Need for Septage Management in India

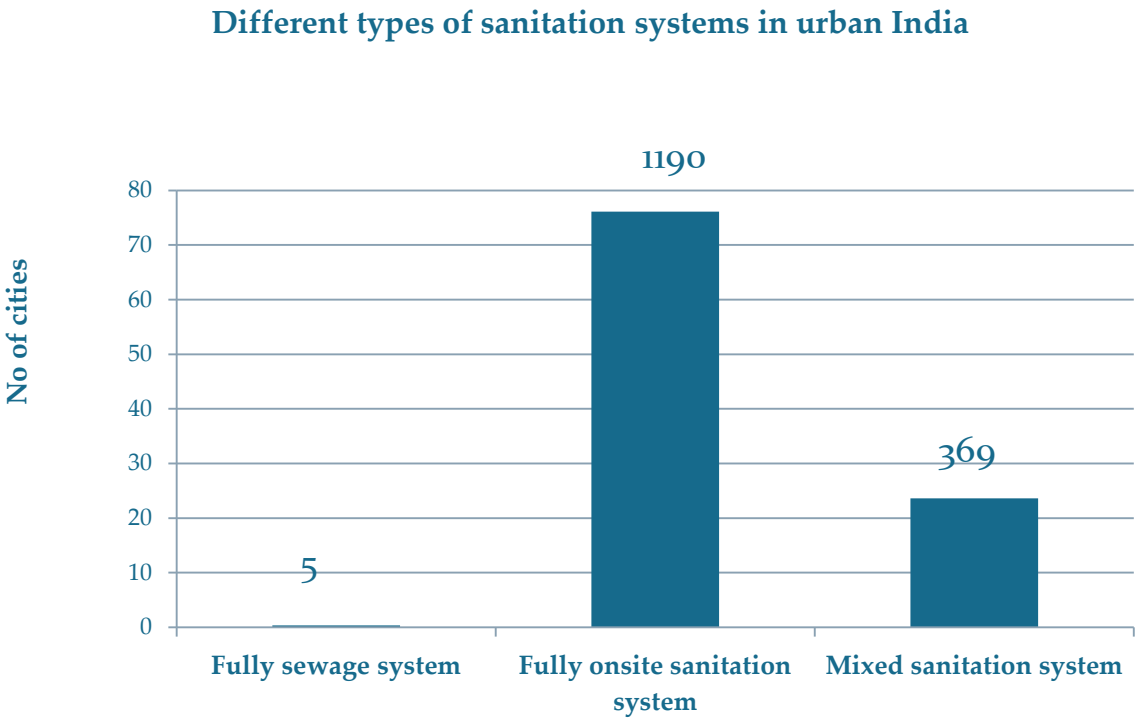
Workshop on Septage Treatment Technology

Pune, October 20-21st

pas performance assessment system

PAS Project, CEPT University, INDIA

Sanitation systems in Urban India



- ✓ Only 5 cities are reported to have 100% sewerage system
- ✓ Nearly 1200 cities have fully onsite sanitation systems

