credibility. Blended fund ensures low cost of capital for investee 	<ul style="list-style-type: none"> Key objective: Pool in significant private capital through the balance sheet of a credible social sector investor (in this case IFC) FSSM Value Chain relevance: Likely only relevant for capex on the treatment side, given higher scale

III. Blended and Pooled Finance (India): The WSPF is a leading pooled fund mechanism globally; IIPDF offers support in project planning and design

10

Water and Sanitation Pooled Fund | Tamil Nadu

- The WSPF is one of a two innovative pooled funds in Tamil Nadu, the other one being TNUDF
- The WSPF issues bonds to commercial investors, with these bonds guaranteed by state government funds in an escrow account and a partial credit guarantee from USAID, in addition to a intricate web of credit enhancements
- Money lent out to small and medium sized ULBs
- The fund has become a model and has inspired other such structures, such as the Karnataka Water and Sanitation Pooled Fund Trust.
- Key drivers of interest and relevance for FSSM
 - Allows small and medium sized ULBs with poor credit ratings to access debt markets
 - Potential to crowd-in otherwise risk-

Raised INR 222 cr
between 2002 and 2013

capital

Capex

11

India Infrastructure Project Development Fund

- The IIPDF fund was set up to provide financial support for project development activities to relevant ministries
- The IIPDF is intended to cover up to 75% of project development costs for projects.
- Meant to be a revolving fund, with an initial funding of 100 crore, that is to be disbursed and then replenished through repayments
- Key drivers of interest and relevance for FSSM
 - Supports the project during a high risk-perception phase (project design, approval, contracting etc), gradually reducing risk perception for the project as it takes shape
 - Small-medium ULBs find it difficult to design good bankable projects. Such a fund could

N/A

quality of

Capex

III. Blended and Pooled Finance (India): While private sector funds would expect market returns, innovative structures could accelerate growth

12

Pooled Municipal Debt Obligation Facility

- The Pooled Municipal Debt Obligation Facility (PMDO) is a INR 3,000 cr fund structured through contributions from 15 banks and financial institutions, headed by I LandFS
- Offers loans to ULBs, SPVs, concessionaires, developers etc; in the urban infrastructure space
- ULBs have to reform their accounting practices and levy user fees in order to access the fund. They have to open an escrow account from these user fees in order to secure their debt obligations
- Key drivers of interest and relevance for FSSM
 - Pooled debt with clear requirements from ULBs can help mitigate investor fears in ULB Creditworthiness
 - Crowds in significant private sector funding

INR 3000 cr corpus

Capex

13

ReNew Power Investment Project

- ADB, JICA, Goldman Sachs, and ReNew Power Ventures Private Limited have provided USD 500 M in loans and equity to create a renewable energy platform
- Presence of low / no-cost multi-lateral funding enhances return potential for the PE investor and ReNew Power
- Key drivers of interest and relevance for FSSM
 - Potential to consider creation of a desludging / treatment platform which may own a chain of plants / desludging operations
 - Portfolio approach can de-risk operations, and create a strong proof of concept
 - Model would need clear financial return mechanisms

USD 500 M USD

Capex

M. Blended and Pooled Finance (International): Models in offer reduction in costs for borrowers, accompanied by risk mitigation in Colombia

14

Aid-Microfinance Blend | Bangladesh



- Households in Bangladesh require installment based loans in order to afford sanitation facilities
- The country is now blending World Bank output-based aid with microfinance loans to lower the cost of toilets and spread repayment installments over a year
- The \$15 per household subsidy decreases households' weekly payments by 11%
- Key drivers of interest and relevance for FSSM
 - This blended aid/loan approach can be used for low income households constructing or desludging septic tanks
 - Combination may also be valid for desludging operators

Scale: will leverage USD
22 M in household
investments

Capex / Opex

15

Second Tier Lending | Colombia



- ANDETER is a government owned 2nd tier lender, lending to commercial banks financing infrastructure project
- It started with donor funds (guaranteed by government), which continue
- Municipality and service providers' loan applications are approved by both the bank and ANDETER, and the latter provides project preparation support
- The lender can intercept municipal revenues to the central government, if needed.
- Key drivers of interest and relevance for FSSM
 - Promoted greater funding by banks
 - Reduces cost of funding for service providers, given risk reduction

COP 7.070 Bn assets in
2014

Capex / Opex

M. Blended and Pooled Finance (International): Collaborative platforms offer the ability to create customized, contextually relevant solutions

