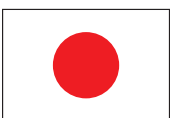




Expanding Access to Improved Sanitation for the Poor

INSIGHTS FROM THE PHILIPPINES

IN PARTNERSHIP WITH



Creating Markets, Creating Opportunities

CONTEXT

THE CHALLENGE:

The Philippines is home to around twenty five million of the 2.3 billion people worldwide who lack access to a basic sanitation service.¹ Poor sanitation has enormous economic and human costs.² The spread of water-borne diseases, for instance, results in billions of dollars in costs to the government and poor quality of life for many citizens.

In the Philippines, only 12 percent of households have connections to sewage systems or septic tanks that are serviced regularly with proper sludge treatment and disposal. As a result, 82 million people have sanitation systems or practices that could endanger the environment and public health, including five million people who still practice open defecation.³ The total cost of all this poor sanitation is estimated to be \$1.4 billion per year, primarily due to its health impact.⁴

The government of the Philippines has recognized the costs and, with various water service providers, has taken great strides towards improving sanitation for its citizens, including helping to accelerate investments in the sanitation sector. However, investments have focused on major civil infrastructure rather than on improvements to individual households. Such a narrow focus has left efforts that would have an immediate effect on household sanitation practices, such as building toilets, solely in the hands of those households, who often face substantial barriers to improving their sanitation.

Ensuring universal access to improved sanitation is complex and challenging. While improved sanitation is a basic expense for most people in developed urban areas, the country's poorest households find such an investment challenging due to a lack of adequate resources or proper information. Moreover, underserved groups in the Philippines can be difficult for outside parties to reach, as they can easily fall through the cracks between the competing priorities of multiple institutions responsible for sanitation.

IFC's Inclusive Business team partnered with the Manila Water Foundation, which is Manila Water Company's social responsibility arm established in 2005, to undertake a three-part study that would assess the reasons why low-

income urban households in the Philippines still do not have improved sanitation facilities and to test possible sanitation solutions that enable these households to improve their sanitation conditions. The study is part of IFC's ongoing efforts to partner with the private and public sectors to promote inclusive and sustainable growth through market-based solutions for the poor and underserved.

OBJECTIVES AND METHODOLOGY:

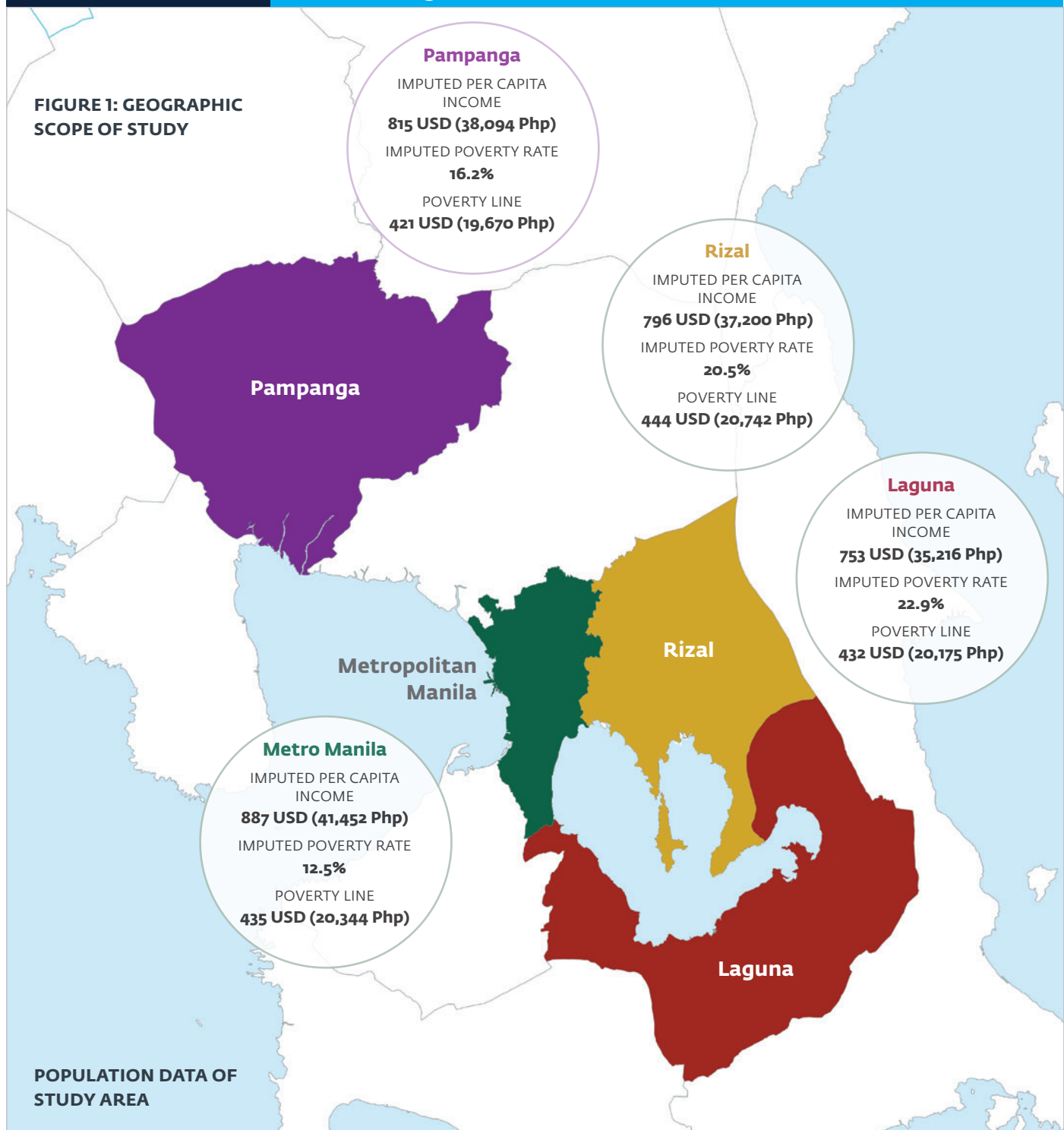
The objectives of this study are to provide context for the sanitation conditions of low-income communities in the Philippines and to identify the opportunities and barriers to improving sanitation systems. The study results are intended to help key stakeholders — such as businesses, governments, and nongovernmental organizations — to develop feasible approaches to expanding access to improved sanitation for low-income communities and to create new markets for sanitation for these underserved segments. The study targeted low-income urban or peri-urban communities of Metro Manila and neighboring provinces that are predominantly not yet served by existing sewerage and septage management services. This study established an analytical framework to assess a number of potential sanitation models, taking into account existing conditions, household preferences and needs, and willingness to pay.

The study included:

1. Quantitative surveys of 800 households
2. Six focus group discussions with a total of 64 participants
3. In-depth interviews with 14 government officers across four provinces (Metro Manila, Rizal, Laguna, and Pampanga) and 12 municipalities

The quantitative surveys included the assessment of socioeconomic conditions, physical characteristics of dwelling places, and preferences and willingness to pay for proposed sanitation models. The survey targeted households belonging to the lowest income class and included households with private (400 respondents) as well as those without private toilets (400 respondents). The 18 percent of total respondents living below the poverty line⁵ had a per capita income of USD 811 (37,928 Philippine pesos).⁶ Detailed information on the profile of the respondents and assumptions underlying the analysis is available in the annex (page 25).

