



Tapping the Market

*Opportunities for Domestic Investments
in Sanitation for the Poor*

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Tapping the Market: Opportunities for Domestic Investments in Sanitation for the Poor

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Abbreviations

GDP	Gross Domestic Product
NGO	Non-government Organization
UNICEF	United Nations Children's Fund
WHO	World Health Organization
WSP	Water and Sanitation Program

Overview

Throughout the developing world, millions of people lack access to improved sanitation. In the four countries covered by this report alone, the problem affects some 228 million people and costs 1.0–6.3 percent of gross domestic product (GDP)—a total of at least US\$10 billion a year.

To improve access to improved sanitation, particularly by the poor, developing country governments and the international development community are looking to the domestic private sector. Figuring out how best to scale up private sector provision of improved sanitation requires estimating potential demand and understanding the factors that constrain private sector investment from meeting it.

This report examines private sector provision of on-site sanitation services in Bangladesh, Indonesia, Peru, and Tanzania, four countries where the local private sector already plays a major role in helping rural (and many urban) households construct and maintain sanitation. In Bangladesh, Indonesia, and Tanzania, at least 95 percent of the population with some kind of toilet relied on a private initiative to construct their facilities. Even in highly urbanized Peru, where public utilities have long provided sewerage systems, a quarter of people with some kind of sanitation use privately constructed latrines/toilets and septic tanks. Little systematic information is available about these markets; most information on the private sector in sanitation focuses on large private enterprises that provide wastewater management services.

Bangladesh, Indonesia, Peru, and Tanzania are countries where the Water and Sanitation Program (WSP) is actively supporting client governments in engaging the domestic private sector. The WSP—a multidonor partnership administered by the World Bank to support poor people in obtaining affordable, safe, and sustainable access to water and

sanitation services—is well placed to offer practical follow-up of the study results in these countries.

In each country, the study examines the preferences and circumstances of poor households and the performance of enterprises that provide sanitation-related services directly to them. It examines commercial and investment climate factors that may affect enterprises' actual or perceived costs and risks, driving their decisions about increasing investment in their business. Specifically, the study seeks answers to the following questions:

- Is lack of interest by the domestic private sector a rational response to weak market potential, or are lack of enterprise viability and the use of inappropriate business models preventing it from taking advantage of market opportunities?
- Are investment climate factors increasing the (actual or perceived) costs and risks associated with doing business?

Market Potential for On-Site Sanitation Services

The current market for improved on-site sanitation services in the four countries is large: supplying new systems and replacing old ones is conservatively estimated to be worth US\$300 million a year. But the potential market is much larger: one-time sales of improved sanitation facilities to the 228 million people without access are worth at least US\$2.6 billion. Poor people alone would account for sales of about US\$700 million. New customers would increase the replacement market to about US\$550 million a year.

Private sector activity associated with the market is not limited to the installation of latrines and toilets. The domestic private sector in these countries is engaged in a range of activities, including wholesale and retail sales of materials and components,

the manufacture of prefabricated cement products used to build latrines and toilets, and the provision of advice on and the design of latrines and toilets. Some enterprises also offer financing facilities or are engaged in related services, such as repairs, pit emptying, and septage disposal, which have the potential to be sizable business opportunities (the potential market for truck-based pit emptying in Indonesia is about \$100 million a year, for example).

Constraints to Serving the Market

The main constraint to the scaling up of private sanitation to the poor and realization of the market's potential is the fact that enterprises are not offering households products and services they want to buy. Many poor (and not-so-poor) people are unwilling to pay for the kinds of improved sanitation solutions currently available. As currently structured, the supply chain delivering these solutions appears unable to offer better value.

Weak Demand for Existing Options

Sanitation is a low expenditure priority for poor households. Cost is an important factor, but it is not necessarily an insurmountable barrier. The improved on-site sanitation options currently available costs between 3 percent (Bangladesh) and 7 percent (Peru) of the annual income of poor households. Many poor households spend considerably more on consumer durables such as mobile phones. In Bangladesh, for example, 100 percent of poor families living on less than \$122 a month in the areas covered by the study had at least one mobile phone, as did a third of extremely poor families living on less than \$62 a month. Average outlays on phones amounted to nearly twice the cost of a standard improved latrine or toilet.

Households do not purchase improved sanitation because they do not find current options attractive enough. Poor households are faced with limited options and significant challenges, which require strong motivation and capabilities to overcome: there are too many reasons not to improve sanitation and not enough in favor. Households consistently aspire to a much higher-level solution than they can afford. Unable to afford what they want, they make do with what they have.

In Indonesia, the favored solution is a septic tank system, but most people are prepared to make do

with a pour flush wet pit system. In Peru, people would like to have a bathroom with a toilet connected to a sewerage network. Some make do with a “false toilet” with walls and roof made from durable local materials, but even that is often out of the financial reach of poor families, who share a false toilet with a neighbor or use a latrine. In Tanzania, many people interviewed would prefer a flush to pit latrine, but they recognize that they probably have to make do with a ventilated dry pit latrine with walls and (sometimes) a roof made from local material, such as maize stalks, jute bags, and sticks.

Nearly 170 million people in the four countries have unsatisfied sanitation aspirations. At least 90 million people living above the poverty line are “making do” with unimproved sanitation or sanitation below the standard they aspire to. If better-off families are prepared to make do, there is not much of an emulation push for poorer households to move up the sanitation ladder.

Lack of Commercial Viability and Inappropriate Business Models

Poor people want good-quality products that are simple to maintain, accessible service, credibility and choice, and complete service. Enterprises are providing them with discrete services, selling sanitation components, manufacturing components, and providing construction and pit-emptying services. Most of the activities are profitable, with some enterprises, particularly in Indonesia and Peru, having the potential to generate higher levels of margins through value-adding. But the industry is characterized by very localized microenterprises with low turnover and limited access to financial resources. As the prevailing technology is generic, and focused on manufacture by microenterprises, it does not lend itself to branding or coordinated marketing. Few enterprises invest in marketing to increase their sales. Fewer have the business skills to realize how they might create more value.

Enhancing their ability to bundle services may be one way sanitation enterprises could exploit their “proprietary” capital—their knowledge of the market—and help reduce transaction costs for households. Although some enterprises are able to do so to a limited extent, few offer turnkey solutions. Many recognize that bundling and expanding the scope of their activities is important to their customers, but doing so, or pursuing more nuanced marketing

activities, involves investment, which enterprises are reluctant to make.

Another way of increasing profitability would be to reduce costs, but enterprises have few options for doing so. With current technologies, inputs are dominated by materials whose prices are not within the control of sanitation enterprises. Production of two key materials, cement and steel, is dominated by a few companies in each country with localized monopoly power. Cement and steel account for about half the cost of production of a typical latrine or toilet set (slab plus three rings) in Bangladesh and 65 percent of the costs of making a slab in Tanzania. There is limited scope to reduce price, except by skimping on materials, with a consequent impact on durability and safety. Given their weight and volume to value ratios, distribution costs can be a significant part of sanitation costs to households in rural areas, where transport infrastructure is weak.

Fragmented and Uncoordinated Supply Chain

The most significant obstacle to scaled-up private provision of improved sanitation lies in the fact that the industry is not supplying products people want to buy. One factor preventing better alternatives from being offered is the fragmented supply chain, in which independent enterprises manufacture or supply one or more types of materials or pieces of equipment. For most manufacturers, importers, and retailers, sanitation represents a very small part of their overall sales. The availability of construction materials is thus driven by the demand for construction activities in other sectors. Materials and equipment that are part of separate supply chains converge at various levels of the supply chain (wholesale, retail, and consumer levels).

Households typically help construct their latrines and toilets. Particularly where households do not have a latrine or toilet in their home, purchasing an improved sanitation solution can be challenging, because households often have to aggregate components and coordinate construction themselves. Enterprises make very little effort to market sanitation solutions or to improve coordination, exert quality control, or reduce costs within the supply chain. Actors that have the resources to address this challenge do not see sanitation as an important part of their market, and the enterprises closest to the market are very small and constrained in geographic reach. Few of these enterprises specialize in

sanitation services, and they find it hard to signal any unique quality of service outside of the immediate vicinity where reputation is attested to by word of mouth.

Attitudes toward Investment and Serving the Poor

Given current demand, expanding coverage of improved sanitation among poor households will generally require expanding production capacity, relocating capacity to areas where demand exists, investing in marketing, bundling market offers, and developing and adopting new materials and technologies. Are enterprises moving in this direction?

Interviews reveal that enterprises in all countries recognize that the market for sanitation is growing, but they are concerned about the regularity of demand. A significant number of enterprises in Indonesia were planning to expand the range of sanitation-related services they offered, responding to signals from customers about their desire for service bundling. In contrast, in Bangladesh, enterprises contemplating investment were focused on expanding the scale of what they already do: manufacturing and selling latrine and toilet components. Few had any interest in expanding into installation, repair, or other sanitation-related business lines. The same attitude was evident in Tanzania.

Perceptions of the poor as an attractive customer segment vary. In Bangladesh and Indonesia, more than 60 percent of enterprises agreed or strongly agreed that the poor were target customers for them. This figure was just 48 percent in Tanzania, where a third of enterprises strongly disagreed that this was the case. More than three-quarters of Bangladeshi enterprises indicated that the poor do not pay on time, a view shared by smaller majorities in Indonesia (54 percent) and Tanzania (63 percent). More than three-quarters of enterprises in Tanzania indicated that the poor live in areas that are expensive to service because of transport and infrastructure problems.

Unsupportive Investment Climate

Broad government policies do not appear to be having much effect on surveyed enterprises, which are typically too small and too localized in reach to be affected by constraints that affect formal sector enterprises. There is little evidence that these enterprises are even aware of government

sanitation policies and programs: more than 90 percent of enterprises in Bangladesh, 60 percent in Peru, and 40 percent in Tanzania either did not know about government policies or indicated that the policies had not been publicized in a way that helped them look out for business opportunities. Where governments have been involved in the direct supply of sanitation services to poor households, the top-down approach has not been very successful, but government provision and subsidies do not seem to be a significant source of distortion of the market.

Enterprises believe that governments should concentrate on removing risks to entry by providing market intelligence and promoting the entry of enterprises that are able to undertake transformative research and development on new technologies and materials. They believe that the poor quality and high cost of transport and the lack of adequate access to finance are obstacles to increased investment.

Recommendations

The study's recommendations focus primarily on the constraints inherent in current technologies and in the supply chains that support provision of on-site sanitation services. It is these constraints that lead to households being offered products and services that they are not very interested in buying. The recommendations are aimed at governments, development partners, and industry.

Stimulate Demand by the Poor

1. Enhance consumer awareness by improving household understanding of improved sanitation and complementing private marketing of sanitation solutions to fill gaps in community understanding and address misinformation about the capabilities and maintenance requirements of improved on-site sanitation.

- Develop education and awareness programs that directly target households that already have some kind of sanitation to complement programs targeting open defecation, and address limited household understanding of the characteristics of improved sanitation systems.
- Ensure that campaigns address the gender dimensions of sanitation awareness and decision making where appropriate.

2. Improve affordability by smoothing and subsidizing sanitation expenditures to help very poor households mobilize cash to pay for improved latrines/toilets, using instruments that do not distort markets.

- Develop and support facilities that enable payment on installment terms, either intermediated through agency arrangements with manufacturers and suppliers of components or through financial institutions that provide consumer loans to households.
- Develop and finance targeted subsidies for extremely poor households in locations where suitable technology cannot be delivered at reasonable costs.

Encourage Innovation and Facilitate Efforts to Relax Business Model and Supply Chain Constraints

3. Spur innovation by stimulating (and if necessary financially supporting) the development of affordable technologies with consumer appeal. Help develop technologies (preferably proprietary or licensable) that use materials that are: light and easy to transport; easy to clean; and amenable to mass production, branding, and marketing through distribution networks coordinated and supported by manufacturers. Assist in the development of modular technologies that facilitate incremental improvements to sanitation facilities as household interest grows and households are able to mobilize funds.

- Explore options for stimulating research and development by the private sector, for example through patents, contracts, and grants.
- If the preferred model of commercial development and roll-out of proprietary technology is not forthcoming, consider expanding funding by the international development community for research and development to develop technologies that are appropriate for delivery through a market-based system.

4. Encourage larger businesses to enter the on-site sanitation sector by fostering entry of well-capitalized enterprises with marketing skills to drive consumer interest, and capacity to coordinate supply chains and support installation and maintenance by small-scale local enterprises.

- Support the collection and dissemination of market intelligence, such as information on the size and nature of the market, including the fact that it includes many households that are above the poverty line.
 - Explore options for incentives to entry, including start-up financing and support.
 - Encourage the formation of associations of enterprises involved in sanitation to develop a distribution channel to the “last mile” and to assist in the dissemination of market and technical information.
5. Enable quality assurance and accreditation: with the entry of larger businesses in the supply chain, assist microenterprises at the front end to more credibly signal service quality to a larger market and assure potential purchasers that they will get value for money and durability and continuity of service.
- If capacity exists, introduce public sector certification of technologies or government endorsement of international certification by development partners, but avoid government regulation of standards.
 - Facilitate industry-based accreditation systems for enterprises or solutions to enable manufacturers to offer warranties on installation.
6. Support business capacity development by helping the microenterprises currently delivering the bulk of on-site solutions to expand their limited business expertise so that they can better participate in an expansion of supply.
- Facilitate capacity building through partnerships with larger actors in the supply chain in

agency, distribution, or subcontracting networks that also address the capacity and commercial challenges at the front end of the supply chain.

- Develop elements of public sector sanitation marketing and education campaigns that can be used by small-scale providers of private sanitation services.

Improve the Investment Climate and Sectoral Policies

7. Facilitate private provision by clearly spelling out an active (rather than default) role for the private sector in government strategies and policies, and improve sector investment planning to identify markets with potential for private participation.

- Detail and publicize policies to facilitate the private sector role. Identify and resource responsibilities across different levels of government for implementation, especially where local governments have responsibility, mandates, and resources for sanitation.

8. Regulate septage disposal by formulating practical standards and protocols for disposal of fecal sludge and by building capacity to implement them, in order to develop safe arrangements for disposal to accompany the growth of private sector pit and septic tank emptying.