16

Convergence Platform | Global

- Convergence is a platform to connect private investors with government lenders and philanthropic funders to invest in deals posted on the site
- It also provides funding to design new innovative financing instruments and training, workshops, and information on blended finance for investors.
- Key drivers of interest and relevance for FSSM
 - Such a platform offers the ability to create customized consortia based on the project characteristics, including risk profiles
 - Also helps funders, who may lack the expertise and linkages to access markets themselves, find appropriate projects

Provides \$7 M in grants for innovative financing instruments

Capex / Opex

17

SDIP Blended Funds | Global

- J between OECD and WEF, the Sustainable Development Investment Partnership (SDIP) is a collaborative initiative of public, private, and philanthropic initiatives
- Focused on sustainable and climate-resilient infra
- Provides a platform for partnership for investors
- Key drivers of interest and relevance for FSSM
 - Such a platform offers the ability to create customized consortia based on project characteristics, including risk profiles
 - Also reduces search, and transaction costs for members

SDIP members have committed \$100 B

Capex

M. Blended and Pooled Finance (International): Crowding in of capital pools through a syndication program

18

IFC's Debt Syndication Program | Global

- IFC's Managed Co-Lending Portfolio Program for Infrastructure (MCCP Infra) is a debt syndication program and allows third party lenders to invest in IFC's future loans
- So far, three private entities (Allianz, AXA and Eastspring) have investors have put 0.5 billion each on the back of a first-loss tranche by SIDA (upto 10% of the portfolio)
- Key drivers of interest and relevance for FSSM
 - Crowds in multiple funding pools through access to IFC's funding portfolio
 - A guarantee would make it even more likely that this would get adopted.

\$1.5 BUSD committed

Capex

Innovative Finance (India): Results based financing, auctions, and listed investment trusts are some interesting innovative finance examples

OVERVIEW and RATIONALE



RELEVANCE

	OVERVIEW and RATIONALE	RELEVANCE
InvITs	<ul style="list-style-type: none"> Financial markets linked instrument, recently launched in India to enable small investors' participation in the financing of infrastructure projects. Similar to a Real Estate Investment Trust (REIT) Ability to tap the large market of retail financial investors 	<ul style="list-style-type: none"> Key objective: Access to a large sum through financial markets to finance a network of assets for ULBs FSSM Value Chain relevance: While the capex of both treatment and desludging can be funded, return expectations, especially for treatment, would have to be managed through appropriate support by government / nonprofit actors
Auctions	<ul style="list-style-type: none"> Auctions for natural resources have become common in India, driven by economic, and other reasons Price discovery of the value of desludging OandM could unlock potential cross subsidization opportunities 	<ul style="list-style-type: none"> Key objective: Unlock value of desludging OandM by auctioning licenses for private players, with the objective of potentially subsidizing treatment operations FSSM Value Chain relevance: Fund raising from the desludging segment, with potential application in the treatment side
Results Based Financing	<ul style="list-style-type: none"> Highlighted two such financing instruments (a) Nirmal Gram Puraskar, and (b) OBA for water and sewerage in Morocco (in addition to impact bonds, described below) Strong potential to derive funding for FSSM by identifying specific output parameters to be funded e.g. each ton of FS safely treated 	<ul style="list-style-type: none"> Key objective: Raise funding for the sector while incentivizing operators to run efficiently to maximize impact FSSM Value Chain relevance: Targeted at the operations of both desludging and treatment
Development Impact Bonds	<ul style="list-style-type: none"> Outcomes based financing instrument, involving an upfront investor who makes a return from social funders only if specific targets are met Sector is amenable to DIBs given the existence of a measurable outcome – sludge safely collected and disposed 	<ul style="list-style-type: none"> Key objective: Attract capital to FSSM operations by a returns generating outcome based financing instrument FSSM Value Chain relevance: Targeted at the operations of both desludging and treatment

Innovative Finance (International): Advance market commitments, aid setoffs, revolving funds, and sanitation credits offer interest possibilities

