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**LOCAL ACTION WITH INTERNATIONAL COOPERATION TO IMPROVE AND
SUSTAIN WATER, SANITATION AND HYGIENE SERVICES**

**Faecal sludge management and technology justice:
promoting sustained and scalable solutions**

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In this paper we use Practical Action's framework of Technology Justice and apply it to faecal sludge management. The framework analyses FSM from the perspectives of access, use and innovation. It encourages a wider systems-based approach to the issue. We illustrate the ideas by discussing how we are trying to create long-lasting change through a positive enabling environment in Bangladesh which encompasses empowerment of informal pit emptiers, engagement with Municipalities, and work to establish a new set of national guidelines.

Introduction

Great progress has been made in recent years in increasing access to drinking water, with 91 per cent of the global population now using an improved source. However, this does not guarantee water quality, and 1.8 billion people are estimated to use a source of drinking water that is faecally contaminated (WHO, 2016). About 2.7 billion people are served by sanitation methods that require faecal sludge management (FSM) and that number is expected to grow to 5 billion by 2030 (EAWAG/SANDEC, 2014). These numbers are concentrated in urban areas, whose growth is putting increasing strain on already limited infrastructure and service provision. Sewerage systems generally do not extend beyond the centre of cities, and their expansion is up to five times more expensive than on-site sanitation (EAWAG/SANDEC, 2014). On-site systems (OSS) are built without sufficient attention to what can be done once their pits are full. This is despite the fact that, as a public good, improved sanitation brings significant health and economic benefits. The return on each US dollar spent on water and sanitation improvements in low-income countries is \$5–46 depending on the intervention (Hutton et al., 2007).

Equitable and safe access to sanitation services is therefore not only about providing people with toilets. It is about ensuring the safe management of contaminating matter along the whole service and value chain. This requires a combination of the right technologies and systems to ensure those technologies are safely used and maintained. There is also a rapidly emerging need to ensure systems are sustained and approaches are scalable.

Why FSM is a technology justice issue

Technology Justice is a concept which shines a light on global inequalities in the access to, innovation, and use of technology. It recognizes that technology is at the heart of human development, but its benefits are not fairly shared. The environmental impact of our use of certain technologies is pushing our planet to a crisis point. And the current innovation system for new technologies fails to address the most pressing global challenges (Meikle and Sugden, 2015).

The lack of access to adequate sanitation, including the safe management of faecal sludge, is a technology injustice. The concept highlights three key aspects of this:

- inequity in access to safe sanitation, including to FSM services;
- unsustainable use of sanitation technologies;
- misaligned drivers for innovation in the sector.

First, inequity in access refers to the gap in access to affordable, safe sanitation services, appropriate to the context. A Technology Justice lens helps to highlight several reasons for this inequitable situation:

- Poor people are rarely regarded as a priority for public investment.
- Their rights and those of the most marginalized (suffering discrimination based on age, disability, gender, or caste) to access technologies and technical knowledge are overlooked. Their potential as technology innovators is ignored.
- The technologies that do exist are often unaffordable for the poor, or are not suitable in densely populated neighbourhoods, and for the types of toilets they use (Practical Action, 2016: 9).

Second, the bias towards large-scale sewered systems as the long-term solution to cities' sanitation problems is often unsustainable in its use of resources (water and energy) and can lead to the economic exclusion of informal waste workers. At the same time, the prevailing situation where urban sanitation is mainly viewed as a household responsibility and is therefore largely ungoverned and unfunded, leads to huge inefficiencies (Fonseca and Rognerud, 2015).

Finally, the drivers of innovation are misaligned in the WASH sector, compounding the injustices of access and use. The Bill & Melinda Gates Foundation's (BMGF) 'Reinvent the Toilet' initiative and the discussion of urban sanitation and faecal waste as part of '50 critical scientific and technological advances needed for sustainable global development' (Buluswar et al., 2014) underline the need for new technologies. There is also need for innovation in business models and approaches to help create the financial incentives to scale-up quality service delivery to reach all residents.

National governments can play a role in shaping innovation through the way they set standards and regulations. If standards are set too high and manual pit emptying is outlawed, as is happening in several South Asian countries, the potential for innovation based on their existing knowledge and experience is lost.

Systems approaches to address FSM injustice at scale

The problem of most development projects is that interventions are led by outsiders and become part of a system that cannot sustain without them. Systems approaches use common sense to provide a strategic framework for greater aid effectiveness. To address technology injustices, a systems approach encourages practitioners to think about a vision in their initiatives, and how to critically think of sustainability, scale and exit strategies. The core principles of systems approach revolve around temporary facilitation, participation and ownership. Sanitation projects exist because they engage a wide range of actors (e.g. governments, private service providers, individuals, communities) who are the only ones who must own the initiatives to take FSM to the next level, by designing business models that work for them.

Beyond the terminology 'Making Markets Work for the Poor (M4P)' that they are associated with in development, systemic approaches do not exclusively focus on the economics of market systems' development, i.e. working with only private actors and enterprises. Far from providing ready-solutions revolving around the sole privatisation of sanitation services provision, systems approaches rather encourage organisations to explore the drivers, and (political, socio-economic, or cultural) blockages for innovation, and an appreciation of the need for circular material flows to address environmental concerns. They are well geared help practitioners making explicit what has previously been implicit, and to analyse specific functions of a sanitation systems without forgetting "the wider system" in which the actors are embedded. Practitioners are only here to play a temporary facilitation role to bring FSM actors to perform their functions in improved ways, i.e. in ways that can improve a complex social, economic and political balance of powers in a given context (Uraguchi, 2015).