- Develop treatment sites and protocols for treatment.
- Explore options for financing disposal sites, including public-private partnerships.

What Is the Problem?

In many developing countries, significant numbers of poor and nonpoor households do not use improved sanitation—a facility that hygienically separates human excreta from human contact (Appendix table A.1 describes the various types of improved and unimproved sanitation). Lack of access is more common among the poor, however, and poor people are less equipped to deal with the personal and economic consequences of poor sanitation. Illness leading to loss of productivity of income earners can have a catastrophic effect on poor households, which may also be less able to afford treatment.

Access Is Inadequate

Despite substantial increases over the past two decades, access to improved sanitation remains limited in the case study countries: Bangladesh, Indonesia, Peru, and Tanzania (figure 1.1, panel a). It is particularly low in rural areas (figure 1.1, panel b).

The nature of the challenge of improving access differs across the four countries. It does not appear to be directly correlated with the level of economic

development. The proportion of the rural population still resorting to open defecation is much lower in rural Tanzania (16 percent), for example, than in countries with much higher average levels of income, such as Indonesia (36 percent) and Peru (28 percent) (figure 1.2).¹

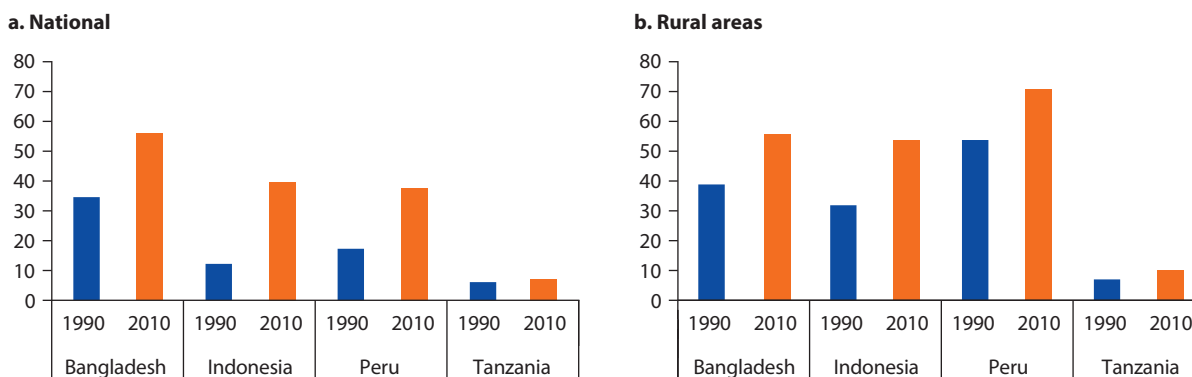
Poor Sanitation Imposes Very High Costs on Developing Countries

Poor sanitation imposes very high costs on developing countries. In the four countries covered by this study, the total economic losses have been estimated to be well over US\$10 billion a year, an astonishing 1.0–6.3 percent of each country’s gross domestic product (GDP) (table 1.1).

Governments Cannot Solve the Problem

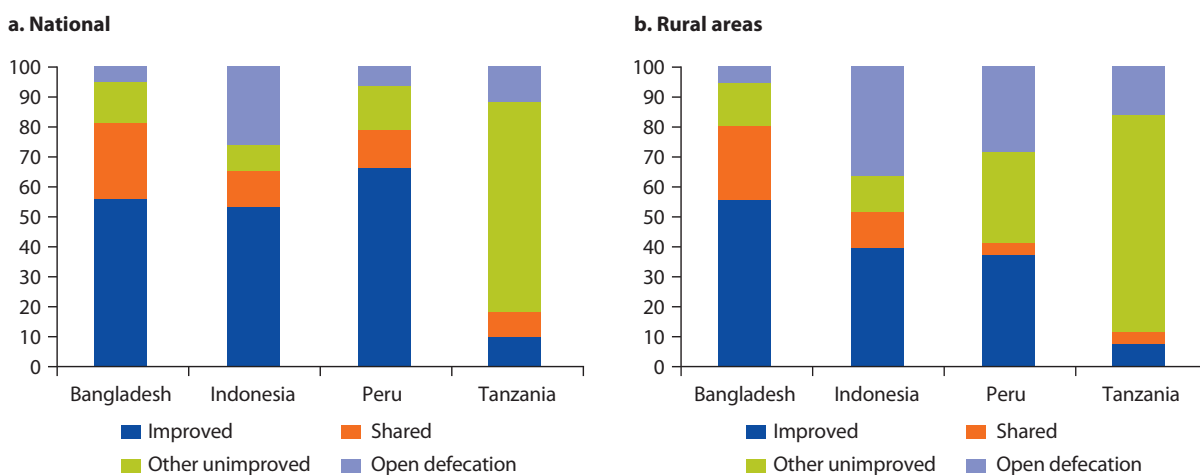
Private enterprises may be underinvesting in the sanitation sector because the social benefits of piped water are not reflected in the price private purveyors charge. The existence of these “externalities” does

Figure 1.1 Access to Improved Sanitation in Bangladesh, Indonesia, Peru, and Tanzania, 1990 and 2010



Sources: WHO/UNICEF 2013a, 2013b, 2013c, 2013d.

Note: Unless otherwise indicated, data for tables and figures come from the country case studies (see References).

Figure 1.2 Type of Sanitation Used in Bangladesh, Indonesia, Peru, and Tanzania, 2010

Sources: WHO/UNICEF 2013a, 2013b, 2013c, 2013d.

Table 1.1 Costs of Inadequate Sanitation in Bangladesh, Indonesia, Peru, and Tanzania

Country	Cost (millions of dollars)	Percent of GDP	Cost per capita (millions of dollars)
Bangladesh	4,200	6.3	28
Indonesia	6,300	2.3	27
Peru ^a	759	1.1	27
Tanzania	206	1.0	5

Sources: WSP 2013a; Larsen and Strukova 2006.

^a Includes costs of inadequate water supply.

not necessarily provide a rationale for government provision of water, however. Moreover, even if it did, in most developing countries with large numbers of poor people, the government lacks the financial and organizational capacity to meet the need for improved water supplies from public resources.

In the countries covered by this study, most poor (and many nonpoor) households look to the private sector to help meet their sanitation needs. In Bangladesh, Indonesia, and Tanzania, at least 95 percent of the population with toilets rely on private initiatives to construct their facilities. In highly urbanized Peru, with a strong tradition of public utilities providing sewerage systems, a quarter of people with some kind of sanitation use privately constructed septic tanks and latrines/toilets.

Why This Study?

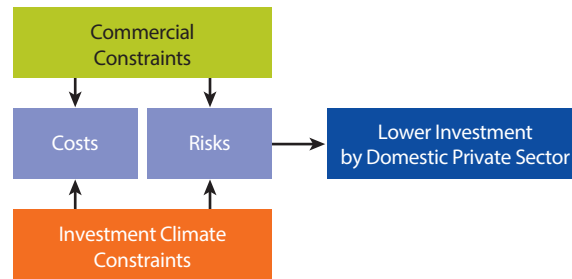
In developing countries, publicly supplied sanitation services fail to reach most poor (and many not-so-poor) people. In recent years, attention has focused on the contribution of the domestic private sector and market-driven solutions to expanding the use of improved sanitation. Governments have taken various approaches. In some countries, governments have left sanitation almost entirely to the private sector and households. In other countries, governments have only recently recognized private provision in their national sanitation strategies and begun exploring ways to facilitate an expanded role for the domestic private sector.

This study examines the involvement of the domestic private sector in the construction of on-site sanitation facilities and the delivery of sanitation services in rural areas and small semi-urban settlements. Its aim is to understand the extent to which private sector schemes can provide the poor with improved sanitation.

This study considers two sets of factors—commercial factors and investment climate factors—that affect enterprises’ actual or perceived costs and risks and, in turn, their decisions to invest in the provision of on-site sanitation services (figure 2.1). It examines both sets of factors by seeking answers to the following questions:

- Is lack of interest by the domestic private sector a rational response to weak market potential, or are lack of enterprise viability and the use of inappropriate business models preventing it from taking advantage of market opportunities?

Figure 2.1 Study Analytical Framework



- Are investment climate factors increasing the (actual or perceived) costs and risks associated with doing business?

To shed light on these issues, the study team conducted research into the sanitation sector and its policy environment, surveyed suppliers of on-site sanitation facilities and services, held focus group discussions with actual and potential customers of these suppliers, and interviewed other stakeholders, including government officials, in Bangladesh, Indonesia, Peru, and Tanzania.² The country studies focused on rural areas and small semi-urban settlements. For the four countries, a total of 109 enterprises were surveyed, and focus group discussions were held with 682 people from poor households. The study teams also consulted with enterprises involved in the supply chain that were not directly providing services to poor households and with officials and staff from relevant government and nongovernment agencies.

On-Site Sanitation Services in the Case Study Countries

In all countries, the country case studies focused on on-site sanitation services, where the private sector plays a large role.³ They looked at a range of private enterprises providing on-site sanitation services, including enterprises manufacturing and selling latrine and toilet components, building sanitation facilities, and providing emptying and disposal services (table 3.1).

In Bangladesh, Indonesia, and Tanzania, all rural people and the majority of people in urban areas use

on-site sanitation (pit latrines and septic tank systems). In Peru, which is much more highly urbanized, nearly two-thirds of the population has access to a sewer network, including 12 percent of the rural population. For the rural poor, however, on-site facilities are the only type of improved sanitation.

The type of on-site facility used varies across countries. The case studies focused on a set of options that are typical in poor rural areas (table 3.2).

Table 3.1 Type and Location of Sanitation Enterprises Interviewed for Country Case Studies

Country	Type of enterprise	Site and reach	Number of enterprises
Bangladesh	Prefabricated concrete producers casting cement platforms and rings and constructing latrines	Rural villages in eight subdistricts	30
Indonesia	Producers of sanitation facilities, including toilets and septic tanks	Secondary towns in seven districts	22
	Truck-based septic tank emptying and disposal companies	Three cities	10
Peru	Regional component suppliers and hardware stores	Three cities and two towns	7
	Construction and plumbing service companies (including an association of plumbers)	One city	4
	Water and sanitation operators	One town	2
	Regional water and sanitation utilities (public providers that operate sewer systems)	Three cities and one town	4
Tanzania	Masons involved in casting sanitation slabs and installation	Rural villages in three districts	9
	Hardware stores selling components and casting sanitation slabs	Two districts	21

Table 3.2 Improved Sanitation Options Available to Poor Households in Bangladesh, Indonesia, Peru, and Tanzania

	Bangladesh	Indonesia	Peru	Tanzania
<i>Type of facility</i>				
Above ground	Water-sealed pour flush pan on concrete slab	Water-sealed ceramic pour flush pan on concrete slab	Water-sealed pour flush pan on concrete slab	Concrete slab on wooden floor
Below ground	Pit lined with three concrete rings	Concrete-lined pit	Concrete-lined pit	Unlined pit
Superstructure	Bamboo housing with plastic roof	Brick housing	Drywall housing	Local materials
Collection and disposal	Manual pit emptying and burying by households or paid labor	Pit emptying by vacuum trucks and disposal into sludge treatment facilities	On-site disposal	Closing pit off when full and moving

Is Market Potential Sufficient to Justify Private Investment?

Between 2000 and 2010, 15 million households in Bangladesh, Indonesia, Peru, and Tanzania acquired improved sanitation facilities for the first time. Supplying these households with the kinds of sanitation options currently marketed in each country cost an estimated US\$800 million, or US\$80 million a year (table 4.1). Over the same period, the entire stock of latrines/toilets and septic tanks in place in 2000 probably needed replacing, at an average annual cost of about US\$220 million a year. Putting the two figures together yields an estimated size of the (rural and urban) sanitation sector in the four case study countries of US\$300 million a year.

How large can the market become? The Joint Monitoring Program of the World Health Organization and UNICEF estimates that about 228 million people in the four countries lack access to improved sanitation. Meeting the needs of these people would involve sales of about US\$2.6 billion (table 4.2).⁴ About 70 percent of these households are in rural areas. Less than a third of them live below the national poverty line (poor people account for about US\$700 million of this market). Once these people are served, the market for pro-

viding them with replacement equipment would be worth about US\$550 million a year.

There is also a potentially significant market for repairing latrines and toilets and emptying and disposing of septage. In Bangladesh, about three-quarters of latrines do not have a functioning water seal. In Indonesia, some 37 million households have pits or septic tanks that need periodic emptying: a conservative estimate suggests that the potential market for truck-based emptying services there is about US\$100 million a year.

Economic Drivers

Real per capita incomes have been rising in all four countries, and the proportion of the population living below the poverty line has been falling (table 4.3). Both figures suggest that the aggregate ability to pay for improved sanitation should be increasing.

Urbanization will also affect the kinds of sanitation solutions the market will require. In Bangladesh, the absolute number of people living in rural areas is projected to start declining by around 2020,

Table 4.1 Estimated Sales of New and Replacement Improved Sanitation in Bangladesh, Indonesia, Peru, and Tanzania, 2000–10

Item	Bangladesh	Indonesia	Peru	Tanzania	Total
<i>Extension of service to new customers</i>					
Number of households (millions)	5.0	8.7	0.9	0.3	14.9
Sales (millions of dollars)	151	556	79	8	795
<i>Replacement of facilities by existing customers</i>					
Facilities needing replacement (million)	13.9	22.9	3.2	0.6	40.6
Sales (millions of dollars)	416	1,466	297	18	2,197

Source: WHO/UNICEF 2013a, 2013b, 2013c, 2013d estimate of improved sanitation coverage and population and 2012 costs of commonly used improved sanitation facilities in each country from country studies. Note that unless otherwise indicated, data for tables and figures come from the country case studies.

as migration to towns and cities continues and urbanization of rural areas accelerates. In Tanzania, where sewerage systems are extremely limited, the urban population is growing nearly 70 percent faster than the population as a whole.

