Community sanitation can be cheaply improved with money-making technology

Basic household sanitation has long been outside the reach of cost-effective comprehensive solutions, especially in communities dependent on septic rather than sewage systems. But this is changing.

Groups as varied as the Bill & Melinda Gates Foundation and a coalition of private-sector water technology interests are attacking the problems of fecal sludge management, or FSM, particularly in underserved communities.

Thanks to innovative products and platforms and the collaboration of the Asian Development Bank Institute, the technology that moves water to bathrooms, taps, and kitchens worldwide is within reach of communities that don't have complex and costly sewage systems.

David Robbins, a specialist in on-site and decentralized wastewater management, found that FSM's efficiency and effectiveness—the hallmarks of modern sewerage systems—can now be used to attract the private sector into a fledgling sanitation economy that can overcome the many political roadblocks faced by communities without sewers.

While sanitation solutions might seem to have a limited scope, experts looking to scale their use to the needs of cities are concentrating on the multiplier effects of improved FSM.

> We all know what the spillover effect is. It's the ancillary benefits, which may include increased property values when you improve sanitation, tourism, economic development, health, wellness, livelihood, etc. But there can be detrimental spillover effects as well, and our job is to maximize the positive

benefits and minimize the negative benefits while moving forward with fecal sludge management.

One of many initiatives, the flagship Project 7 treatment technology, in its 10th year of operation in the highly urbanized Quezon City district, and its track record of success in improving sanitation has made it a model for the kind of system that can win support of elected officials and urban managers.

Designers have developed a blueprint of an FSM toolkit able to adapt to the needs of a selection of urban environments. The signal features of the $5.2 million system make use of the benefits of existing sanitation systems while opening the door to a host of cost-saving and income-generating opportunities.

Although the benefits of improved wastewater treatment are clear, getting government support to expand FSM options depends on overcoming traditional approaches.

Three questions are now dominant: how much sludge, how much work, and how much money.

Among the spillover effects are those relating to sludge transport and its associated carbon footprint.

Narrow laneways and heavy road traffic make it difficult to deliver sanitation to underserved urbanized areas that rely on septic systems, but Project 7 has developed a simplified technique to treat septic and sewage waste.

The result is shorter drive times for sanitation workers, less exposure to traffic, and better performance. Instead of 2.7 transport loads a day, Project 7 septic service trucks can now average four loads a day each; instead of 11.7 trucks, now only 7.5 trucks are needed.

That translates into $16,000 a year in fuel savings and fewer trucks, costing $100,000 each.

Factoring in reduced staffing and maintenance over the 20-year depreciated lifetime of the facility, savings will amount to three times what it cost the build the system.

On top of the savings, Project 7, over its lifetime, will prevent 3,000 tons of carbon dioxide from entering the atmosphere. Under a carbon trading system, this could have considerable credit value.

Savings and revenue from FSM can be used to fund other investments in the community. The spillover effects from Project 7, for example, have included improved local roads, the construction of a health facility, job creation, and a scholarship program.

> This is a very viable program. Certainly, the treatment plant is paying for itself by virtue that everybody is paying a tariff covering the operation and capital expenditures. But the fact that we're getting positive cash revenues from the taxes and the restaurants and the hotels is a positive indicator that this is a successful project.

While improved livelihoods and health may catch the attention of sanitation experts, data from the 10 years that the Project 7 system has been in operation are now being used to entice further private investment into areas without sewers.

Regions with sewers are more attractive to private investors than regions without sewers. But FSM allows areas without sewers to match the sanitation efficiency typically achievable only with sewers.

Such areas can therefore sidestep bureaucracy and funding difficulties that come with sewer construction, and projects like the Quezon City treatment plant can serve as the foundation for a private-sector sanitation economy able to meet the growing needs of urban environments.

Aspects of this economy include smart sanitation, toilet-related products and services, and waste-to-resource business opportunities. Studies on waste-to-resource opportunities in India have shown a $60 billion market waiting to be developed.

Quantified value chains also help cultivate public–private partnerships.

In another waste treatment project in the Philippines, private sources financed the infrastructure while the local government set the funding terms and fee schedules.

With public participation in the FSM project, public tariff rates can stay low while leaving rates flexible enough to attract private investors that prefer more comprehensive solutions.

Yet another project in the Philippines saw the local water district, on its own initiative, finance the needed infrastructure with a commercial bank loan.

For communities where this is not possible, revolving funds have shown success, where municipalities collect tariffs that are then returned to the fund in anticipation of eventual sustainability.

> **So, as we can start to quantify these real and tangible aspects of the spillover effect, this is something you can go to a mayor with and say, "Look at all these potential benefits. If you make this investment, this is the return."**

With incentives supported by quantified value chains, on-the-ground evidence of the success of treatment facilities like those of Project 7, and World Bank–financed studies highlighting the economic cost of poor urban sanitation, FSM has developed the kind of overall toolkit that has helped both the public and private sectors see the economic ripple effect of good water-movement technology.

In this way, FSM can make communities that don't have sewers more attractive to private investment and encourage partnerships.

By expanding efficiency and effectiveness to all forms of wastewater management, communities can be revitalized.

David Robbins is a specialist in on-site and decentralized wastewater management, with an emphasis on fecal sludge management. He spoke at ADBI, Tokyo.

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