

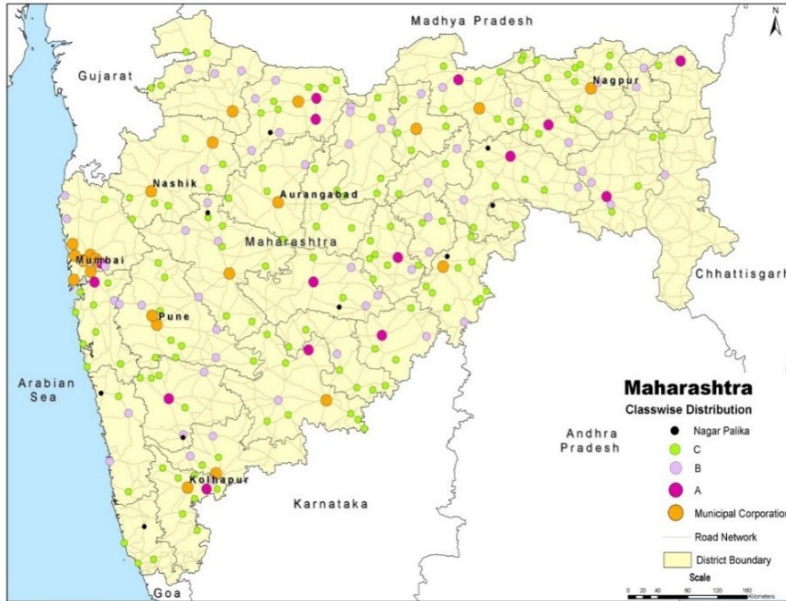


## Nature-based Faecal Sludge Treatment Plants At Scale In Maharashtra, India

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Senior Program Lead

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# Maharashtra- one of the most urbanized states in India



**60** million urban population

**412** urban local governments

**48%** HAVE ACCESS TO **piped sewer** SYSTEM

**52%** USE **Onsite systems**

**6** administrative divisions

# Maharashtra's FSSM journey started with two cities Wai and Sinnar



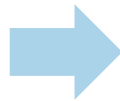
Small & Medium towns in Maharashtra

Population  
Wai ~43,000  
Sinnar ~72,000 ,

Declared ODF in  
2016 - 2017

Declared ODF++  
2018-2019

Comprehensive City Sanitation planning and municipal council resolution for FSSM



*1st cities in India to implement citywide scheduled emptying of septic tanks*



1

Scheduled emptying of septic tanks

2

Involving Private sector for emptying operations

3

Levying a Sanitation tax to support operations

4

Faecal Sludge and Septage treatment facility (FSTP)

5

Use of Own (DBO) / Philanthropy funds for FSTPs

6

Online monitoring systems for FSSM – emptying and treatment

7

Reuse of treated Waste Water

8

Municipal council commitment and leadership

**From URBAN LABORATORIES to LIGHT HOUSE cities . . . !!!**

# Two-pronged FSM strategy developed for urban Maharashtra is adopted

## Co-treatment at own/near by STPs

Category A cities:  
ULBs with STPs

Category B cities:  
Co-treatment at nearby STPs

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

Co-treatment at nearby STPs within 20  
km

Functional/proposed/under  
construction STPs

**35 ULBs**

Co-treat at nearby STPs

**36 ULBs**

**71 ULBs**

## Independent FSTP

Category C cities:  
Independent FSTPs

Remaining ULBs will treat septage at  
FSTPs

Independent FSTP

**311 ULBs**

**311 ULBs**

# 71 ULBs are performing co-treatment and have achieved the ODF++ status . . .

Government resolution on co-treatment of Septage – Own STP and Cities within 20 km of a nearby STP city

Institutionalize FS co-treatment through MoU between sending and receiving cities

Designated FS discharge point (at wet well at pumping station/STPs or maintenance hole)

स्वच्छ महाराष्ट्र अभियान (नागरी) अंतर्गत  
राज्यातील नागरी स्थानिक स्वराज्य संस्थांनी  
करावयाच्या मैला व्यवस्थापना बाबत.

महाराष्ट्र शासन  
नगर विकास विभाग  
शासन निर्णय क्रमांक: स्वमअ-२०१८/प्र.क्र.३५१/ तवि-३४  
हुतात्मा राजगुरु चौक, मादाम कामा मार्ग,  
मंत्रालय, मुंबई-४०० ०३२  
दिनांक: १५ डिसेंबर, २०१८.