Policy Drivers

The impact of sector policies in developing the sanitation market is limited and has not promoted increased participation from the private sector. Public policies have tended to focus on infrastructure

Table 4.2 Estimated Potential Expansion of Market for Improved Sanitation in Bangladesh, Indonesia, Peru, and Tanzania

Estimate	Bangladesh	Indonesia	Peru	Tanzania	Total
<i>Size of market (millions of people not using improved sanitation in 2010)^a</i>					
Whole country	66.2	111.4	8.5	41.6	227.8
Rural areas	48.4	81.8	4.2	31.5	165.9
Urban areas	17.9	29.6	4.3	10.2	69.2
Poor ^b	54.2	12.5	3.5	12.6	97.4
Nonpoor	12.1	98.9	5	29	148.4
<i>Market value (US\$ million)</i>					
Whole country	452	1,739	155	240	2,587
Rural areas	330	1,278	77	182	1,866
Urban areas	122	462	79	59	720
Poor ^b	369	196	64	73	701
Nonpoor	82	1,543	92	167	1,885

Sources: WHO/UNICEF 2013a, 2013b, 2013c, 2013d reports; country studies.

^a Figures reflect the Joint Monitoring Program definitions of improved sanitation (see appendix table A.1). Bangladesh uses a slightly different definition; it includes conforming latrines that are shared by a maximum of two households as improved. Based on this definition, the number of people not using improved sanitation 28.1 million.

^b Defined using national poverty line.

Table 4.3 Per Capita Gross Domestic Product and Poverty Headcount in Bangladesh, Indonesia, Peru, and Tanzania, 2000 and 2010

Indicator	Bangladesh	Indonesia	Peru	Tanzania
<i>Per capita GDP (2005 US\$)</i>				
2000	970	2,623	5,547	868
2010	1,488	3,885	8,555	1,293
Change (percent)	53	48	54	49
<i>Poverty headcount</i>				
2000 (percent)	49	19	48	36
2010 (percent)	32	13	28	33 ^a
Change (percentage points)	-17	-6	-20	-3

Sources: World Bank 2013 and country studies.

^a Data are for 2007.

investment rather than setting a framework for market provision of services. Recent policy statements have begun to emphasize the role of government in creating demand for sanitation services and should have a positive effect in the future. But the lack of articulation of the role for the private sector and how it might be facilitated could frustrate this intent.

Current policies have not promoted private sector participation—but they do not seem to have hindered it (table 4.4). Focus group discussions reveal that rural households, poor and nonpoor, believe that sanitation ought to be a publicly provided service, but they recognize that they will have to look after their own needs.

Interviews with service providers indicated that policies and government agencies are seen as largely irrelevant to their business. In Bangladesh, nearly all surveyed enterprises said they did not know when asked for an opinion about the clarity of rules and standards for sanitation. In Peru and Tanzania, about half of the surveyed enterprises disagreed or strongly disagreed that rules were clear. Asked whether sanitation promotion programs were well publicized so that enterprises can look out for business opportunities, a similar pattern of responses emerged: more than 90 percent of enterprises in Bangladesh did not know and 60 percent of enterprises in Peru disagreed or strongly disagreed as did 40 percent of enterprises in Tanzania. Only in Indonesia did a large majority of enterprise think that the rules were clear (80 percent) and provided opportunities to look out for business (90 percent). These figures probably reflect the fact that the government has made it clear that sanitation is a private responsibility.

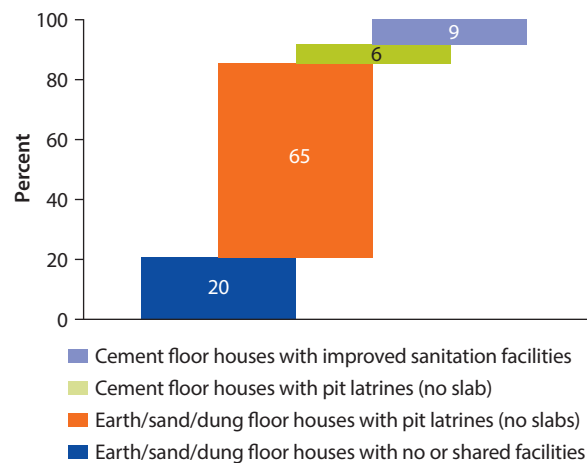
Rethinking Market Drivers

Beyond broad market drivers lies the complexity and diversity of household preferences and aspirations. Both affect the value households place on sanitation and the expectations they have with respect to how sanitation solutions suit their needs.

Household income is not always a reliable predictor of demand for improved sanitation. In Indonesia, more than 39 million nonpoor rural people (about 29 percent of that population) still resort to open defecation. In Peru nearly three-quarters of nonpoor households living within the sewer network choose not to connect to it. In Tanzania,

nearly 17 million nonpoor rural people (about 85 percent of the rural nonpoor population) use unimproved sanitation—about 400,000 households that are wealthy enough to have cement floors in their houses do not have a slab in their latrines that would meet the standards of improved sanitation (figure 4.1).

Figure 4.1 Opportunities for Providing Improved Sanitation in Tanzania



Source: PATH 2012.

Focus group discussions reveal that households look for qualities in their facilities without reference to what government or international standards may define as “improved sanitation.” In Bangladesh, there also seems to be a willingness to share latrines not observed in the other countries. Poor households in Bangladesh indicated preferences for different features of an improved latrine: more than 20 percent indicated a preference for a raised platform to provide safety from floods, and a similar proportion opted for a superstructure with bamboo walls and corrugated iron roofing. In Peru, households at all income levels that have a regular supply of water (80 percent of all households) regarded latrines as a symbol of poverty and social exclusion. They aspired to a bathroom with a sink and a shower or at the least a “false toilet” with all the appurtenances of a bathroom except the connection to a sewerage network. Interest in improved sanitation is very low in Tanzania, even though—or, perhaps, because—strong government programs after independence led to a very high coverage of basic sanitation.

Table 4.4 Policy Drivers of Sanitation in Bangladesh, Indonesia, Peru, and Tanzania

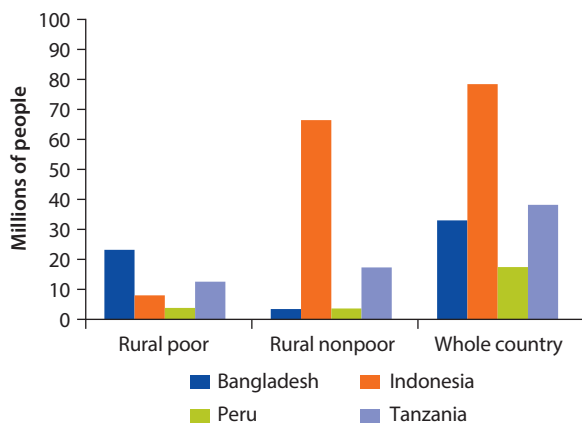
Subject of policy	Bangladesh	Indonesia	Peru	Tanzania
Private sector engagement for on-site sanitation	No evidence of specific policy.	Regulation is in place governing public-private partnerships for private operation of sanitation infrastructure where users cannot opt out.	No evidence of specific policy. Recent policy statements express desire to engage private sector.	Water Act of 1966 includes policy statement on public-private partnership but no implementation regulations.
Subsidy to households for on-site sanitation	Directive for local governments to allocate 20 percent of development budget to support poor households' access to sanitation.	De facto policy of no subsidy, but programs have invested in communal and household-level sanitation facilities.	Policy of no subsidy for household investment in sanitation, including connecting to sewers. Recent statements emphasize need for providing low-cost alternatives to sewers.	Policy of no subsidy for sanitation.
Promotion of sanitation	Traditionally, strong public focus on hygiene and sanitation promotion implemented through localized, subdistrict committees.	Recent policy emphasis on demand creation role of government.	Not clear.	Traditionally, strong public focus on sanitation. National program launched in 2010 for promotion and marketing of sanitation.
Regulation of on-site sanitation	Local committees emphasize promotion rather than enforcement or regulation.	Standards exist, but implementation varies across local governments.	Approaches only just being developed for on-site solutions for rural and poor households. Traditionally focused on sewers.	Local institutions monitor that households have a latrine.
<i>Operationalization</i>				
Public investment programs	Free latrines distributed.	Cost-sharing of rural household sanitation, communal facilities and investment in municipal facilities.	Public sector finances development of network water and sanitation. Some municipalities provide free toilets.	Focus is on school facilities.
Instruments for delivering sanitation programs	Local government institutions and NGOs.	Community and public health institutions.	State utilities and community water operators.	Line ministries and local government institutions.
Market-based approaches supported by public programs	To be tested for first time at scale under national program.	Proof of concept stage; scaled testing underway.	Proof of concept stage; some targeted pilots being conducted.	Proof of concept stage; scaled testing underway.

Based on evidence on people’s preferences, it appears that there are nearly 170 million people in the four case study countries who have unsatisfied aspirations or wants with respect to improved sanitation. Between 60 percent (Bangladesh and Indonesia) and 100 (Tanzania) percent of rural poor people fall into this category (figure 4.2). Large numbers of nonpoor rural people—more than 60 million in Indonesia and 90 million in total—also have unsatisfied aspirations.

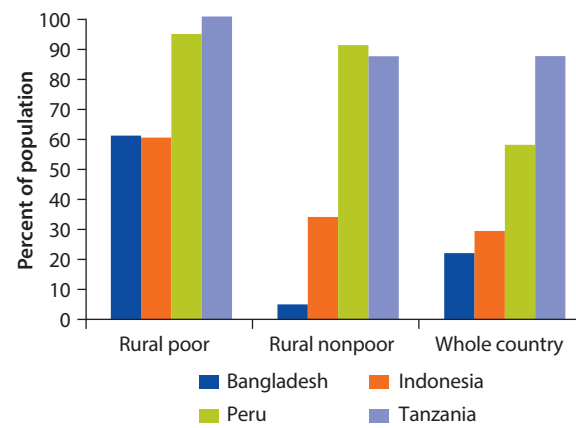
The benefits of moving from open defecation to basic sanitation are much larger than the benefits of moving to the next stage of improved sanitation, and the incremental costs of moving up the ladder are relatively high.⁵ The gap between what households want/expect in their sanitation solutions and what solutions are most cost-effective in delivering benefits has important implications for public programs seeking to adopt market-based approaches.

Figure 4.2 Unsatisfied Sanitation Aspirations of Poor Households in Bangladesh, Indonesia, Peru, and Tanzania, 2012

a. Size of population with unsatisfied wants



b. Percent of population with unsatisfied wants



Note: Poverty defined using national poverty lines.

What Affects Demand for On-Site Sanitation?

Affordability is an important determinant of demand for on-site sanitation. The fact that many poor households without sanitation own mobile phones suggests that the poor are willing to pay for value and that affordability is not the only factor, however. The more important constraint on increasing access is the low value people place on the improved sanitation options available in the market.

Cost

The on-site sanitation solutions offered to poor households by the private sector are similar in the four countries surveyed, partly because of efforts made by the international community to develop and promote a set of inexpensive and easy to produce solutions. Except in Peru, these solutions typically cost 3–4 percent of the annual income of households living below the poverty line—not an insurmountable cost barrier (table 5.1).

Cash Constraints

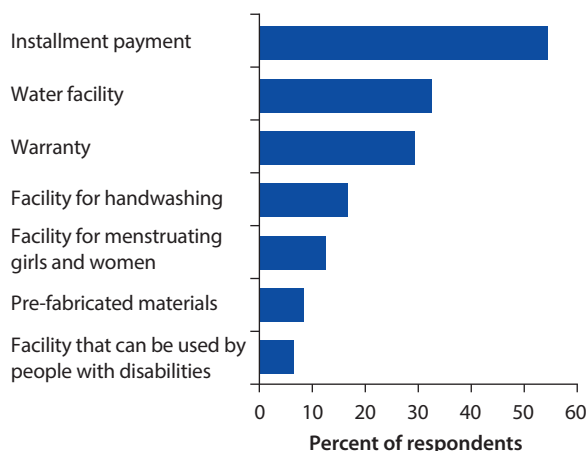
The poor households interviewed owned many consumer durables, such as mobile phones, motorbikes, and bicycles. Many of these households spend as much on mobile phone use annually as it would cost

to install the available sanitation solution. In Bangladesh, all of the poor households and 34 percent of the extremely poor households that participated in the focus groups had at least one mobile phone.⁶ On average, households with a phone were spending US\$55 a year on the service, nearly twice the one-time cost of a standard improved latrine or toilet. The prevalence of mobile phone ownership among poor households suggests that households can make significant outlays for a valued service if expenditure can be spread out over time.

Purchasing improved sanitation requires a large outlay of cash at one time. Many poor households interviewed have uncertain and seasonally varying incomes; in many cases, a significant part of their consumption is also self-produced, so that cash income is less than total income. Indeed, when estimating what they thought they would have to pay for their ideal sanitation facility, focus group participants in all countries except Bangladesh generally cited a value that represented a significant portion of their average monthly household income (figure 5.1). Respondents were able to correctly identify the cost of ideal options. These figures suggest that poor people understand the order of magnitude of outlay involved in purchasing the kind of sanitation to which they aspire.

Table 5.1 Estimated Costs of Toilets and Pit Emptying in Bangladesh, Indonesia, Peru, and Tanzania, 2012

Country	Country/on-site sanitation option	Cost per unit/service (US\$)	Share of poor household monthly income (percent)	Share of poor household annual income (percent)
Bangladesh	Toilet	30	39	3
	Pit emptying	5	7	1
Indonesia	Toilet	64	44	4
	Pit emptying	15	11	1
Peru	Toilet	93	89	7
Tanzania	Latrine	30	48	4

Figure 5.2 Additional Services Households in Bangladesh Would Like from Their Sanitation Providers

Source: DevCon 2013.

design introduced in the 1970s to reduce the spread of waterborne diseases. In the intervening 40 years, there has been little product development to address households' needs or match their growing aspirations.

The focus group discussions conducted in all four countries probed what poor households would like to have in a sanitation solution and their ability and willingness to pay for it. They consistently revealed that households aspire to a much higher-level solution than they can afford; sensing the futility of their desire, they “made do” with a less desired option. In Bangladesh, for example, coverage of a wet pits is high, but many facilities do not function well (broken water seal). People who shared a facility were keenly aware of the burden this malfunction imposed on their neighbors. In Indonesia, most people would have liked to have had a septic tank system but were prepared to make do with a pour flush pit system. In Peru, respondents ideally wanted a bathroom with a toilet connected to a sewerage network. Some people made do with a “false toilet,” the walls and roof of which were made from durable materials (adobe, fiber cement, brick, wattle and daub), but even that was often out of the financial reach of poor families, who therefore shared one with a neighbor or used a latrine. In Tanzania, many respondents preferred a flush toilet to a pit latrine but recognized that they probably had to make do with a ventilated dry pit latrine with walls and (sometimes) a roof made from local materials, such as maize stalks, jute bags, and sticks.