76 % of cities in India are fully dependent on on-site sanitation systems

24% are dependent on mixed sanitation systems

Source: Based on the SLB data submitted to GOI by 16 states covering 1564 cities

Onsite sanitation and FSM – emerging questions

38.2% URBAN HHs HAVE SEPTIC TANKS

Are septic tanks linked to soak pits

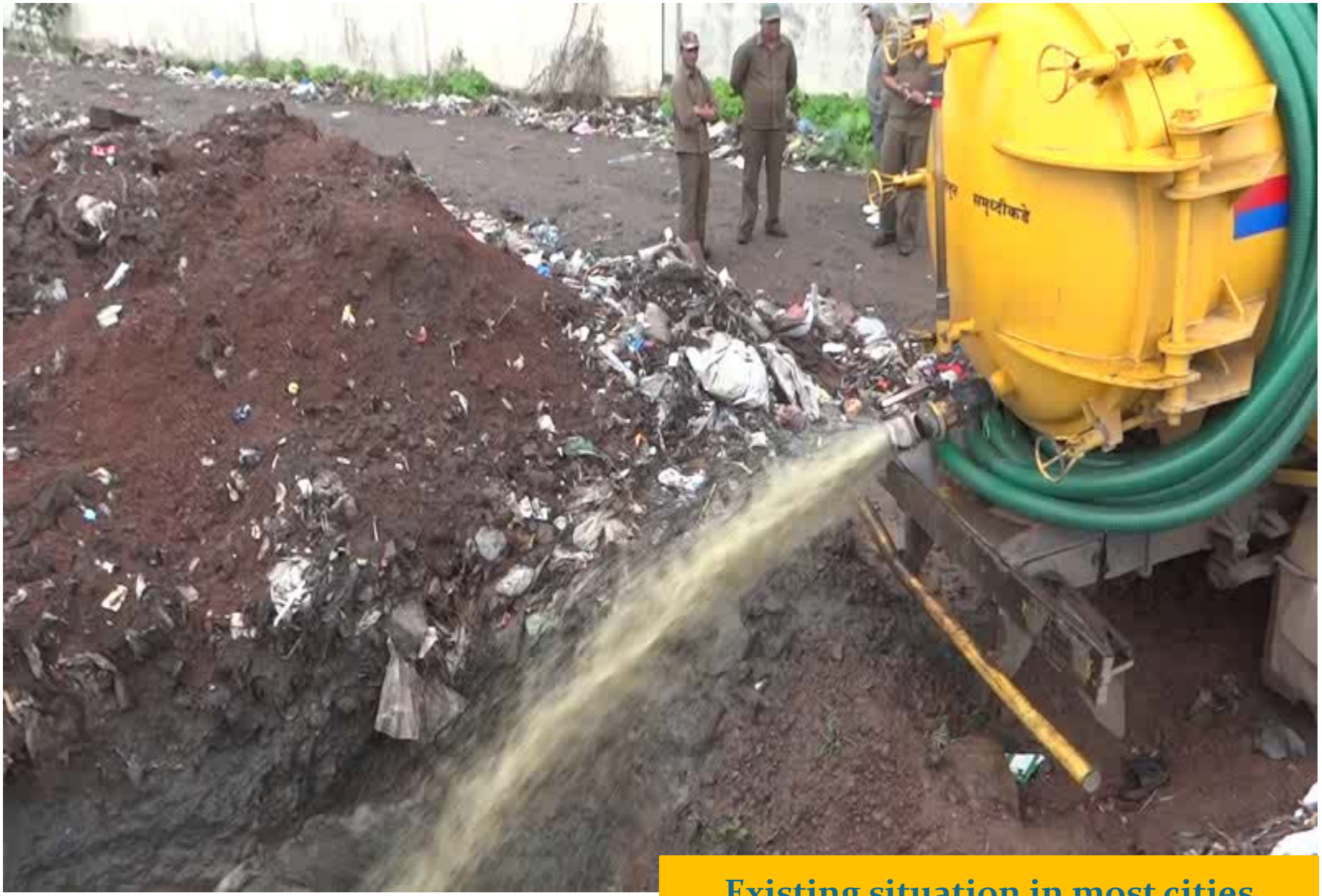
Are they built as per Codes / Specifications ?

How often are they cleaned ?

Where does the effluent flow ?

What happens to the SLUDGE?

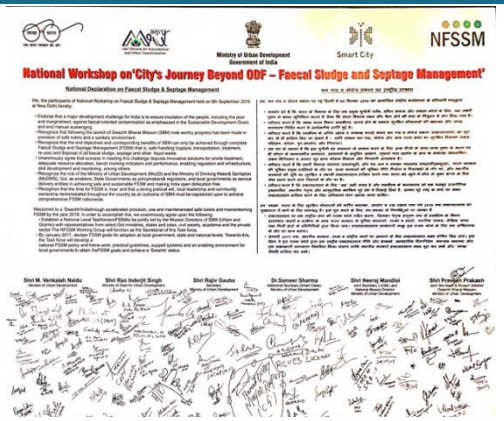
Crude disposal of septage without treatment . . .