- बाब्या: १. शासन निर्णय, नगर विकास विभाग, क्रमांक स्वमअ-२०१५/प्र.क्र.२३/तवि-३४, दिनांक १५ मे, २०१५  
२. शासन परिपत्रक, नगर विकास विभाग, क्रमांक स्वमअ-२०१७/प्र.क्र.३१/तवि-३४, दिनांक १७ मार्च, २०१७  
३. शासन परिपत्रक, नगर विकास विभाग, क्रमांक स्वमअ-२०१७/प्र.क्र.२६३/तवि-३४, दिनांक ३० डिसेंबर, २०१७

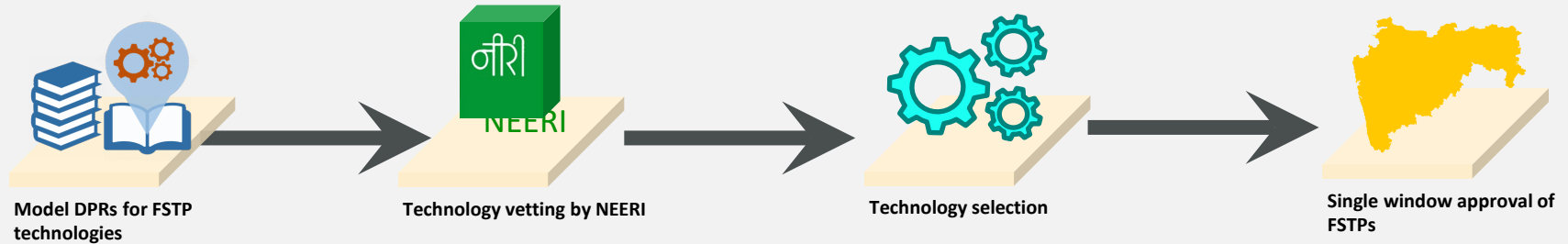
## शासन निर्णय:

केंद्र शासनाच्या स्वच्छ भारत अभियानाच्या धर्तीवर राज्यामध्ये स्वच्छ महाराष्ट्र अभियानाची अंमलबजावणी सुरु आहे. या अभियानांतर्गत शहरांमधील ज्या कुटुंबांकडे शौचालयाची सुविधा नाही अशा कुटुंबांना वैयक्तिक अथवा सामुदायीक शौचालयाची सुविधा उपलब्ध करून देवून शहरे "हागणदारी मळम" करणे तसेच शमनकरणा ठावस्थापन निगम २०१६ नसार शहरातील शमनकरणा ठावस्थापन करून



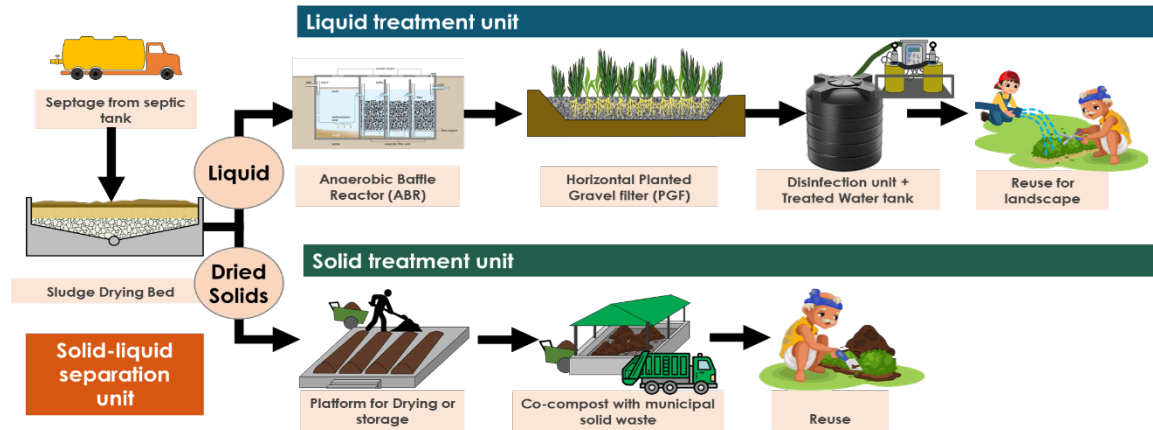
Co-treatment of Septage –  
Own STP and Cities within 20 km of a nearby STP city

