

Key Points

- From a citywide sanitation perspective, providing safely managed sanitation services for all requires extending the partnership between the public and private sectors as well as expanding state penetration across the sanitation value chain.
- The private players are willing to innovate and commit for the long term as the sanitation market is generally seen as having potential.
- While the private sector sees indirect service provision by the state as an opportunity, the lack of state penetration in sanitation service provision is a challenge.
- The solutions for sustainable sanitation must be technology driven. As a way forward, the private sector and development partners can be tasked with research and development of new technologies, but public support is necessary for financing manufacturing firms or training centers to achieve quality products at affordable prices.

Revisiting the Public–Private Partnership for Rapid Progress on the Sanitation-Related Sustainable Development Goals

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The Global Sanitation Challenge and Need for Improved Partnership

Rapid progress on the sanitation-related Sustainable Development Goals (SDGs) is one of the most formidable challenges facing our world. Globally, 61% people lack access to safely managed sanitation services (WHO/UNICEF Joint Monitoring Programme 2017).¹ The sanitation challenges are particularly severe in East Asia and the Pacific, South Asia, and sub-Saharan Africa.

Capital requirements for providing access to safely managed sanitation services are projected to be huge, and government finances for the same are not sufficient. On the other hand, private sector investment in the water and sanitation sector, especially in the sanitation sector, has remained low in Asian regions, specifically in South Asia (Figure 1). A recent study by ADB estimates the infrastructure needs of the water and sanitation sector in Asia up to 2030 to amount to \$787 billion in 2015 prices (ADB 2017 cited in Yoshino et al. 2019), against a backdrop where the current public tax expenditures are not sufficient, and the level of total private investment

¹ See World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) Joint Monitoring Programme for Water Supply, Sanitation and Hygiene. Sanitation. <https://washdata.org/monitoring/sanitation>.