Table 5.2 Spending Priorities of Poor Households in Bangladesh, Indonesia, and Tanzania

Priority	Bangladesh	Indonesia	Tanzania
1	Food	Food	Health
2	Clothing	Health	Water
3	Education	Clothing	Education
4	Housing	Education	Housing
5	Health	Water	Furniture
6	Cell phones	Housing	Sanitation
7	Electricity	Communication	
8	Furniture	Sanitation	
9	Water	Transportation	
10	Sanitation	Recreation	

These “making do” solutions leave many people unsatisfied with their current systems. People defecating in the open were concerned about the inconvenience of going outside at night and the risk of physical harm (from snake bites, for example). People using latrines complained of odors, the rapid filling up of the pit, the maintenance involved, and the fact that latrines are a temporary solution. For example, unimproved latrines are widely used in Peru, even though they do not provide great advantages and cause problems. Improved latrines are used only by some members of the family, particularly children; they are considered provisional and difficult to relocate. For this reason, some respondents indicated that they prefer to relieve themselves outside, in order to keep their latrines from filling up. The word latrine has very negative associations (flies, odors, inconvenience); people view latrines as symbols of poverty and social exclusion. They do not perceive that the benefits of installing them are worth the costs. In contrast, they view bathrooms as clean and hygienic, easy to clean, and comfortable to use and associate them with modernity and progress; having a toilet conveys a sense of status.

What Poor Households Would Like

Poor are looking for a much broader and better sanitation experience, one with options for good-quality products, offered by an accessible and credible person as part of a larger service package (including maintenance). Table 5.3 summarizes the features they are looking for.

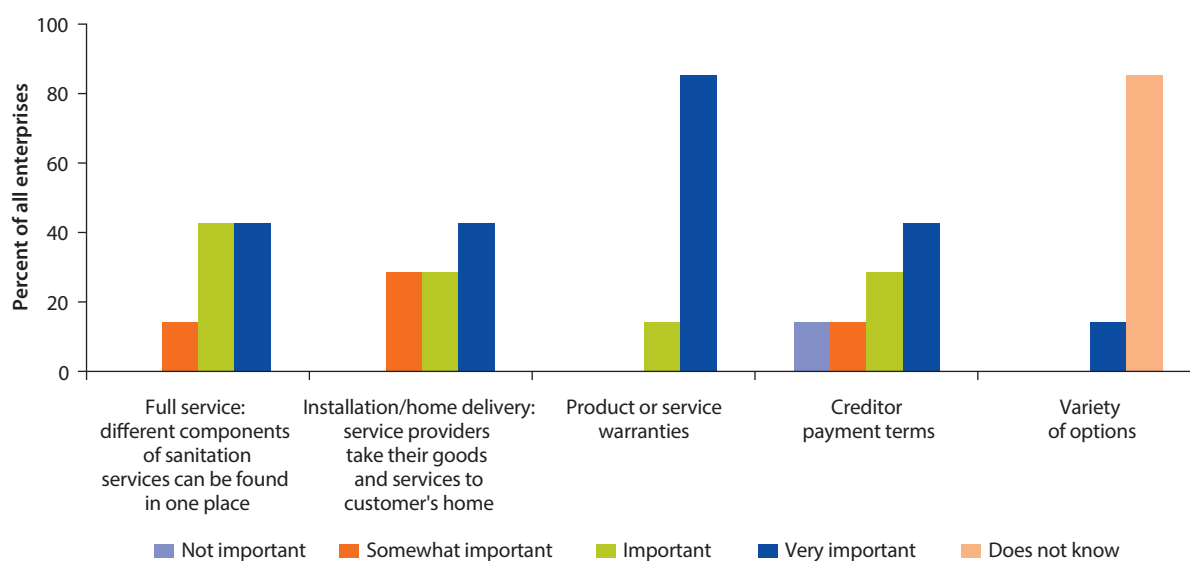
Table 5.3 What Poor People in Bangladesh, Indonesia, Peru, and Tanzania Look for in a Sanitation Solution

Country	Ideal product qualities	Buying experience	Add-ons desired
Bangladesh	Ease of transport, quality plastic pan, raised platform and superstructure with bamboo walls and corrugated iron sheet roofs.	Would buy from local prefabricated concrete component manufacturers who provide them options.	Transport of slab, emptying of pit, repair and maintenance, warranty.
Indonesia	Durable facility, ease of maintenance.	Would like options to be presented.	Warranty of installation, septic tank emptying service.
Peru	Do not want a dry system, even if water supply is not available; want permanent, not temporary, solution, ability to purchase materials and build incrementally with a clear vision of final product.	Would like guidance on price.	Not specified.
Tanzania	Durable and long-lasting; pit should not fill up easily; door and lid for hole.	Would like products to be available nearby and sold by technician who is honest about pricing.	All-in provision of labor, materials, emptying of pit or moving.

The desire for good-quality products that are easy to maintain, accessibility of service, credibility and choice, and completeness of service are borne out by the experience of poor households that were satisfied with their sanitation solutions. In Bangladesh, where satisfaction rates among focus group participants were higher than in the other countries, the most important factors influencing the decision to buy latrines from the local entrepreneur

were price, reputation, assurance of after-sales services, easy transportation, and the variety of latrine types. Enterprises seem to be aware of how important these aspects are to their customers (figure 5.3).

The lack of information or misinformation among focus group participants was apparent. In Indonesia, for example, people wondered how often a septic tank needed to be emptied and

Figure 5.3 Factors Enterprises in Peru Think Consumers Consider Important in Purchasing Improved Sanitation

Source: IMASEN and Ausejo Consulting 2013.

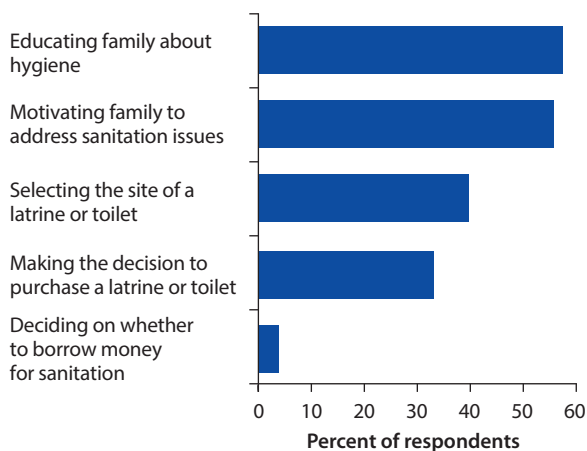
whether it was more cost-effective to dig a new pit or empty an existing one. People in Indonesia and Peru lacked knowledge about how to build their own facilities, where to go for help, and what standards products were expected to meet. Lack of adequate information on design options, costs, capacity, and builders may help explain households' unwillingness to pay for products and services. In Bangladesh, some enterprises with more skilled and entrepreneurial proprietors have been able to address some of these issues.

Many poor households are unable to build systems because of lack of land or water supply. Among people who can have facilities, motivations for investing include the ease of achieving a satisfactory solution; aspirational drivers such as modernity, comfort, dignity and peer approval; and awareness of why sanitation is important (table 5.4).

Women's Role in Decision Making about Sanitation

In all four countries, women prioritized sanitation much more than did men, partly out of concern for their children. Focus group discussions revealed the role of women in initiating decisions about sanitation (figure 5.4). In Tanzania, women usually initiate the discussion about building a latrine or toilet. Men do not seem to value household latrines or toilets because they are away from home most of the day and can use facilities outside their homes (in schools

Figure 5.4 Women's Role in Sanitation in Bangladesh



Source: DevCon 2013.

or towns, for example). Both men and women agreed the women make the decision about building or not a building a latrine or toilet. The move toward improved sanitation was viewed as a joint decision, however, with the woman acting as the initiator and the man as the implementer.

In contrast, women play a minor role in the sanitation supply business. The average share of women in full-time employment in the enterprises surveyed was 6 percent in Bangladesh, 9 percent in Indonesia, and 19 percent in Tanzania; the shares of women in part-time employment were 17 percent in Bangladesh, 38 percent in Indonesia, and 14 percent in Tanzania.

Table 5.4 Nonprice Factors Motivating Households in Bangladesh, Indonesia, Peru, and Tanzania to Purchase Improved Sanitation, 2012

Country	Factor
Bangladesh	Women's privacy, health, saving of treatment costs, dignity, improved standard of living, approval of peers.
Indonesia	Availability of land, durability (and length of time before pits or tanks need emptying), avoidance of contamination of water sources, comfort, health, ease of maintenance.
Peru	Comfort, modernity, hygiene.
Tanzania	Safety, durability, ease of use and maintenance, appealing product design, ease of access, hygiene and health, ease of transport and installation, privacy, modernity.

How Is On-Site Sanitation Supplied?

Households interested in purchasing on-site sanitation are often faced with an uncoordinated supply chain characterized by microenterprises with limited geographical reach and low turnover, selling generic items with little or no branding, quality assurance, or organized marketing. The enterprises that deal directly with households lack the capacity and resources to identify and act on opportunities to provide value-adding services to attract customers, and current technologies offer no avenues to reduce prices to stimulate demand.

Enterprise Characteristics

Enterprises selling on-site sanitation services to households are very small-scale operations. They are usually informal, have limited investment, do not keep financial records, do very little marketing, and rely on a fragmented and costly supply chain in which the major players do not view sanitation as an important part of their business.

Enterprise Size

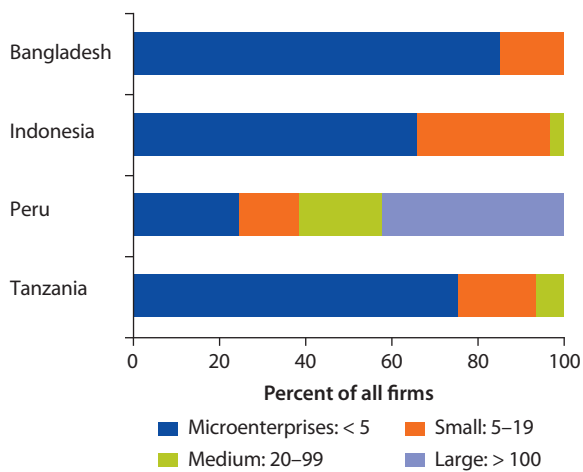
Enterprises providing sanitation services directly to poor households in Bangladesh, Indonesia, and Tanzania are typically microenterprises (defined as having fewer than five employees) (figure 6.1). In contrast, in Peru, many enterprises are medium-size or large.

Scope and Scale of Activities

Across the four study countries, the main revenue-generating activity of enterprises in the sanitation sector falls into one of four main activities (table 6.1). Enterprises provide a variety of services (figure 6.2).

In Indonesia, 92 percent of enterprises' revenues came from sanitation. This figure was 56 percent in Bangladesh and 67 percent in Peru. In Tanzania, enterprises were either hardware stores selling a range of products or masons that took on a range of

Figure 6.1 Average Number of Employees of Sanitation Enterprises in Bangladesh, Indonesia, Peru, and Tanzania, 2012



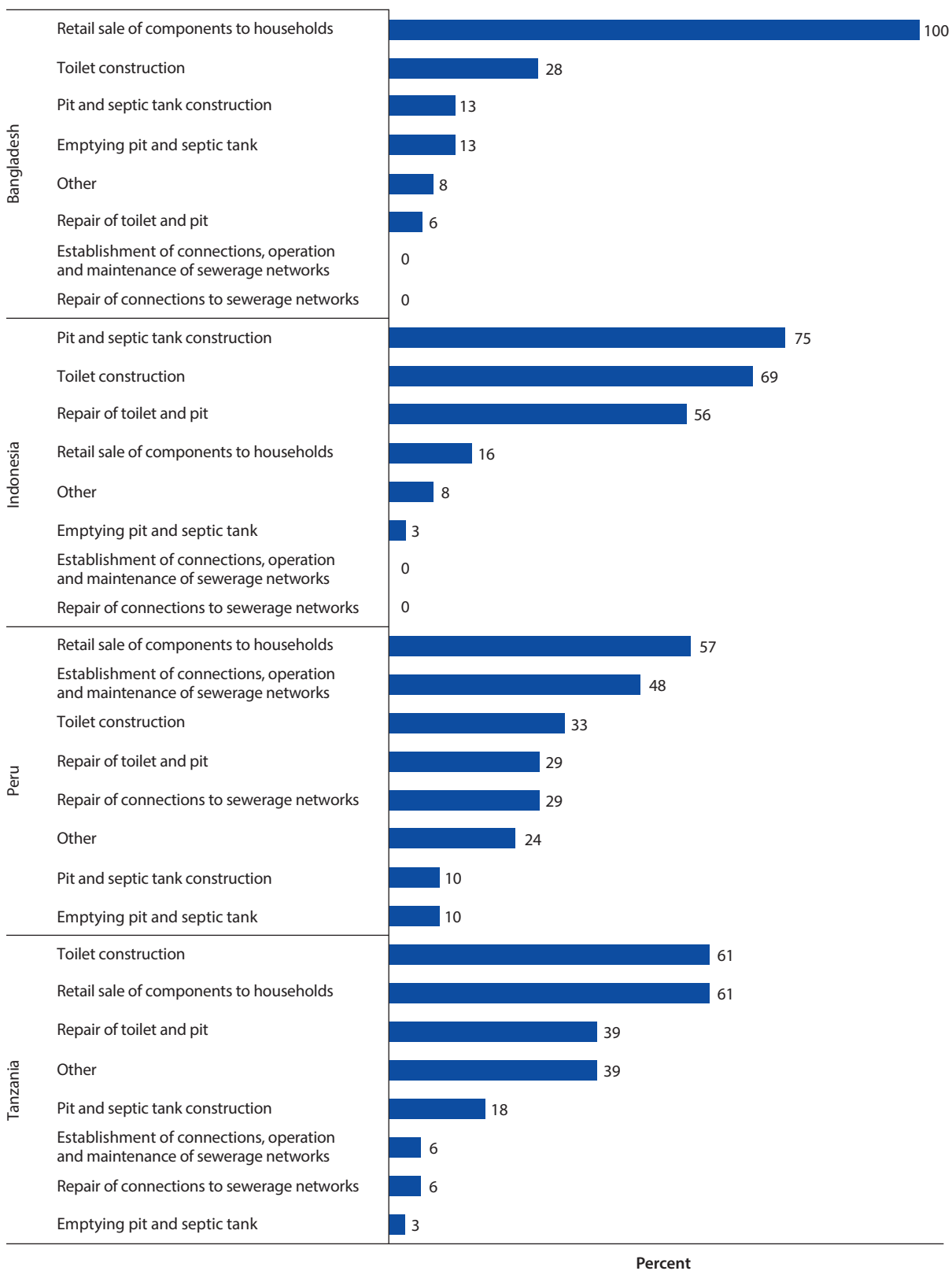
Source: DevCon 2013.

building tasks. For both, sanitation represented only a small share of their business.