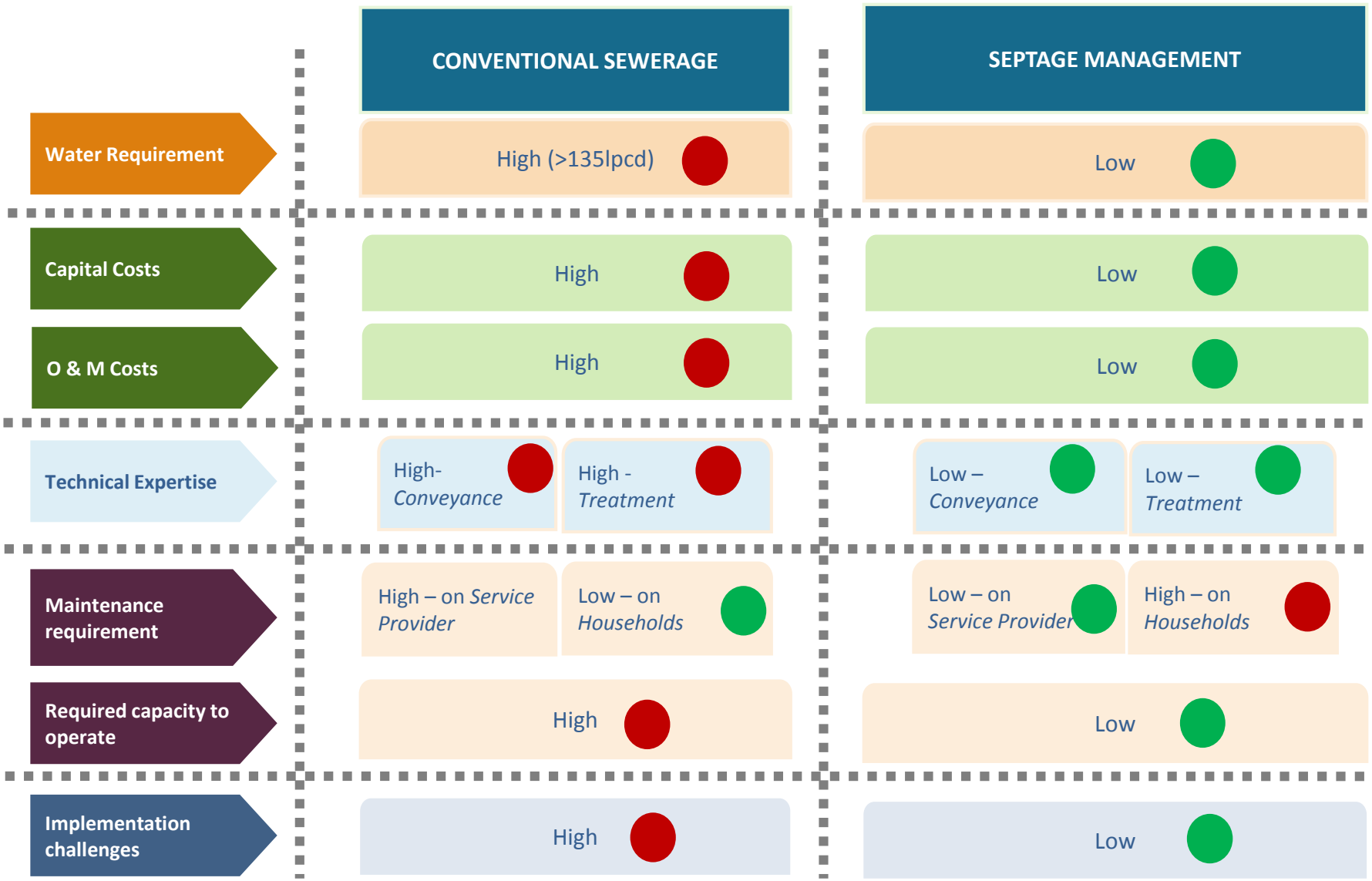
Existing situation in most cities

Emerging recognition of septage management

- **National declaration** on **Septage Management** by Ministry of Urban Development, GoI
- One of the major **thrust areas** of **AMRUT** is **Septage Management**
- **Primer** on **septage Management** and **Rapid Assessment tool** for estimating **budget requirements** for **FSM** has been rolled out by MoUD, GoI
- **Septage Management Advisory** of Government of India provides references to CPHEEO guidelines, BIS standards, and other resources for preparing SMP / FSM plan.