FIGURE 1: GEOGRAPHIC SCOPE OF STUDY



POPULATION DATA OF STUDY AREA

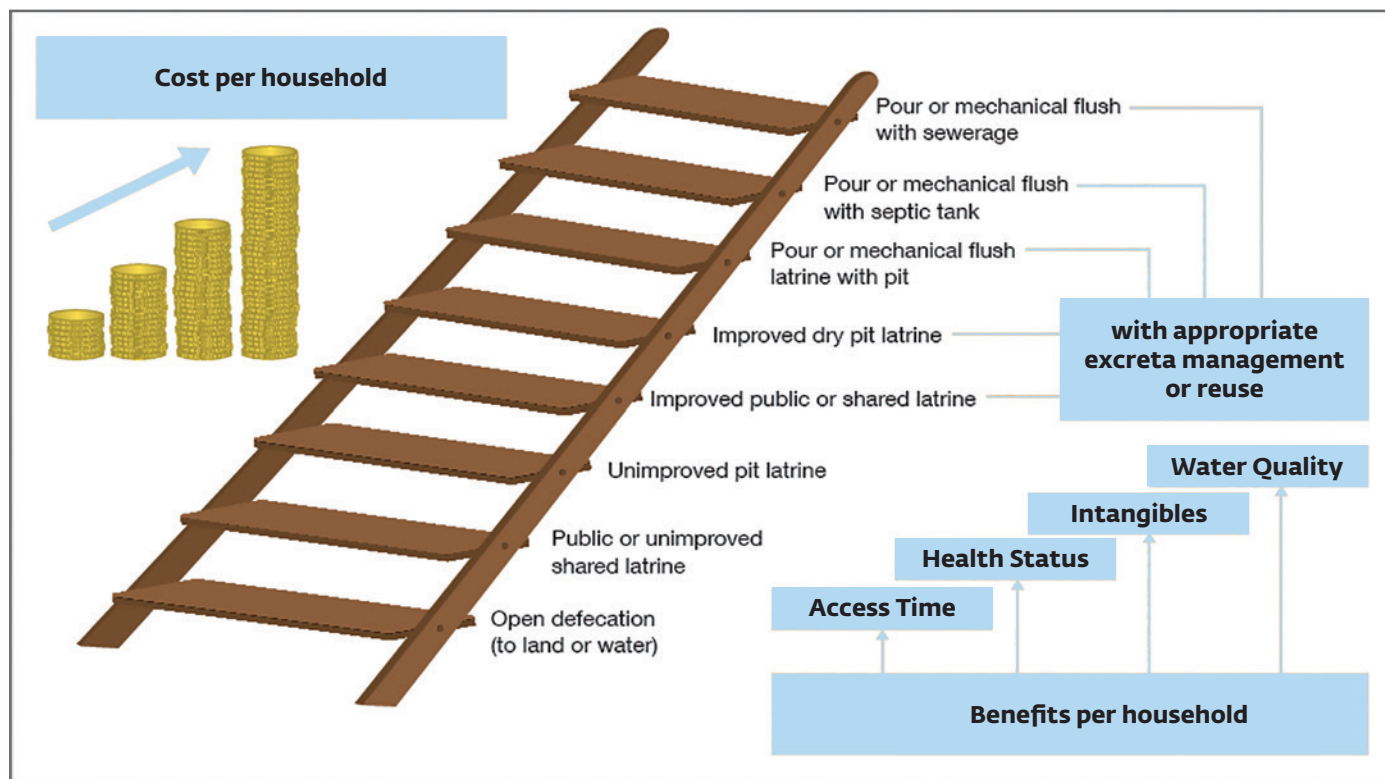
Region, Province, And Highly Urbanized City	Area (km ²)	Average Population Density (pop/ km ²) 2015	Total Population 2015	Population Growth Rate (per year) 2000 – 2015
Philippines	300,000	337	100,981,437	1.84%
Metro Manila	639	20,166	12,877,253	1.72%
Rizal	1,191	2,422	2,884,227	3.50%
Laguna	1,917	1,583	3,035,081	2.89%
Pampanga	2,062	1,266	2,609,744	2.04%

Source: Philippine Statistical Authority, 2015

Imputed poverty rate: % shows proportion of household below the poverty line to the total population

Source: Philippine Statistical Authority (PSA). SWIFT Poverty Estimation Methodology calculation conducted by World Bank, September, 2016

FIGURE 2: REPRESENTATION OF THE SANITATION TECHNOLOGY “LADDER”



Economic Assessment of Sanitation Interventions

SANITATION MODELS TARGETING THE POOR

This study looked at the sanitation situation of low-income Filipino households in view of viable alternatives, potential barriers, and benefits of expanding access to improved sanitation systems. Alternative sanitation facilities form a ladder in which increasing benefits and level of service correlate with increasing costs, as in the figure above from the Water and Sanitation Program's 2011 Economic Assessment of Sanitation Interventions in Philippines.⁷

The socioeconomic condition of the households, as well as the limitations or opportunities set by their dwelling places and locations, make certain rungs of the “sanitation ladder” more applicable to them. Additionally, the study also investigated how the physical design and pricing of typical sanitation options could be tailored to the specific needs of low-income Filipino households.

Instead of looking at every possible sanitation option, the study focused on four models:

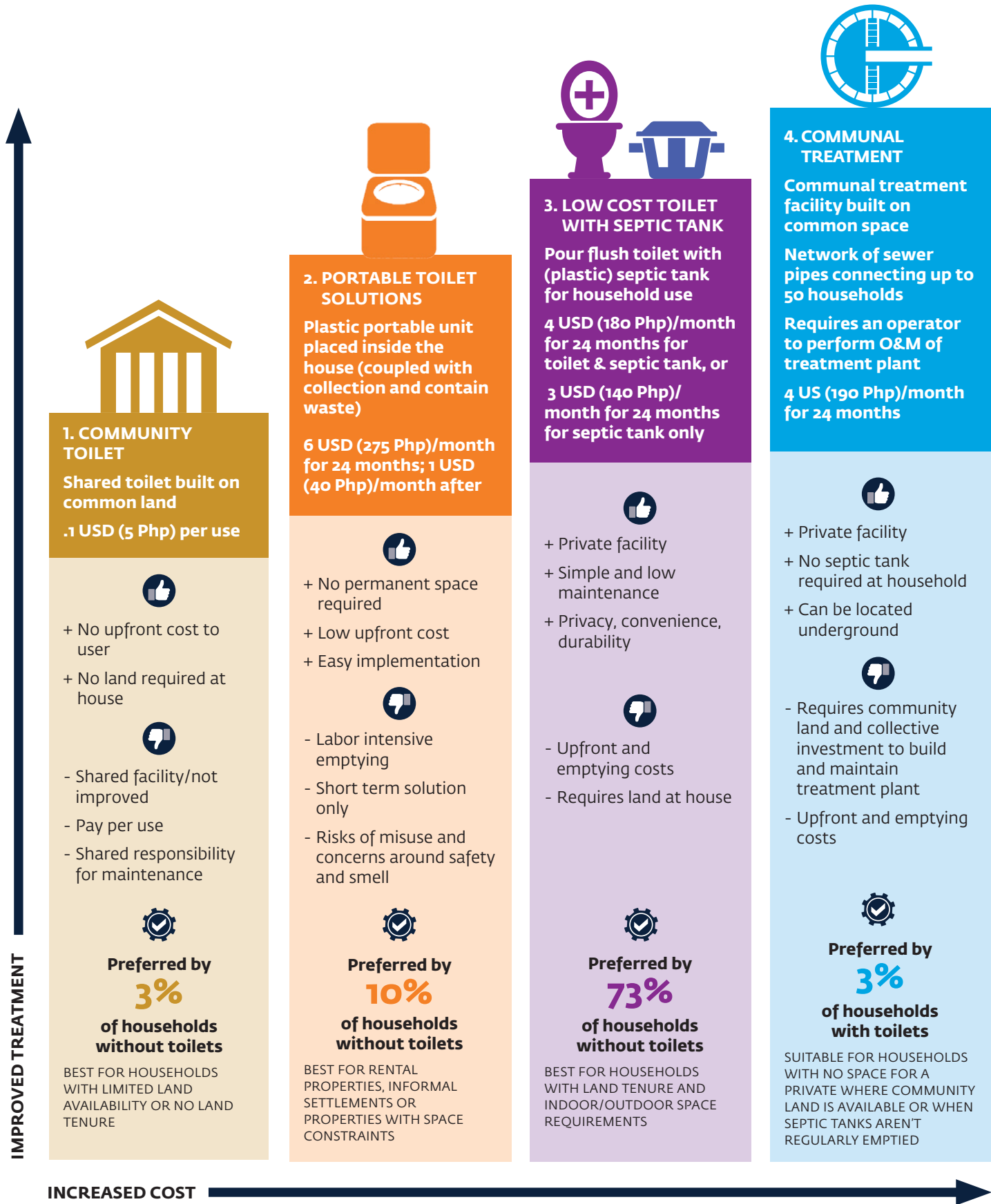
1. Public or community toilets
2. Portable toilets for home use

3. Private toilets that connect to a low-cost septic tank
 - a. Septic tank only for those who already have toilets and toilet bowls, but discharge directly to drains or waterways
 - b. Septic tank including the toilet structure
4. Communal septic tanks

The options were selected to reflect different conditions found in poor households, which tend to have little or no space and lack land rights. In addition to social, financial, and technical aspects of each model, the study also investigated the present strategies and plans of local governments to identify potential location-specific recommendations for the models.

The figure on page 5 presents a summary of alternative options with their corresponding technical description, identified barriers, strengths, operational requirements, and assessed appropriateness. Recommendations are based on the particular conditions and needs of various groups. Unfortunately, uncertainty still exists about what subsidies or funding mechanisms would be leveraged.

FIGURE 3: PRESENTED SANITATION OPTIONS



Findings

KEY FINDING 1: Current sanitation conditions for low-income households are substandard.

Households with private toilets predominantly use a seated, pour flush toilet that discharges typically to unsealed, single pit. About 91 percent of households with private toilets have facilities that discharge to a septic tank. However, the quality and function of the septic tank need to be assessed to determine whether it can be safely improved. About 39 percent of septic tanks have an unsealed base, 49 percent have no outlet, and only 22 percent have concrete walls, suggesting that a high number of on-site systems are leaking into the groundwater or nearby surface waters.

Most septic tanks are designed to be desludged every three to five years to allow for the efficient breakdown of waste by bacterial activity. The study found, however, that only 13 percent of septic tanks have ever been desludged. With more than 50 percent of systems having operated for longer than five years and a mean age of nine years, many of these septic tanks are leaching pollution into the environment.

