

Stanford SOCIAL INNOVATION^{Review}

Spotlight on Sanitation
Fixing India's Sewage Problem
By Anurag Chaturvedi

Stanford Social Innovation Review
Spring 2017

Copyright © 2017 by Leland Stanford Jr. University
All Rights Reserved



Fixing India's Sewage Problem

SEWAGE TREATMENT SYSTEMS ARE BEING BUILT THAT ARE SIMPLER AND LESS EXPENSIVE.

By Anurag Chaturvedi

News headlines such as “Half of homes have phones but no toilets,” and the diligent efforts of the government of India and non-profits to provide toilets to the 48 percent of Indians who don’t have one, suggest that enough toilets will solve India’s sanitation woes. In reality, while toilets are a necessary part of the solution, an arguably bigger yet often overlooked issue is how to contain and treat India’s sewage. Currently, 93 percent of sewage finds its way to ponds, lakes, and rivers without treatment.¹

Untreated sewage is the leading polluter of water sources in India, causing a host of diseases including diarrhea (which kills 350,000 Indian children annually²), agricultural contamination, and environmental degradation. The urban poor often live alongside dirty drains and canals in which mosquitoes and germs breed.

India’s largest cities have centralized sewage systems, complete with underground pipes, pumping stations, and treatment plants. However, these systems are expensive to build and to operate, requiring uninterrupted power, skilled operators, and extensive maintenance. As a result, according to India’s Central Pollution Control

Board, fewer than half of them work effectively.³ What’s more, India’s smaller towns cannot afford to build such systems.

The good news is that a handful of organizations are developing sewage systems that are less expensive and more

CDD’s Decentralized Wastewater Treatment System (DEWATS), developed with support from the Bremen Overseas Research and Development Association, has adapted multiple technologies to conditions where electricity is not reliably available, skilled manpower is hard to come by, and mechanical parts that break may never be repaired.

The system is designed to encourage the development of smaller, more affordable systems to treat wastewater closer to the point of generation, enabling more effective water reuse for toilet flushing and gardening. Using natural bacteria, plants, and gravity instead of electricity

CDD has more than 150 clients in 13 Indian states. It also has 25 clients in Nepal and Afghanistan. And the organization is poised to do much more. For example, to meet the varied needs and constraints of clients, CDD’s partner, Auroville Centre for Scientific Research, has developed a “vortex” system that reduces land requirement by 90 percent. CDD is also developing modules that can be mixed and matched to suit the needs of communities and their budgets. “Most of the DEWATS can be built

A team of CDD engineers takes a sample of treated wastewater at a factory in Bangalore.



effective. Prominent among them is the Consortium for Decentralized Wastewater Treatment System Dissemination Society (CDD), a nonprofit organization that has been developing and promoting technologies for decentralized wastewater management since 2002.

and chemicals, DEWATS can be up to 80 percent less expensive to operate than conventional technologies. DEWATS can also help tackle water shortages, because it can reduce the use of freshwater by up to 50 percent for domestic uses locally, like washing, flushing, and gardening.

underground, and the land above can be used as a garden or parking space,” says Sasanka Velidandla, CEO of CDD.

Consider: In November 2015, CDD commissioned a fecal sludge treatment plant in Devanahalli, a town of 31,000 near Bangalore. Built using



a simple and low-operating-cost approach, the plant has so far prevented about half a million liters of fecal sludge from polluting the environment. What's more, CDD distributes the treated sludge to local farmers, who use it as an organic soil conditioner. With CDD's support, the local town council has passed resolutions to introduce comprehensive fecal sludge management processes.

The CDD team is encouraged by the results it is seeing, but with nearly 37 billion liters of untreated sewage generated by India's cities every day,⁴ the organization has its sights on the future. "Sewage management is finally a priority," says Velidandla. "Large-scale investments are being planned, and we want to ensure that all options are properly evaluated so that sustainable infrastructure is developed."

But CDD, even with its current partners, can't realize its vision alone. "We keep asking ourselves, how do we multiply our impact?" says Velidandla. "We innovate, and pilot, and test continuously because it's important to get it right—but the time to act is now. We plan to be working in five states to design and implement comprehensive solutions, and to do that we need all the partners and support we can find."

Anurag Chaturvedi co-leads Dasra's work on urban sanitation, fostering collaborations and building a community of practice among more than 60 partners.

NOTES

- 1 Census 2011 analysis by CDD.
- 2 <http://www.washinstitute.org/pdf/FSM-STUDY-REPORT-April-2015.pdf>
- 3 http://cpcb.nic.in/upload/NewItems/NewItem_210_Inventorization_of_Sewage-Treatment_Plant.pdf
- 4 [http://cpcb.nic.in/Uttarakhand_swg_18\(1\)\(b\)_2015.pdf](http://cpcb.nic.in/Uttarakhand_swg_18(1)(b)_2015.pdf)

Engaging Citizens to Improve Sanitation

THE AGA KHAN DEVELOPMENT NETWORK IS EMPOWERING COMMUNITIES.

By Esha Chhabra

Two years ago, India's prime minister, Narendra Modi, made a bold statement: India, he said, would eliminate open defecation by October 2019. To accomplish this enormous goal, the Indian government aspires to build 120 million toilets in rural India. The budget for the massive public project, which is referred to as Swachh Bharat Abhiyan (Clean India Mission), is INR 200,000 crores (\$29 billion).

The solution, though, is not as simple as just handing out free toilets. The people of India need to be compelled to change long-entrenched habits as well. As the Aga Khan Development Network (AKDN) argues, it will take a three-pronged solution—a combination of funds, raw materials, and human capital—with India's citizens fully engaged on each front, to yield a successful rollout of toilets across India.

To that end, several agencies of AKDN have been working with India's government to develop more community-driven approaches to building toilets in villages. Specifically, between 2015 and 2019 the Aga Khan Foundation, the Aga Khan Rural Support Programme, Aga Khan Health Services, and the Aga Khan

Agency for Habitat are facilitating access to sanitation for 100,000 families as well as improving water, sanitation, and hygiene in 538 schools. AKDN is working in the states of Bihar, Gujarat, Madhya Pradesh, and Uttar Pradesh, and plans to expand to Hyderabad and Maharashtra.

Asad Umar is the senior program officer for health at the Agha Khan Foundation and responsible for this extensive project. He has seen charitable organizations dole out toilets in the past. As he says, "Clearly, building toilets works only when people use them, and usage is

A mason trained by AKDN builds a toilet for a family in Muzaffarpur district in Bihar state.

only possible when communities are involved in the planning, construction, and maintenance of toilet facilities."

FINDING THE MONEY

AKDN's approach is aligned with the implementation strategy of the Indian government; that success rests in part on compelling communities to help build their own toilets. And with that approach in mind, the government's Swachh Bharat campaign has set up a INR 12,000 (\$175) subsidy for each household to buy construction materials for a toilet. Unfortunately, those funds are released only after the toilet is constructed, a practice that Umar says can be problematic. "One of the biggest challenges the poor and the marginalized face in constructing toilets is lack of money."

To help people get the initial capital they need to construct a toilet, AKDN has established a revolving fund in Madhya Pradesh through local village institutions. Families in tribal communities can tap into the fund for an interest-free loan