The benefits of septage management over the conventional sewerage systems



GoM launched Swachh Maharashtra Mission

Launch of SMMU

15th May 2015

7 Steps to ODF and Clean Cities *(Swachhatechi Saptapadi)*

Mission Objectives

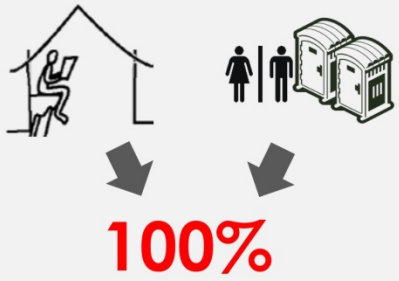
- Elimination of open defecation
- Eradication of Manual Scavenging
- Modern and Scientific Municipal Solid Waste Management
- To effect behavioral change regarding healthy sanitation practices
- Generate awareness about sanitation and its linkage with public health
- Capacity Augmentation for ULB's
- To create an enabling environment for private sector participation in Capex (capital expenditure) and Opex (operation and maintenance)

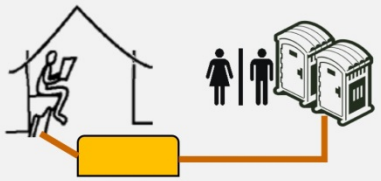
MoU with Government of Maharashtra

CEPT University signed MoU with Government of Maharashtra for providing technical support in implementing Swachh Maharashtra Mission in Urban areas.

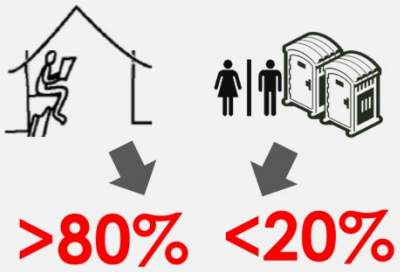
Developed concept of ODF , ODF +, ODF ++

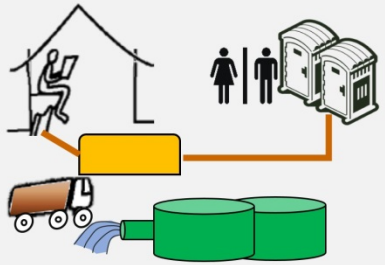
ODF



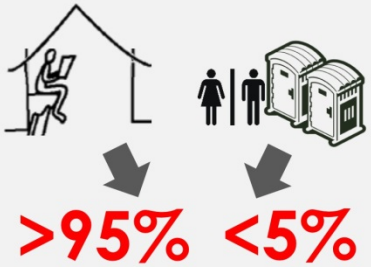


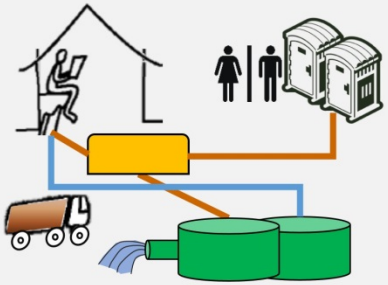
ODF+





ODF++





Incentives for ODF Cities . . .

