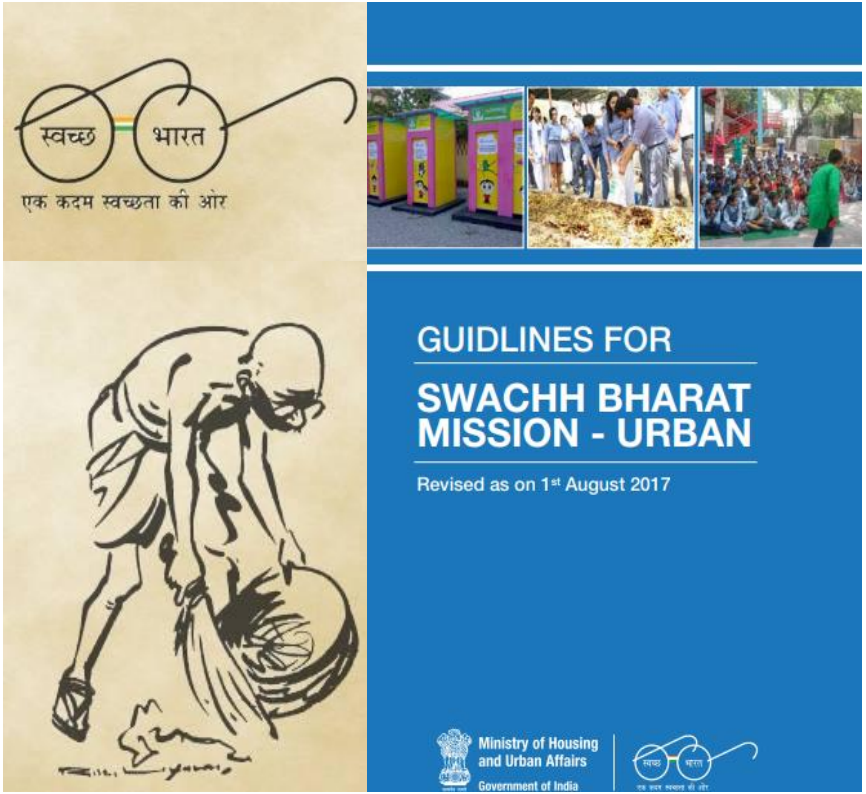
Equitable Sanitation Financing for Urban India

International Seminar on
Inclusive Development: Issues and Challenges
In the honour of Prof. R. Radhakrishna

Centre for Economic and Social Studies
Hyderabad, India, October 10 2018

Meera Mehta and Dinesh Mehta
Center for Water and Sanitation
CEPT University, Ahmedabad, India

Swachh Bharat Mission (SBM) Urban



Mission Objectives by October 2019

- **Elimination of open defecation**
- Eradication of Manual Scavenging

SBM (Urban) aims to ensure that

- No households engage in the practice of open defecation
- No new insanitary toilets are constructed during the mission period
- Pit latrines are converted to sanitary latrines

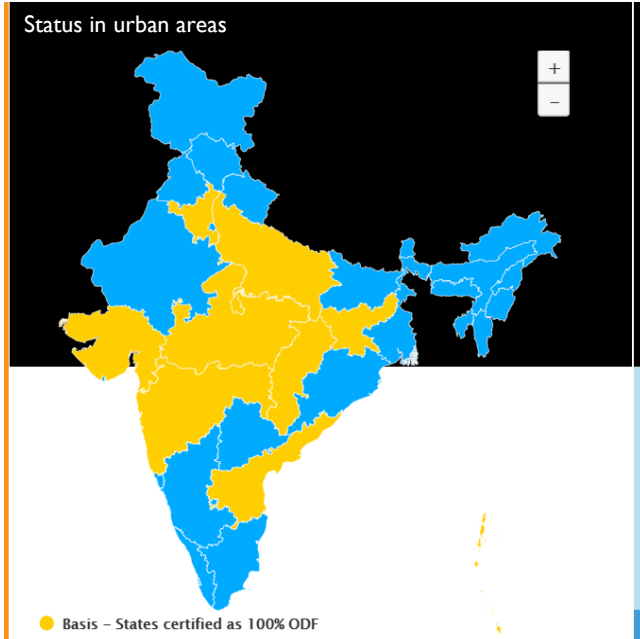
Mission Components

- Household toilets, including conversion of insanitary latrines into pour-flush latrines
- Community toilets
- Public toilets and urinals

Source: http://www.swachhbharaturban.in:8080/sbm/content/writereaddata/SBM_Guideline.pdf

Achievements under Swachh Bharat Mission (Urban) – a flagship programme

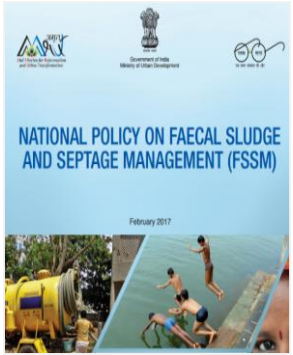
Focus has been largely on toilet construction



50,71,725	3,95,200	2,920
Constructions Achieved	Constructions Achieved	No. of Cities
Individual Toilets	**Community & Public Toilets**	**Open Defecation free**
100% Door to Door Waste Collection	**Waste to Energy**	**Waste to Compost**
Wards Achieved	Current Production (Mega Watt)	Current Production (Metric Ton)
67,085	**88.4**	**15,06,501**

Source: SBM website (Dated – 27.9.2018)

One truck of faecal sludge and septage carelessly dumped = 3,000 people defecating in the open!