By providing a guide to understand the underlying root causes (or "systemic" barriers) faced by the various stakeholders and that can explain why a FSM system is failing or dysfunctioning in providing access to essential services, systems approaches step away from tackling the only symptoms of what is now a "second generation sanitation challenge". These barriers can lie not only at the sanitation value chain level, but also be rooted in the national policy environment (e.g. sanitation regulatory framework), in the local cultural norms (e.g. reluctance to re-use human waste, prevalence of a cast system) or in the various inputs and service providers to the sanitation actors (e.g. artisans, equipment or finance providers).

Systems approaches hereby focus on the incentives and drivers which influence how particular parts of the system operate (Uraguchi, 2016), and changing these to create better outcomes (better access to sanitation and less faecal sludge openly dumped in the environment).

They can be applied at a variety of scales, and Practical Action has previously published work demonstrating how we have applied a systems approach to the design of new business models and partnerships at the city-level in Faridpur (for example Stevens et al 2015). This work aims to create a sustained and scalable solution.

At the same time, action is needed at a wider level to ensure that the political drivers and incentives for the municipality are supportive, encouraging Faridpur municipality and along with other towns and cities in Bangladesh to continue to work towards FSM systems that genuinely serve the needs of poor people, use appropriate technologies and systems, and work with the actors (including those in the informal sector) who can create the best, and most responsive (innovative) solutions. There are three ways in which we currently working to ensure the creation of this enabling environment.

A supportive national framework for FSM in Bangladesh

If models such as the one we are experimenting with in Faridpur are to be adopted more widely, new guidelines and a clearer institutional framework and division of responsibilities will be required. The system approach taken by Practical Action allowed prioritising and focusing energies on one of the root causes that would impede any long-term upscale of FSM. The absence of a national policy environment enabling different levels of public authorities to improve and enforce safe FSM was identified as one of the keystones to meet the sanitation SDGs in Bangladesh.

Although the Government of Bangladesh has acknowledged that appropriate institutional arrangements are a prerequisite for effective FSM, the development of a new national framework was a delicate balancing act. Too much regulation can act as an entry barrier if containment standards are too high and unaffordable for the poor (Blackett et al., 2014), who fall back into unregulated services. On the other hand, the absence of a framework means that there is no driver for municipalities to leverage any change.

Practical Action and ITN-BUET (International Training Network – Bangladesh University of Environmental Technologies) supported the participatory design of an Institutional and Regulatory Framework in Bangladesh that aims to encourage a more systematic approach to FSM, to clarify the role of different levels of government and other actors, and to establish a model to encourage circular economy principles in dealing with faecal waste.

This framework has been designed for different scales of urban areas: City Corporations, Dhaka megacity, Paurashavas, and rural areas (MoLGRDC, 2015). It provides a uniform set of guidelines for municipalities on ensuring the proper construction of sanitation facilities and of disposal options for faecal sludge and solid waste. Each framework provides guidance on:

- The responsibilities of authorized stakeholders for each step of the service chain, their roles and obligations, and the mechanisms responsible for the monitoring and enforcement of each activity, with a focus on proper design and construction of sanitation and disposal facilities, social sustainability (i.e. social discrimination, rights, and safety for pit emptiers), environmental sustainability (i.e. stopping illegal connections to, and disposal into, water sources by integrating an ‘Environmental Police’ to ensure compliance), and economic sustainability (i.e. sustainable business models for FSM, including cross-subsidies for more pro-poor service level agreements, and ‘safe sludge transfer’ incentives, gradually developing a database of all sanitation facilities and their emptying frequency).
- Capacity building, training, and research including filling knowledge gaps, technical assistance, training, and quality assurance of processes and products (e.g. compost) in the FSM service chain.
- Awareness raising campaigns, promote private sector participation, and demonstration of FSM business.
- Technical assistance and funding support of the government on high capital infrastructure and other assistance, for example securing land for construction of the treatment facility, for the development of FSM infrastructure in the City Corporations.
- Guidance on FSM business models, whereby treatment plant operators pay the collection and transportation operators a discharge incentive to dump the sludge safely. This financial incentive rewards socially desirable behaviours, and encourages reuse and resource recovery.

A clear voice for the informal sector

A National FSM Network has been established to promote peer-learning. Its first convention included a session on ‘Dignity for Septic Tank Emptiers’ where manual pit emptiers had an opportunity to share their challenges with a variety of national and local stakeholders. This contributes to building a strong momentum

around not only the business potential of FSM, but also the rights of both service users and providers for healthier life conditions. The network will also support integrated approaches, such as the nexus between farming and urban sanitation that can alleviate the cultural concerns about the safety of faecal compost utilization in agriculture.

Conclusion

There has been a growing interest in the use of systems approaches to tackle the complex issue of sustained and scalable FSM systems. This seems highly appropriate given the extent to which FSM systems need to integrate such a wide range of stakeholders as well as different value chains (for toilet construction, pit emptying, treatment of waste and its eventual marketing). By looking at this systems through the lense of ‘technology justice’, we are encouraged to ensure that the interventions we design meet the needs of poor and marginalised users and encourage incentivise the innovation needed to come up with solutions to emerging challenges. A wider enabling environment is needed for this with regulations which are both practical and balance safety with affordability. A clear voice for the informal sector and slum dwellers within this will be essential – a gap which the nascent FSM network in Bangladesh is seeking to fill.

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Note

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