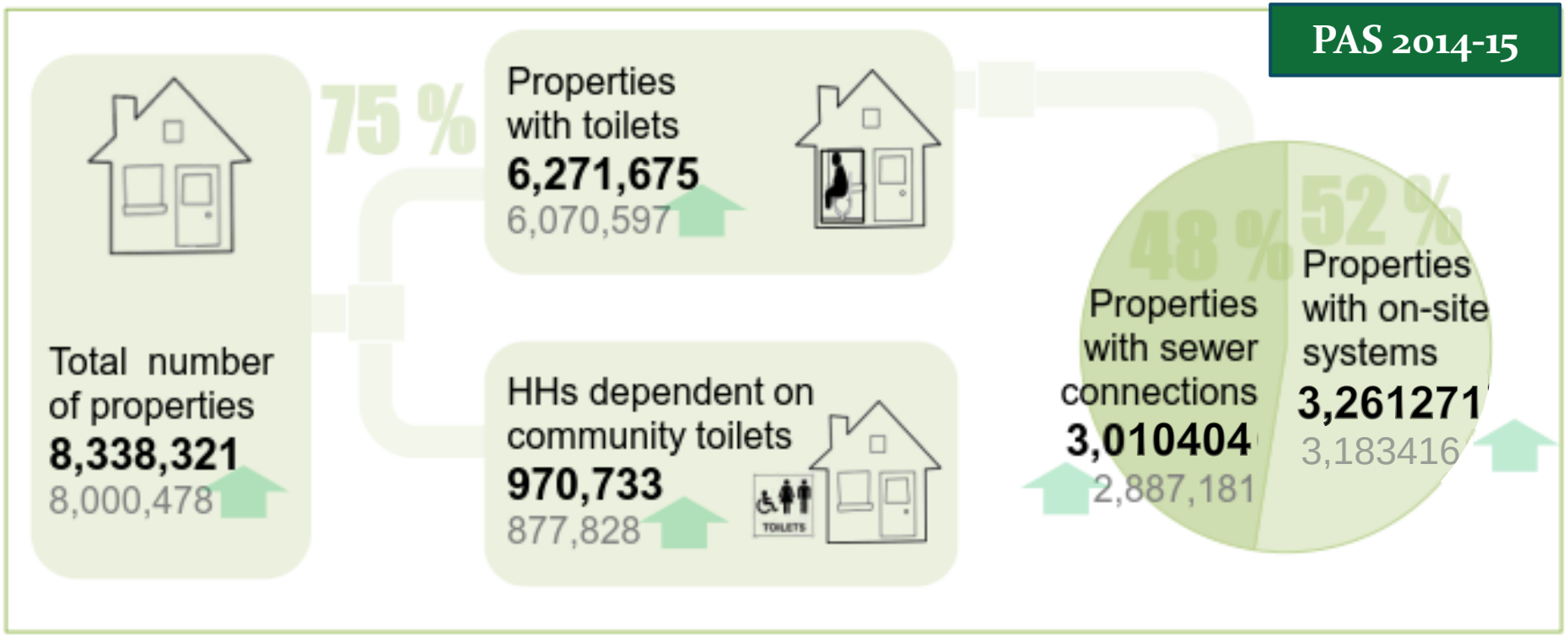
	ODF Cities (Rs.)	Swachh Cities (Rs.)	Linked to Sustainability
A Class	2 Cr.	2 Cr.	30% released on first validation, if positive 70% released on 2nd validation after a year, if positive
B Class	1.5 Cr.	1.5 Cr.	
C Class	1 Cr.	1 Cr.	