# Maharashtra decided to set up independent FSTPs in all the remaining 300+ ULBs

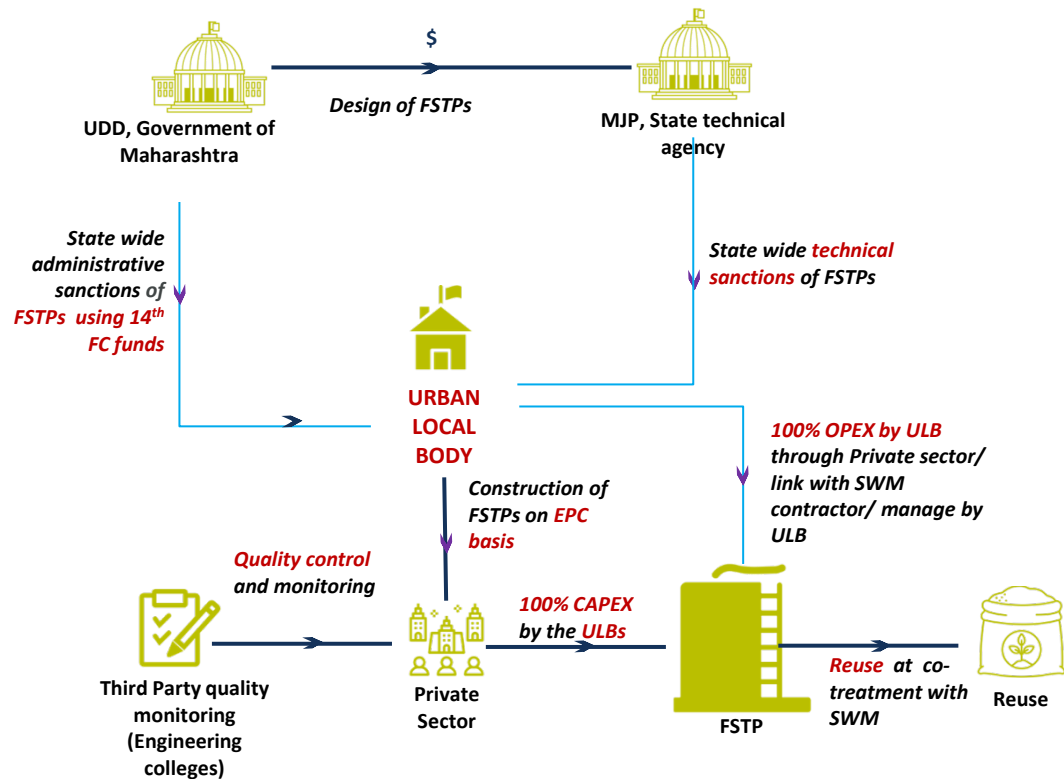


Adoption of **cost effective and less mechanized technology** for setting up faecal sludge treatment facilities

Cost of FSTPs in Maharashtra:  
~ 1.40 – 2.8 lakh per KLD



# A single window approval process was adopted for fast track implementation of independent FSTPs at scale



## Financing entities and revenue source

Capital cost: Provided by ULB's owned funds using 14<sup>th</sup> FC through support from state government

Operating cost: by municipalities using local taxes/ sanitation tax

## Innovative or unique feature of project

1. Single window technical and administrative sanctions for implementation of FSTPs
2. Simple, easy to implementation of treatment infrastructure at scale
3. FSTPs co-located at SWM site

# Many benefits were achieved due to the single window approval process

- A single window approval helped ULBs to **curtail the complex and lengthy approval process**
- Pre-approved technical design, structural and hydraulic design templates of FSTP helped **ULBs to fast track implementation of FS treatment facilities.**
- Mandatory compliance of **third party technical audit** through the empanelled engineering/polytechnic college **ensured quality checks**





# Several rounds of workshops to instruct and guide cities to take up FSSM activities at scale in Mission mode



3.1 What percentage of Households, Commercial Institutions, Establishments and Public area CU/PIs are connected to a closed system such as sewerage, septic tank or soak pit, soak system etc. (no open system/connection/flow/discharge)