Among those surveyed, **about 80 percent of households without a private toilet** rely on their neighbors' toilets, which face the issue of poor septic tank maintenance and improper design. Even though the quality of existing sanitation systems is generally low, the majority of the households who use their neighbors' toilets are satisfied with the practice. There are a minority of households that use other alternatives. Around 8 percent of households without a private toilet use communal toilets, which are mostly local government facilities. Some concerns raised by respondents, include distance from home, waiting times, safety concerns especially for female users, and bad smell, which suggests poor conditions. Moreover, respondents reported feeling "hiya," a Filipino term that means embarrassment or shame, for using communal toilets.

Finally, some households without a private toilet reported defecating in chamber pots or a plastic bag and then disposing of waste on vacant lots, with the garbage, into waterways or into the drainage system. Around 9 percent of households practice open defecation directly defecating on the ground or waterways.

KEY FINDING 2: Open defecation or other unsafe practices for disposing of waste in the environment pose significant risks to health and the environment.

Contaminated waterways are a health risk for everyone, especially people in areas prone to poor drainage and exposed to polluted water. A majority of respondents reported having open drainage in their community with stagnant waters blocked by solid waste. Among households that practice open defecation, 36 percent do not have proper plumbing inside the house.

Contaminated waterways are also a huge issue for people who rely on wells for water supply. Almost half, or 46 percent, of the households are less than 50 meters away from a well that people use, with even higher rates among households in Pampanga and Laguna. These wells serve as common sources of water supply. In Pampanga and Laguna, for example, 18 percent of respondents still use wells as their drinking water source, while another 50 percent use wells for non-drinking purposes.

Flooding from nearby rivers only heightens these risks as it can bring polluted waters in direct contact with people or contaminate water supply. For 27 percent of respondents, rivers near their home flood after every rainfall with a higher proportion of flooding in areas where people do not have a private toilet. For 22 percent of respondents, flooding reaches inside their houses.

Contamination is not only a problem for those practicing open defecation or improperly disposing of feces. It is also an issue for those with an operating toilet in a home with a

Shifting norms around safety and health for women and children are making it less acceptable for women and girls to practice open defecation, thereby increasing the perceived need for sanitation solutions that provide greater privacy. Respondents cited a desire to reduce health risks, particularly for children, as a driver for improving sanitation, suggesting increased understanding of the impact of poor sanitation practices on community health.

sanitation system that allows seepage and contamination. Among those households surveyed who have a toilet, there was a high number, 37 percent, of on-site systems. Therefore, sanitation projects should consider addressing this issue by developing a piped water supply and discouraging the use of shallow wells.

Households recognize the connection between poor sanitation practices and health risks. In fact, a primary motivation reported by respondents for improving sanitation was concern for health, especially for the health of children. However, they tend to associate health risks and disease more with water quality and garbage disposal. Among those surveyed, water quality was reported as a major cause of illness by 27 percent of households. Poor hygiene followed with 14 percent of households and then sanitation, cited by 11 percent of households. Households cite several ways to reduce illness — 44 percent cited cleanliness and garbage reduction, 20 percent cited treating water, and 19 percent said regular bathing. Only 3 percent, however, mentioned sanitation.

Further, local government officials and health officers interviewed seem to rank the issue of sanitation-related diseases such as diarrhea as lower priority because the overall cases of diarrhea were perceived to be less severe when compared to other health issues, such as dengue. Moreover, with rapid improvement of water services since the entry of utilities such as Manila Water, water-borne diseases have generally declined, except in the poorest households lacking access to service improvements. Local government officials and health officers may also underemphasize sanitation because of their lack of understanding about its importance. Two such cases are that of health officers in Laguna and Rizal, who did report recent cases of diarrhea but linked it to poor water quality, hygiene, and food rather than sanitation.

Contrary to the perceptions of health officers, however, water and sanitation-related diseases still seem to be widely prevalent, particularly among children. The households surveyed reported that, in the previous four weeks, among children under the age of five, 36 percent had diarrhea, 33 percent had stomach aches, 14 percent had parasitic worms, and 1 percent had typhoid or cholera. Children who discharged feces on the ground, along with those who used a neighbor's or friend's toilet, were most affected by these sicknesses.

KEY FINDING 3: Demand for improved sanitation, particularly for private toilet solutions, is high among the urban poor.

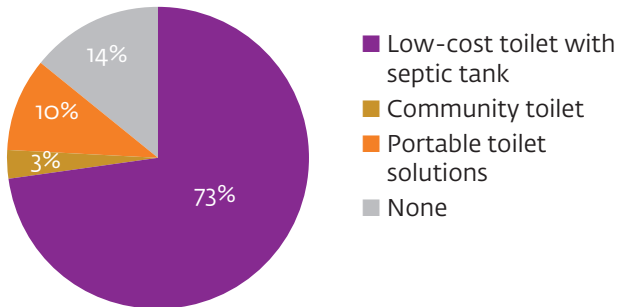
Almost all households surveyed wanted their communities to improve sanitation conditions, and unsurprisingly 90 percent of households without private toilets indicated a desire and aspiration to improve from their present conditions. Presented with four sanitation models, 73 percent of these households showed interest in private toilet solutions, 10 percent in portable solutions, and 3 percent in community-based solutions. However, it is important to note that there is a gap between respondents' aspiration and their reality. Households face a number of barriers to improvement including their status of tenure, space availability, and financial ability. With land tenure and space taken into consideration, only 13 percent of the households without private toilet would be able to implement the desired private toilet solutions such as a low-cost toilet with septic tank.

Households with private toilets were less interested in improving their sanitation conditions. Two-thirds of individuals with private toilets indicated they wanted to keep the status quo. However, these households underestimated the risks associated with their current sanitation system. Lacking understanding of needed maintenance and information about the risks of leakage, they did not perceive a need to upgrade from their existing tank. When presented with specific sanitation improvements, almost half did not want any of the options provided, though 49 percent did show interest in a low-cost septic tank that would complement their existing toilet system. Very few were interested in communal treatment options, likely due to a lack of understanding of the benefits of such systems.

Low-income households show significant demand for private, in-home toilet systems.

FIGURE 4: PREFERRED SANITATION MODEL: HOUSEHOLDS WITHOUT PRIVATE TOILETS

n=400 respondents



KEY FINDING 4: COST IS AN IMPORTANT CONSIDERATION AMONG POOR HOUSEHOLDS, BUT DESIRE FOR PRIVACY, CONVENIENCE, AND SAFETY ALSO DRIVE PREFERENCES.

Household preferences and aspirations around new sanitation solutions are simple. People surveyed value **privacy, convenience, and safety**, and they recognized the health and safety benefits that would come from new systems, particularly for women and children. As such, there is a strong preference for private toilets over other alternatives.

An option that is “simple,” “private,” “comfortable,” and “cheap” was commonly emphasized. In addition, participants actively discussed having a bowl, pour flush

FIGURE 6: PREFERRED FEATURES FOR IMPROVING SANITATION FOR HOUSEHOLDS WITHOUT TOILETS

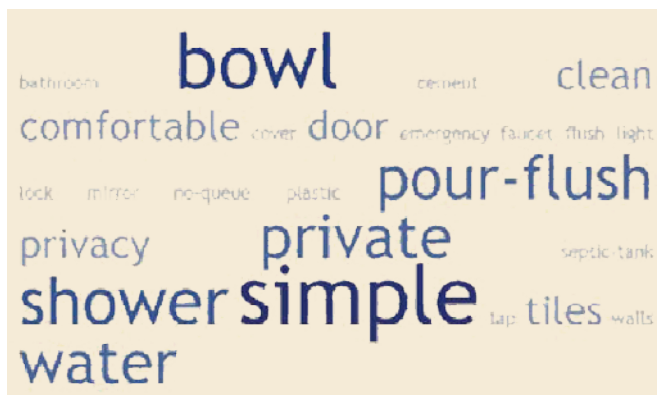
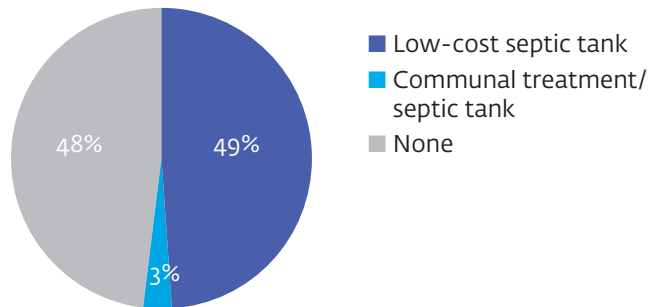


FIGURE 5: PREFERRED SANITATION MODEL: HOUSEHOLDS WITH PRIVATE TOILETS

n=400 respondents



toilet, septic tank, and portable option. Their responses are summarized in figure 6. The larger and darker words below were reported more frequently by respondents.

Households opting for a portable toilet solution also value privacy and convenience highly, but placed more weight on spatial considerations in choosing their preferred model. About 21 percent of those who wanted a portable option indicated that this was the primary reason for their choice.

Individuals see a number of disadvantages in communal facilities. They do not provide the same privacy, convenience and safety that home-based solutions offer. However, a few households did prefer a community toilet, particularly because of concerns about the availability of land.

Privacy was cited as the main reason for 58 percent of households who chose a private toilet, followed by convenience and safety.