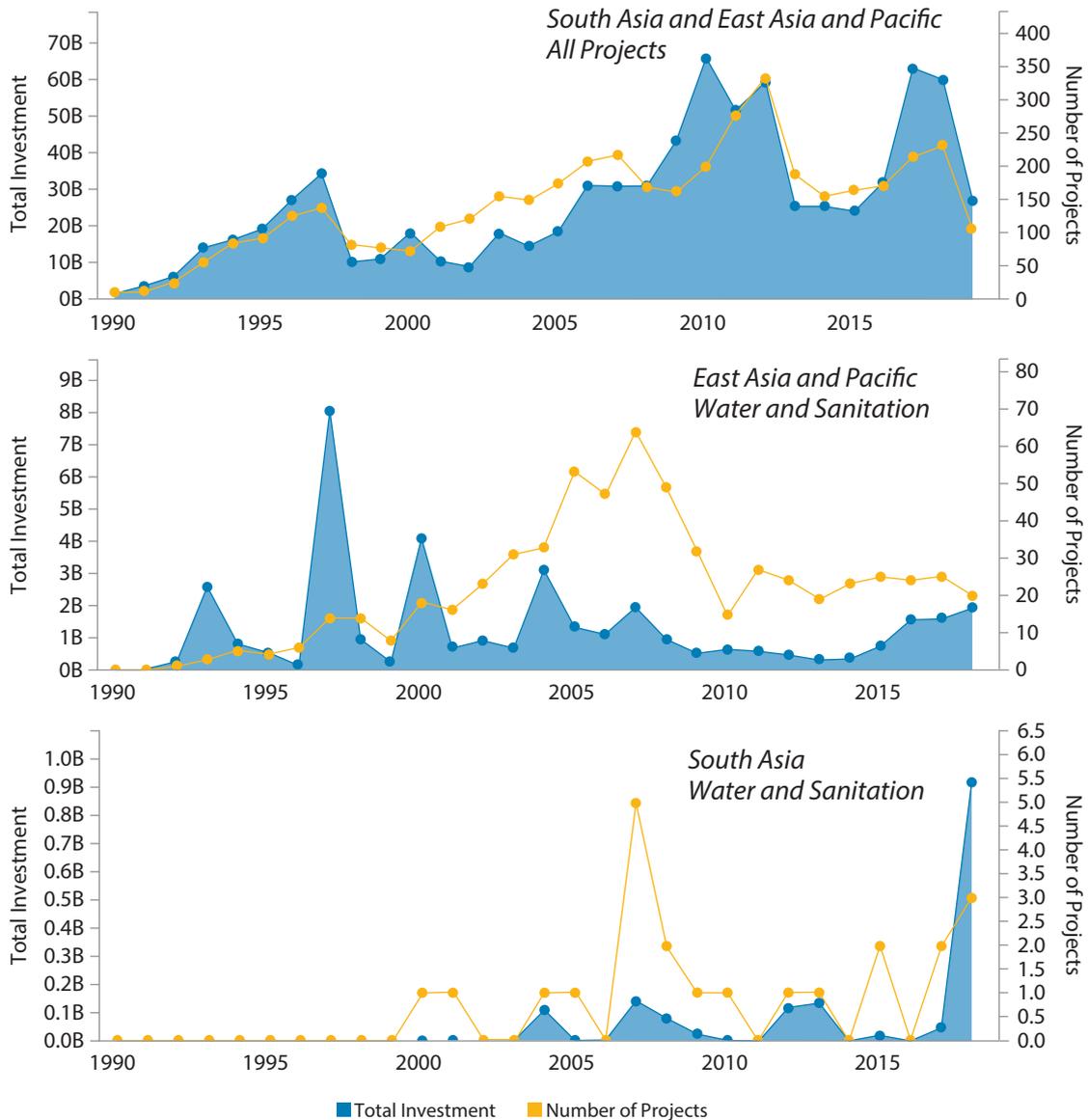


Business Leaders' Policy Dialogue on Accelerating Sanitation for All

30 August 2019
 Tokyo, Japan

Organized by the Asian Development Bank Institute and the Bill & Melinda Gates Foundation (BMGF). The experiences and lessons shared by participants from private firms active in the sanitation sector in developing countries form the basis of this brief and provide essential directions for policy decision-making.

Figure 1: Private Sector Participation in the Water and Sanitation Sector in Asia, 1990–2018



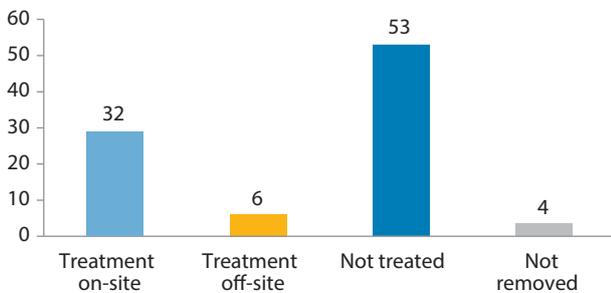
Source: Data from World Bank PPI Visualization Dashboard. <https://ppi.worldbank.org/en/visualization>.

in the water and sanitation sector in South Asia, East Asia, and the Pacific is close to just \$3 billion per year (Figure 1). Increasing private sector participation is thus considered a critical component in solving the SDG sanitation challenge.

Transformation is also necessary for methods for sanitation delivery. In the traditional centralized wastewater management system, such as sewerage, wastewater is collected from a variety of sources and treated at large-capacity treatment facilities. While the

cost of per capita treatment decreases significantly with increasing size of the treatment facilities (more centralized), the large initial capital requirement and lack of funds often make centralized wastewater management systems unviable. The costs are also expected to be very high for a large proportion of the world population living in densely populated areas with no access to sewerage. The other solution is a decentralized or non-networked approach, where the wastewater is contained on-site, transported through small or medium-sized vehicles, treated at small plants, and, if possible, reused.

Figure 2: Overview of Service Provision across the Sanitation Value Chain, Sites Assessed (%)



Source: Presentation by Roshan Raj Shrestha of Bill & Melinda Gates Foundation at the Business Leaders' Policy Dialogue on Accelerating Sanitation for All, Tokyo Japan, 30 August 2019.