- The SBM goal of making India ODF in 5 years was considered ambitious. Nearly 70% of cities in India have already become ODF in four years and it is likely that the goal will be reached by October 2019.
- The key challenge is now to move to ODF+, a state where all the faecal sludge and septage is properly collected, transported and treated.
- There is now a growing recognition of FSSM in national urban programme like AMRUT. However, no specific funds allocation has been made for FSSM, so state and local governments have not been able to take this up in a significant way so far.

Sustainable Development Goal (SDG) and safely managed sanitation

SDG 6 relates to clean water and sanitation

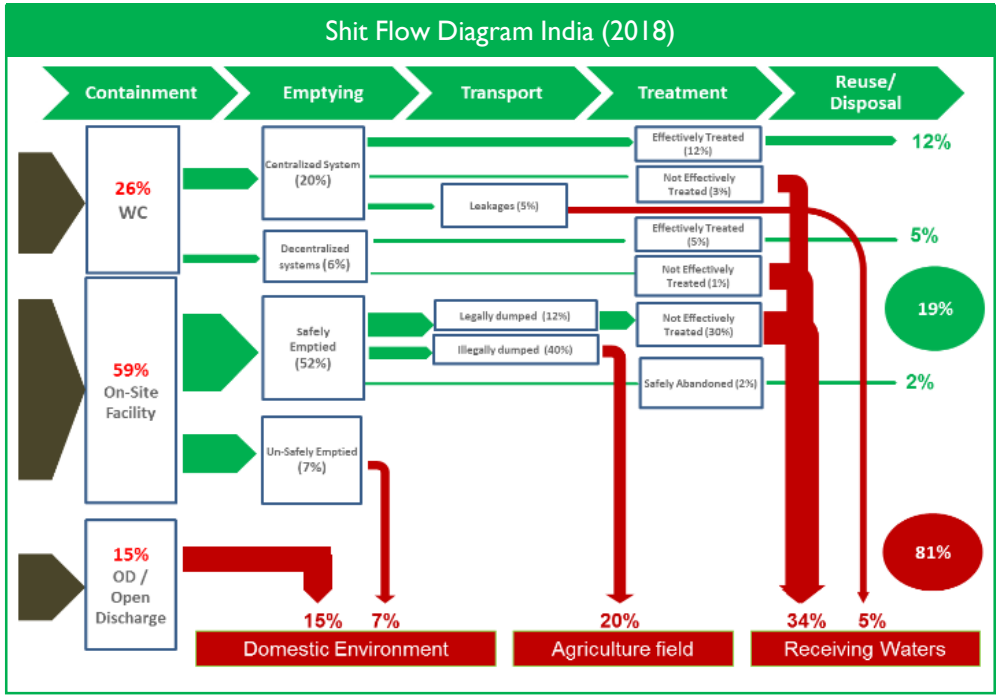
Target SDG 6.2 states that by 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation.

Sanitation ladder of JMP (WHO-UNICEF)

SERVICE LEVEL	DEFINITION
SAFELY MANAGED	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
BASIC	Use of improved facilities that are not shared with other households
LIMITED	Use of improved facilities shared between two or more households
UNIMPROVED	Use of pit latrines without a slab or platform, hanging latrines or bucket latrines
OPEN DEFECATION	Disposal of human faeces in fields, forests, bushes, open bodies of water, beaches or other open spaces, or with solid waste

Note: improved facilities include flush/pour flush to piped sewer systems, septic tanks or pit latrines; ventilated improved pit latrines, composting toilets or pit latrines with slabs.

Focusing only on toilets leads to a situation where 80% of waste remains untreated