Focus Group Discussions: Benefits and Concerns of Sanitation Models

Focus group respondents reflected on the benefits and concerns of different sanitation improvements. They felt that community toilets were better than their current conditions and they liked that they had no upfront costs, had water, looked clean, had fewer health risks, and would be used by women. Respondents were concerned that they might not have the money to use it, that there would be little privacy, that it would be difficult to maintain, and that there would be vandalism and other security concerns. Some compared it to a truck stop.

They liked that portable toilet solutions were low-cost, looked like an improved chamber pot, were sanitary, private, could be used indoors, did not require piping, and were good for small houses. They were worried that they would fill quickly and smell if not collected frequently, and they thought people would dump waste into river or garbage to save money. They also worried that portable toilets were not a long-term solution, might break, could be used mistakenly by children as water pails, and that they would not be suitable for remote homes.

They liked that the low-cost private toilet and septic tank was a long-term solution that was clean, sanitary, safe, private, comfortable, independent, and did not require lengthy piping. But they were worried about the cost and size of such an option, as well as the challenges of emptying and building it.

They felt that it might be difficult to maintain a communal facility and were worried that it would fill quickly and that pipes would clog. Finally, they were worried that they were expensive and that the community did not have the space for such an option.

KEY FINDING 5: While poor households want improved sanitation solutions, costs, technical barriers, land rights, and other issues stand in their way of upgrading.

5.1 The biggest barrier to the adoption of improved sanitation systems is cost.

The high interest in improving sanitation and the high demand for improved sanitation systems do not translate into the ability to pay.

Half of households were not willing to pay for a solution, with two-thirds citing lack of funds as the primary reason. Almost half of households without a toilet indicated that cost was the main reason they did not have a toilet. Even for households who said they were willing to pay, the estimated cost of each option was too high for their income. This gap is driven by fluctuation in income and expenditures, budget pressures, the inability to save, lack of financing, and poor credit options for home improvement, among other aspects.

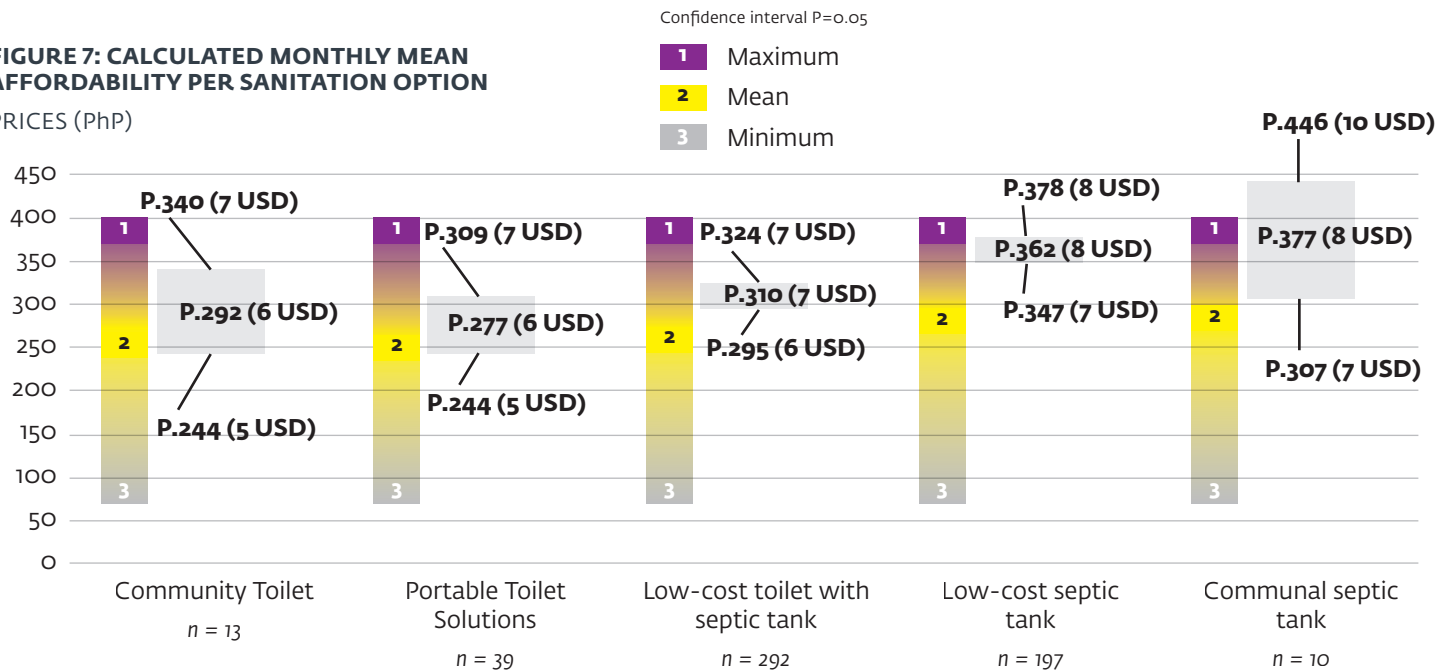
Many families in the Philippines face the reality of an extremely limited budget. Among the households surveyed in this study, the mean estimated annual per capita income is 811 USD (37,928 Php) and the mean annual self-reported income is 592 USD (27,689 Php).⁸ The overall poverty rate of survey respondents was 18 percent.

In addition to having limited incomes, households have very little in savings. Only 17 percent of respondents surveyed indicated they were able to save regularly, and those households saved an average of 22 USD (1,028 Php) per month. They also have poor access to financing. 78 percent of households reported that they do not have any channel for borrowing money. The majority of those with some access cite informal sources such as family, friends, or money lenders as their primary channel.

Households with some disposable income have competing needs which may be prioritized above sanitation improvements. Among those surveyed, 24 percent prioritized home repairs and 17 percent school or college fees; only 13 percent prioritized sanitation improvements.

FIGURE 7: CALCULATED MONTHLY MEAN AFFORDABILITY PER SANITATION OPTION

PRICES (Php)

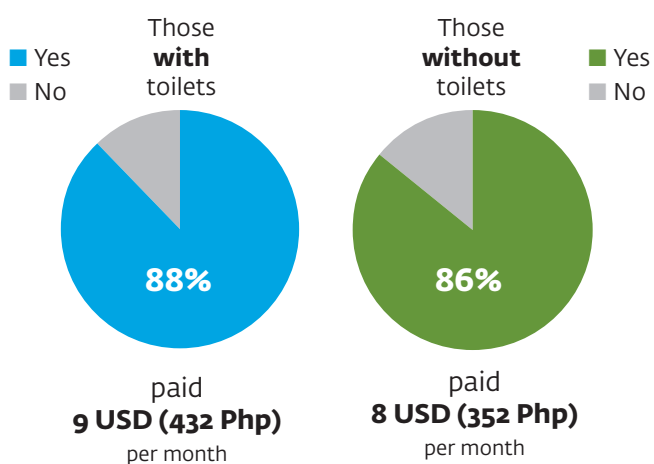


Unit=households who have chosen a sanitation option

While households do have experience with paying for access to basic utilities, there is a significant gap between what households are willing or able to pay and the cost of constructing or upgrading such systems.

Household spending behaviors suggest that people do have some experience with paying for access to other basic utilities such as water and electricity. About 86 percent of those without a toilet pay an average of 8 USD (352 Php) a month for water, while 88 percent of those with a toilet pay an average of 9 USD (432 Php) a month.

FIGURE 8: PERCENT CURRENTLY PAYING FOR WATER



However, the limited and sporadic cash flow of low-income households makes it difficult for them to spend a significant part of their budget on sanitation. Such households often cannot afford the large upfront investment required to construct or purchase an improved sanitation system.

Respondents were asked how much they would be willing to pay for their preferred facility. On average, households were willing to pay 53 USD (2,468 Php) for all the solutions including portable toilet solutions, low-cost toilets with septic tank, low-cost septic tanks, and communal septic tanks.

Acceptable price ranges for sanitation investments were derived using households' declarations as to minimum and maximum acceptable amounts. On average, the price range between 68 USD (3,200 Php) and 86 USD (4,000 Php) was most deemed acceptable for a low-cost toilet with septic tank and low-cost septic tank alone. Only 39 percent of households accepted this price range, suggesting that there is a significant percentage of households for whom this range is not acceptable and the consensus about a preferred price is low among the surveyed households.

There were sizeable differences between regions and between people with differing income levels. A higher willingness to pay was found in Metro Manila and Laguna

than in Rizal and Pampanga.⁹ Households in the non-poor group expressed, on average, greater willingness to pay for improved sanitation facilities than those considered poor.¹⁰ The study also found that the amount households were willing to pay for a sanitation option does not necessarily match the amount of savings they have declared. Surprisingly, even households who declared they had no savings were willing to pay on average 52 USD (2,426 Php) for improved sanitation options.

The study used a benchmark of 2.5 percent of household income to assess the maximum amount households could pay for sanitation.¹¹ Using this benchmark, the mean affordable amount per household is 7 USD (327 Php) a month. Households willing to pay for the option that they have chosen accept to pay 7 USD (332 Php) a month. This amount is much higher than the amounts that were tested in the study. Prices tend to be higher for those opting for a low-cost septic tank or communal septic tank because households with toilets tend to have higher incomes. Conversely, the affordable prices are lowest for community toilets and portable toilet solutions, as households opting for those solutions tend to have lower incomes.

