The Ongoing Scale-Up Process of Small-Scale Sewage Treatment and Reuse Systems in India: Taking the Lead through Effective Governance Interventions

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CSE Webinar “Decentralized Wastewater Treatment and Local Reuse for Citywide Sanitation and Improved River Health”
13 August 2020
The Role and Potential of Small-Scale Sewage Treatment and Reuse Systems
Small-Scale Sanitation Scaling-Up
The 4S Project (2016-2019)

Comprehensive field research on the performance of small-scale sewage treatment plants (SSTPs) in urban India and the success & failure factors for such systems.

Main Partners:

Funding:
Small-Scale Sanitation Scaling-Up
The 4S Project (2016-2019)

GOAL: evidence-based policy recommendations for the successful implementation and operation at scale

APPROACH: assessment of sanitation systems on the ground and analysis of governance aspects
Small-Scale Sanitation Scaling-Up
The 4S Project (2016-2019)

Methods

- **Landscape study**: inventorisation of technologies, existing installations, private players and previous research

- **Evaluation of SSTPs** covering entire spectrum:
  - Basic assessment of **279 units** (inspection visits & interviews)
  - Detailed performance analysis of **35 systems**

- **Governance analysis**: study of policies, regulations, stakeholders and governance arrangements

- **Financial analysis**: study of life cycle costs of SSTPs and financial reasons for underperforming systems
Small-Scale Sanitation Scaling-Up
The 4S Project (2016-2019)

Key Research Findings

- **> 20,000 installations** in India (estimated)
- Majority are variations of **conventional wastewater treatment** technologies
- Enormous **reuse potential** (flushing, gardening, construction and more)
- **> 300 private companies** implement a wide range of technologies
- Any of the technologies studied have the **potential to achieve quite stringent BOD, COD and TSS standards**

► Download report from www.sandec.ch/4S
Key Research Findings – Challenges

- **Life cycle costs** are not considered
- Systems generally fail to meet **nutrient** and **microbial parameters**, and often struggle with **BOD**
- Lack of **sludge management**
- Most units **underperform**

Download report from [www.sandec.ch/4S](http://www.sandec.ch/4S)
How to explain the current challenges and what can be done?
Governance Arrangements for the Scaling Up of Small-Scale Wastewater Treatment and Reuse Systems – Lessons From India

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Environmental pollution and increasing water scarcity are key features of the urban landscape of India today. The extension of centralized sewerage networks cannot keep up with city growth, and alternative sanitation systems are needed for citywide inclusive sanitation (CWIS). The government of India mandated larger buildings to be equipped with small-scale wastewater treatment plants (SSTP). This resulted in the emergence...
Identified loopholes (Karnataka)

GOVERNMENTAL AGENCIES

Consent delivery

- Karnataka State Pollution Control Board (KSPCB)

PRIVATE SECTOR & CIVIL SOCIETY

Planning, Design & Implementation

- Design of small-scale STP
- Technology provider
- MEP consultant (Mechanical, Electrical & Plumbing)
- Consent to Establish (CTE)
- Building approval
- Consent to Operate (CTO)
- Mandate
- Real Estate Company

Operation & maintenance

- Mandate
- O&M service provider
- Operator
- Onsite inspections
- Sampling/Monthly report
- CTO Renewal
- Laboratory

Consent delivery:

1. Consent to Establish (CTE)
2. Handover
3. Consent to Operate (CTO)
4. Building approval
5. Mandate
6. Sampling/Monthly report
7. Laboratory
8. Onsite inspections

PRIVATE SECTOR & CIVIL SOCIETY

- WSSB / ULB
- Consent to Operate (CTO)
- Consent delivery

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- Karnataka State Pollution Control Board (KSPCB)
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How to Explain the Current Shortcomings?

MoEFCC’s policy very successful to foster the development of a large SSS market ...

... but the market developed quicker than the necessary governance structures

... and the integration by MoHUA and line agencies

⇒ Decentralised systems also need centralised structures:

  Monitoring, training, troubleshooting, guidelines, etc.
What can be done?

Efficient governance requires:

- **An online platform**
  - collating all databases, streamlining & supporting processes from establishment to monitoring

- **Dedicated SSS units** at state and city level
Online Database and Platform

- System management, monitoring and learning

Dashboard / Analysis Interface (Mapping, Alerts, Time Series)

- System Specifications (ID for each SSTP)
- Consent Management Information
- Performance Data History (lab analyses)
- Public Interface (information, complaints)
- Treated Water Market Place

App linking supply and demand of treated wastewater?
Interministerial structure (MoHUA, MoEFCC, MoEIT,...)

- SSS training of trainers in selected training centre

**Pioneer state: spearhead and pilot the online platform and SSS unit?**

- SSS unit in Karnataka
  - SSS training in selected training centre

- SSS unit in Tamil Nadu
  - SSS training in selected training centre

- SSS unit in state XY
  - SSS training in selected training centre

- SSS unit in city A
- SSS unit in city B
- SSS unit in city C
- SSS unit in city D
- SSS unit in city E
- SSS unit in city F
Benefits

1. Facilitating the **merging** and **completing** of existing databases.
2. Fostering **coordination** between the governmental agencies
3. **Geo-localization** and **mapping** of the SSTPs
4. Simplifying administrative procedures through **digitalization**
5. Allowing **prioritization of monitoring** visits based on **automated** verification procedures
6. Enabling **learning** through big data analysis of all existing SSTPs
Recognise the key role of small-scale wastewater treatment in urban sanitation coverage and citywide inclusive sanitation (CWIS)

- Put SSS on the urban sanitation map, next to conventional sewerage and FSSM

- Clarify roles and responsibilities, esp. of WSSBs and ULBs

- Produce technical specifications, guidelines for technology selection and O&M

- Develop the centralised online database
Conclusion: increasing role, high potential
Thank You for Your Attention!

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**Synthesis Report:** A Roadmap for Small-Scale Sanitation in India: Fulfilling its Potential for Healthy and Water-Secure Cities

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