Most enterprises reached markets in a single town or district. The only exceptions were national construction companies and regional water and sewerage operators in Peru. The vast majority of enterprises operated either at the subdistrict level (all enterprises in Bangladesh; masons and most hardware store in Tanzania) or at the level of a district or town (some hardware stores and construction enterprises and pit emptying enterprises in Indonesia and Peru).

The scale of operations is very small (table 6.2). The average number of toilets constructed the previous year ranged between 25 (Tanzania) and 98 (Indonesia); the average number of households whose pits or septic tanks emptied ranged between 0 (Tanzania) and 500 (Bangladesh).

Construction and servicing (emptying) of sanitation is currently a low-volume business. Enterprises

Figure 6.2 Sanitation Services Provided Directly to Households in Bangladesh, Indonesia, Peru, and Tanzania

Note: Enterprises may be involved in more than one activity, so the percentages for each country may add up to more than 100 percent.

Table 6.1 Main Revenue-Generating Activity of Enterprises in the Sanitation Sector in Bangladesh, Indonesia, Peru, and Tanzania

Subsector	Activities
Product sales	Hardware stores that retail components and raw materials, such as cement, bricks, and reinforcing wire. Some of these stores install services, directly or by contracting semiskilled contractors or laborers.
Manufacture of prefabricated cement products	Enterprises casting concrete products, such as rings, and slabs, as well as other items, such as tiles. Most are involved in building latrines and toilets; some sell products to contractors and households.
Labor and masonry	Individuals who contract directly with households or through other players, such as construction enterprises, to undertake on-site construction activities.
Pit emptying and septage removal	In Indonesia, contractors operate trucks and pumps. Some lease equipment from and operate for local governments.

Table 6.2 Yearly Average Scale of Sanitation Operations in Bangladesh, Indonesia, Peru, and Tanzania, 2012

	Bangladesh	Indonesia	Peru	Tanzania
<i>Production or services</i>				
Number of toilets/latrines constructed	97	98	81	25
Number of pits/septic tanks constructed	138	99	—	2
Number of toilets connected to sewerage network	—	—	—	4
Number of toilets/pits/septic tanks repaired	417	26	—	22
Number of households whose pits/septic tanks were emptied	500	229	15	—
<i>Sales</i>				
Value of sanitation accessories sold (US\$)	5,849	1,820	22,679	—

Note: — = Not available.

in Bangladesh constructed 8 to 11 toilets or pits a month, and enterprises in Peru handled about 7 installations a month. Hardware stores in Tanzania that were engaged in sanitation construction serviced 35 households and masons installed 10 units a month. The average number of pits emptied a month was 40 in Bangladesh and 19 in Indonesia (in contrast, specialist pit-emptying enterprises in Indonesia emptied an average of 60 pits a month). In Indonesia, enterprises specializing in construction (as opposed to pit emptying) built an average of 14 latrines and pits/septic tanks a month.

Formality

The majority of surveyed enterprises involved in on-site sanitation have very simple business structures (sole proprietorships) or no formal constitution as businesses (figure 6.3). Most enterprises were registered only with local government authorities. Only in Peru are significant numbers formally registered as limited liability companies.

Capitalization

Capital intensity varies—hardware stores and pit-emptying operations have much more fixed and working capital than masons and construction enterprises—but the overall level of investment is small (table 6.3).

Business Models

Profitability

The enterprises surveyed did not keep detailed financial records, making it difficult to review only their sanitation operations. Several findings nevertheless emerge.

More than 90 percent of enterprises covered their operating costs (table 6.4). Annual revenues ranged from US\$5,000–US\$6,000 for enterprises in Bangladesh and Tanzania to more than US\$40,000 for enterprises in Indonesia.

On a per unit basis, enterprises generate adequate profit margins. In Indonesia, average estimated margins were about 46 percent of sales for pit-emptying enterprises and 37 percent for construction enterprises; margins were smaller in Bangladesh (about 13 percent). Only in Tanzania were margins very low (2.6 percent). (Given the large number of family owned operations, measured profits may well include implied returns to family labor as well as returns to capital and ownership.) Low profitability appears to reflect low volumes. Enterprises could substantially increase their margins by moving from the manufacture and sale of sanitation components to the manufacture and installation of services (essentially adding labor), as the example in table 6.5 indicates.

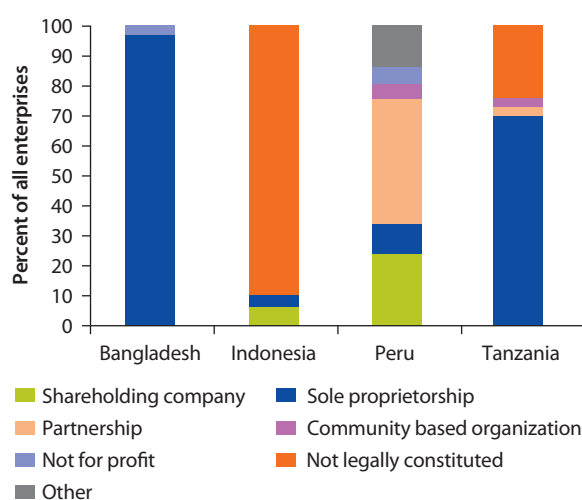
In Indonesia, some enterprises have addressed pricing and ability to pay issues by selling modular units that can be upgraded as needs and ability to pay evolve (table 6.6).

Cost Structure

Enterprises are not likely to be able to increase margins by lowering costs, because 60–80 percent of costs are linked to materials (mainly iron, cement, and sand). Nor can they negotiate lower prices for these products.

The typical enterprise buys these inputs in small quantities (in the case of masons, often only after a contract has been struck). The materials are typically produced (or imported) by large enterprises operating capital-intensive plants located close to raw materials or ports. They are (relatively) low value to weight/volume commodities, for which transport costs can be significant. Capital constraints and rational risk aversion mean sanitation enterprises are unable or unwilling to benefit from bulk purchasing discounts or bypass intermediate players in the distribution chain. Moreover, the

Figure 6.3 Legal Form of Sanitation Enterprises in Bangladesh, Indonesia, Peru, and Tanzania, 2012



technologies for making the sanitation solutions are fixed-proportion technologies. There is no scope for substituting cheaper inputs or reducing input volumes without seriously reducing the integrity and durability of the product.

Embedded in the cost of input supplies and sanitation construction is transport and distance from the work site, which add an estimated 10–20 percent to the price at each step from the wholesaler, regional hardware store, and local retailer. Theft and breakage in transport also raises costs.

Some indication of the importance of transport is suggested by the data in table 6.7, which shows how far workers in Tanzania need to travel to install sanitation devices. One householder interviewed described the problem as follows: “The hardware shops are far away from here.... If they could be nearer, one could buy even a bag of cement per month and put it inside the house.

Table 6.3 Average Investment by Sanitation Enterprises in Bangladesh, Indonesia, Peru, and Tanzania since Inception
(US\$, except where otherwise indicated)

Item	Bangladesh	Indonesia	Peru	Tanzania
Number of enterprises reporting	34	32	3	13
Minimum investment	335	21	2,222	286
Maximum investment	24,450	60,963	506,556	31,807
Average investment	5,310	4,663	173,296	11,747

Note: Figures show total investment in fixed and working capital from inception to 2011. The sample in Peru included one atypical enterprise, which had invested more than \$500,000.

Table 6.4 Average Annual Revenues and Earnings by Sanitation Enterprises in Bangladesh, Indonesia, and Tanzania, 2011
(US\$)

Country	Average annual revenues	Net profit
Bangladesh	11,000	6,300
Indonesia, construction	46,000	33,000
Indonesia, pit emptying	50,000	43,000
Tanzania	9,000	5,000

Table 6.5 Profits of Bangladeshi Enterprise from Selling Pit Materials and Components and Installing Twin Pit Toilet. (Tk, except where otherwise indicated)

Item	Sale of pit materials and components	Installation of twin pit toilet
Sale price	600	4,400
Cost	510	2,635
Operation profit	90	1,765
Profit margin (percent)	18	67

Table 6.6 Modular Toilet Designs in Indonesia

Toilet type	Description	Cost (dollars)
WC Ekonomis	Branded ceramic closet, slab, concrete ring, cover, two days labor.	60
WC Tumbuh Sehat	Branded ceramic closet, slab, one-meter pit, one day labor (does not include cover), upgradable to WC Sehat Murah Sumade.	26
WC Tumbuh Sehat	Branded ceramic closet, slab, one day labor (does not include ring), upgradable to WC Ekonomis.	18
WC Sehat Murah Sumade	Branded ceramic closet, slab, concrete ring, one -meter pit, cover, two days labor.	8

Source: WSP 2012.

Note: Upgrading a product (rather than buying the upgraded product at the start) adds a day of labor.

Table 6.7 Travel Times in Tanzania to Reach Households for Latrine Construction
(minutes)

Method of transport	Average travel time	Minimum travel time	Maximum travel time
Foot	51	10	360
Bicycle	110	45	300
Vehicle	208	15	1,440

Source: PATH 2013.

Because of the distance, [it is] inconvenient to pay a fare to go and return compared to any gain.”

Because the supply chain is fragmented, much effort is spent aggregating materials for construction. In Tanzania, for example, masons building latrines spend about 70 percent of their time organizing material supply.

Marketing

Enterprises rely primarily on governments and NGOs for information about sanitation technologies and their characteristics and in marketing the benefits of improved sanitation. They do little to

market their services themselves. They focus on a limited geographical area and rely on referrals and walk-ins.

In Bangladesh, almost half of surveyed enterprises engaged in no marketing at all, and nearly 90 percent relied on word of mouth to inform customers of their products and services. Of the enterprises that did not market, nearly all said that they had enough business, so that marketing was not needed. In Indonesia, only about 20 percent of enterprises engaged in some form of marketing or advertising, and just 15 percent used sales agents. In Tanzania, only 30 percent of surveyed enterprises

Table 6.8 Supply Chain Constraints in Tanzania

Actor	Characteristics	Customers	Products	Constraints
<i>Input suppliers</i>				
Manufacturers, importers	Located in major towns, well capitalized	Wholesalers	Construction materials	Passive sales approach
		Retailers	High degree of specialization among manufacturers	Far removed from end customer
		Large construction projects	Importers have wider product range	Focus on immediate customers for construction commodities
		Households (very small amounts)		Little knowledge of end use Highly specialized
<i>Distributors</i>				
Wholesalers, retailers	In regional towns, formally registered, sufficiently capitalized, family owned	Smaller retailers	Construction materials, including latrine components, broken up from bulk supplies to sell in smaller lots	Products not sanitation specific
		Construction projects	Tools and equipment	Passive sales approach
		Households (small amounts)		Limited market information Sanitation only small part of business
<i>Local retailers</i>				
Hardware stores, retail shops	At ward and village level, sole proprietorships, thinly capitalized	Small construction projects	Construction materials sold in very small lots	Very thinly capitalized
		Households	Household consumer goods	On-site marketing because of localized market
			Farming inputs, especially fertilizer	Low share of sales from sanitation products Owners often engage in other income-generating activities, such as farming High cost of transport for goods

Table 6.8 (Continued)

Actor	Characteristics	Customers	Products	Constraints
<i>Masons</i>				
Construction workers	Little or no capital invested; village-level market. Face heavy demand for urban and large-scale construction projects; highly mobile	Households	Offer services only	Passive sales approach
		Construction projects	Slab production, construction advice, building and construction	Limited technical and business knowledge
			Latrine construction	Undertake other income-generating activities
				High cost to mobilize materials and get to site
				Lack of capital

Source: WSP 2013b.

reported any marketing, and almost 80 percent relied entirely on word of mouth.

Supply Chains

One factor preventing better alternatives from being offered to potential customers is the fragmented supply chain, in which independent enterprises manufacture or supply one or more types of materials or pieces of equipment (table 6.8). For most manufacturers, importers, and retailers, sanitation represents a very small part of their total sales. The availability of construction materials is thus driven by the demand for construction activities in other sectors. Materials and equipment that are part of separate supply chains converge at various levels of the supply chain (wholesale, retail, and consumer levels).

Households typically help construct their own latrines and toilets. But particularly where they do not have a latrine or toilet in their home, purchasing an improved sanitation solution can be challenging, because households often have to aggregate components and coordinate construction. Enterprises make little effort to market sanitation solutions or to improve coordination, exert quality control, or reduce costs within the supply chain. Actors that have the resources to address these challenges do not see sanitation as an important

part of their market; the enterprises closest to the market are very small and constrained in geographic reach. Few of these enterprises specialize in sanitation services. They find it hard to signal any unique quality of service outside of the immediate vicinity where reputation is attested to by word of mouth.

Most players in the supply chain take a very passive stance toward sanitation. The technologies used do not lend themselves to economies of scale or scope in production or stock management or to any kind of branding that might make marketing useful. There are no large well-resourced players for whom on-site sanitation is a large enough market to warrant intensive efforts to market solutions or coordinate activities across the supply chain.

Enterprises catering to poor households deliver value and are generating profits, but they find it difficult to scale up, horizontally or vertically, to offer compelling products and services to the poor. Where labor is the main input driver, some horizontal integration is possible by moving from low-technology manufacturing to semiskilled installation or pit emptying. Where the input requirement is capital, many enterprises will be limited in their capabilities.