These findings show the necessity of bridging the gap between the amounts households are able or willing to pay and the actual costs of sanitation improvements. Most of the respondents indicated a need to pay in small installments rather than up-front, due to their low levels of savings and difficulty in accessing financing. Therefore, interventions will need to include the establishment of financing, as well as payment terms that reflect the flow of irregular income patterns among low-income households.

5.2 The biggest technical challenge for feasible sanitation options is a lack of space in the home for toilets and around the home for septic tanks. Other geographical considerations include soil conditions, proximity to waterways, and unavailability of access-ways.

Space Is The Biggest Technical Challenge

From the perspective of the household, space emerged as the biggest barrier in the ability of some households to upgrade sanitation facilities. The average size of dwellings, combined floor area, without toilets was 16.5 square meters for the entire study area. These small sizes make building a toilet or septic tank difficult.

Interviewers were instructed to measure the space inside and around the house. They found that 30 percent of households had insufficient space inside the house for a toilet, while 45 percent had enough space for a separate bathroom. Therefore, the plans given to households for adopting new sanitation systems will have to take into account the space constraints and make effective use of the limited space.

Availability of land outside the house for septic tanks was also limited. Only 56 percent of households had the 1.5 square meters around the house needed to build a septic tank. Even community land, which could be used as an alternative for private land around the house to build communal septic tanks, was highly limited. 78 percent of households were situated in communities where there was insufficient community land.

Willingness to pay: Defined as a declaration by households of the amount they would pay for a certain service. Accurate information about willingness to pay is critical for assessing the economic viability of projects, evaluating policy alternatives, setting affordable tariffs, assessing financial sustainability, and designing socially equitable subsidies.

Acceptable price range for sanitation improvements: Defined as the range between the minimum and the maximum amounts each household declared they would be willing to pay.

Affordability: Defined as the share of monthly household income that households have the capacity to pay for utility services. Unlike willingness to pay, it is not based on a declared amount that households would want to pay; rather it is an amount calculated based on a ratio to the household's income, which is 2.5 percent of income in this study.

Type Of Property Influences What Can Be Constructed

The type of property also influences the ability of a household to build a toilet or septic tank. About 48 percent of respondents lived in studios or one-bedroom dwellings. In Metro Manila the figure reaches 69 percent, compared with only 33 percent in Rizal. Another 20 percent of respondents live in multi-story buildings, which present additional challenges for toilet construction. In addition, non-robust housing materials such as bamboo make it difficult to build a toilet out of the traditional ceramic and concrete desired by some respondents. Alternatives that are lightweight and suitable for such conditions will have to be explored.

Access To Septic Tank For Desludging

A simple sanitation improvement option would be to ensure that current septic systems are desludged, while also creating desludging requirements for new systems. In addition to social and financial reasons for not desludging, there are pragmatic issues that make accessing septic tanks for desludging very difficult:

- **Location of septic tanks:** About 70 percent of households surveyed have a septic tank or pit located under the house, which means that the flooring would need to be broken in order to access it. There is often no lid or easily accessible opening through which to empty the septic tank because many systems were built on the

mistaken assumption that they would never need to be emptied.

- **Road accessibility:** Emptying a septic tank is typically done by a vacuum truck, but the process is a challenge in dense urban areas where roadways to houses are often too narrow to accommodate these trucks. About 18 percent of respondents' toilets were located more than 20 meters from a main road where a truck could park. Additionally, in the majority of cases the width of the access path to the house is too small for an emptying vehicle to pass. Only in 19 percent of the cases was it big enough for a car, while in 71 percent of the cases the access path to the house was big enough only for a person or a motorbike. The limited width adds complexity to constructing a sewer as well, since roads will need to be completely closed for construction.

Terrain And Soil Conditions Need To Be Addressed At The Design Stage

Sanitation solutions must address technical considerations raised by the physical environments of households. The areas in the survey mostly had sandy soil, which is fast draining and suitable for septic tanks emptying into soak pits. However, Rizal and Laguna have slower-draining soil, which makes it difficult for septic tanks to discharge to soak pits or to leach fields as typically required by standard designs. In these areas, systems must be designed so that discharge is redirected to covered drains or to an additional



Informal settlements face very poor sanitation conditions. In Metro Manila, the relocation of informal settler families to private lands can take two or more years. In the meantime, these families do not have sufficient residency rights to receive sanitation support, and the local government does not implement sanitation projects on-site due to the lack of land ownership. The city health officer in Taguig, Manila suggested that informal settler families could form associations and get accredited to help with applications for water, electricity, and other basic services.

chamber with filter media. Further, 19 percent of the surveyed households' dwellings are below street level, making desludging even more challenging.

5.3 Effectively expanding access to sanitation to the underserved lacking land rights and those in informal settlements is another key challenge.

Lack of land ownership is a major obstacle to improving sanitation systems. Among households that currently do not have a toilet, land ownership was, after cost, the most frequently cited reason for not improving sanitation. About 76 percent of households without private toilets did not own the land they lived on, but instead rented, squatted, or occupied the land for free. Respondents indicated that the landlord refused to build a septic tank or that they could not build one since they did not own the land. Additionally, many worried that asking the landlord to build a toilet could lead to an increase in their rent, affecting their ability to afford housing.

Land ownership is a particularly difficult issue for those living in informal settlements. Even though many government officials recognize the need to protect informal settlers living on waterways, the lack of land rights and plans to relocate these households make carrying out sanitation upgrades extremely difficult. In one province, an official said that he was instructed to defer the implementation of a sanitation project for an informal settlement area because the project could encourage the settlers to resist relocation efforts.

Another issue is the influence of culture on sanitation practices. This is particularly true for those people living in Tabun, Pampanga where there is a community of migrant Badjaos who view open defecation as a safe and accepted sanitation approach. The city health official reported that some Badjao residents continue to practice open defecation despite the construction of a communal toilet for them.

5.4 Institutional fragmentation and poor coordination among local governments is another barrier to sanitation improvements.

The institutional setup of national government agencies is fragmented, and supporting agencies are weak, posing a challenge for improving sanitation services throughout the country, as such an effort requires cross-sector engagement. The multiple government agencies involved in sanitation services often have unclear and overlapping mandates, hampering sector development. Local government units (LGUs), which oversee the sectors, have varying capacities. LGUs also have difficulty coordinating the efforts of departments, such as those managing health, environment, or community issues. So, while officials in the in-depth interviews were clear on their roles, they often operated in silos. Other key large players such as the Local Water Utilities Administration have the technical capacity to support sector development, but operate under a difficult governance framework and have financially underperformed.

Informal settlements in particular fall through the cracks of this fragmented framework. Ongoing plans to relocate households living in informal settlements prevent sanitation improvements, since they lead officials and government employees to downplay the extent of sanitation issues,

Focus Group Discussions: Role of Community Leaders



Participants in focus groups discussed how setting an example for others to follow and educating people through informal and formal campaigns would influence them to upgrade their sanitation conditions. While regulations were seen as important to force people to act, most people thought that local leadership from a **barangay leader** was more effective at changing people's behavior.

saying that they would later disappear when the residents moved or were resettled. Even when the government does recognize that informal settlement families need proper sanitation facilities and that those people living on waterways need to be protected, officials feel that there is little they can do to help.

Limited budgets and competing public priorities make sanitation a low priority for the government. Government institutions that are working to support the poorest households have limited financial resources and therefore limited ability to address sanitation, especially as they focus on “more immediate” issues, such as mosquito-borne diseases. Even though a considerable number of people in the Philippines still lack improved sanitation facilities, local government employees and ministry officials minimized the importance of sanitation during the in-depth interviews. These government officials commonly believed that sanitation is not a major problem and that water-borne diseases are rare, and they had other priorities. Limited budgets mean that local government units tend to instead prioritize diseases that are perceived to be more life-threatening such as dengue (which was a priority for many health and environment departments) and other mosquito-borne diseases. Many environmental officers reported being primarily focused on the sanitation permits of commercial establishments, which generate revenues for the local government units and therefore attract greater attention. Officers tend to focus on septic tank improvement for businesses rather than residences, and on management of water and garbage. Local government units that do have sanitation programs have focused mainly on personal hygiene practices. Unsanitary practices or lack of toilet facilities rarely emerge as immediate causes of concern.

KEY FINDING 6: Community engagement can play a positive role in influencing households about sanitation practices, and ensure project sustainability.

Barangay leaders are viewed as an effective and often a preferred source of information on sanitation practices. They are strong influencers and motivators in the community. The research also showed that community action can be effective when there is wide agreement in the community and among community leaders. Community engagement in water and sanitation service delivery has been effective in facilitating a change in behavior and ensuring project sustainability and accountability.

