ABIDJAN 2023

21st African Water Association International Congress & Exhibition
and
The 7th International Faecal Sludge Management Conference

Reuse of treated wastewater and sludge from Faecal Sludge Treatment Plants (FSTPs) in Maharashtra, India: Existing and potential practices

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CWAS CENTER FOR WATER AND SANITATION | CRDF CEPT RESEARCH AND DEVELOPMENT FOUNDATION | CEPT UNIVERSITY

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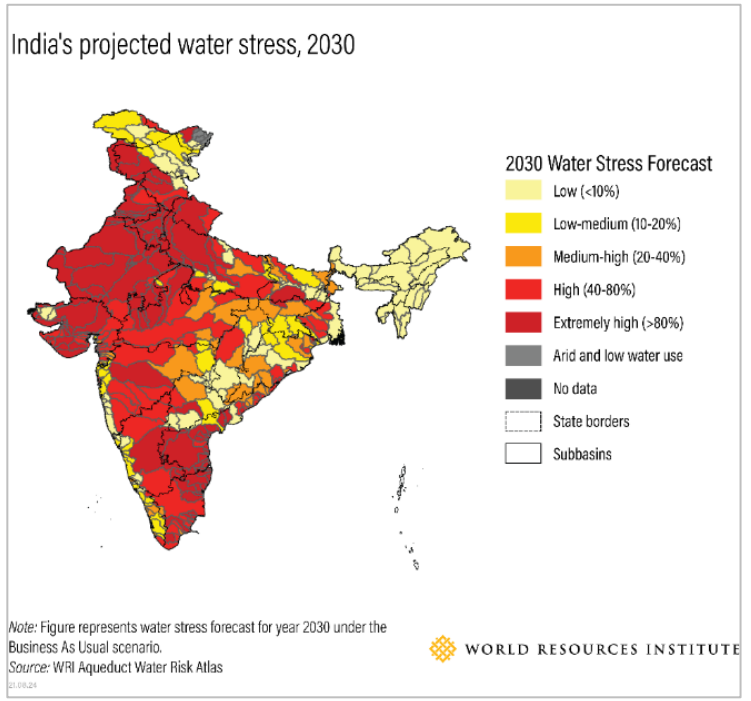
Why Waste Water?

Until very recently....
~80% of wastewater in India was untreated

Treated or untreated ...
This water is let out in our rivers and water bodies

Meanwhile 54% of India faces high water stress
By 2030, India's water demand to be twice the available supply



Wastewater re-use is the solution to India's water woes !!

An opportunity with enabling environment in India

- The Service Level Benchmarks for Water and Sanitation in India recommend 20% reuse of treated water as the performance benchmark for Indian Cities
- Though without treatment, there is little scope for reuse!
- For the first time in India, Govt. programs focusing on 100% treatment in all cities with financial outlay

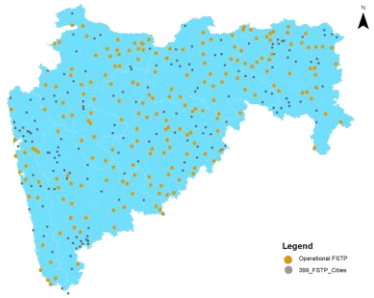
An opportunity with Enabling Environment

More treatment plants	More generation of treated water	Huge potential to tap!
AMRUT 2.0 and 15th FC indicate 20% reuse	Challenge fund for Million+ cities to achieve	Reuse conditions to achieve WATER+ status

स्वच्छ भारत 2.0
एक कदम स्वच्छता की ओर

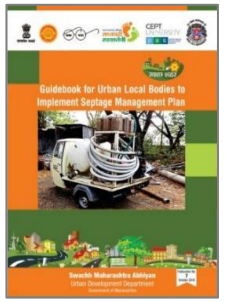
AMRUT 2.0
Making Cities Water Secure

Maharashtra, a state in India has taken up FSSM in a big way

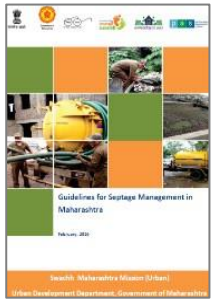


- Maharashtra is one of the most urbanised states in India
- 350+ cities in Maharashtra are dependent on onsite sanitation systems
- After becoming Open Defecation Free in 2017, the state issued a 7-point ODF-Sustainability charter that mentions FSSM as an area of focus.