However, the decentralized approach faces its own challenges. For example, data presented of a recent qualitative assessment from the Bill & Melinda Gates Foundation show that of 309 sites assessed in 8 states of India, 30 locations in Nepal, and 10 in Pakistan, with a sludge volume of 5–700 cubic meters per day, less than 40% of the sludge (wastewater collected from the on-site container units) was treated by any means. More than 50% of the sludge was removed but not treated (Figure 2). Thus, to address the sanitation issue, inclusive sanitation services in which decentralized wastewater management is integrated into the citywide wastewater management plan are thought to be a way forward.

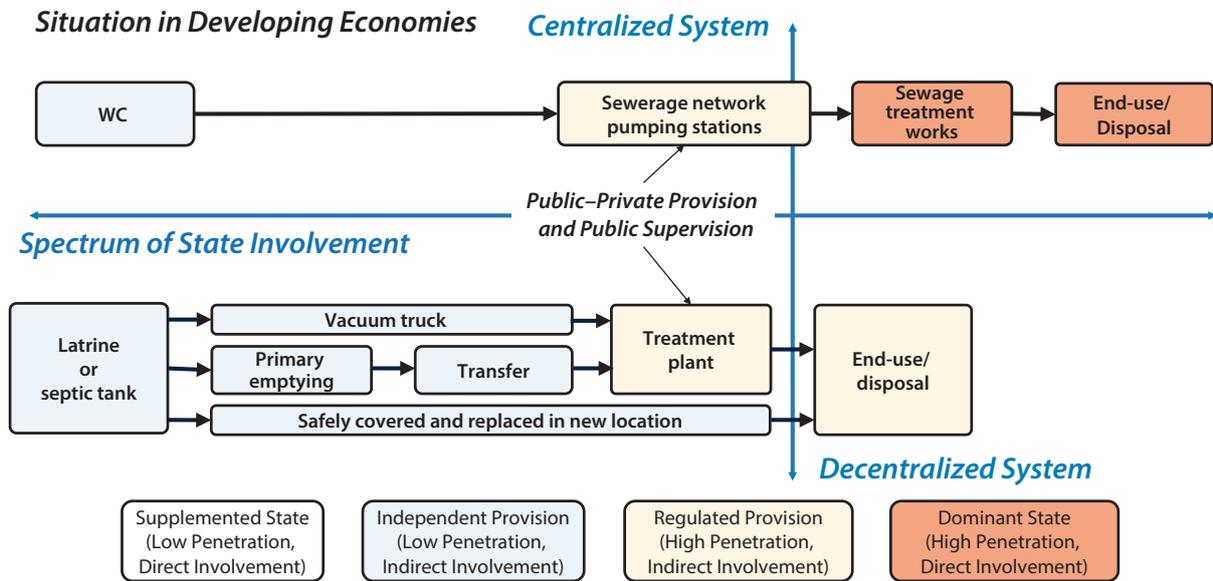
However, the issue of private sector involvement in delivering public goods such as sanitation cannot be fully understood if only considering the level of state involvement in the service provision. While the state could have a *direct* involvement in service delivery through public entities, it could also engage in *indirect* provision by delegating the service provision to non-state (or private) providers. Additionally, a dimension involving the degree of “state penetration” is deemed necessary (Post, Bronsoler, and Salman 2017). This refers to the extent to which the state effectively operates throughout the physical territory in a given policy area. Thus, a two-dimensional space for public service provision exists, with four major types of service provision:

1. Dominant state – the state is efficient (high penetration) in direct service provision.
2. Regulated provision – the state formally delegates service provision (indirect provision) but provides effective regulation, and the majority of service provision is managed through such provision (high penetration).
3. Supplemented state – the state is directly involved in the service provision but is extremely inefficient in doing so (low penetration), leading to a situation where the state gets substituted by often informal non-state entities.
4. Independent provision – the state provides almost all services indirectly and provides minimum formal regulation or oversight (low penetration), leading to a situation where the informal service providers dominate.