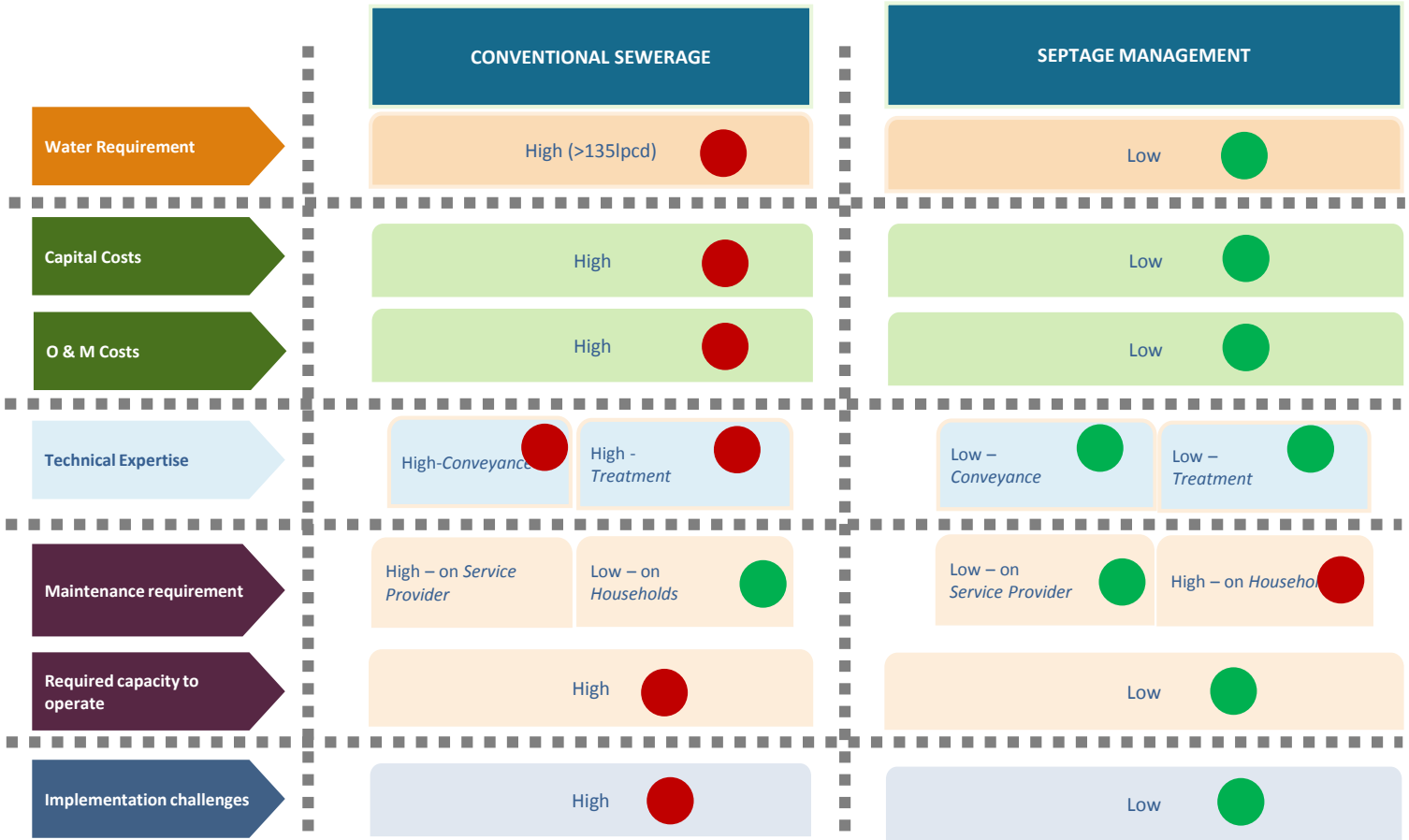
- A Shit-Flow Diagram (SFD) for India suggests that nearly 80 percent of faecal waste in India remains untreated and discharged in the domestic environment, agriculture fields or in water bodies.
- Water borne diseases in India are a major cause of infant and child mortality. Untreated waste is one of the main reasons for this.
- There is now a growing recognition of the fact that centralised sewerage systems are expensive both to build and to operate and maintain. The sewage treatment plants in India, as per the report of the Central Pollution Control Board are not efficient and do not treat waste as per the norms.