Step by Step Guide for ODF+



Septage Management Guidelines



Government Resolutions

- ODF,ODF+ and ODF++ framework
- Utilizing Incentive grants and 14th FC funds for sanitation/ ODF+/++ activities
- 70+ cities Co-treating of FS at own or nearby STP
- 311 independent FSTPs Construction

A two-pronged approach for scaling up FSSM strategy

Co-treatment at own/near by STP Cities - 70

Category A cities: ULBs with STPs

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

Functional/proposed STPs

35 cities

Category B cities: Co-treatment at nearby STPs

Co-treatment at nearby STPs within 20 km

Co-treat at nearby STPs

35 cities

Independent FSTP Cities - 311

Category C cities: Independent FSTPs

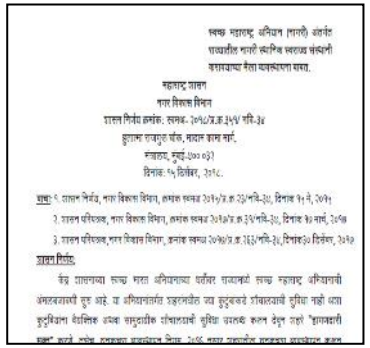
Remaining ULBs will treat septage at FSTPs

Independent FSTP

311 cities

70 ULBs practicing co-treatment and have achieved ODF++

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

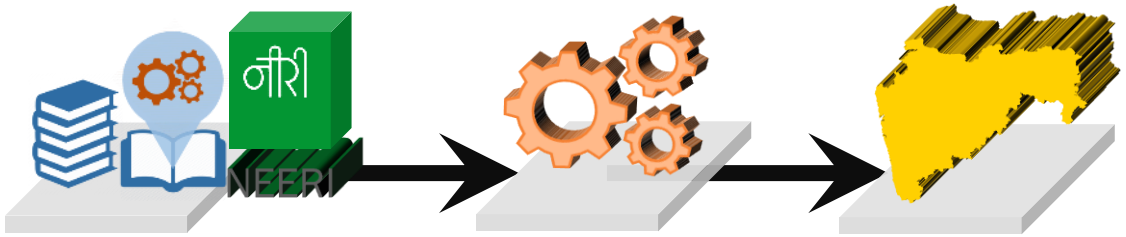


MOU between NMC and Wanadongri

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)

217 independent FSTPs are functional



Model DPRs for FSTP technologies vetted by NEERI

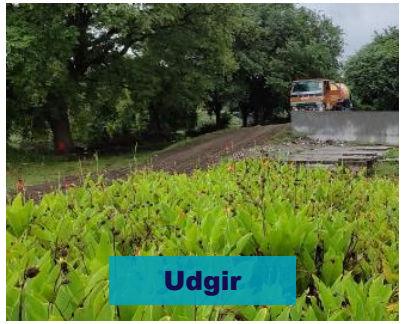
Technology selection

Single window approval of FSTPs

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

Many FSTP cities have already taken up reuse practices

- Treated water reuse : 15+ cities in Maharashtra use treated wastewater and dried sludge for landscaping and plantation purposes.
- Aesthetic developments in the form of landscape and plantations add value to FSTP infrastructure
- Dried sludge: 10+ cities using the by-product in the form of compost and fertilizer for gardening purposes.
- Non-edible crop farming: Dried sludge also being given to farmers for their use. Mostly the reuse of dried sludge is carried out for non-food crops.