Different systems of sanitation service provision prevail across the inclusive sanitation service chain in developing economies (Figure 3). For those with centralized systems, large-scale treatment facilities follow a *dominant state* type of service provision, which is on the verge of falling into the category of *supplemented state*, as the state is not able to cope with increasing demand and faces financial challenges. Further, the sewerage network has grown to become a *regulated provision* type, with the state in several developing economies increasingly assigning the responsibility of maintenance to non-state actors. For a long time, the non-sewered sanitation sector received no or only limited attention from policy makers in developing countries. Such neglect led to the private sector (often informal) dominating the provision of products and services at the beginning of the sanitation value chain, such as providing toilet bowls or constructing containment facilities, services related to sludge emptying, and sludge transportation services, making it a *supplemented state* or *independent provision* type. Most projects featuring partnership between the public and private sectors have thus been limited to the later steps of the sanitation value chain, such as the construction and operation of sludge treatment plants, end use or disposal, and so on. However, under such a system, service provision is fragmented between the *supplemented state* or *independent provision* types for the beginning steps and the *regulated provision*

From a citywide sanitation perspective, it may thus be necessary to consider extending the partnership between the public and the private sectors as well as the state penetration to more aspects of the sanitation value chain.

Figure 3: Status of Sanitation Value Chain in Developing Economies for Level of State Involvement in Service Provision



Source : Authors.

type for the ending steps of the sanitation value chain. This results in poor efficiency of the overall service provision in non-sewered sanitation, as shown in Figure 2. From a citywide sanitation perspective, it may thus be necessary to consider extending the partnership between the public and the private sectors as well as the state penetration to more aspects of the sanitation value chain. Such a finding is also consistent with recent studies on city-wide sanitation perspectives (Schrecongost et al. 2020). An overview of the four types of service provision is also given later in Figure 5.

Overview of Private Sector Participation in the Sanitation Value Chain

The Business Leaders’ Policy Dialogue on Accelerating Sanitation for All, jointly organized by the Asian Development Bank Institute and the Bill & Melinda Gates Foundation (BMGF), centered on enhancing the scope of public–private partnership across the sanitation value chain. Participants included those from private firms with successful business operations in various aspects of the sanitation value chain focusing on decentralized wastewater management (see Figure 4 for an overview). The recommendations presented in this policy brief

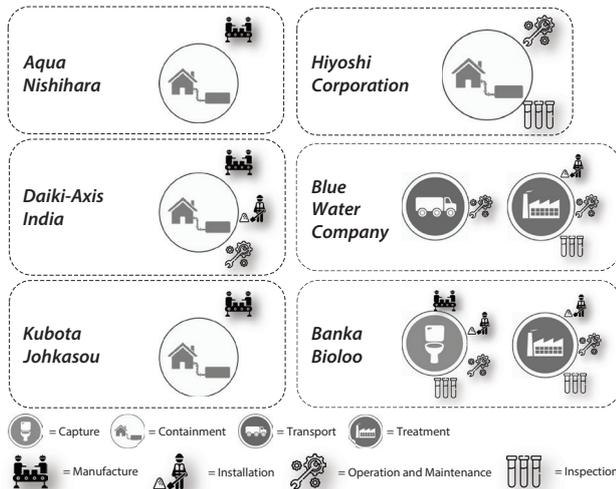
synthesizes the lessons from their activities on the ground in developing countries, challenges encountered, and potential ways of tackling business barriers.

The participating firms included Japanese firms working overseas, such as Hiyoshi Corporation and Daiki-Axis in India and Kubota Johkasou in the People’s Republic of China. Aqua Nishihara is a joint venture between Japanese and Thailand firms operating in Thailand. Further, firms such as Banka BioLoo and Blue Water Company operate in India, utilizing domestically developed solutions across the sanitation value chain. At the policy dialogue, representatives shared their experiences, describing the state of the sanitation sector in the markets in which they are active and their innovative business practices.

Opportunities and Innovative Approaches for Businesses in Sanitation

Sanitation in developing countries is seen as a considerable market opportunity. Improving regulations, such as stricter enforcement of the high-quality effluent standards, have created opportunities for private firms across the sanitation value chain, especially for greenfield projects. Established firms in related businesses from

Figure 4: Overview of Selected Private Firms Working in Developing Countries across the Sanitation Value Chain



Note: The firms participated in the Business Leaders' Policy Dialogue on Accelerating Sanitation for All.