Source; CDD

Contents

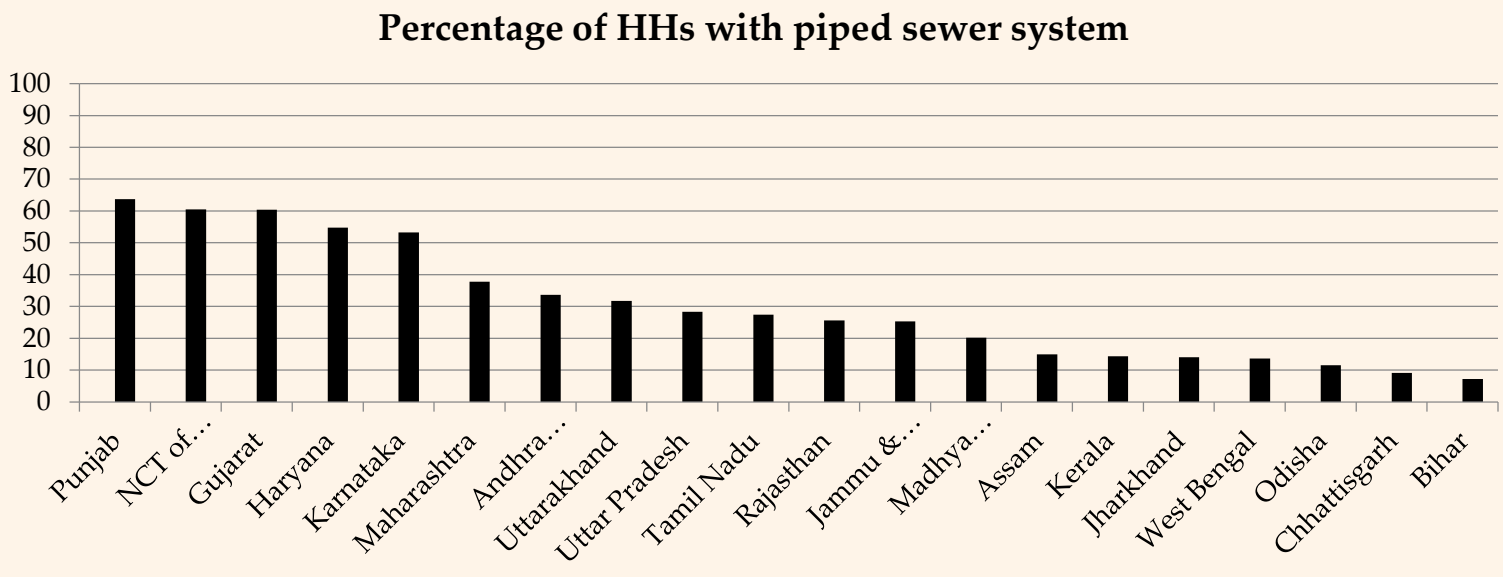
- From subsidized centralized sewerage to onsite sanitation systems
- Focus is needed on sanitation services in small and medium towns across India
- Citywide and affordable FSSM services

Septage management as compared to conventional sewerage systems



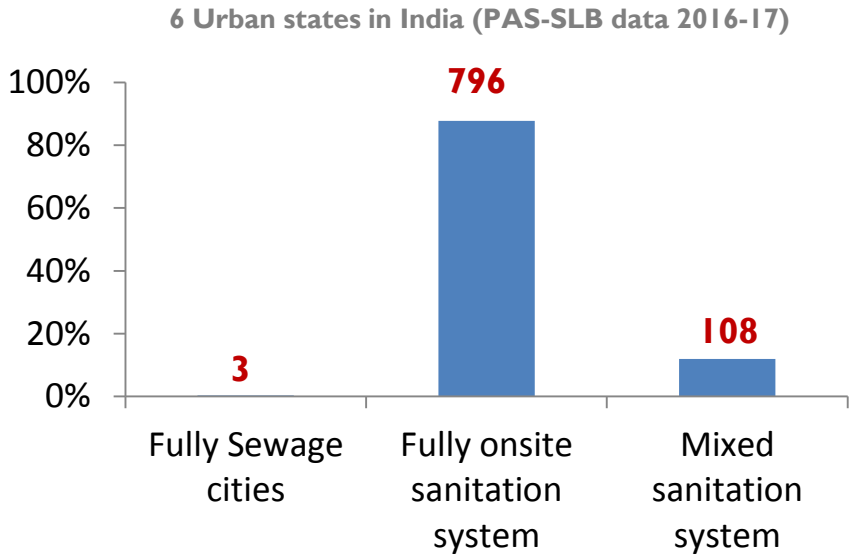
Sewerage systems are not common in urban India

Only 33% of urban households have access to piped sewerage system



Census of India. (2011); Availability and Type of Latrine Facility: 2001-2011 under Houselisting and Housing Census Data Highlights – 2011. Retrieved in April 2012 from http://www.censusindia.gov.in/2011census/hlo/Data_sheet/India/Latrine.pdf

High dependence on Onsite systems in Urban India!!



- ✓ Only 3 cities are reported to have 100% sewerage system
- ✓ Nearly 800 cities have fully onsite sanitation systems

88% of cities in India are fully dependent on on-site sanitation systems

12% are dependent on mixed sanitation systems

Based on the PAS-SLB data by 6 states covering 907 cities, 2016-17

Investment requirement for sewerage infrastructure in India

Investment requirement for 2012-2031,
Rs. Crores in 2009-10 prices

Capital investment Requirement (Rs in crore)	2,42,688
O&M Requirement (Rs in crore)	2,36,964

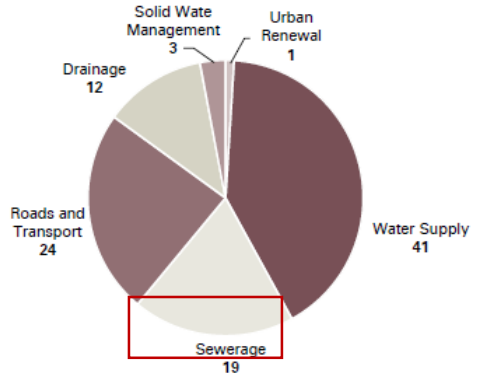
As per the HPEC Report, more than 242,000 crores required for 100% collection and treatment of wastewater using conventional centralized sewerage systems

HPEC (2011) "Report on Indian Urban Infrastructure and Services"

Sewerage projects take more resources and longer time

- Largest urban infrastructure funding by GoI in 2005 through JnNURM with allocation of Rs. 66,000 crore.
- 206 sewerage projects accounted 19% of total spending

JNNURM: Spending by Sector for UIG and UIDSSMT
(as on 1 December, 2010)
(per cent)



Source: MoUD, Government of India.