Wai and Sinnar. . .
From URBAN LABORATORIES to LIGHT HOUSE cities . . .

- Wai and Sinnar are cities in Maharashtra having 43,000 and 72,000 population respectively
- These cities are representative of 4000+ small and medium cities of India.

FSSM activities undertaken from 2014. . .

Scheduled emptying of septic tanks

Faecal Sludge and Septage treatment facility (FSTP)

Reuse of treated wastewater

Municipal council commitment and leadership

Equitable Services for Slums and Vulnerable areas

& many more...

Scheduled desludging improved drain water quality and also generated higher volumes of treated used water and sludge

Improved performance of septic tanks resulting in improved drain water quality flowing into river

Reduction in Nitrogen, Total Suspended solids and Organic loads in septic tanks effluent after desludging

In open drains of desludged areas-

- 50-60% decrease in the value of TSS
- 50-60% decrease in BOD load

Regular desludging services will eventually improve the quality of river water and ground water as the quality of drain water and supernatants will improve

Sinnar FSTP
70 KLD UASB+SDB

- Treated Water - 20 KLD
- Dried Sludge - Nominal

Wai FSTP
70 KLD Thermal FSTP

- Treated Water - 20 KLD
- Dewatered sludge -1000 KG
- Biochar – 39 kg

Sinnar: reuse of water for development of garden and urban forest

- 8000 square meters of urban forest and landscaped area in midst of barren land
- 1400 trees of 16+ species planted
- Treated water is used for watering the plants through a drip irrigation system
- Sludge used as fertilizers at the urban forest or taken away by farmers.
- The quality of the treated products are regularly monitored through testing the samples.
- The landscaped area was designed by professional landscaping consultants.

Creating Urban Forests to reuse treated water and sequester carbon at Wai and Sinnar

Urban forestry

1400 trees with **16+ species** are planted and maintained

Reduced emissions

21,000kg CO2 is sequestered

Environmental and social benefits

Community empowerment and livelihood development

- SMC engaged a SHG for maintenance of garden and urban forest through a contract and paid on a monthly basis.
- handholding support and trainings

Greenification and Bio-diversity

- Green oasis amidst barren land
- Strong roots of planted trees – local plant species
- Attracting 10+ bird species and butterfliers – previously not seen
- CO2 emissions mitigation: 6.3 Metric ton/annum

16 million+ litres water reused

21,000 kg CO2 sequestered

Wai: landscaping, composting and other pilots

15 million+ litres water reused

Treated Wastewater

FSTP landscape and site maintenance

Vehicle washing

Demonstration for fire fighting at SWM site

Dewatered Sludge

Stored to render neutral

Shared with farmer on trial basis

Biochar

Composting pilot

Wai and Sinnar FSTPs have also become net energy positive

Wai and Sinnar have solar panels installed and have been connected to the grid. Now, both FSTPs are en-route to becoming “net energy positive

Wai, India

- Consumption of electricity: 1396 **Units/month**
- Estimated generation of electricity: 3208 **Units/month**
- CO2 emissions mitigated: 16.06 **Metric ton/annum**