Utilisation of funds for

Sustainability and moving towards

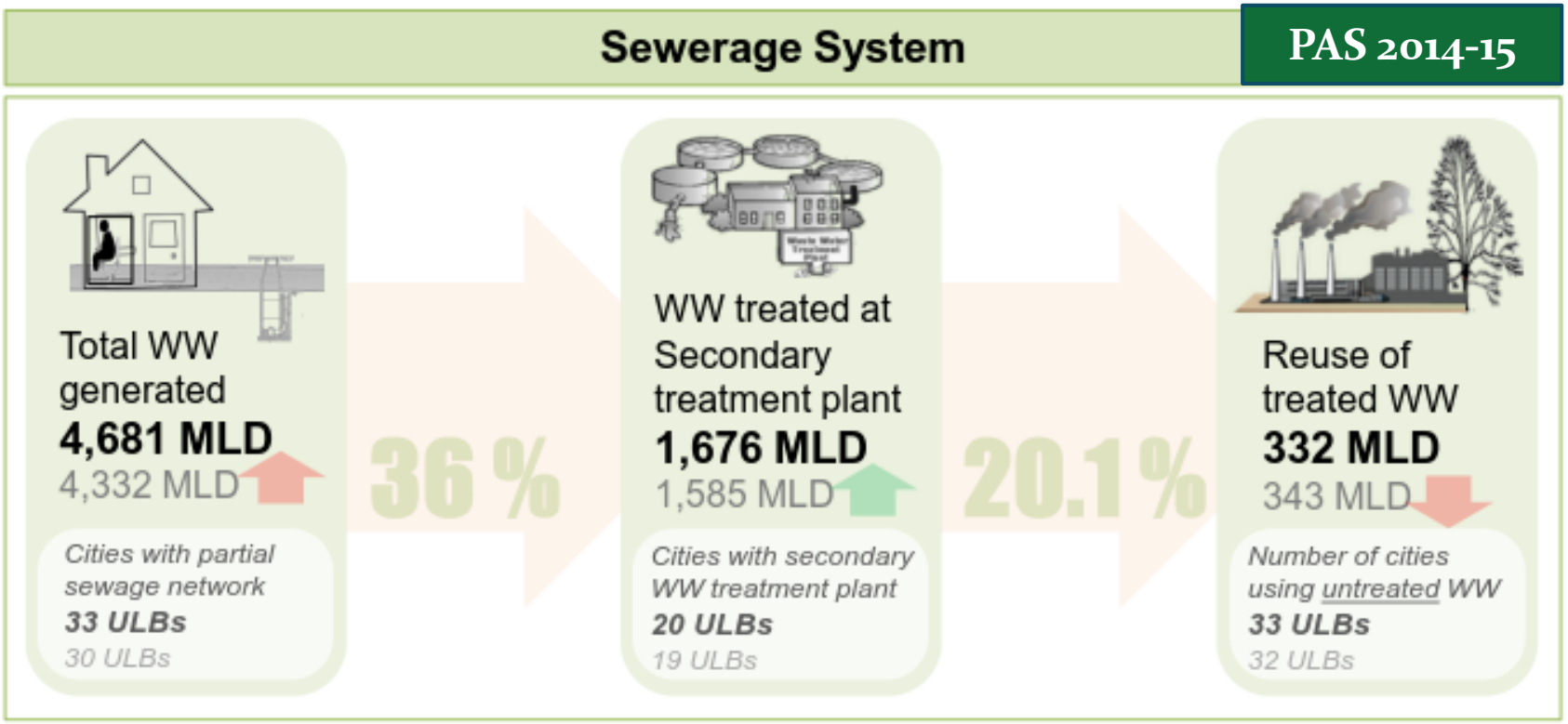
ODF+ and ODF++

Overview of sanitation situation in Maharashtra (1/3)



- **75 %** Properties have **access** to **individual toilets**.
- **52%** of properties are **dependent** on **Onsite sanitation system**