	<u>OVERVIEW and RATIONALE</u>	<u>RELEVANCE</u>
Debt2Health	<ul style="list-style-type: none"> • Mechanism whereby grantee countries with high debt and disease burdens can forgo debt repayments if equal amount is invested in public health • Potential mechanism to drive focus on the FSSM sector from governments 	<ul style="list-style-type: none"> • Key objective: Potential mechanism to support the scale up of public support for the sector by reimbursing a part of the public financing need. Similar agreement could be reached between state and ULBs/ center and state etc • FSSM Value Chain relevance: Targeted at capex in both desludging and treatment
Advance Market Commitments	<ul style="list-style-type: none"> • Advance market commitments have been used by governments to guarantee a market for innovative products once developed • Potential solution to incentivize development of reuse products 	<ul style="list-style-type: none"> • Key objective: Incentivize innovation in the reuse markets by putting in place a significant advance market commitment, which can also be leverage to access other funding sources • FSSM Value Chain relevance: Focus on the treatment / reuse space – in the innovation arena
Revolving Funds	<ul style="list-style-type: none"> • Revolving debt funds are continuously replenished when cash flows are available, and withdrawals made when needed • Potential to access concessional debt funding by a set of players / ULBs 	<ul style="list-style-type: none"> • Key objective: Create a pool of concessional debt that can be used fungibly between capex and opex • FSSM Value Chain relevance: Can be utilized for capex and opex of both treatment and desludging
Sanitation Credits	<ul style="list-style-type: none"> • Asanitation credit could be used to pay potential polluters in order to not pollute common resources • By calculating costs of faecal waste pollution per unit waste, governments could incentivize households, communities, and operators to not pollute 	<ul style="list-style-type: none"> • Key objective: Funding households utilizing sanitation credits to ensure that desludging is done on time – the economic value could flow from the households down the value chain • FSSM Value Chain relevance: Operations of desludging and treatment

V. Innovative Finance (India): InvTs and auctions offer innovative cross- sectoral opportunities in India

Instruments	Structure and Current Usage	Relevance for FSSM
 <p>Infrastructure Investment Trusts (InvIT)</p>	<ul style="list-style-type: none"> • Recently launched in India, InvTs allow small (INR 10 lc+) investors to pool funds and finance infrastructure projects, with these projects returning a portion of their income to the investors in these funds • InvTs distribute regular dividends • Currently being used in transportation (eg. ILandFS has structured a INR 3500 cr InvIT for toll roads), and renewable energy (eg. ILandFS has structured an InvIT for its solar assets) 	<ul style="list-style-type: none"> • Ability to access a vast pool of non-institutional equity holders through a markets based mechanism • Given the market offering size needs, will likely need to finance a chain of assets across ULBs
 <p>Auctions for resources</p>	<ul style="list-style-type: none"> • In the recent past, auctions of natural resources have become commonplace in India, driven by economic and other reasons • Strong price discovery mechanism, open auctions also reduce some perverse incentives in government resource allocation • The government has auctioned natural resource usage rights including gold, copper, molybdenum and coal mines, via auctions. They have also auctioned electromagnetic spectrum, land, and public properties 	<ul style="list-style-type: none"> • Price discovery of OandM licenses may unlock significant value for ULBs • Relevant for the desludging part of the value chain • Equity considerations would have to be factored in


VI. Innovative Finance (India + International): Results based financing mechanisms ensure the alignment of incentives of various stakeholders

- A wide variety of results based financing mechanisms are used across the world, examples of which include:
 - Rewards to communities or local governments
 - Performance based government-to-government transfers
 - Output based aid
 - Advanced market commitments
 - Conditional cash transfers
 - Results based grants etc.
- We have highlighted two examples below, one from India, and one from overseas



Instruments	Structure and Current Usage	Relevance for FSSM
<p style="text-align: center;">NIRMAL GRAM PURASKAR, INDIA</p>	<ul style="list-style-type: none"> • National program in India, where central government provides one-off monetary rewards for qualifying gram panchayats • Payments based on a set of criteria including 100% sanitation coverage of households, ODF status • Payments made following a verification process 	<ul style="list-style-type: none"> • Relevant outcomes for FSSM could be identified and funding linked to that to align incentives for relevant stake-holders
<p style="text-align: center;">OUTPUT BASED AID FOR WATER and SEWERAGE, MOROCCO</p>	<ul style="list-style-type: none"> • In 2007, a project was launched to connect 11,300 households to piped water and sewerage networks • The Global Partnership for Output Based Aid paid US\$ 7 mn in grant to 3 service providers (2 private and 1 public) – 60% on completion of connection, and 40% upon verification of at least 6 months of sustained service • Scheme planned to be scaled up to national level 	

VI. Innovative Finance (India + International): Development Impact Bonds offer an interesting markets-based, results-based mechanism