Potentially 16.06 carbon credits can be generated

Solar Power generation capacity: 30 KW

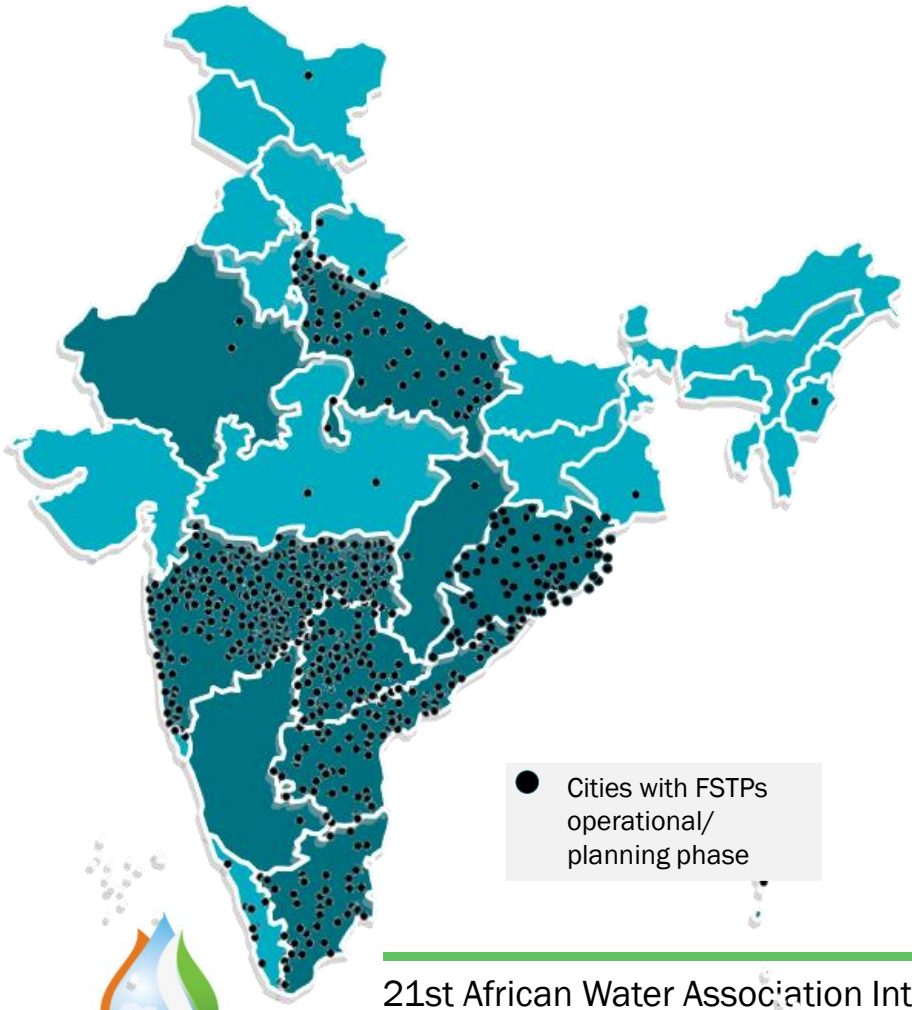
Sinnar, India

- Consumption of electricity: 1184 **Units/month**
- Estimated generation of electricity: 1258 **Units/month**
- CO2 emissions mitigated: 6.3 **Metric ton/annum**

Potentially 6.3 carbon credits can be generated

Solar Power generation capacity: 7.5 KW

Great potential of replicating the systematic approach wastewater reuse efforts in various cities in India



- Learnings from these cities is being scaled up across 300+ FSTPs coming up in Maharashtra
- With various FSTPs coming up across India, replicating and adopting sustainable reuse practices is highly feasible.

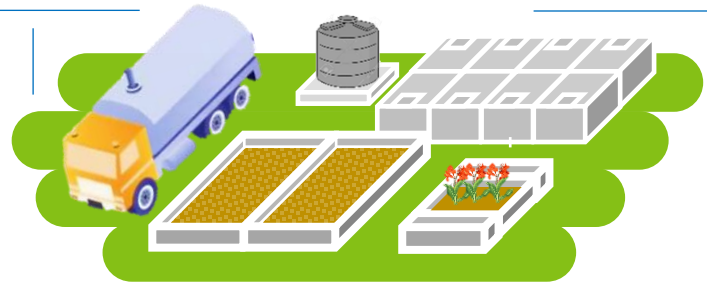
Benefits of treating wastewater and its reuse potentials contributing to SDG 6