Many communities have instituted education campaigns to inform and engage community members with health and hygiene issues. Such campaigns have been successful in communicating the importance of handwashing and of clean drinking water. Another example is the “Green Clean” campaign, which raised awareness and community engagement on issues related to water and sanitation and created a sense of shared responsibility between government and individuals around community improvement. In Metro Manila, where communal services include water pumps and toilets, respondents reported that each household takes part in shared responsibilities such as cleaning the communal toilet. The effectiveness of community campaigns has varied by geography, with more success in Metro Manila, where there seems to be stronger “community spirit” and cooperation, than other regions such as Pampanga. Still, education campaigns can be effective in informing people and changing behaviors, which can be used in the effort to improve toilet facilities.

Recent Success at Community Engagement



Many interviewees mentioned that it has become more common for households to buy purified drinking water and that education campaigns around handwashing have been successful in reducing risks of water-borne illnesses. Though improvements to the drinking water supply have helped decrease water-borne illnesses, they may also have inadvertently contributed to a lowering of concern about sanitation. Nonetheless, a number of interviewees cited community-level engagement as the best option for promoting and improving sanitation. Such engagement could leverage the network of local barangay health workers, who usually reside in the barangay itself, visiting households and personally talking to residents. Additionally, representatives from a couple of local government units mentioned that these health workers also issue tickets against offenders who violate environmental or sanitation ordinances.

The Philippines has a number of laws and policies governing sanitation and water supply. While there are no lack of laws designed to support the water and sanitation sector in the Philippines, translating them into projects and programs still remains a challenge. Several agencies play key roles in the sanitation sector in the Philippines.

FIGURE 9: NATIONAL GOVERNMENT AGENCIES: ROLES AND RESPONSIBILITIES

Agency	Roles and Responsibilities
National Economic and Development Authority (NEDA)	Leads the formulation and implementation of national policies
Department of Public Works and Highways (DPWH)	Oversees Local Water Utilities Administration (LWUA) and Metropolitan Waterworks and Sewerage System (MWSS) Manages major infrastructure projects
Department of Health (DOH)	Implements programs related to public health aspects of sanitation Operationalizes the Sanitation Code, including regulating the operations of regional and provincial sanitation providers (desludging, septage hauling, wastewater treatment) Advocates for sanitation efforts by local government units (LGUs)
Department of the Environment and Natural Resources (DENR)	Implements programs aimed at lessening environmental pollution resulting from sanitation Leads the operationalization of the Clean Water Act
Local Water Utilities Administration (LWUA)	Promotes and oversees development of water supply systems through local water districts in areas outside Metro Manila Provides capacity building support to water districts
Metropolitan Waterworks and Sewerage System (MWSS)	Serves Metro Manila through two concessionaires, the Manila Water Company and Maynilad Water Services

Utilities agencies in charge of the sanitation sector in the Philippines are highly fragmented, with different standards, priorities, and implementation timelines

FIGURE 10: UTILITIES / SERVICE PROVIDER: ROLES AND RESPONSIBILITIES

Provider	Roles and Responsibilities
Metropolitan Waterworks and Sewerage System (MWSS)	Two private companies (Manila Water Company, and Maynilad Water Services) operate under contract to the public MWSS to serve the mega-Manila area, which extends beyond Manila's center into the neighboring provinces.
Water Districts	Autonomous utilities created under Presidential Decree 198, water districts have traditionally been financed and technically supported by the Local Water Utilities Administration and serve nearly 19 million people. There are 844 Water Districts, of which around 514 are operational.
Local Government Utilities (LGU)	Anywhere from 660 to 3,900 utilities operate as part of Local Government Units.
Other public-private partnerships and private utilities	Three large companies, Manila Water, Balibago Water services, and PrimeWater Infrastructure, and several smaller ones operate around 360 systems outside mega-Manila.
Community providers	There may be around 7,950 small community utilities organized in various forms, including Community-Based Organizations, Rural Water Supply Associations, Barangay Water Supply Associations, and Co-operatives.

RECOMMENDATIONS










This study focused on the ways that solution providers can help develop a market for low-cost, quality sanitation products for low-income households in the Philippines. It also considers what needs to be done to establish an environment that would enable such a market to grow.

Progress in creating universal access to sanitation will require a range of activities and innovations along all parts of the value chain. Figure 11 below provides a synopsis of

these activities, starting with research and development on the left hand side of the spectrum and ending with Operation and Maintenance (O&M) and after-sales support on the right hand side.

This section goes into each of these phases of the value chain in more detail, providing recommendations on actions that solution providers could take. Given that success will require collaboration with other entities it also provides some further considerations on areas where solution providers could work together with other parties throughout the value chain.

FIGURE 11: RECOMMENDATIONS

	 Research & Development	 Product / Service Development	 Distribution / Service Delivery	 Sales and Marketing and After-Sales Support
 Value Chain				
 Solution Provider	<ul style="list-style-type: none"> Help generate demand for toilets and lead value chain development Lead technical design 	<ul style="list-style-type: none"> Prototype products and test models and prices for BOP 	<ul style="list-style-type: none"> Provide/facilitate access to finance through innovative payment 	<ul style="list-style-type: none"> Conduct education awareness and effective community campaign Leverage community support for maintenance
 NGO	<ul style="list-style-type: none"> Conduct product design and facilitate process 	<ul style="list-style-type: none"> Conduct capacity training for masons Monitor quality construction 	<ul style="list-style-type: none"> Help connect customers with financial assistance/subsidies 	<ul style="list-style-type: none"> Help conduct awareness training and generate demand Provide ongoing operation and maintenance and after sales support for customers
 MFI			<ul style="list-style-type: none"> Provide sanitation loans for customers 	<ul style="list-style-type: none"> Raise awareness of solutions Help generate demand
 Government	<ul style="list-style-type: none"> Gather inputs for product design for BOP 	<ul style="list-style-type: none"> Facilitate financing for private sector to support technical design and pilot testing 	<ul style="list-style-type: none"> Provide guideline for customers to access to financial assistance for sanitation 	<ul style="list-style-type: none"> Help provide ongoing operation and maintenance and after sales support for customers



Value Chain

Research & Development
Product / Service Development
Distribution / Service Delivery
Sales and Marketing and After-Sales Support

FOR SOLUTION PROVIDERS

1. Research & Development: develop quality and cost-effective solutions targeting low-income households

Design product tailored to the **needs and profiles** of target households:

- i. Providers should consider design and engineering alternatives that reduce the footprint and cost of private toilets so that low-income households that aspire to have them can afford and accommodate them. Solution providers also need to make sure to elicit feedback from the targeted communities and even seek community involvement in the design of sanitation products.
- ii. For each customer segment, options should address physical and socioeconomic considerations, such as available space, physical geography, and land tenure along with personal preferences, aspirations, and willingness to pay.
- iii. Consider how all proposed sanitation models, including community toilets or portable toilets, will maximize the qualities most highly valued — safety, convenience, and privacy.

Design a product that low-income households can **afford**:

- i. **When engaging with partners to design sanitation models, consider affordability and willingness to pay of low-income households.** Partnerships with nongovernmental organizations and with the public sector can support the development of low-cost latrines and the creation of sanitation entrepreneurs through training and sanitation marketing in the Philippines. Innovations, particularly in the design and pilot testing of low-cost options, may also grow out of the process known as Human Centered Design, in which the perspectives and experiences of end users are included in the design process to make sure solutions are suitable and relevant to their needs.
- ii. **Explore additional possibilities for developing innovative sanitation models in the area of reuse of human waste and recycling of sanitation products.** Types of sanitation businesses are emerging that use raw waste or the outputs of waste water treatment for productive and profitable purposes. Because waste has a potential monetary value that can be tapped, and waste reuse has a broader environmental benefit, there may be a possibility that these approaches may increase the financial and physical demand for waste which can help incentivize and even help pay for alternatives to such unregulated discharge. Potential exists in this area, though very little progress has been demonstrated thus far in the Philippines.



Value Chain

Research & Development

Product / Service Development

Distribution / Service Delivery

Sales and Marketing and After-Sales Support

2. Product / Service Development: Incubate value chain players and explore holistic market-based business models

Consider formulating market-based business models for sanitation that capitalize on household needs and constraints together with the detailed supply side information to understand what models are available and feasible for different conditions.

- i. First, conduct a product landscaping analysis to find available products, paying attention to options, features, and price. Second, identify gaps in the local market in which technologies are not present and identify suitable product solutions. Then, gather inputs from a range of stakeholders, including experts and institutions, value chain participants, and potential customers.

- ii. Develop an initial business model which details product design parameters, value chain players and their roles, and volume projection and economics over the project's life cycle, along with key success factors, risks, and concerns. Then, pilot potential market-based "end-to-end" solutions based on a pilot design including an overall plan to reach potential value chain players, pilot locations identified, and potential performance metrics for pilots.