Source : Authors.

developed countries such as Japan are increasingly attracted to exporting their products and services to developing countries. Many local firms in developing countries are also hoping to leverage on technology suitable to local conditions. Private entities across the sanitation value chain are gradually seeing positive (though modest) financial outcomes.

The sanitation sector in developing countries is characterized by low willingness to pay for initial installation and recurring maintenance costs associated with various sanitation products and services (Robbins, Strande, and Doczi 2012). Hence, the businesses involved in supplying containment facilities have made incredible efforts to reduce the initial costs. Key innovations include changing the materials used for manufacturing containment units, setting up local manufacturing plants, and building up products suitable to local water-effluent standards. The focus of these firms has also been on highlighting the low maintenance needs associated with their respective technologies. Businesses involved

in the construction and operation of sludge treatment plants and so on also rely on using low-cost, low energy-intensive techniques suitable to local ecological and environmental conditions.

Apart from adapting technologies to local needs, private firms have taken up numerous other measures to promote their businesses. For example, experienced water treatment firms in Japan have undertaken build–finance–operate–transfer projects in India to demonstrate the effectiveness of their products in the developing country context as well as their long-term commitment to the sector and the market. Other firms have started training programs to prepare the human resources necessary to sustain their businesses.

Challenges in the Sanitation Business

While the sanitation market is generally seen as full of opportunity such that the private players are willing to innovate and assure their long-term commitment, the sector is also full of challenges that require closer partnership between the public and private sectors.

Low or no enforcement of effluent standards for existing households. While, in general, many developing countries enforce high-quality effluent standards for new residential and commercial entities, few have the programs or the capability to implement such measures for existing households. Such weak enforcement leads to weaker uptake of sanitation-related products, thus reducing market opportunities for the private sector.

Low barriers to market entry. Another common occurrence is low barriers to market entry for businesses offering sanitation services. Such low barriers lead to noncommitted businesses with no proven experience that enter the market and provide substandard products and services. Not only do reliable and qualified companies then have to compete with substandard products in the short term, but the poor performance of the substandard products and services also further reduces the consumers' willingness to pay for such services in the future, thus affecting the market in the long term.

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Poor skill levels of the personnel involved. Sanitation-related businesses across developing countries report challenges with poor-quality human resources. The sanitation sector is often affected by social stigma associated with the work. Thus, finding skilled personnel is difficult. Also, the businesses find it challenging to fulfill the growth aspirations of their employees and therefore struggle to retain quality personnel.

Capacity and capability of the public agency. The most successful business cases in the sector usually require a firm commitment from the urban local bodies. This support comes in various forms, for example mandating the scheduled desludging, strictly enforcing the standardized installation of containment facilities, and so on. However, such implementation also requires public officials involved in the projects to have strong capabilities. The project officers are transferred frequently or cannot enforce the rules, leading to delays in payments, among others, thus affecting the involved businesses negatively. During the project implementation stage, the burden is often transferred to private companies, making the situation more challenging for them.

Revenues from by-products. As part of the general push toward a circular economy, emphasis has been given to recycling end products coming out of treatment plants such as fertilizers and treated water. However, many private businesses report difficulties in monetizing these products mainly because of the variability in quality and their inability to stock these items and to handle the imbalance in the demand and supply of such by-products.

The experiences of the private sector firms involved in the business at the beginning of the sanitation value chain indicate that while the private sector views the indirect service provision by the state as a positive opportunity, their commonly faced challenges relate to the lack of state penetration in the sanitation service provision. All challenges mentioned by the firms require the state to take a greater role in providing adequate regulation across the sanitation value chain.