Sustaining freshwater supply

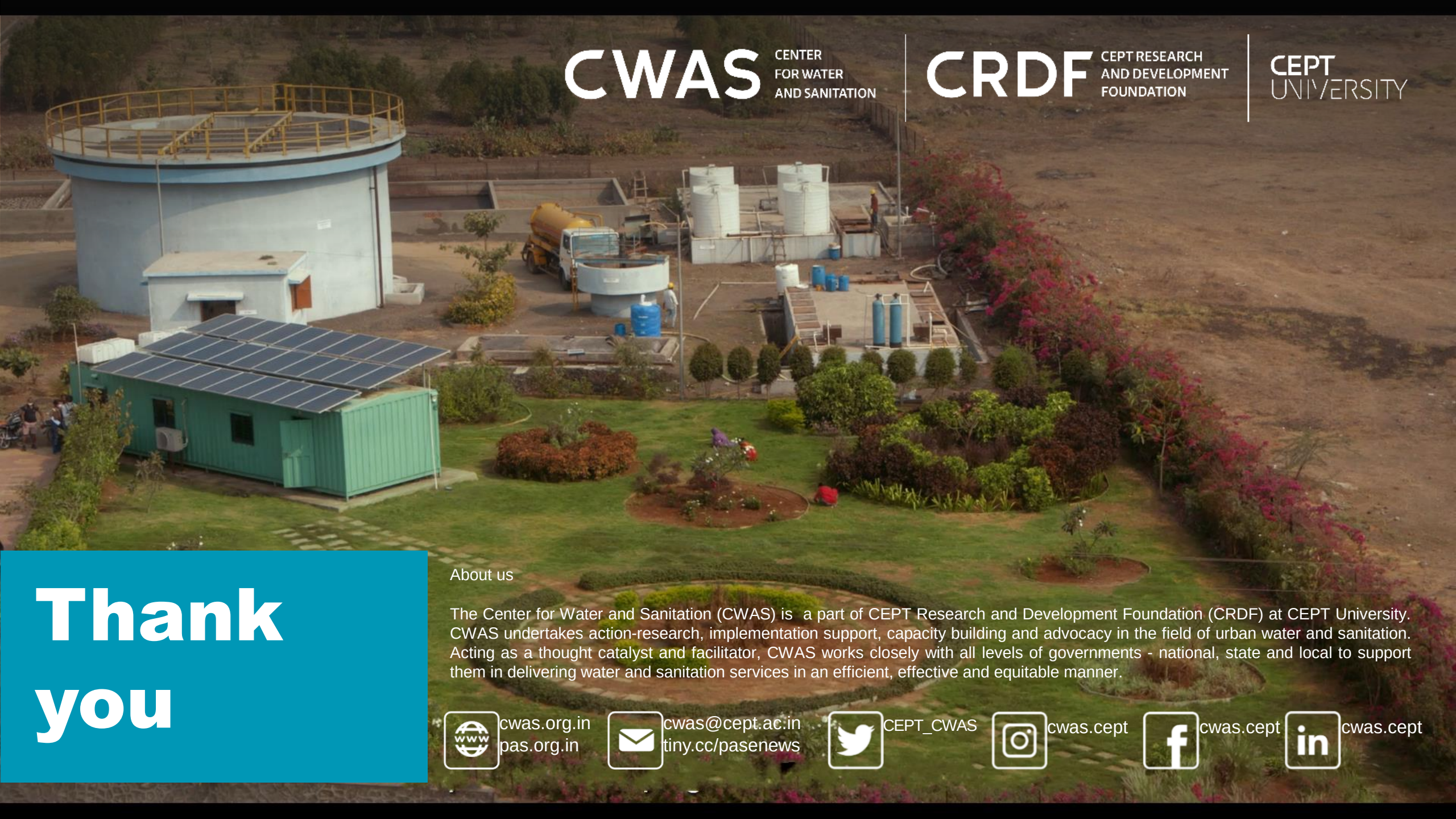
Improved green cover in urban areas

Energy efficient, self sustained FSTPs

Treatment of excreta to enable safe disposal and reuse



Contributing towards reducing water and soil pollution



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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