Are Enterprises Interested in Increasing Investment and Serving the Poor?

Expanding coverage of improved sanitation among poor households will involve increasing production capacity, moving capacity to areas where demand exists, investing in marketing, bundling products and services, and developing and adopting new materials and technologies. This expansion may come through new players or additional investment by current suppliers. Whatever the source, it will require investment.

Intentions to Invest

Intentions to invest differ across countries. In Indonesia, 75 percent of enterprises said they planned to invest in the coming three years. In contrast, just 33 percent of enterprises in Bangladesh and less than half of enterprises in Tanzania (48 percent of hardware store owners and 38 percent of masons) intended to do so. In Peru, where most enterprises do not regard sanitation as a primary business, 87 percent were intending to expand their sanitation-related activities over the next three years.

In Bangladesh, most enterprises considering investment wanted to invest in stocking and expanding sales (80 percent) and manufacturing (77 percent) of latrine and toilet components. Few had interest in expanding into installation or repair of latrines and toilets or other sanitation-related businesses.

In Indonesia, 85 percent of enterprises were planning to increase the range of sanitation-related services, responding to signals from customers about the desire for service bundling. Enterprises involved primarily in construction of latrines and toilets were considering getting involved in designing and consulting on sanitation systems (70 percent), selling sanitation-related consumer products (45 percent), and treating and disposing of waste-

water (40 percent). The optimism of construction enterprises is reflected in the number of households they expected to serve the following year. Half of respondents in the construction business were sure that they would serve more than 500 households the following year—a quadrupling of volume from the average of 143 households at the time of the interviews. Pit-emptying respondents expected only a modest increase in the number of customers.

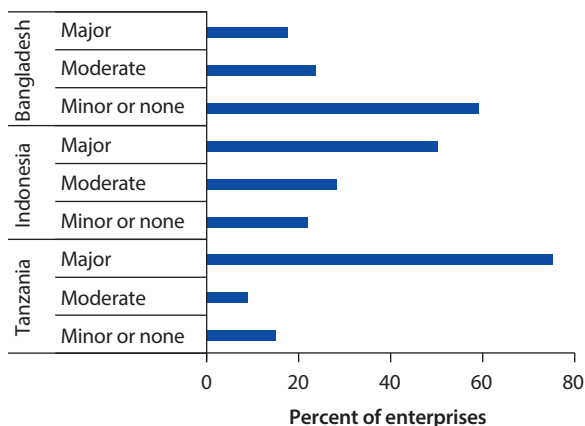
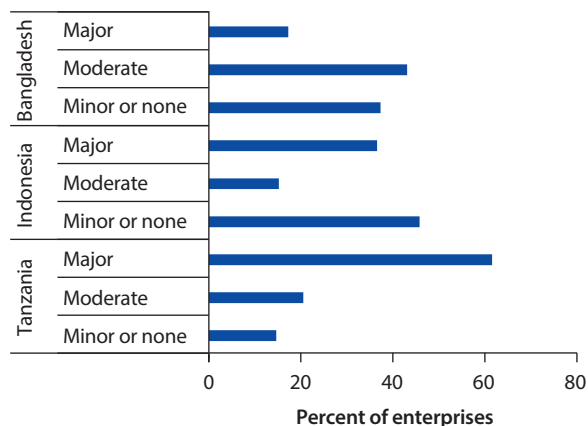
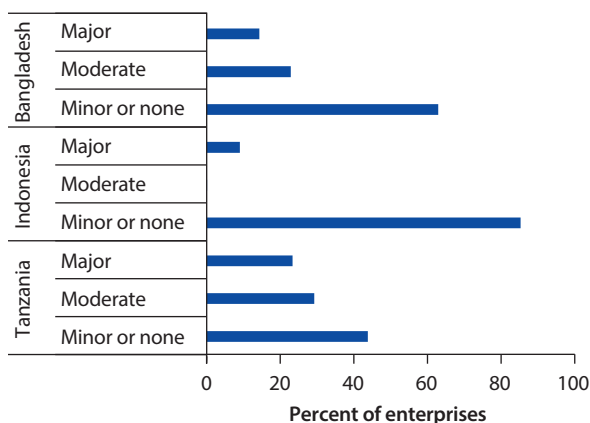
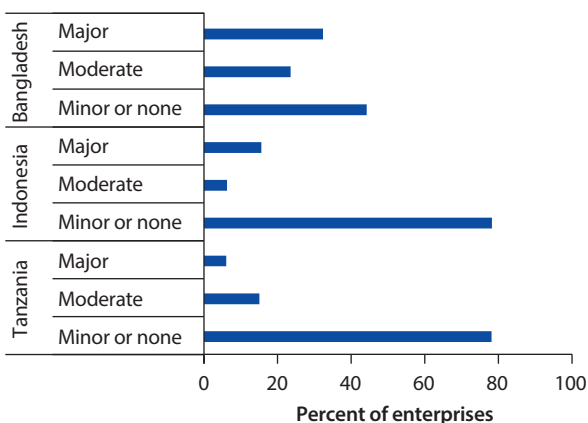
In Tanzania, nearly all enterprises contemplating investment were thinking of expanding their current lines of business rather than moving into other sanitation-related activities.

Perceived Risks

Asked to name obstacles to investment, 50 percent of enterprises in Indonesia and 75 percent in Tanzania indicated that they were “very concerned” about the level of demand (figure 7.1). In Bangladesh, a significant proportion of enterprises worried about finding reliable workers to manage additional business. In Tanzania, 63 percent of enterprises were concerned that investment would be too costly to be profitable. In Tanzania and Bangladesh, around 50 percent of enterprises considered that difficulty in choosing what to invest in was a moderate or major problem.

Perceptions of the Poor as a Target Market

Perceptions of the poor as an attractive customer segment vary. In Bangladesh and Indonesia, more than 60 percent of enterprises agreed or strongly agreed that the poor were target customers for them. In contrast, just 48 percent of respondents in Tanzania did so, with a third strongly disagreeing that this was the case (figure 7.2). More than three-quarters of Bangladeshi enterprises indicated that the poor do

Figure 7.1 Enterprises' Assessment of Obstacles to Investment in Sanitation in Bangladesh, Indonesia, and Tanzania**a. Demand****a. Cost****c. Choice****d. Labor**

not pay on time, a view shared by smaller majorities in Indonesia (54 percent) and Tanzania (63 percent).

In Tanzania, respondents recognized that a significant number of households lacked improved sanitation. Masons were much more likely than hardware stores to target the poor. Less than a quarter of hardware store owners or managers agreed or strongly agreed that poor households are their major target customers. In contrast, 91 percent of masons agreed or strongly agreed that the poor were a major target group.

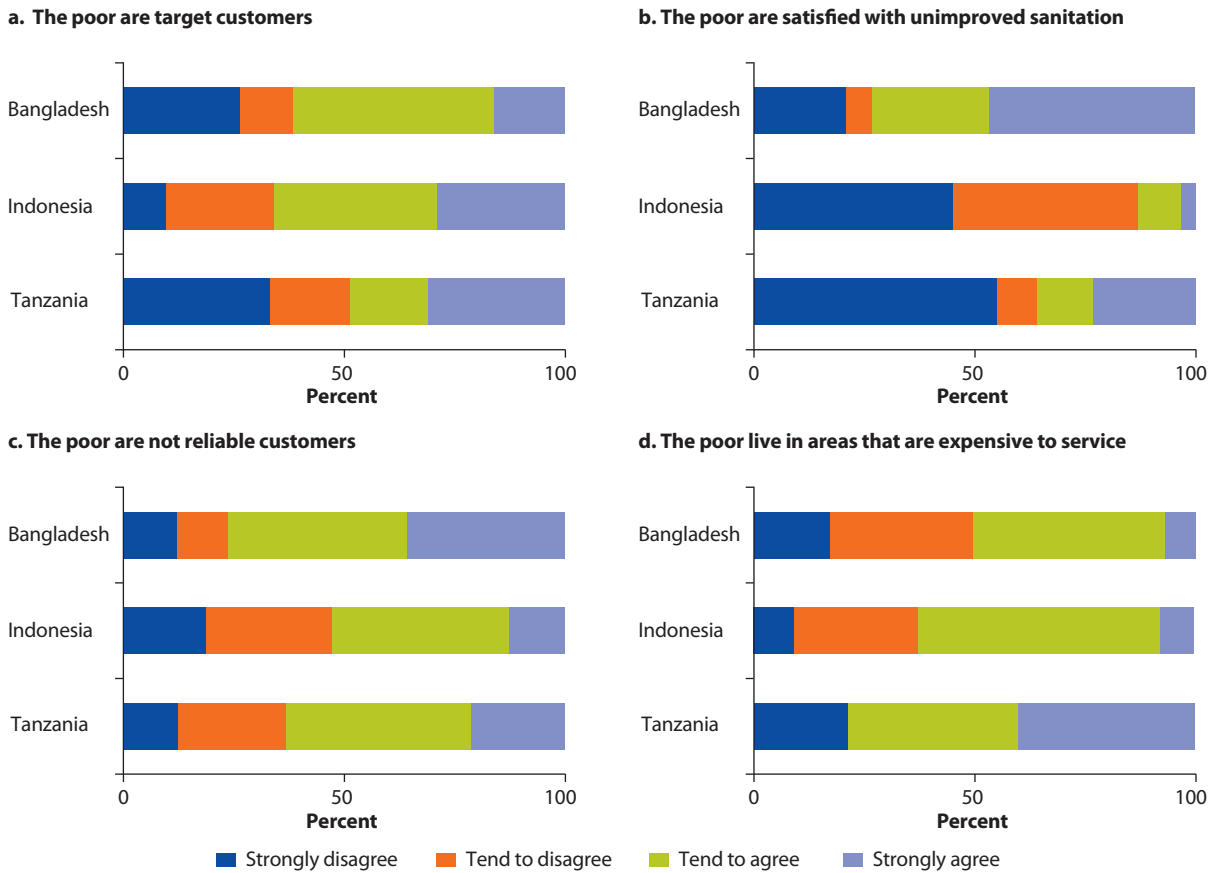
A majority of enterprises in all three countries (77 percent in Bangladesh, 54 percent in Indonesia, and 63 percent in Tanzania) believe that the poor are not reliable customers in terms of paying on time. A majority of Peruvian enterprises (57 percent) disagreed that a 10–20 percent price reduction would increase their sales to poor households. They agreed that the inability of poor

households to make large cash outlays is the most important constraint on their ability to pay.

In Indonesia, enterprises involved in pit emptying did not view poor households as an important part of their market, because poor households tend not to have pits or septic tanks that need emptying. Construction businesses were more engaged with these households: nearly 70 percent agreed or strongly agreed that poor households were their major target customers. The majority of both pit-emptying enterprises (50 percent) and construction companies (70 percent) agreed that the poor lived in areas that would be harder and therefore more costly to reach. About half of these enterprises thought that poor customers would not make timely payments.

More than three-quarters of enterprises in Tanzania indicated that the poor lived in areas that were expensive to service because of transport and infrastructure problems.

Figure 7.2 Enterprises' Perceptions of the Poor as Target Customers and Assessment of Their Attitudes toward Sanitation in Bangladesh, Indonesia, and Tanzania



Is the Investment Climate Limiting Private Sector Involvement?

Government policy and practice, the quality of infrastructure, and access to finance shape the way enterprises perceive the tradeoff between risk and return when considering expanding their business. All of these aspects of the investment climate affect the sanitation sector.

Government Policy and Practice

Table 8.1 summarizes enterprises' views on the extent to which different aspects of governance acted as obstacles to doing business. It shows that enterprises in Peru and Tanzania more frequently identified governance issues to be major to severe obstacles.

Lack of Market Intelligence and Inability to Conduct Research and Development

Enterprises identified few restrictive actions arising from government policy or action that would prevent them from entering the market. The problem is therefore not what governments are doing but what they are not doing.

None of the countries had specific mechanisms or incentives set up to promote private sector entry into the market. Few enterprises in Indonesia could point to specific government programs that prioritized sanitation service delivery to the poor. In Tanzania, few enterprises could identify institutions that could address the needs of the poor in sanitation.

Two areas emerge as requiring proactive action from government if a market-based approach to sanitation service delivery is to result in widespread access by the poor: provision of market intelligence and the facilitation of entry by enterprises that have research and development (R&D) capabilities.

Even among existing enterprises, there is concern about the profitability of their planned investments and the regularity of demand by the poor. Sanitation to the poor is a nascent market, in which entry costs for first movers are high. Enterprises lack the analytical tools to determine the existence of a potential market that needs servicing. Without a clear idea of the volume and nature of market demand, they have no way of knowing how supply structures and offers might need to change to meet it. Lack of information probably also increases enterprises' perceptions of risk.

Between 40 and 50 percent of enterprises in Bangladesh, Indonesia, and Tanzania believe that technological improvements are necessary to better meet the needs of the poor, who often live in flood-prone or steeply sloped areas, where standard approaches do not work well (figure 8.1). Few enterprises indicated that the availability of appropriate, affordable technology would motivate them to specifically cater to poor households, however (although in Tanzania, 75 percent of

Figure 8.1 Enterprises' Views on Whether Technological Improvements Are Needed to Address Problems Where Poor Households Live

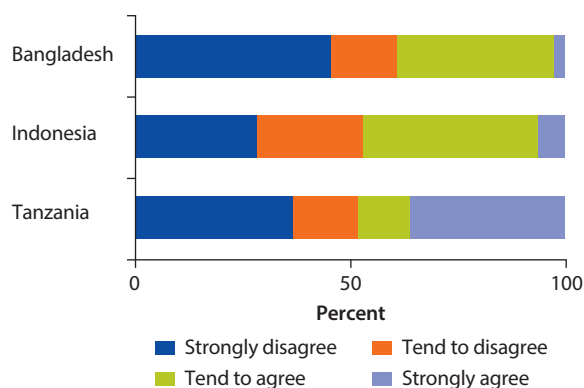


Table 8.1 Enterprises' Perceptions of Governance-Related Obstacles in Bangladesh, Indonesia, Peru, and Tanzania (percent of enterprises identifying issue as an obstacle)

Country/severity	Corruption	Unpredictability (including lack of consistency of local government administration)	Political instability	Restrictions on entry into markets in other locations	Project development procedures
<i>Bangladesh</i>					
None/no view	35	32	15	53	65
Minor-moderate	50	59	56	38	35
Major-very severe	15	9	29	9	0
<i>Indonesia</i>					
None/no view	84	88	81	66	75
Minor-moderate	3	9	13	22	16
Major-very severe	13	3	6	13	9
<i>Peru</i>					
None/no view	48	33	19	52	38
Minor-moderate	19	29	43	24	33
Major-very severe	33	38	38	24	29
<i>Tanzania</i>					
None/no view	39	36	39	27	27
Minor-moderate	15	30	33	55	33
Major-very severe	45	33	27	18	39

masons, who engage much more directly with households than do hardware stores, agreed with the statement).