CAG report of JnNURM reveal that only a few projects were completed

- 56 projects were selected for audit
  - Only 4 projects were completed
  - 43 at various stages of completion
  - 5 were deferred, 3 were not started and 1 was abandoned
- In these projects, only 15 cities were targeted for 100% coverage, and only 2 cities have completed these projects

Source: Report of the CAG on performance audit of JnNURM, Report No 15 of 2012-13, page no 59-72

Still we face many problems…

"DJB treats just 54% of sewage, the rest flows into Yamuna: CAG". The Tribune, April 2, 2013.

"*Cleaning your s***: The story and tragedy of people who clean sewers In Delhi, ten sanitation workers have died in little over a month*". Hindustan Times, Sep 20, 2017.

"*CAG slams Gujarat govt. for pollution of water bodies*". Mint, April 2, 2012.

"*Bombay HC expresses concern over discharge of untreated sewage in sea*". The Times of India, July 30, 2018.

"*Sewage waste pollutes water in Kochi*". Deccan Chronicle, October 2, 2016.

"Shimla grappled with untreated sewerage: CAG". The Times of India, April 12, 2013.

"*West Bengal treats only 49 per cent of the waste water before dumping it in the Ganga, says a recent assessment report on the pollution in the river, prepared by the CPCB*". Down to Earth, September 17, 2015.

"*Hyderabad: Pollutants in Musi rise, River becomes sewage*" Deccan Chronicle, Jul 25, 2016.

"Over half of Bangalore's sewage flows into storm water drains, lakes: Report". *Daily News and Analysis*, March 15, 2011.

Where do piped dreams end ?

Central Pollution Control Board and Controller and Audit General point to inadequate treatment of collected sewage

Key result of CPCB 2013 study on performance evaluation of STPs are:

- 152 STPs spread over 15 states in the country, total treatment capacity of 4716 MLD.
- The actual treatment capacity utilization is only 3126 MLD (66%).
- Out of the 152 STPs, 9 STPs are under construction, 30 STPs are non-operational and 28 STPs performance is not satisfactory.
- With respect to BOD and COD, 49 and 7 of STPs respectively are not meeting the General Standards for Discharge

Source: Performance Evaluation of Sewerage treatment plants under NRCD, Published by Central Pollution Control Board, August 2013

FSSM – emerging solution to address the challenge of urban sanitation

What is the challenge?

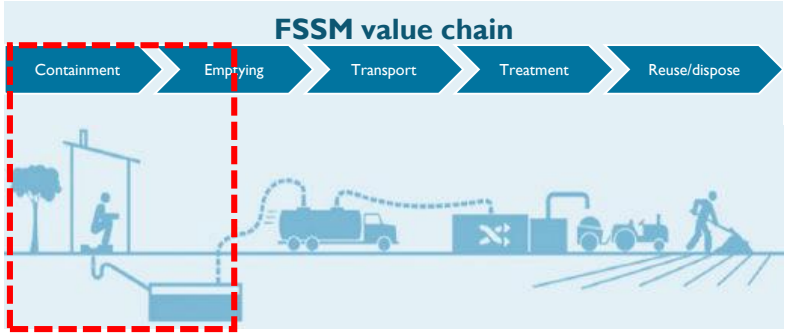
Only **33%** of the latrines are connected to a piped sewer network

Only **20%** of the waste generated in the urban areas is currently treated

India is expected to experience the **second highest rate of urbanization** by 2030 indicating further sanitation challenges

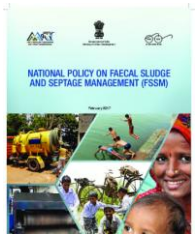
What is the solution?

- One of the proven approaches to tackle the sanitation challenge is faecal sludge and septage management
- FSSM takes a service-chain based approach, which comprises safe containment, conveyance, treatment, disposal/reuse of faecal waste



Current focus of SBM

FSSM on the international and national agenda



Contents

- From subsidized centralized sewerage to onsite sanitation systems
- Focus is needed on sanitation services in small and medium towns across India
- Citywide and affordable FSSM services

Inequity in Urban programs - focus on Large Cities

Most Urban Flagship programs focus only on Large Cities

500 Large cities with population more than 1 Lakh.

100 Large cities

Mainly covers large cities and corporations

Except for SBM, no specific program/ funds for 3542 small and medium towns and 3888 census towns

Financing sanitation in small towns requires only 7.5% of annual MOHUA budget for flagship programs