The Success Story from the Developed World

While the challenges facing the private sanitation sector are manifold, the experiences of developed countries provide interesting examples of how they have previously addressed similar challenges. For example, during the prewar period in Japan, human excreta (commonly known as night soil) had considerable economic utility, as farmers would pay for the night soil either in cash or in the form of produce from their farms using it as fertilizer. Hence, the virtuous cycle of resource recovery had prevailed. In the postwar period, the night soil lost its value due to rapid urbanization and thus began the familiar issues of poor wastewater management. The resulting rapid drop in water quality then led authorities to take action and prioritize wastewater management once again.

In Japan, regulated service provision supported by a strong institutional structure in every aspect of the decentralized sanitation value chain (known as *johkasou*) has been highly successful. Seetha Ram, Hashimoto, and Bugalia (2018) provide a detailed explanation of the state penetration across the sanitation value chain. The standards are developed and effectively enforced for each step of the value chain, from proper installation to regular maintenance, inspection, and desludging of the decentralized wastewater treatment units (high penetration). Such effective enforcement leads to a steady uptake of the products and services offered by various private players (indirect provision). The performance-based technical standards keep the barriers to market entry reasonably high, thus allowing only committed businesses to develop innovative products without compromising product quality. Only predesignated businesses can participate in services such as operation and maintenance, desludging, or inspection. The licensing provided to these businesses helps the local governing bodies determine the financial sustainability of a company in relation to the market size and competition. The price for the products and services is also regulated by the local governing bodies, keeping

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in mind the financial sustainability of the business as well as users' willingness to pay. In areas where price regulation is not practical, subsidies are offered to install decentralized wastewater treatment facilities. This robust institutional system and its effective enforcement have enabled the steady growth of the associated businesses as well as the subsequent improvement in the environment and the water quality in Japan.

Such experiences provide hope to developing countries currently facing challenges that adopting the success stories from developed countries and adapting them to the local context might solve the problem. In the past, however, the solutions from the developed world have often failed to materialize results in developing countries because of the vast difference in context. The generally poor level of governance in several developing countries in Asia is sure to be among the challenging issues in replicating the success of Japan.

The challenges in developing countries are even more complex, as the need of the hour is to accelerate the growth of sanitation. Business as usual is not sufficient; to accelerate progress, more avenues for private involvement must be explored. In this regard, a review of the successful cases from the developing world is also necessary.

Success Stories from the Developing World

Sheikh (2011) examines the success of various organizations in the delivery of sanitation services in developing countries. The organizations were categorized on a hybrid spectrum: traditional nonprofit organizations on one end and for-profit organizations on the other. The challenge is that neither the nonprofit nor the for-profit models are successful. The sanitation businesses are inherently not highly profitable, whereas the nonprofits often face challenges in securing a steady supply of government or private funding. Hence, Sheikh looks at the roles of organizations located between the two ends of the spectrum: social enterprises or socially responsible businesses. Such organizations place a high value on the social contribution of their activities and are often willing to forsake profit for the impact that they generate.

Sheikh (2011) then analyzes models adopted by 10 social enterprises on parameters relevant for the rapid acceleration of sanitation:

1. Extent of replication – range of places where the idea can be implemented despite minor differences in context.
2. Sustainability – measured in terms of social and institutional acceptability, technical and environmental feasibility, and economic viability.
3. Scalability – measured on indicators that enable the scaling up of the business.
4. Business orientation – measured in terms of the revenues and profit level of the social enterprises.

Of the 10 enterprises that were reviewed, those that performed highly on all four parameters had a few common characteristics. First, all the enterprises are supply driven and have been initiated by private organizations, allowing them to replicate the service provision wherever necessary (indirect provision). All models have adopted technology that was socially acceptable to use, focusing on job creation and removing the social stigma associated with sanitation work prevalent in the local community. Finally, the organizations had a high business orientation, generating sufficient profit for all stakeholders in their value chain and thus sustaining their businesses. A key aspect in scaling any particular model was peer learning among the local small businesses, which allowed for achieving scale on the supply side. Ultimately, all models depend on government support to develop the demand for sanitation, through adequate development, promotion, and enforcement of sanitation practices (high penetration).