This indicator will ascertain whether the city has adequate coverage of sewerage network or septic tanks

Scheme of Sewerage	Marks
>95% Households/Commercial establishments /CT&PT are connected to sewerage system or have septic tanks or Soak Pit/without Soak Pit	75
80-94% Households/Commercial establishments / CT & PT with Sewerage/Septic tanks/Soak Pit/without Soak Pit	65
50-79% Households/Commercial establishments / CT & PT with Sewerage/Septic tanks/Soak Pit/without Soak Pit	55
40-49% Households/Commercial establishments / CT & PT with Sewerage/Septic tanks/Soak Pit/without Soak Pit	30
<40% Households/Commercial establishments / CT & PT with Sewerage/Septic tanks/Soak Pit/without Soak Pit OR no data available	0

Note: City to also confirm if areas where households are not connected to a closed system having sewerage system in place

REC | Rucha Tavkar is presenting | Kadgaon Naga... and 36 more | 1:41 PM

Definitions : ODF

ODF	ODF+	ODF++	Water +
A city / ward can be notified/declared as ODF city /ODF ward if, at any point of the day, not a single person is found defecating in the open.	Not a single person is found defecating and/or urinating in the open, and all community & public toilets are functional and well maintained	ODF AND Faecal sludge/septage and sewage is safely managed and treated, with no discharging and/or dumping of untreated faecal sludge/septage and sewage in drains/water bodies/open areas	All wastewater released from households, commercial establishments ,drains, nallahs etc. is treated to a satisfactory level before releasing the treated wastewater to the environment.

UMESH GHADGE has left the meeting

**will be now moving,towards achieving ODF++ Status**

Meeting details | Turn on captions | Rucha Tavkar is presenting



(101)

Omkar Kane (You)

Rucha Tavkar

Amit Saraf

Rucha Tavkar

Others in the meeting (97)

Aasim Mansuri

# Peer learnings: Training and capacity building by ULB staff...



# Technical support to sustain FSSM operations . . .

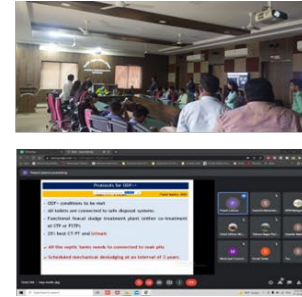
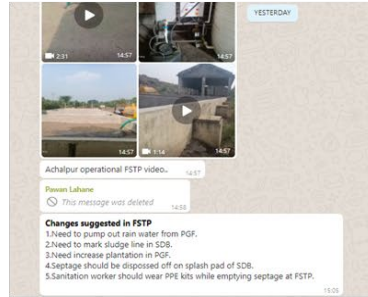
## Operational guidelines for sustained FSSM services

### Making cities ODF++

#### Manual for Operation and Maintenance of Faecal Sludge Treatment Plants

**Swachh Maharashtra Mission, Urban**

## Monitoring practices adopted to track the performance of FSTPs



Videos and photographs - Corrections/ maintenance requirement is suggested to cities

Monitoring of operational FSTPs

Conduct review meetings and workshops at state/divisional level.



