

# What Role Should Small-Scale Sanitation Systems Play in South Asia?

Sandec is doing the first systematic assessment of small-scale sanitation systems in South Asia with IIT Madras, BORDA, CDD Society, NMBU and ENPHO. The goal is to develop evidence-based policy recommendations for improved system design, implementation, operation and management. Rohit Chandragiri<sup>1</sup>, Lukas Ulrich<sup>1</sup>



Photo 1: Small wastewater treatment plant for office buildings in Chennai, India.

Ever growing South Asian cities need huge financial resources to construct and operate wastewater infrastructure. Achieving the ambitious Sustainable Development Goal 6.3 target (halving the proportion of untreated wastewater by 2030) requires making well-thought-out investments with these resources. Since decentralised wastewater treatment approaches have proven to be a valid alternative to conventional large-scale treatment plants, small-scale sanitation systems are gaining more attention, particularly in South-Asia.

A few Indian cities have mandated the installation of small-scale sanitation systems for newly constructed buildings. Bengaluru, Karnataka's capital, is among them. In 2006, the Karnataka State Pollution Control Board adopted a policy requiring residential establishments of more than 20 000 m<sup>2</sup> within sewerage areas, and 5 000 m<sup>2</sup> or 50 apartment units outside sewerage areas, to install a treatment plant with zero discharge of treated wastewater. Commercial establishments larger than 2 000 m<sup>2</sup> (outside sewerage areas) must also have an on-site treatment plant [1]. There are now more than 4 300 small-scale systems, which currently treat 10 % of the city's wastewater [1]. The authors estimate that there are more than 20 000 decentralised sanitation systems in South-Asia, the majority in India. Though the number of documented installations in Nepal (50–60) and Pakistan (25+)

are small, they are likely to increase. Interestingly, very few installations have been recorded in Bangladesh, despite 99 % of its population now having access to toilets [2].

## Scale up small-scale sanitation systems?

Where connections to centralised systems are not realistic, increasing numbers of small treatment units are being installed. Yet, authorities in places with many units struggle to maintain up-to-date databases and to monitor their performance. Scaling-up small-scale sanitation entails more than replicating a large number of discrete projects. It requires standardisation, innovative management and institutional schemes, the private sector and innovative financing [3]. It can be promoted through: a) national and state-level strategies and policies; b) systematic implementation where appropriate and sustainable, using suitable financing mechanisms; c) development of adequate training and university curricula to foster engineering and management know-how; and d) establishment and institutionalisation of corresponding maintenance, monitoring and management structures and capacities.

## The need for research

To go to scale, the "How" first has to be understood. To date, there have been many studies on small-scale treatment systems in South Asia and findings reveal that a majority of existing systems – whatever technology is used – are underperforming. This is mainly due to inadequate operation, maintenance, monitoring and funding [4, 5, 6]. Technology and design are most often not the source of the problem, but are determinants of operating costs.

While previous research has contributed important insight into sustainable system design, the question posed in this article has not yet been fully answered. The goal of the BMGF-funded 4S project (Small-Scale Sanitation Scaling-Up) is to advance small-scale sanitation by understanding the multi-faceted dynamics of existing decentralised approaches and enabling contexts. Analysing

technical aspects, financial mechanisms, institutional setups and management gaps will reveal what factors impact the success and sustainability of small-scale sanitation approaches. A Life Cycle Assessment will also enhance our knowledge of the environmental friendliness of different technologies and scales of application, and assist decision-makers when they consider issues in system design, such as climate change. 4S will develop recommendations on how small-scale sanitation can be designed and managed to ensure that future up-scaling of wastewater infrastructure in South Asia is possible and sustainable.

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