A common pattern for the accelerating growth emerging from the experiences reported in the literature from across the globe is a service provision scheme featuring indirect provision with high penetration from the state. The same *regulated provision* type was also effective for rapid acceleration in service provision for several private firms that participated at the policy dialogue. The examples from Banka BioLoo (Box 1), Daiki Axis (Box 2), and the Blue Water Company² all point to the necessity of state supervision and penetration to support the effectiveness of the indirect service delivery through the private sector.

Policy Proposals

The experiences highlighted by the private firms, the review of scalable business models in developing countries, and the successful case studies from the now developed countries give rise to the following policy

² For details, see Bugalia (2018).

Box 1: Case of Banka BioLoo, India

The Indian startup company is manufacturing and installing a “reinvented toilet” by leasing the so-called bio-digester technology developed by the Defence Research and Development Organisation of India and adapting it to suit the country’s context. With the support from large-scale clients such as the Indian Army and Indian Railways, Banka BioLoo was able to achieve the necessary scale for an economic production. For example, the technology from Banka stops 1.64 million tons of solid waste per day from being deposited on the tracks, leading to a substantial saving in track maintenance costs for the Indian Railways. Using the resources to advance the technology, Banka is now installing similar effective products at the household level. Thus, by leveraging strong support from its public clients with the right technology, Banka was successful in securing a rapid scaling of the service provision.

Source: Presentation by Namita Banka of Banka BioLoo (www.bankabio.com) at the Business Leaders’ Policy Dialogue on Accelerating Sanitation for All, Tokyo, Japan, 30 August 2019.

Box 2: Case of Daiki Axis, a Japanese Firm in India

The firm is a well-established water treatment system (*johkasou*) manufacturer in Japan. With its experience of more than 60 years in the sanitation sector, Daiki Axis entered the Indian market in 2018. Within a span of just 2 years, Daiki has installed at least 100 *johkasou* units in India and has also established a manufacturing unit. By making a suitable modification to their core technology for the country context, the firm has been able to achieve net positive benefits for their small- to large-scale treatment units in the short to long term when compared to the conventional technology in India. While the initial pilot projects have been successful, Daiki is now preparing a long-term partnership with the public utility, with the aim to demonstrate the firm’s success and commitment and to be able to rely on public bodies to create the necessary enabling environment to undertake future projects. Hence, while the indirect service provision has proven successful, the necessary element for rapid scale now is the high penetration from the state.

Source: Presentation by Waza Rio, Daiki Axis India at the Business Leaders’ Policy Dialogue on Accelerating Sanitation for All, Tokyo, Japan, 30 August 2019.

recommendations for rapid scaling-up of the progress on the sanitation-related SDGs.