FIGURE 12: APPLICABILITY OF SANITATION OPTION BASED ON PHYSICAL CONSIDERATIONS

Option	Have existing toilet facility	Have space inside house ^a	Have space in communal area	Have space/ access for pipe-laying
Community Toilet	No	No	Yes	No
Portable Toilet Solutions	No	No	No	No
Shared Toilet	No	No	Yes ^b	No
Private Toilet with low-cost septic tank	No	Yes	N/A	N/A
Low-cost septic tank only	Yes	Yes	N/A	N/A
Private Toilet w/ communal facility	No	Yes	Yes	Yes
Communal facility only	Yes	Yes	Yes	Yes

a Area requirement pertains to space among numerous individual houses

b Communal area in this instance refers to a neighbor's house

FIGURE 13: SOCIOECONOMIC FACTORS

Option	Level of service ^a	Overall requirement for tenure and space ^b	Requirement for community participation	Relative cost ^c
Community Toilet	Medium	Medium	Very high	Low
Portable Toilet Solutions	Low	Low	Low	Low
Shared Toilet	Medium	Medium	High	Low
Private Toilet w/ low-cost septic tank	High	High	Low	Medium
Low-cost septic tank only	High	High	Low	Medium
Private Toilet w/ communal facility	Very high	Very high ^d	Very high	High
Communal facility only	Very high	Very high	Very high	High

a Level of service is a positive attribute and so is color-coded opposite the other negative attributes

b Based on totals of Table 1

c Values shown are based on the absolute cost of construction of the option. However, subsidies and payment schemes can make costlier alternatives more affordable, especially if they are found to be most feasible and sustainable for the specific area.

d Rated as very high due to opportunity for higher level of treatment ex. primary to secondary treatment



Value Chain

Research & Development

Product / Service Development

Distribution / Service Delivery

Sales and Marketing and After-Sales Support

3. Distribution / Service Delivery: facilitate access to financing to help break down affordability barriers and reduce upfront costs for sanitation systems

Facilitating access to financing will be critical for any of the options to succeed, as it will help with affordability and reduce the upfront costs of sanitation systems for low-income households.

- i. Public and private sector partnerships should be leveraged to implement innovative and suitable financing solutions that increase access and maximize affordability for low-income households. Partnerships with financial institutions, such as microfinance institutions, can help with financing, providing subsidies, or disbursing loans to make sanitation improvements possible for low-income households.
- ii. Blended finance could be used in a way that does not distort the markets but instead directs more commercial finance toward water and sanitation infrastructure. Approaches such as grants, concessional lending, and various forms of credit enhancements can help address financing constraints that households face.
- iii. Types of funding that base financial incentives on tangible outcomes, such as result-based financing,¹² can be successfully leveraged, for example subsidies that boost access for underserved households to sanitation or “Output Based Aid.”

4. Distribution / Service Delivery: design adequate payment methods and help facilitate payment for low-income households

- i. **Work with financial institutions to design adequate payment methods** and to make sure monthly payments are affordable for low-income households based on their affordability benchmark. Research shows that most low-income households prefer paying their contribution or fees in monthly installments, though some households will pay upfront for installing or improving a sanitation facility if the cost is reasonable.
- ii. The monthly contribution should be affordable, and ideally it will be below the affordability benchmark of 2.5 percent of a household’s monthly consumption, which is, on average 7 USD (327 Php) a month. Lastly, it is important to ensure payment for products by arranging appropriate payment channels for customers.

People in most households prefer to pay at a local level: 44 percent preferred to pay at a barangay or payment center, 35 percent preferred a barangay authorized representative, and 14 percent preferred a service provider.



Value Chain

Research & Development

Product / Service Development

Distribution / Service Delivery

Sales and Marketing and After-Sales Support

5. Sales & Marketing and After-Sales Support: build awareness and create demand for solutions

Develop a targeted, community-based approach, and conduct education and marketing campaigns to build understanding of the importance of improved sanitation and of available sanitation options.

Only 10 percent of surveyed households have ever received information about sanitation, and this information was limited to instructions on hand-washing with soap or disposal of solid waste. Most surveyed households have little awareness of sanitation options, do not know how to construct toilets, and do not know where to find masons or other community members that could construct them.

- i. Leverage the influence of barangay leaders by involving them in any promotion and education campaigns, communicate to them the benefits of improved sanitation through quality products, and help them to provide accurate information to the whole community.
- ii. With leadership of a proactive community leader, coordinate projects and targeted socialization with the community, leveraging lessons learned from other successful community activities. Information should be based on community views and should show the benefits of improved sanitation, the options for improvement, the estimated cost of each option, and the options for payment. Any solution will initially need strong community support while the market is built and until it becomes large enough to be self-sustaining.

Effective Collaboration and Partnerships: work with the government to push a comprehensive sanitation-for-the-poor agenda

Solution providers, the government, microfinance institutions, non-governmental organizations, and the private sector can develop a market for underserved

populations, attract private investment, and create an environment that will enable the market to grow.

While the research shows that the local government officials often underemphasize the importance of sanitation and are unaware of concrete actions to take, they are rich in political capital and can mobilize people and push projects quite effectively, so long as they are given technical assistance, especially in planning and engineering.

To push further sanitation efforts on the national level, solution providers can engage national government leaders broadly, or they can do so in the context of specific projects. Relevant government agencies include the Department of Health, the Department of Environment and Natural Resources, and Congress. Government officials should be involved from the earliest stages of development in order to increase buy-in.

Solution providers should seek the assistance of the government in reducing the occurrence of unsanitary practices as well as increasing demand for sanitary alternatives. Direct discharge of feces into waterways could be policed or, alternatively, improvements could be rewarded. Defecation by children near the roadside or into creeks should be curbed. Local government units could also campaign more strongly against throwing away feces along with garbage. Providers can encourage governments to get involved by pointing to negative effects on public health and the environment — the same issues that led to a Supreme Court mandate to clean up Manila Bay.

All actors in the value chain should work together to drive demand for sanitation solutions and to ensure that the right products are provided at affordable prices.

Because improving sanitation in underserved communities is a challenge of such great magnitude, partnerships among various stakeholders are likely to be very important. Solutions providers can benefit from partnering with non-governmental organizations, microfinance institutions, and governments. Below are some examples of ways that solutions providers can partner with others and foster an environment in which universal access to sanitation can be achieved.

NON-GOVERNMENTAL ORGANIZATIONS (NGOs)

NGOs have a solid presence, strong networks and relevant local knowledge in many localities (or communities). By partnering with solutions providers, NGOs can widen the impact of their efforts while staying consistent with their social mission. Solutions providers can leverage NGOs' strengths to build awareness, generate demand, train local manufacturers, monitor the quality of construction, endorse trustworthy and quality providers, and provide long-term customer support. Some NGOs will have experience in bringing the perspectives and experiences of potential customers into product development and design, ensuring that solutions are feasible and relevant to the needs of the people who will use them. Some NGOs may also be able to help customers find appropriate subsidies to help pay for sanitation solutions.

MICROFINANCE INSTITUTIONS (MFIs)

Solutions providers can partner with MFIs to help people pay for water and sanitation services. MFIs can leverage existing funding by disbursing it through loans to people in need. Water.org, for instance, provides funding to various MFIs in the Philippines for capacity building and technical assistance. Through its Water Credit program, it offers grants to MFIs (or affiliated NGOs) for operational expenses while providing water and sanitation loans.¹³ MFIs, together with local NGOs, can also help raise awareness and drive demand for specific products.

GOVERNMENT

Governments, with their knowledge of and ability to affect local conditions, can help solutions providers design sanitation options that are feasible in particular communities.

More significantly, governments can help create demand for sanitation solutions among low income households by creating education and marketing campaigns that build an understanding of the importance of improved sanitation and awareness of available options.

Solutions providers can also work with governments to ensure that sanitation solutions are affordable. They can work with local government units to facilitate creation of financial assistance programs and to help customers learn about current options for financial assistance. Governments can even develop new financing instruments for potential providers, such as viability gap financing or output-based aid and subsidies. Such financing will encourage providers to work on technical design, pilot concepts, build awareness, and roll out business models.

Annex

RESEARCH METHODOLOGY

Provided below is background on data collection methodology, on sanitation models, and more information on the analytical framework used to assess the optimal conditions for implementation of each of these models.

Focus Group Discussions:



Led by TNS Philippines and MWF with guidance and supervision from IFC

technical team members, discussions were conducted from January 2016 to March 2016 in the same areas as the household surveys. The aim was to understand the drivers, barriers, and preferences of low-income households for improving sanitation systems. Two focus groups, each with four to six residents, were conducted per province, with a total of 64 participants.

In-depth Interviews:



Semi-structured interviews with 14 government officials were conducted by MWF,

with guidance from IFC technical team members, between April and June 2016. Interviewees included barangay leaders, barangay health workers and officials, city health officers, sanitation inspectors, and sanitation heads of local governments. The aim of these interviews was to understand the status of ongoing government efforts concerning sanitation.

Household Quantitative Surveys:



From June to July 2016, surveys were conducted with 800 households (400

households with private toilets and 400 households without private toilets) by local survey firm TNS Philippines, whose surveyors were trained and supervised by IFC. The survey focused exclusively on residential buildings and excluded dormitories and buildings that were used for commercial, service, business, or industrial purposes.

For the household quantitative surveys, target respondents were the heads of households or their partners, between the ages of 20 to 60 years old, and within the lowest income economic class. For detailed survey methodology and sample design, refer to contact information on the last page.

The household survey included more than a hundred questions, or about 470 variables. Many of the variables were derived from a framework based on three parameters: social, financial and technical.