Union Budget allocation for flagship programmes – 2018-19

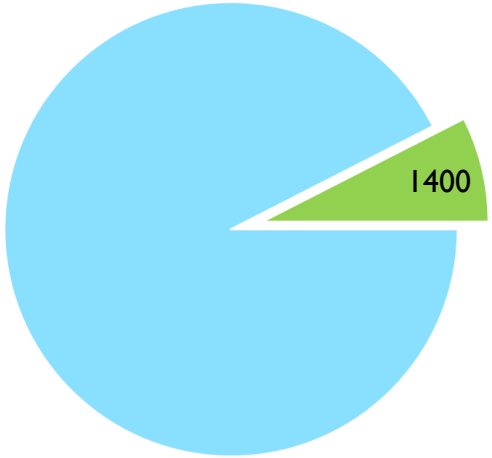
Rs. 6000 Crore

Rs. 6169 Crore

Rs. 6505 Crore

Total Rs. 18674 Crore funding

Financing requirements for FS Treatment facilities in India for 5 years (2018-22) ~ 7,100 Crore



7.5 % of annual budget on urban flagship programmes 2018-19 required for treatment facilities

All India FSSM financing Requirement

Capex Requirement

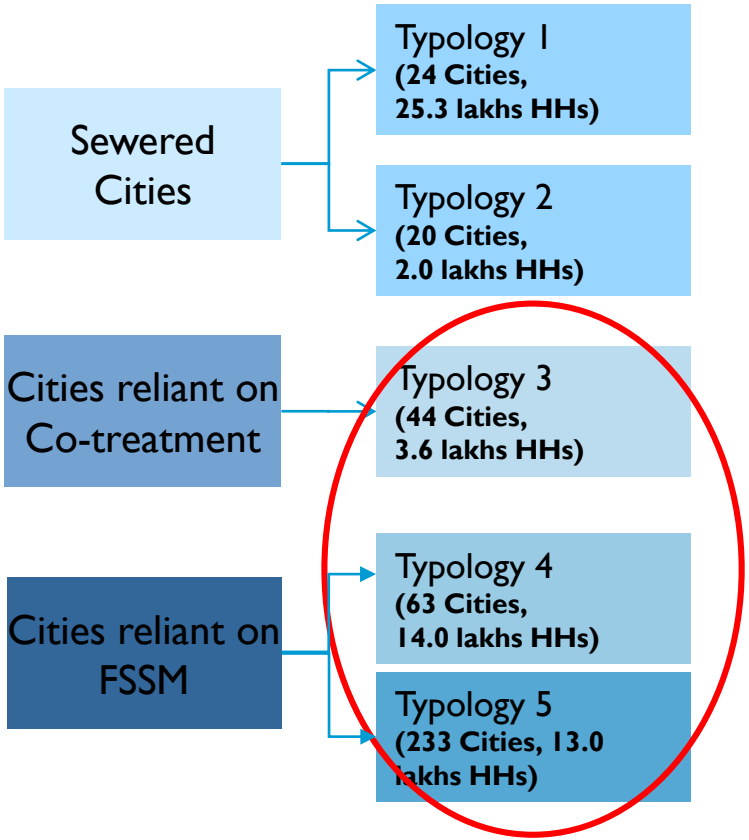
Values in Crore

	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

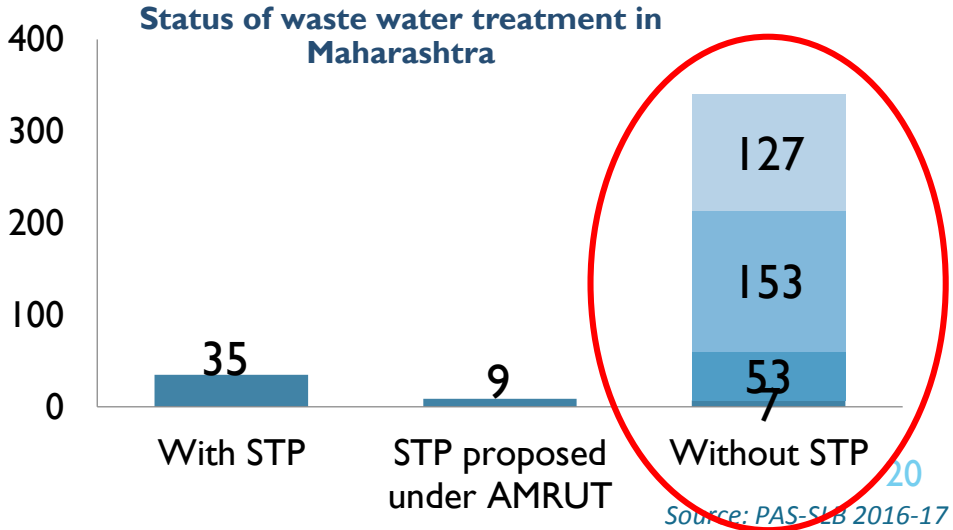
Opex Requirement

	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

58 lakh households are dependent on FSSM in urban Maharashtra
But, the treatment facilities are needed mostly in small and medium cities