Overview of sanitation situation in Maharashtra (2/3)



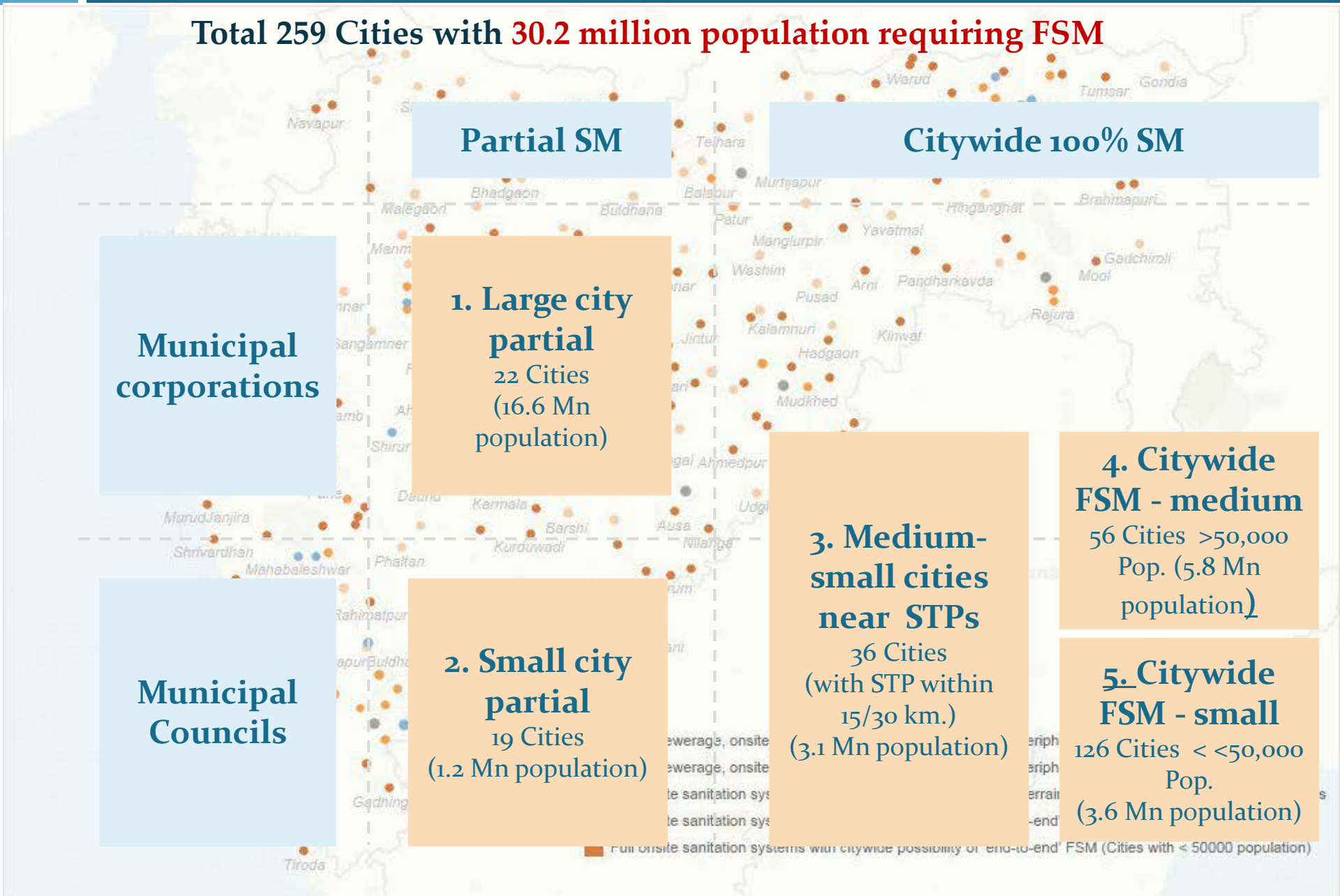
- **Only 33** Cites out of 360+ cities have **partial sewer network**
- **Only 20** Cites have **wastewater treatment facility**
- **20%** of **treated wastewater** is **reused**