- A variety of results based financing mechanisms are used, we have presented here 1 case each from India, and overseas

Instruments	Structure and Current Usage	Relevance for FSSM
 <p>WASH Development Impact Bonds (DIB), Rwanda and Senegal</p>	<ul style="list-style-type: none"> • Outcomes based financing model – investors generate a return if specific social targets are met • Social Finance, in partnership with USAID, is developing a WASH DIB to improve safe collection and transport of faecal sludge • Safe conveyance of faecal sludge from low- income households the key outcome variable based on which investors make a return • Social Finance is currently assessing the feasibility of this approach 	<ul style="list-style-type: none"> • The Social Finance initiative is entirely focused on FSSM • Sector is amenable to this kind of financing given the availability of a clearly measurable outcome i.e. sludge safely collected
<p>Educate Girls DIB, Rajasthan India</p>	<ul style="list-style-type: none"> • The first ever development impact bond – a joint project between Educate Girls, ClFF, UBS Optimus Foundation, Instiglio, and IDinsight • The objective of the funding is to improve educational outcomes by increasing enrolment and improve learning outcomes for 18,000 girls in Rajasthan • The funder invested the working capital for the service provider (Educate Girls) – ClFF (the outcome payer) agrees to pay UBS the principal + return, so long as agreed targets are met 	

VII. Innovative Finance (International): Debt2Health incentivizes public funding; Advance Market Commitments incentivize innovation

Instruments	Structure and Current Usage	Relevance for FSSM
 <p>Debt2Health</p>	<ul style="list-style-type: none"> • Debt2Health is a mechanism where by grantee countries with high debt and disease burdens are provided the ability to forgo debt repayments if they spend an equal amount of money on investments in public health • Four agreements have been signed, involving Germany and Australia as creditors, with Pakistan, Cote d'Ivoire and Indonesia as debtors • Half of a debt was forgiven, with the other half paid to a Global Fund to be invested in those countries 	<ul style="list-style-type: none"> • Similar agreements may be reached for investments in FSSM between donors and states / ULBs or state funds and debtor ULBs • Important to avoid providing a perverse incentive to avoid paying the loan
 <p>Advance Market Commitment</p>	<ul style="list-style-type: none"> • Advance market commitments are used by governments to guarantee a market for products once they are developed. • They are used in situations where private entities consider upfront costs, and risks of development too high for investment without guarantees • Have been used in vaccines: donors give funds to guarantee vaccine prices after development, incentivizing investment in the required R&D. In exchange for the guarantee, firms must agree to provide vaccines at affordable rates for developing countries in the long run 	<ul style="list-style-type: none"> • Advance market commitments for reuse outputs could incentivize innovation in the space, through R&D in riskier projects

VII. Innovative Finance (International): Revolving funds help ULBs access cheap loans; Sanitation credits can incentives for proper sludge disposal

Instruments	Structure and Current Usage	Relevance for FSSM
 <p>Revolving funds by Oxfam in Philippines</p>	<ul style="list-style-type: none"> • Revolving funds are accounts which are continuously replenished when cash flows are available, and withdrawals made when needed - no fiscal year limitation • Organizations use revolving funds to simultaneously fund and fundraise for projects, while parking excess cash when available • Oxfam and the Philippines Business of Social Program started a revolving fund with an initial USD 500,000 grant from the former – provides interest free loans up to USD 100,000 to FSTPs and charges a 5% administration fee. 	<ul style="list-style-type: none"> • Concessional debt funding potential – can be used by multiple parties at different points of time • These funds can be used for FSTP construction and other capital expenses, providing ULBs with low interest loans from governments' own funds.
 <p>Sanitation credits</p>	<ul style="list-style-type: none"> • Asanitation credit system could be used to pay potential polluters in order to not pollute common resources • By calculating costs of faecal waste pollution per unit waste, governments could incentivize households, communities, and operators to not pollute • Sanitation credits are derived from the concept of carbon credits. A local government in Ahmedabad financially incentivized people to use public toilets. • Some NGOs value feces according to its fertilizer value ensuring its safe disposal 	<ul style="list-style-type: none"> • Sanitation credits can be used to value faecal sludge not dumped. This is similar to paying private operators reverse tipping fees, or subsidizing desludging costs for households



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The Center for Water and Sanitation (C-WAS) at CEPT University carries out various activities – action research, training, advocacy to enable state and local governments to improve delivery of services. In recent years C-WAS has focused its work on urban sanitation.