Visited various cities to check FSTP condition



DO letter to ULBs to keep FSTPs operational from state and divisional level



# With the facilitation support from state, more than 220 FSTPs are operational within a span of 4 years



Dhule, Nashik

**34** FSTPs  
Functional  
across  
various  
divisions



Mar. 2020



Karjat, Konkan

**102**  
FSTPs  
Functional  
across  
various  
divisions



Nov. 2020



Vita, Pune

**170**  
FSTPs  
Functional  
across  
various  
divisions



Jul.. 2021



Ahmednagar, Nashik

Nov. 2019

GR Published  
Sanctioning  
311 FSTPs in  
Maharashtra



Bhadrawati, Nagpur

**38** FSTPs  
Functional  
across  
various  
divisions



Jul. 2020



Karanja, Amravati

**145** FSTPs  
Functional  
across  
various  
divisions



Feb 2021



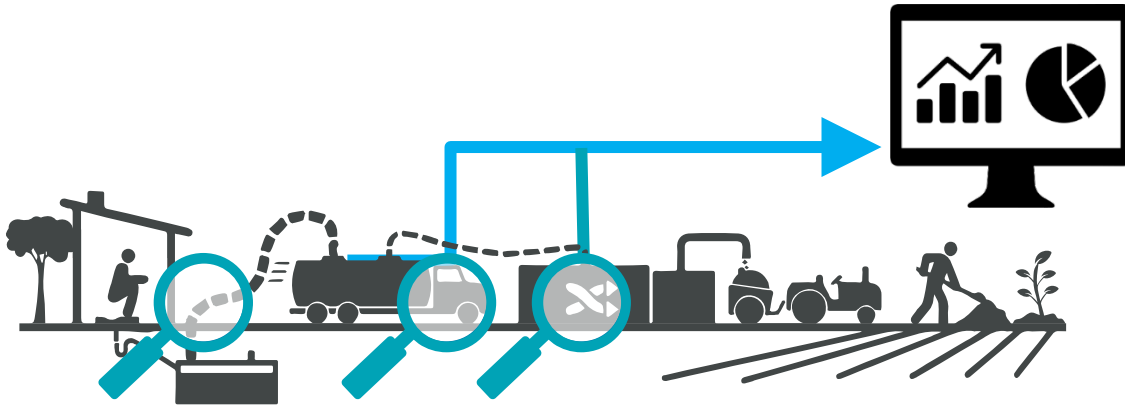
Mahur, Aurangabad

January  
2023:  
**220** FSTPs  
Functional



# Digital monitoring for effective service delivery

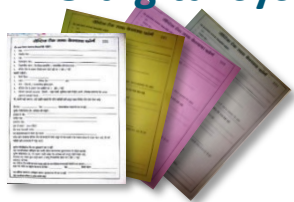
## Use of monitoring systems across sanitation service chain – digital systems with dashboards



### Possible uses of AI and ML

- Network and time efficiency - Optimise energy/water use
- Wide applications for image, video and voice processing - complaint redressal and breakdown assessment, monitoring use of PPE
- Large data processing – detecting accounting issues

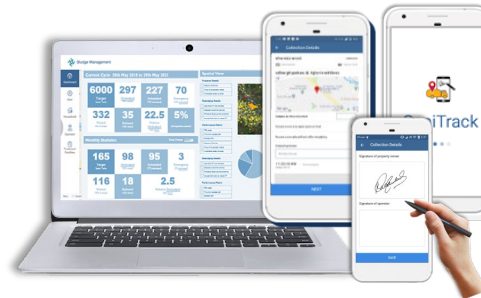
### FROM Paper based – TO digital systems



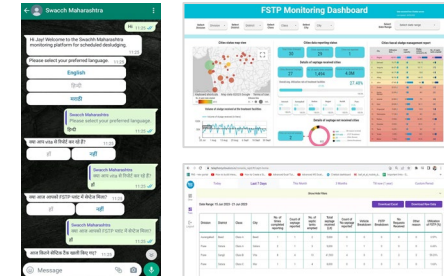
### SaniTab



### SaniTrack



### SaniChatbot



# Monitoring Dashboard for FSTPs across Maharashtra

## State Dashboard

### Division Summary – ODF

### Division Summary - FSTP

### City Profile - FSSM



### Fecal Sludge and Septage Management Strategy

Select Division: **Pune**

**ODF++**  
45 cities

FSTP cities: **36**  
STP cities: **16**

About: This Dashboard is an interactive tool representing all aspects of Fecal Sludge and Septage Management of the state of Maharashtra. Datasets includes FSTP, STP and Co-Treatment details for all urban local bodies of Maharashtra

### Fecal Sludge and Septage Management Strategy

Select City: **Satara**

State Level information

Division: **Nagpur**

Operation: **40**

About: This Dashboard is an interactive tool representing all aspects of Fecal Sludge and Septage Management of the state of Maharashtra. Datasets includes FSTP, STP and Co-Treatment details for all urban local bodies of Maharashtra

### Fecal Sludge and Septage Management Strategy

City: **Satara**, Division: **Pune**, District: **Satara**

Select City: **Satara**

City profile

Certification: **ODF++**

----- FSTP Photo -----

----- FSTP Photo -----

About: This Dashboard is an interactive tool representing all aspects of Fecal Sludge and Septage Management of the state of Maharashtra. Datasets includes FSTP, STP and Co-Treatment details for all urban local bodies of Maharashtra