- 25 lakh households in large cities require conveyance services
- 31 lakh households in small-medium towns require conveyance and treatment infrastructure
- 340 Cities are without any treatment facility



Source: PAS-SLB 2016-17

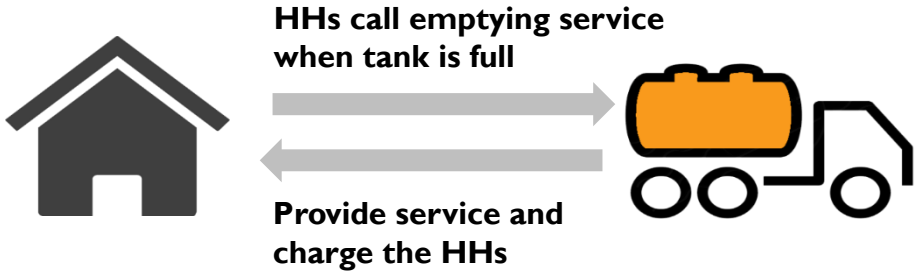
Contents

- From subsidized centralized sewerage to onsite sanitation systems
- Focus is needed on sanitation services in small and medium towns across India
- Citywide and affordable FSSM services

National Policies and guidelines advise regular cleaning of septic tanks

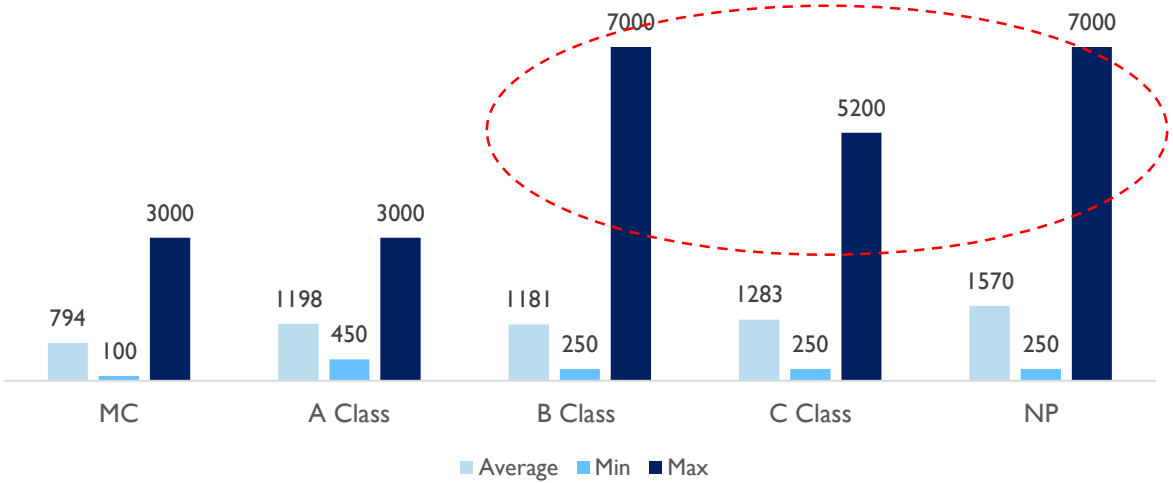
- While desludging frequencies vary, it is typically considered best practice to desludge tanks once every three to five years, or when the tank becomes onethird full.
- **National Policy on Faecal Sludge and Septage management** says Regular cleaning of septic tanks through a systematic extraction and collection procedure is essential to check environmental pollution.
- **CPHEEO** suggests septic tanks should be cleaned at least once in two - three years.

Existing practice is of Emergency Complaint Redressal system with high user charges



Common practice is of on-call demand based services as complaint redressal in India

High User charges are paid by households, especially in smaller towns.



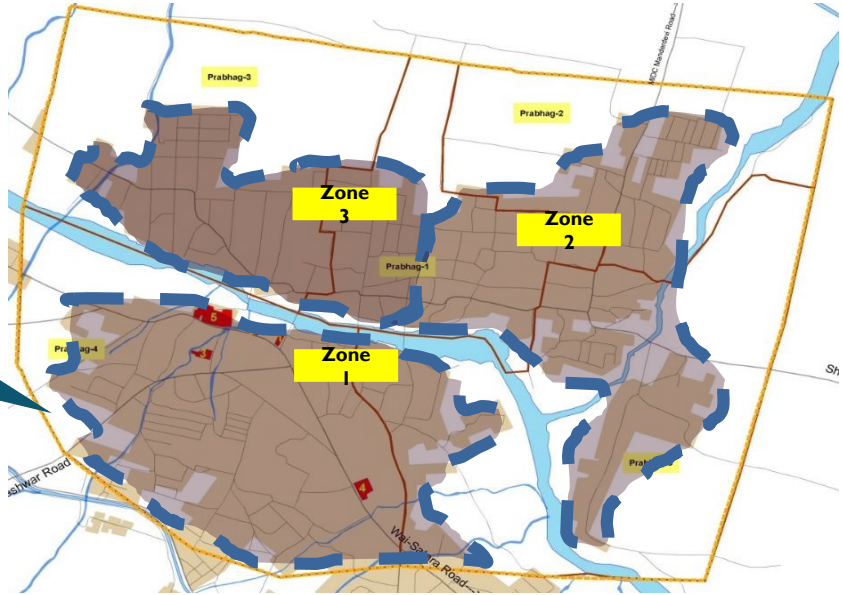
User charges of septage emptying services in Maharashtra

