sustainable sanitation alliance

SuSanA Open Exchange Forum

India Chapter

# Small-Scale Sanitation Scaling-Up (4S) – Research Objectives & Experiences from On-going Field Work


www.sandec.ch/4S

rohit.chandragiri@eawag.ch

jai4jai@gmail.com

**Rohit Chandragiri, Eawag**

**Jayakumar Renganathan, IIT Madras**


**17 February 2017**

**Chennai, India**

# Small-Scale Sanitation Scaling-Up (4S)



- Comparative assessment of small-scale sanitation systems
- 3 countries: India, Nepal, Pakistan (and Bangladesh)
- Partnership between Eawag, IIT Madras, BORDA, CDD, NMBU and ENPHO (Nepal)
- BMGF-funded, 2016-17

**Why this project?**

- ✓ Increasing numbers of small systems, especially in India
- ✓ Previous research focused mostly on technology, not management
- ✓ Sanitation as policy priority of governments in South Asia
- ✓ Expressed need by the Indian Government (supported by BMGF)
- ✓ Interest in viability of small-scale systems in comparison with convent. approaches

**Scaling-up small-scale sanitation entails more than replicating a large number of discrete projects**

# Objectives




- To investigate technical, financial and management **performance of existing small-scale sanitation systems**
- To develop a **cause-impact framework** for the success and failure of small-scale sanitation systems
- To investigate the **management and institutional schemes** required for effectiveness, and how to include the private sector
- To carry out a simplified comparative **cost-benefit analysis**, incl. CAPEX, OPEX and asset maintenance requirements for varying scales of operation (INR/capita)
- To determine in which contexts a small-scale approach is **optimal** and **sustainable.**
- To develop **policy recommendations** for scaling-up

# Methods



**Landscape study** (database of systems, review of literature, policies and stakeholders)

**Basic assessment** (socio-economic questionnaires and technical evaluation checklist)

- Technical details and enabling environment
- Management, O&M, financial and social/behavious related indicators
- Smartphone-based data collection for 400 systems

**In-depth assessment** (detailed performance evaluation through wastewater analyses and further data collection)

- 40 installations in India, 5 in Nepal - three rounds of sampling
- Reality check: comparison of planned design and treatment performance against measurements and local effluent standards

**Institutional and stakeholder analysis** at National, State and partly city levels

- Incl. legal and regulatory framework

**Financial analysis** (costs and benefits for different technologies and scales)

# Main challenges

## *Basic assessment*

- To collect contact details of small-scale system nation wide
- To coordinate the presence of interviewee viz., (managers, operators, users) during the day of visit
- Sometimes contradictory observations may be made at site during visit
- Difficult to get information from Gov. engineers (as managers)
- Communication gap at interviewee's end leads to delay in start of study
- Difficult to retrieve information regarding detailed engineering design (DED), CAPEX & other expenses during initial construction phase
- Replacement of deciding authority, results in restarting the contacting process
- Denial of permission to discuss with users

## *In-depth sampling*

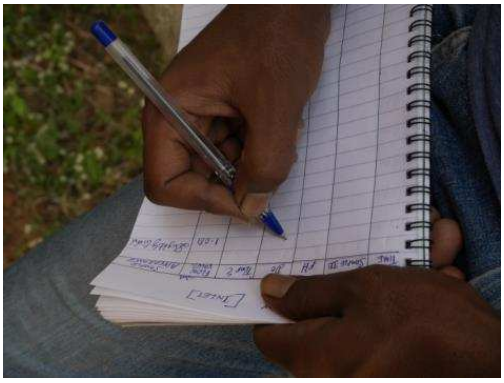
**Sampling process**

- Grab, composite and complete sampling
- Insitu analyses: flow volume, pH, Temperature and dissolved oxygen – in & outlet samples
- Lab analyses: BOD, COD, TSS, turbidity, FC, O&G, AN, OP, TN

- Getting approval for in-depth sampling (24h stay at premises)
- Change in shift in-charges during the day
- Adverse weather conditions
- Presence of mosquitoes, insects, rodents etc.
- Narrow collection points
- Cleaning and preparing raw and treated water collection points before initiating the study
- Components (motor pumps) go out of service

# Project status

- Landscape study South Asia: extensive literature review, database of 8500 systems and 238 companies – baseline for field work
- 160 systems covered for basic assessment
- 15/40 systems covered for sampling (1 round), plus 5 systems in Nepal (2 rounds)
- Conducted 18 stakeholder interviews for social network analysis and institutional analysis
- Started financial analysis to understand costs/benefits of different technologies at different scales, as well as business and management models


# Thank you!

**Please visit us on www.sandec.ch/4S**