### Fecal Sludge and Septage Management Strategy

City: **Bhor**, Division: **Pune**, District: **Pune**

Select City: **Bhor**

Go to Dashboard | Home | ODF Certification | Treatment

<p>Treatment infrastructure</p> <p><b>FSTP cities</b></p> <p>Category: <b>FSTP</b></p> <p>Treatment Capacity: <b>5 KLD</b></p> <p>Status: <b>Operational FSTP</b></p> <p>Operational date: <b>31/12/2019</b></p> <p>FSTP - service provider: <b>PVT</b></p> <p>Electricity units (Per month): <b>90 Kwh</b></p>	<p>3rd party validation done?</p> <p><b>Yes</b></p> <p>Validation institute name: <b>COEP</b></p> <p>Sludge Reuse: <b>ND</b></p> <p>Reuse of treated WW: <b>ND</b></p> <p>Capex: <b>12.00 Lakhs</b></p> <p>Opex (in Rs /month): <b>24,000</b></p> <p>Utilization rate: <b>118%</b></p>	<p>Water testing</p> <p>Water quality testing done?</p> <p><b>Yes</b></p> <p>Agency: <b>COEP</b></p> <p>Date: <b>1/3/20</b></p> <p>BOD (Miligram/litre): <b>26 / 116</b></p> <p>COD (Miligram/litre): <b>76 / 378</b></p> <p>FC (index number/100 ml): <b>None / None</b></p> <p>TSS (Miligram/litre) - <b>11 / 47</b></p> <p>Monthly FSTP Load: <b>141.1 KLD</b></p>	<p>Desludging</p> <p>Desludging service provided by: <b>Both</b></p> <p>Number of vehicles: <b>2 truck</b></p> <p>Average vehicle capacity: <b>3,000 Litres</b></p> <p>Monthly trips: <b>1 Trips</b></p> <p>Average trip charges: <b>₹600</b></p> <p>Desludging outside city limits?: <b>ND</b></p>
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About: This Dashboard is an interactive tool representing all aspects of Fecal Sludge and Septage Management of the state of Maharashtra. Datasets includes FSTP, STP and Co-Treatment details for all urban local bodies of Maharashtra

# Tracking treatment efficiency...



# Reuse of treated end products encouraged development of new green spaces and livelihood opportunities...





# Measures to strengthen FSM service delivery in the state .

- Along with the FSTPs, to sustain the inclusive FSM services, the mission has sent the directives to cities to **implement scheduled desludging services**
- **Moving from Manhole to Machine holes** - Safeguard sanitation workforces. 470+ mechanized desludging vehicles are under procurement stage.
- Exploring **private sector engagement** for FSTP operations
- **Urban- Rural convergence** for FSM operations are underway
- Institutional Strengthening for sustained FSSM service delivery – **Capacity building of laboratories for testing of faecal sludge and septage**
- Institutionalise monitoring and **third-party review for performance** of FSTPs
- **State level strategy for convergence of livelihood-sanitation** – Promote engaging Women Self Help Groups FSSM/Sanitation activities



# Wider implication and lessons learnt . . .

- **Recognition of FSM as mainstream municipal service** impacting 30 million OSS dependent population in the state
- Immersed as ‘model’ state for scaling up FSM services - **Mission led by urban local bodies, facilitated by state government**
- Adoption of cost effective, simple and less mechanised helps amplification of faecal sludge treatment solutions at scale
- **Single window approval** to fast-track implementation
- **Scalable/ replicable to 7600+ towns** of India and many small cities in South Asia and Africa are of similar size can also learn from Maharashtra’s experience
- **Recognition and influenced policy decisions** at various level of government

# Partnerships and Collaboration to attain Scale



Government of  
Maharashtra

**एकच लक्ष्य  
शहरे स्वच्छ**  
स्वच्छ महाराष्ट्र अभियान (नागरी) २.०



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GATES *foundation*



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**Thank  
you**

#### About us

The Center for Water and Sanitation (CWAS) is a part of CEPT Research and Development Foundation (CRDF) at CEPT University. CWAS undertakes action-research, implementation support, capacity building and advocacy in the field of urban water and sanitation. Acting as a thought catalyst and facilitator, CWAS works closely with all levels of governments - national, state and local to support them in delivering water and sanitation services in an efficient, effective and equitable manner.



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