Source: PAS-SLB data 2016-17, the figures present the maximum charges present in each city category

An approach of "Citywide" Scheduled Emptying

Authority sets up an emptying schedule to make sure that all households get access to practice "regular emptying" as opposed to having to resort to "emergency emptying".

2 trucks to desludge ~ 2000 septic tanks annually



Wai in Maharashtra is 1st City in INDIA

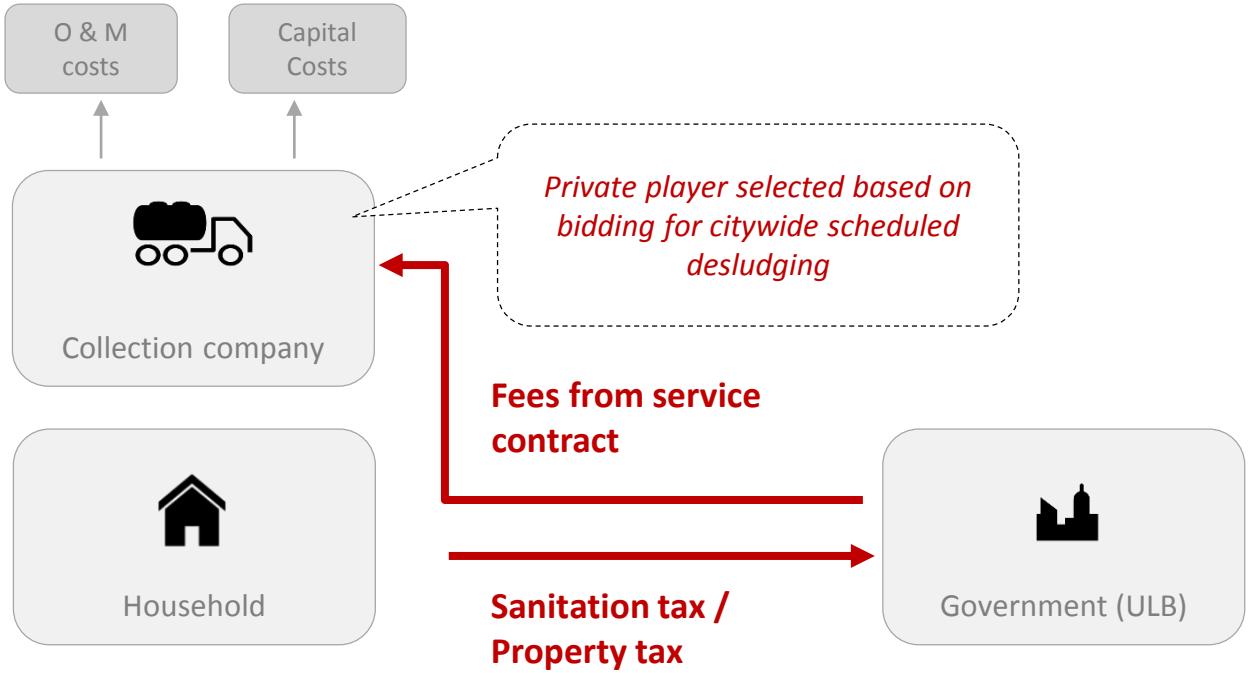
to execute the idea of scheduled emptying…

Benefits of Scheduled Emptying

- **Equitable services** - all households / properties are covered by services
- **Pricing** – Services are offered at lower prices, due to efficiency gains
- **Behavior change** - Contribution to ODF sustainability as toilet usage can increase
- **Manual scavenging** - Removal of need for manual scavenging due to regular emptying
- **Infrastructure optimization** - More predictable loads for treatment facility and route optimization of trucks
- **Environmental benefits** - Likely reduction in BOD and coliform in septic tank effluent, as well as lower likelihood of septic tank overflows

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.



- **Scheduled emptying**
- **Performance based fixed monthly payments**
- **Sanitation tax – only 10% increase in HH tax bill**

Summary

- Urban India needs to consider citywide FSSM services rather than relying on sewerage – which mainly serves large cities and has shown poor performance

- Urban flagship programmes need to look beyond large cities and ensure funding and coverage of small and medium towns

- Innovative models such as scheduled emptying backed by a performance based annuity model for private providers will ensure affordable, equitable and citywide services

Thank You