Overview of sanitation situation in Maharashtra (3/3)

- **Mostly all cities** are **dependent** on **partial or full onsite sanitation system**
- **194 ULBs** provide **septic tank emptying services**
- **ULBs** are **treating** septage at their **existing STP**

Extent of septage management (SM) required in Maharashtra

Total 259 Cities with 30.2 million population requiring FSM

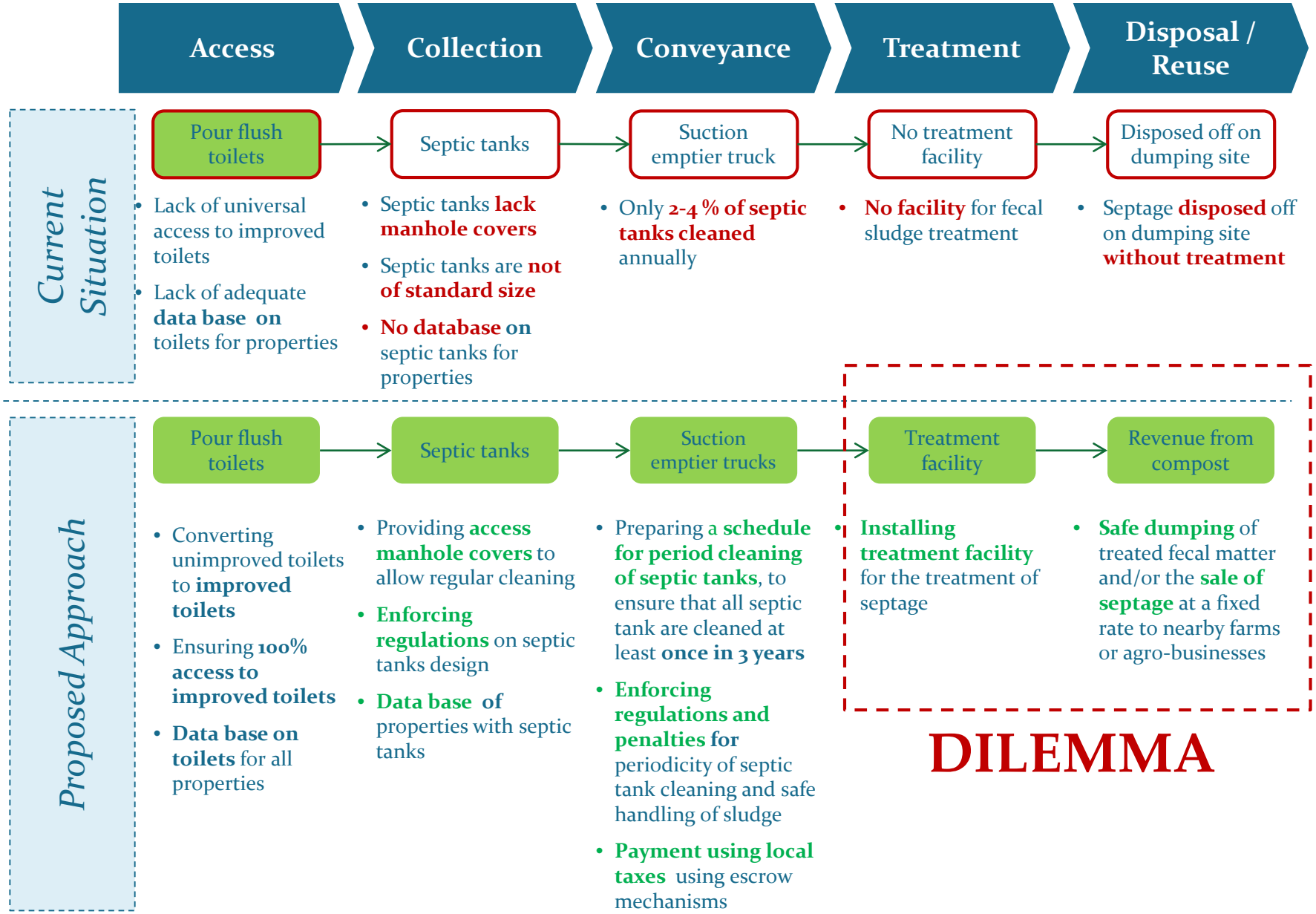


Current situation of septage management in Small – Medium towns of Maharashtra

User interface	Collection	Conveyance	Treatment	Reuse /Disposal
Pour flush latrines	Existing Pit and Septic tank with drain field	Open / covered drains		Into river or natural drain
		No conveyance system in new developments		
			No treatment of fecal sludge	Dumping along with solid waste
Old city area - Inadequate primary treatment but good conveyance through open drains		Lack of 100% coverage of conveyance system	Lack of treatment facility	Lack of scientific disposal of septage
New developments - Improved primary treatment through septic tanks but no drains				

Missing links in Sanitation value chain in a city

Need to look at End-to-end IFSM solution –From red to green



But which technology works for varying septage quality test results . . .

Sr.No.	Parameter	Unit	Wai		Sinnar	
			Household septage	Community - Public toilet septage	Household septage	Community - Public toilet septage
			Result	Result	Result	Result
Test results						
2	BOD5 at 20°c	mg/l	6000 - 16500	228 - 5400	336 - 39000	346 - 2533
3	COD	mg/L	11408 - 27776	395.2 - 9523	1000 - 88000	920 - 7200
4	Total Solids by volume	%	0.992 - 8.07	0.071 - 1.36	0.42 - 7.74	0.43 - 1.06
5	Total Nitrogen (as N) , by volume	%	0.044 - 0.0719	0.016-0.067	0.02 - 0.16	0.06 - 0.11
6	Phosphorus (as P), by volume	%	0.004 - 0.009	0.001 - 0.007	0.0002	0.0002
7	Pottasium (as K) by volume	%	0.004 - 0.014	0.005 - 0.015	0.006 - 0.027	0.017 - 0.029
8	Gross Calorific Value, on dry basis	cal/g	4148	*	3226 - 4817	1281 - 2732
9	Faecal Coliforms	/100ml	>1600	>1600	22 - 920	32 - 170

Note : * - Not analyzed due to insufficient quantity of sample

Septage Quality differs City to City and from Source to Source . . .

Discussion points . . .

- Septage characteristics differs significantly – often dependent on the emptying interval. (e.g. in Wai the septic tanks in community toilets are emptied every week)
  - Should one mix the septage collected from community toilets (emptied once a week) with other septage (emptied once in 3-5 years)

- Does the scheduled emptying of septic tank work? Or is the demand based emptying better? (the daily septage volume in each of this differ a lot and has implications on septage technology adopted)

Discussion points

- What do urban local governments want? A septage technology that has:
  - Ability to meet CPCB standards
  - Low Capital cost/cu.m
  - Low Footprint of the treatment system (land requirement)
  - Low Operating costs/cu.m
  - Should not have 24x7 power requirement
  - Less skilled staff for operation
  - High Resource recovery – gas, compost
  - Ability to market these
- Are there technologies that meet the above requirement?

Thank you

meeramehta@cept.ac.in dineshmehta@cept.ac.in

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