Enterprises look to government for innovation. Government should not necessarily be developing technology, but it can actively promote research and development on sanitation solutions that are suited to the living conditions and life aspirations of the poor, through grants, patent protection, contracts, and accreditation systems.

Bureaucracy, Uncertainty, and the "Hassle Factor"

Enterprise perspectives on the impact of corruption vary considerably. In Indonesia, where enterprises reported paying up to 9 percent of annual sales in payments to "get things done," corruption was generally not seen to be a significant problem but instead regarded as part of the rules of the game. In Tanzania, 45 percent of enterprises reported that corruption was a major to very severe obstacle, but two-thirds said they did not know how much they paid annually in informal gifts.

In Bangladesh and Tanzania, slightly more than half of enterprises had obtained some kind of business permit or license. In contrast, in Indonesia, 85 percent had not. Enterprises that had obtained a permit did so for pit emptying, which is a regulated activity. Among respondents, 80 percent in Bangladesh and 90 percent in Indonesia said that permits and the need to obtain them represented no or only a minor obstacle to doing business. In Tanzania, 24 percent of enterprises saw it as a severe obstacle.

Infrastructure

Table 8.2 summarizes enterprises' assessment of the extent to which inadequate infrastructure acts as an obstacle to their operations. In Bangladesh, more than 60 percent of enterprises viewed the water supply as a major to severe obstacle. In all countries but Peru, a majority of enterprises viewed transport as a problem. Enterprises in Tanzania were more likely than enterprises in other countries to cite all aspects of infrastructure provision (electricity,

Table 8.2 Enterprises' Perceptions of Infrastructure-Related Obstacles in Bangladesh, Indonesia, Peru, and Tanzania
(percent of enterprises identifying issue as an obstacle)

Country/severity	Electricity	Telecommunications	Water	Transport
<i>Bangladesh</i>				
None/no view	44	35	6	21
Minor-moderate	50	53	32	68
Major-very severe	6	12	62	12
<i>Indonesia</i>				
None/no view	91	53	91	50
Minor-moderate	6	31	6	16
Major-very severe	3	16	3	34
<i>Peru</i>				
None/no view	67	76	86	57
Minor-moderate	19	14	5	29
Major-very severe	14	10	10	14
<i>Tanzania</i>				
None/no view	30	39	39	21
Minor-moderate	33	21	24	36
Major-very severe	36	39	36	42

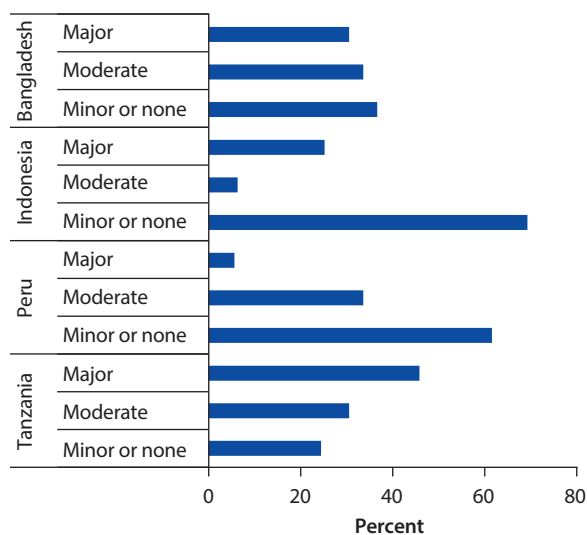
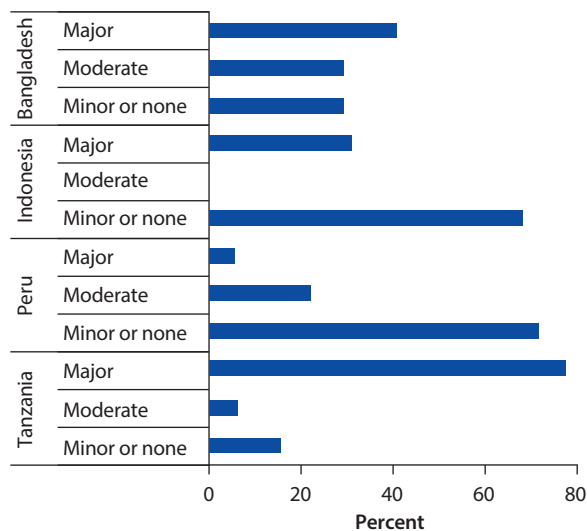
Figure 8.2 Enterprises' Assessment of Inadequate Access to Finance as an Obstacle to Current Operations in Bangladesh, Indonesia, Peru, and Tanzania**a. Overall operations****b. Ability to serve poor households**

Table 8.3 Percentage of Sanitation Enterprises in Bangladesh, Indonesia, Peru, and Tanzania with Bank Accounts or Line of Credit

Financial instrument	Bangladesh	Indonesia	Peru ^a	Tanzania
Bank account	47	22	67	39
Loan or line of credit from a financial institution	52	41	56	21

^a In Peru, interviewed personnel in some enterprises reported they did not know if the enterprise had a bank account (11 percent) or loan/line of credit (6 percent).

telecommunications, water, and transport) as major to severe obstacles to their operations.

Access to Finance and Financial Services

Enterprises considered inadequate access to finance an obstacle to both their operations in general and their ability to reach poor households. A majority of enterprises in all countries except Indonesia cited access to finance as a moderate or major obstacle (figure 8.2).

A large share of the money that enterprises invested in their sanitation business came from their own or family funds (82 percent in Bangladesh, 72 percent in Indonesia). Smaller portions came from microcredit institutions and grants from governments or NGOs. Only a small share of financing

came from commercial financial institutions (0.8 percent in Bangladesh, 11 percent in Indonesia). In Tanzania, it was harder to piece together a consistent picture of investment funding, but it appeared that most hardware stores and masons financed investment from their own resources.

Interaction with the banking system varied across the countries. The proportion of interviewed enterprises with a bank account ranged from 22 percent (Indonesia) to 47 percent (Bangladesh) (table 8.3); the proportion with a loan or line of credit ranged from 21 percent (Tanzania) to 52 percent (Bangladesh). Just 28 percent of enterprises in Bangladesh and 53 percent in Indonesia have loans or lines of credit from the banking system. Only in Peru did a majority of enterprises have bank accounts.

Conclusions and Recommendations

Governments in Bangladesh, Indonesia, Peru, and Tanzania recognize that millions of their people in rural and semi-urban areas lack improved sanitation, but they have neither the resources nor the capacity to redress the problem directly. Together with development partners, they are looking to the domestic private sector to play a larger role in expanding access to improved sanitation.

The private sector is already serving poor households in the region. But the poor are not very interested in buying the improved on-site sanitation solutions that are being offered to them. To help the private sector improve its ability to meet the needs of this segment of the population, governments can take a variety of actions, described here.

Conclusions

The sanitation market in the four countries studied is large. Significant commercial and technological constraints prevent the domestic private sector from tapping it, however.

Market Potential Is Great

The market for improved on-site sanitation services in the four study countries is already large: supplying new systems and replacing old ones is conservatively estimated to be worth \$300 million a year. The potential market is much larger: providing improved sanitation facilities to the estimated 228 million people in these countries who lack access would involve sales of at least \$2.6 billion. Poor people alone would account for sales worth about \$700 million, and new customers would increase the value of the replacement market to about \$550 million a year. There is also significant market potential in repairing facilities and collecting and disposing of septage (in Indonesia alone the potential market for truck-based collection services is about \$100 million a year).

Enterprises Are Not Offering Products and Services Households Want to Buy

The main constraint to a scaling up private provision and realizing the market's potential is that business are not offering households products and services they want to buy. Many poor (and not-so-poor) people are unwilling to pay for the kinds of improved sanitation solutions currently available in the market. As currently structured, the supply chain delivering these solutions appears unable to offer better value.

Demand. Sanitation is a low priority for many poor households. Inability to pay does not seem to be the main reason for low demand: poor households lay out significant sums for other consumer durables, such as mobile phones. Instead, it appears that many households that are unable to afford the type of sanitation they want prefer to “make do” with inferior solutions rather than purchase what they can afford. The fact that even better-off households often lack improved sanitation means that there is not much of an “emulation” push for poorer households to move up the sanitation ladder.

Poor rural households have seasonal and unsteady cash flow and limited access to financial services that could help them smooth consumption. Weather and its impact on transport compound the seasonality of the market. Enterprises serving this market must contend with these challenges.

The problem of low prioritization and limited ability to pay is complicated because the market is heterogeneous. The drivers of household decisions to stop open defecation are likely to be different from the drivers of household decisions to move up the sanitation ladder. So the strategies used to motivate households still engaged in open defecation to purchase improved sanitation may have to differ from the strategies used to motivate households that already have basic sanitation. And some

households not using improved sanitation may be very costly to reach because of their isolation or because cheaper technologies do not fit their circumstances.

Enterprise viability and business models. What consumers want differs from what enterprises are providing. Poor people want good-quality products that are easy to maintain, accessibility of service, credibility and choice, and completeness of service. Most private enterprises manufacture and sell components, build sanitation units, or provide pit-emptying services. Few offer a full-service option, most offer very rudimentary technologies, and the burden of coordinating construction usually falls on the consumer.

Most enterprises in the sector are profitable; enterprises in Indonesia and Peru in particular have the potential to increase their profits through value-adding. But the industry is characterized by very localized microenterprises with low turnover. The prevailing technology is generic and focused on manufacture by microenterprises; it does not lend itself to branding or coordinated marketing, and there are few opportunities to reduce costs. Few enterprises invest in marketing to increase their sales. Even fewer have the business skills to figure out how to use labor to create more value.

Bundling of services may be one way in which sanitation enterprises could exploit their knowledge of the market. Many enterprises recognize that bundling and expanding the scope of their activities is important to their customers. But like other ways of expanding business, adopting bundling strategies or pursuing more nuanced marketing activities involves investment, which enterprises do not appear interested in making.

One reason why the industry is not supplying products people want to buy is that the development of sanitation solutions has traditionally been seen as the preserve of the public sector, aided by NGOs. The absence of efforts to develop and market alternative solutions also reflects the existing industry structure.

Most players in the supply chain take a very passive stance toward sanitation. There are no large, well-resourced players for whom on-site sanitation is a big enough market to warrant intensive efforts to market solutions or to coordinate activities across the supply chain. For their part, enter-

prises closest to the market are very small and constrained in their geographical reach. Few agents specialize in the provision of sanitation services. Most enterprises in the sector are either hardware store or a concrete fabricators, for whom sanitation makes up a small share of their business.

Attitudes toward investment and serving poor customers. Expanding coverage of improved sanitation among poor households will require expanding production capacity, relocating capacity to areas where demand exists, investing in marketing, bundling products and services, and developing and adopting new materials and technologies.

Enterprises recognize that the market for improved on-site sanitation will continue to grow, but they are concerned about the regularity of demand. A significant number of Indonesian enterprises were planning to expand the range of sanitation-related services they offered, responding to signals from customers about their desire for service bundling. In contrast, in Bangladesh enterprises contemplating investment focused on expanding the scale of what they currently do: manufacturing and selling latrine and toilet components. Few had any interest in expanding into installation and repair of latrines and toilets or other sanitation-related business lines. The same attitude was evident in enterprises in Tanzania.

Perceptions of the poor as an attractive customer segment vary. In Bangladesh and Indonesia, more than 60 percent of enterprises agreed or strongly agreed that the poor were target customers for them. This figure was just 48 percent in Tanzania, where a third of all respondents strongly disagreed that this was the case. More than three-quarters of Bangladeshi enterprises indicated that the poor do not pay on time, a view shared by smaller majorities in Indonesia (54 percent) and Tanzania (63 percent).

In Tanzania, more than three-quarters of enterprises believe that the poor live in areas that are expensive to service because of transport and infrastructure problems.

A Weak Investment Climate Is Constraining Investment

Despite a variety of high-level strategies, plans, and statements of intent, central and lower-level governments seem to have little impact on private provision of sanitation: enterprises are typically unaware of

national policy, and implementation by local level governments is undirected and poorly funded.

Where governments have been involved in the direct supply of sanitation services to poor households, the top-down approach has not been very successful. But government provision and subsidies do not seem to be a significant source of distortion to the market. Most enterprises that provide sanitation services to households are typically too small and localized to be affected by constraints that affect the formal business sector.

Enterprises in the sector believe that governments should concentrate on addressing the market imperfections related to households' understanding of the benefits of improved sanitation and the nature of on-site solutions and on promoting the entry of enterprises able to undertake transformative research and development on new technologies and materials not within the capacity of present players. They indicate that the quality of transport infrastructure is an obstacle to increased investments. Tanzanian enterprises also cite obstacles in other infrastructure sector, and enterprises in Bangladesh identify water supply as an issue. Access to finance and financial services is low except in Peru, reducing enterprises' ability to invest and cater to the poor.

Recommendations

Scaling up private sector provision of improved sanitation to the poor requires addressing the commercial constraints that confront the sector. These constraints are inherent in the technologies used and the supply chains that support service provision.

Governments, development partners, and the business community could help relax these constraints in a variety of ways (table 9.1). They could encourage larger businesses and funders of sanitation to develop technologies with more consumer appeal, help reduce distribution costs, inject more proactive and commercial coordination into the supply chain, and help develop financial products that would enable poor households to manage the upfront costs of purchasing latrines, toilets, and septic tanks. Over the longer term, they could solve some of the infrastructural problems that raise the costs of connecting rural markets to urban centers of production of components and materials.