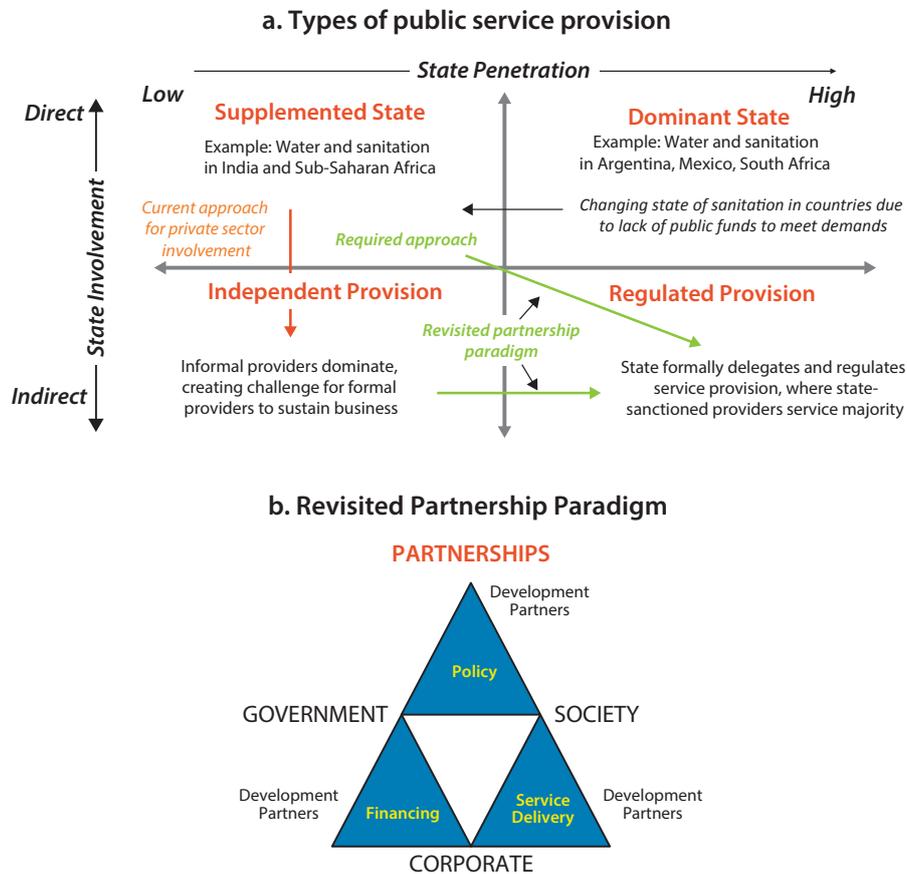
A revised partnership paradigm (Figure 5) is necessary. As opposed to the time-consuming process of public service provision, private service provision is faster and efficient in responding to the local needs in the sanitation sector. However, the private sector’s efforts to accelerate service provision are often marred by low demand and slower scaling of the supply chain. Hence, the policy should focus on increasing the uptake of sanitation services through localized innovative marketing campaigns supported by the subsidy programs targeted at the poor. The solutions for sustainable sanitation must be technology driven. As a way forward, while the onus of promoting new technology research and development can be left with the private players and development partners, public financing is necessary to establish manufacturing firms or training centers so that the scale for quality products can be achieved at a price that is affordable for those

most in need. The local diffusion of technology and smart imitation should also be promoted as long as product quality is not compromised.

When the systemic issues are addressed through appropriate policy action, the sanitation market can be turned profitable, and the large pool of accumulated private wealth can be mobilized for developing countries to enter the historically neglected sanitation market. The new partnership paradigm also highlights the responsibility of the development partners. Their role should be to promote the accelerated development of new decentralized technologies, not only by investing in research projects but also by allowing pilot projects to be undertaken quickly. Once the systemic issues are addressed through effective policy and the technology is developed and proven effective in the socioeconomic

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Figure 5: The Partnership Paradigm Revisited



Source: Author, using the framework by Post, Bronsoler, and Salman (2017).

context of the respective developing country, private partners will find the sanitation market attractive—and a virtuous cycle of accelerated growth of the sanitation sector will prevail.

The proposed partnership paradigm is no longer theoretical, but one being put into practice by the Bill & Melinda Gates Foundation (BMGF). They have developed two new solutions for historically neglected parts of the sanitation value chain: reinvented toilets and reinvented wastewater treatment plants (stand-alone units requiring low to no energy and water). The International Organization for Standardization (ISO) has produced further technical standards for decentralized sanitation systems (ISO 30500). These new designs, as well as the ISO standard, are now guiding future technology development. On the one hand, BMGF is partnering with various local and state government bodies (such as the Government of Hyderabad in India) to test prototypes of the new systems. On the other, its activities in partnership with development agencies such

as the Asian Development Bank and the World Bank have led to increased financing in the sector. BMGF is also focusing on developing the next generation of sanitation professionals by partnering with numerous universities across the world and offering online e-learning modules. The initial success of this comprehensive approach has enabled a partnership between BMGF and Lixil, the world’s leading manufacturer of sanitary ware. This partnership is expected to make reinvented toilets a commercial reality in developing countries, thus contributing to the goal of rapid progress on the sanitation-related SDGs.

While the significant efforts from development partners such as BMGF are expected to improve the progress on sanitation, it is also necessary to align support from the state in the form of adequate policies and regulations supporting the private sector. The proposed partnership paradigm in this policy brief is one such approach, and the dialogue to promote lesson-sharing and problem-solving must continue.

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