The study's recommendations focus primarily on the constraints to expanded private provision of on-site sanitation inherent in current technologies and in the supply chains that support service provision. It is these constraints that lead enterprises to offer products and services households are not very interested in buying.

Table 9.1 Policy Recommendations for Increasing the Provision of Improved Sanitation to the Poor

Policy goal	Recommended action	Actor
<i>Stimulate demand by the poor</i>		
Enhance consumer awareness	<p>1. Improve household understanding of improved sanitation: complement private marketing of sanitation solutions to fill gaps in community understanding and address misinformation about the capabilities and maintenance requirements of improved on-site sanitation.</p> <ul style="list-style-type: none"> • Develop education and awareness campaigns directly targeting households that already have some kind of sanitation, to complement campaigns targeting open defecation and address limited household understanding of the characteristics of improved sanitation systems. • Ensure these campaigns address the gender dimensions of sanitation awareness and decision making where appropriate. 	Governments, development partners
Improve affordability	<p>2. Smooth and subsidize poor household sanitation expenditures: use instruments to help very poor households mobilize cash to pay for improved latrines/toilets that do not distort markets.</p> <ul style="list-style-type: none"> • Develop and support facilities that enable payment on installment terms, either intermediated through agency arrangements with manufactures and suppliers of components or through financial institutions that provide consumer loans to households. • Develop and finance targeted subsidies for extremely poor households or in locations where suitable technology cannot be delivered at reasonable costs. 	Governments, development partners
<i>Encourage innovation and facilitate efforts to relax business model and supply chain constraints</i>		
Spur innovation	<p>3. Stimulate and if necessary financially support the development of affordable technologies with consumer appeal: help develop technologies (preferably proprietary or licensable) that use materials that are light and easy to transport, easy to clean and maintain, and amenable to mass production, branding, and marketing through distribution networks coordinated and supported by manufacturers. Also help develop modular technologies that enable incremental improvements to sanitation facilities as household interest grows and as households are able to mobilize funds.</p> <ul style="list-style-type: none"> • Explore options for stimulating research and development by the private sector such as through patents, contracts and grants. • If the preferred model of commercial development and roll-out of proprietary technology is not forthcoming, consider expanding funding by the international development community of research and development to develop technologies that are appropriate for delivery through a market-based system. 	Governments, development partners
Encourage larger businesses to enter the on-site sanitation sector	<p>4. Foster the entry of well-capitalized enterprises with marketing skills to drive consumer interest and capacity to coordinate supply chains, and support installation and maintenance by small-scale local enterprises.</p> <ul style="list-style-type: none"> • Support the collection and dissemination of market intelligence such as information on the size and nature of the market, including that significant segments of households above the poverty line are a part of the market. • Explore options for incentives to entry including start-up financing and support. • Encourage the formation of associations of enterprises involved in sanitation to develop a distribution channel to the 'last mile' and assist in the dissemination of market and technical information. 	Governments, development partners
Support quality assurance	<p>5. Enable quality assurance and accreditation: with the entry of larger businesses in the supply chain, assist the microenterprises at the front end to more credibly signal service quality to a larger market, and assure potential purchasers that they will get value for money and durability and continuity of service.</p> <ul style="list-style-type: none"> • If capacity exists, introduce public sector certification of technologies, or government endorsement of international certification by development partners, but avoid government regulation of standards. • Facilitate industry based accreditation systems for enterprises or solutions to enable manufacturers to offer warranties on installation. 	Governments, development partners, business community

Table 9.1 (Continued)

Policy goal	Recommended action	Actor
Support business capacity development	<p>6. Help the microenterprises currently delivering the bulk of on-site solutions expand their limited business expertise so that they can better participate in an expansion of supply.</p> <p>Facilitate capacity building through partnerships with larger actors in the supply chain in agency, distribution, or subcontracting networks that also address the capacity and commercial issues of the front end of the supply chain.</p> <ul style="list-style-type: none"> • Develop elements of public sector sanitation marketing and education campaigns that can be used as information and marketing material by small-scale private sanitation service providers. 	Governments, development partners
<i>Improve investment climate and sectoral policy</i>		
Facilitate private provision	<p>7. Clearly spell out an active (rather than default) role for the private sector in government strategies and policies and improve sector investment planning to identify markets with potential for private participation.</p> <ul style="list-style-type: none"> • Detail and publicize policies to facilitate the private sector role, indicate responsibilities across different levels of government for implementation, especially where local governments have in-principle responsibility, mandates, and resourcing for sanitation. 	Governments, development partners
Regulate septage disposal	<p>8. Formulate practical standards and protocols for disposal of fecal sludge and build the capacity to implement them; develop safe arrangements for disposal to accompany the growth of private sector pit and septic tank emptying.</p> <ul style="list-style-type: none"> • Develop sites for treatment of fecal sludge, along with protocols for treatment. • Explore options for financing disposal sites, including public-private partnerships. 	Governments, development partners

Appendix

Table A.1 Types of Improved and Unimproved Sanitation

Type of sanitation	Description
<i>Improved</i>	
Flush toilet	Uses a cistern or holding tank for flushing water and a water seal (a U-shaped pipe below the seat or squatting pan) that prevents the passage of flies and odors. A pour flush toilet uses a water seal but uses water poured by hand for flushing (no cistern is used).
Piped sewer system (sewerage)	Designed to collect human excreta (feces and urine) and wastewater and remove them from the household environment. Sewerage systems consist of facilities for collecting, pumping, treating, and disposing of human excreta and wastewater.
Septic tank	Consists of a water-tight settling tank, which is normally located underground, away from the house or toilet. The treated effluent of a septic tank usually seeps into the ground through a leaching pit. It can also be discharged into a sewerage system.
Flush/pour flush to pit latrine	System that flushes excreta to a hole in the ground or leaching pit (protected, covered).
Ventilated improved pit latrine (VIP)	Dry pit latrine ventilated by a pipe that extends above the latrine roof. The open end of the vent pipe is covered with gauze mesh or fly-proof netting; the inside of the superstructure is kept dark.
Pit latrine with slab	Dry pit latrine that uses a hole in the ground to collect excreta and a squatting slab or platform that is entirely supported on all sides, easy to clean, and raised above the surrounding ground level to prevent surface water from entering the pit. The platform has a squatting hole or is fitted with a seat.
Composting toilet	Dry toilet into which carbon-rich material (vegetable wastes, straw, grass, sawdust, ash) is added to the excreta. Special conditions are maintained to produce inoffensive compost. A composting latrine may or may not have a urine separation device.
<i>Unimproved</i>	
Flush/pour flush to elsewhere	System in which excreta are flushed into the street, yard/plot, open sewer, ditch, drainage way, or elsewhere (not into a pit, septic tank, or sewer).
Pit latrine without slab	Consists of a hole in the ground without a squatting slab, platform, or seat. An open pit is a rudimentary hole.
Bucket or other container	Container is used to retain feces and sometimes urine and anal cleaning material. Contents are periodically removed for treatment, disposal, or use as fertilizer.
Hanging toilet latrine	Device is built over the sea, river, or other body of water, into which excreta drops directly.
No facility, bush, or field	Excreta are deposited on the ground and covered with a layer of earth (cat method).

Source: WHO/UNICEF 2012.

Table A.2 Demographic, Geographic, and Socioeconomic Indicators for Bangladesh, Indonesia, Peru, and Tanzania, 2010

Item	Bangladesh	Indonesia	Peru	Tanzania
<i>Demographic and area information</i>				
Population (millions)	150	240	48	45
Rural population (millions)	107	120	23	34
Land area (km ²)	147,570	1,811,570	1,280,000	885,880
<i>Key socioeconomic indicators</i>				
Per capita Gross National Income (GNI) (purchasing parity) (current US\$)	1,649	4,180	8,790	1,410
Gini coefficient	0.32	0.34 (in 2005)	0.48	0.37 (in 2007)
Percent of population living on less than US\$2 a day (purchasing power parity)	77	46	13	88 (in 2007)
Percent of population living below national poverty line	32	13	31	33 (in 2007)

Source: World Bank 2013.

Table A.3 Sanitation Indicators for Bangladesh, Indonesia, Peru, and Tanzania

Indicator	Bangladesh	Indonesia	Peru	Tanzania
Percent of entire population with Improved sanitation (2010)	56	54	71	10
Percent of rural population with Improved sanitation (2010)	55	39	37	7
Number of rural people with access to improved sanitation (2010) (million)	58.97	46.85	17.77	2.37
Annual loss from lack of sanitation (million dollars)	4,200	6,300	—	206

Sources: Data on annual monetary loss from lack of sanitation are from WSP 2013.

All other data are from WHO/UNICEF 2013a, 2013b, 2013c, 2013d.

Note: — = Not available.

Table A.4 Size, Formality, and Type of Enterprise in Sanitation Sector in Bangladesh, Indonesia, Peru, and Tanzania

	Bangladesh	Indonesia	Peru	Tanzania
<i>Employment</i>				
Number of full-time employees	3	3	204	2
Years in in operation	11	6	14	9
Years of experience of manager	14	7	12	4
<i>Registration/license</i>				
Percent of all enterprises	50	9	90	67
<i>Type (percent of all enterprises)</i>				
Shareholding company	0	6	24	0
Sole proprietorship	97	3	10	70
Partnership	0	0	43	3
Community-based organization	0	0	5	3
Nonprofit organization	3	0	5	0
Not legally constituted	0	91	0	24
Other	0	0	14	0

Note: Totals may not add to 100 percent due to rounding.

Table A.5 Summary Characteristics of Sanitation Enterprises in Bangladesh, Indonesia, and Tanzania

Country/ type of enterprise	General characteristics	Estimated total transfers by industry to economy (through labor, finance, tax)	Line of business	Finance and profitability ^a	Outlook toward and view of the poor
<i>Bangladesh</i>					
Prefabricated cement suppliers and builders	<ul style="list-style-type: none"> Estimated 4,500 enterprises nationally 85% microenterprises 60% have trade licenses Own or rent factory space 	\$2,700/enterprise x 4,500 enterprises = \$12 million	<ul style="list-style-type: none"> Manufacture and supply of prefabricated cement products; construction and installation More than 50% of revenue comes from sanitation At least 50% of cost is materials 	<ul style="list-style-type: none"> Average capitalization is \$5,300 97% cover costs; average margin is 53% (higher in Chittagong and Dhaka region) High level of financing use (multilateral financial institutions, state banks, and so forth) 	<ul style="list-style-type: none"> 30% will increase investment in a year; 50% will invest in 3 years linked to easy markets 75% believe low price main motive of the poor, need subsidy and demand creation for quality latrine
<i>Indonesia</i>					
Construction enterprises	<ul style="list-style-type: none"> Estimated 200 enterprises nationally 70% microenterprises; 30% small 85% not legally constituted (informal single proprietor) but have business license 	\$13,700/enterprise x 200 enterprises = \$3 million	<ul style="list-style-type: none"> Mainly household installation, but repairs and sale of components also important for business profitability 89% of revenues are from sanitation 80% of cost is materials (little room for innovation) 	<ul style="list-style-type: none"> Average capitalization is \$4,800 100% are profitable, average margin is 73% Half of enterprises keep financial records Majority have loans from commercial banks, nonbank financial institutions, and state banks 	<ul style="list-style-type: none"> Optimistic: 80% plan to invest; median investment is \$1,000 View the poor as primary client but not certain of their ability to pay even with financing
Pit emptiers	<ul style="list-style-type: none"> Estimated 750 enterprises nationally 60% microenterprises; 40% small Not legally constituted, but 70% have emptying license 	\$3,900 x 750 enterprises = \$3 million	<ul style="list-style-type: none"> Use vacuum trucks; districtwide operation 100% of revenues are from sanitation 93% of cost is labor 	<ul style="list-style-type: none"> Average capitalization is \$4,600 100% are profitable; average margin is 87% No financial records A few have loans from private banks and nonbank financial institutions 	<ul style="list-style-type: none"> 60% plan to invest, median investment is \$3,000 Poor are not a primary target

(Continued to next page)

Table A.5 (Continued)

Country/ type of enterprise	General characteristics	Estimated total transfers by industry to economy (through labor, finance, tax)	Line of business	Finance and profitability ^a	Outlook toward and view of the poor
<i>Tanzania</i>					
Masons	70% informal Own or rent factory space	\$3 x 240,000 units sold per year = \$720,000	<ul style="list-style-type: none"> • Mainly construction work; sanitation seen as occasional form of employment; masons engage in other income-generating activities, such as farming • 35% of revenues are from sanitation • Up to 70% of labor cost is transport • San Plat mold a big constraint 	<ul style="list-style-type: none"> • Little or no capitalization • No financial records 	<ul style="list-style-type: none"> • Only 30% plan to expand service range • Main target market is the poor
Hardware stores	Legally constituted as sole proprietors	—	<ul style="list-style-type: none"> • Wholesale and retail trade of inputs into construction of on-site sanitation • Inventories and transport are largest costs • San Plat mold a big constraint 	<ul style="list-style-type: none"> • Most enterprises earn profits; large enterprises have margins of more than 50 percent 	<ul style="list-style-type: none"> • Only half have expansion plans • Do not target the poor

Note: — = Not available.

^a Margins in this column refer to profits as a portion of total revenues.

Endnotes

- 1 In 2011, on a purchasing power parity basis, per capita Gross National Income (GNI) was US\$1,940 in Bangladesh, US\$4,500 in Indonesia, US\$9,440 in Peru, and US\$1,500 in Tanzania, according to the World Development Indicators.
- 2 The data from surveyed enterprises in Peru were more limited than they were for the other countries.
- 3 In Peru, where 12 percent of the rural population and 66 percent of the total population have access to sewerage, the study authors also interviewed sewer operators, to provide context.
- 4 For information on the Joint Monitoring Program, see WHO/UNICEF 2012.
- 5 For example, a 2011 study by the Water and Sanitation Program shows that the cost-benefit ratio for moving from open defecation to a shared latrine in a rural district in Indonesia was 5.4, whereas the ratio for moving from a shared latrine to a private septic tank was 2.
- 6 Among the households covered by the focus group discussions in Bangladesh, nearly 80 percent of which were classified as poor or extremely poor, 82 percent had a mobile phone and 25 percent had more than one mobile phone.

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