These three parameters were used to assess the barriers and drivers for changing sanitation practices, and to ultimately to test the feasibility of different models and the potential tradeoffs. The next page presents an overview of the analytical framework used in this exercise. This framework captures both existing conditions and variables that influence selection of sanitation options.

This was combined with testing with households willingness to improve, interest among a proposed set of sanitation models, and their ability and willingness to pay for improved models.

FIGURE 14: ANALYTICAL FRAMEWORK

	Social	Financial	Technical
Understanding existing sanitation	<p>Understanding of need for sanitation, impact of poor sanitation on health and environment</p> <p>Perception of sanitation performance</p> <p>Socio-economic data that may influence needs and decisions</p>	<p>Current financial situation and affordability</p> <p>Costs of current sanitation</p>	<p>Details of design in comparison to standards</p> <p>Configuration and operation of current system and its current and potential impact on health and environment</p> <p>Operation and maintenance</p> <p>Needs/requirements</p>
Improving options	<p>Motivations for improvement and factors that influence decision-making</p> <p>Satisfaction with existing sanitation options</p> <p>Role of stakeholders including community leaders in influencing change</p> <p>Perception of individual versus collective or government responsibility</p> <p>Ongoing sanitation programs or projects</p>	<p>Anticipated costs for upgrading</p> <p>Income, affordability, and willingness to pay</p> <p>Access to finance and preferred payment schemes</p> <p>Role of other public or nongovernmental institutions in financing</p>	<p>Suitability of upgrading existing system</p> <p>Land for building new system</p> <p>Elevation and gradient</p> <p>Soil conditions and groundwater use</p> <p>Access to emptying and street width</p>



PROFILES OF SURVEY RESPONDENTS

Respondent Profiles:

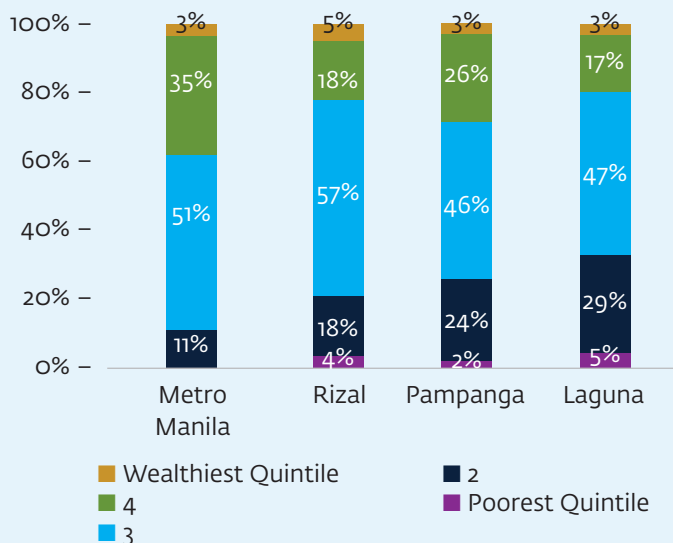
About 82 percent of respondents were females, although only 16 percent of females were heads of households. Half of all heads of households were unskilled workers or worked in agriculture, 22 percent worked in services or sports, and 19 percent were skilled workers. The average age of respondents was 39 years, with males slightly older than females.

On average, households have 5.11 members: 3 adults, 1.3 children aged between five and 14 years old, and 0.8 young children below the age of five years old. Nearly all households surveyed live in small quarters: 48 percent live in studio-type or one-room dwellings and 42 percent live in single-detached houses.

Nearly half of the households in the survey owned their homes. On average, 40 percent of households own their plots or land and 39 percent occupy land for free. A larger number of land owners is found among private toilet owners and those who use a neighbor or friend's toilet.

SWIFT (Survey of Well-being via Instant and Frequent Tracking) — key findings by province:

The project employed the SWIFT Tool, or the Survey of Well-being via Instant and Frequent Tracking, which is a quick and low-cost way to gauge the consumption levels of households. Consumption can be used as a proxy for income or poverty levels. The Poverty Global Practice at the World Bank has developed this tool as part of its efforts to reduce absolute poverty.



Using the SWIFT tool, the team estimated consumption levels for the overall sample and segmented the responses to other questions according to income or poverty levels. The average consumption levels provide an idea of the average income levels of the households in the survey areas. The mean estimated annual per capita income through SWIFT is 811 USD (37,928 Php), whereas the mean annual self-reported income is 592 USD (27,689 Php). The general poverty rate of survey respondents was 18 percent, compared with 25 percent for typical households in the same region. The poverty line changes based on province, the highest line being found in Rizal and the lowest in Pampanga. But Laguna had the highest share of

those in the lowest quintile in terms of income, with 29 percent of respondents in the second-lowest quintile, and 5 percent in the lowest income bracket. Metro Manila had no respondents in the lowest income level and 11 percent in the second-lowest.

SANITATION OPTIONS

There are four general categories of sanitation facilities:

1. **Open defecation** when human excreta is disposed of in fields, forests, bushes, open bodies of water, beaches, or other open spaces or disposed with solid waste
2. **Unimproved sanitation facilities** do not ensure hygienic separation of human excreta from human, animal, or insect contact. They include the following:
 - Flush/pour flush to elsewhere refers to excreta being deposited in or nearby the household environment (not into a pit, septic tank, or sewer). Excreta may be flushed to the street, yard or plot, open sewer, a ditch, a drainage way, or other location.
 - Pit latrine without slab uses a hole in the ground for excreta collection and does not have a squatting slab, platform, or seat. An open pit is a rudimentary hole.
 - Bucket refers to the use of a bucket, chamber pot, or other container for the retention of feces (and sometimes urine and anal cleaning material), which is periodically removed for treatment, disposal, or used as fertilizer.
 - Hanging toilet or hanging latrine is a toilet built over the sea, a river, or other body of water, into which excreta drops directly into the water.
3. **Shared improved sanitation facilities** are facilities of an otherwise acceptable type (see description of improved sanitation facilities below), shared between two or more households. This is distinguished from the original JMP definition which only classified facilities that are not shared, or not public, as improved. Shared sanitation facilities, especially those constructed properly, can provide drastically better service to users of unimproved sanitation facilities, but still do not provide the level of privacy, security, and reliability of a private improved sanitation facility.
4. **Improved sanitation facilities** are likely to ensure hygienic separation of human excreta from human, animal, or insect contact. They include the following, relevant to the likely conditions in the Philippines:
 - Flush toilet uses a cistern or holding tank for flushing water, and a water seal (which is 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 unlike a flush toilet, a pour flush toilet uses water poured by hand for flushing (no cistern is used). This can discharge to:
 - Piped sewer system is a system of sewer pipes, also called sewerage, that is designed to collect human excreta (feces and urine) and wastewater and remove them from the household environment. Sewerage systems consist of facilities for collection, pumping, treating, and disposing of human excreta and wastewater.
 - Septic tank is an excreta collection system consisting of a water-tight settling tank, which is normally located underground. The treated effluent of a septic tank is designed to seep into the ground through a leaching pit. It can also be discharged into a sewerage system.
 - Pit latrine refers to a system that flushes excreta to a hole in the ground or leaching pit (protected, covered). Dry improved toilets are less common in urban areas of Philippines, where water based sanitation is typical, but can include:
 - Ventilated improved pit latrine (VIP) is a 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 and the inside of the superstructure is kept dark.
 - Dry pit latrine with the pit fully covered by a slab or platform that is fitted either with a squatting hole or seat. The platform should be solid and can be made of any type of material (concrete, logs with earth or mud, cement, etc.) as long as it adequately covers the pit without exposing the pit content other than through the squatting hole or seat.
 - Composting toilet is a dry toilet into which carbon-rich material (vegetable wastes, straw, grass, sawdust, ash) is added to the excreta and special conditions are maintained to produce inoffensive compost. A composting latrine may or may not have a urine separation device.

TESTED SANITATION MODELS

In order to better understand attitudes toward different sanitation improvement features, a limited set of sanitation options, selected from the list discussed in the previous section, was presented to study participants. The selection was based on current sanitation systems, available technologies, and early, ongoing piloting of certain options, such as the portable toilet solutions.

COMMUNITY TOILET



Community toilets have been built primarily by local governments, typically in public spaces, like barangay or neighborhood halls. Community toilets, unlike the public toilets found in parks or malls, are made for everyday use by communities that lack private sanitation. These toilets are installed within the community itself unless issues with land acquisition make that infeasible, as in informal settlements. To be truly viable, a community toilet needs to be appropriately sized, be located close to the community, have a secure water supply, be well maintained, and have user fees that are manageable for members of the community.

PORTABLE TOILET SOLUTIONS



The concept of a portable toilet solution is somewhat new. It has been tested in Ghana and Haiti and is being considered for use in Laguna, a province in the Philippines.¹⁴ The toilet itself is similar in concept to a chamber pot kept inside the house and emptied after use. The difference is that the portable toilet system is designed to reduce smell and to help individuals avoid direct contact with feces. The system includes regular collection and subsequent treatment of the waste by an external service provider. The portable toilet solution unit tested in the study, following a proprietary design of a toilet manufacturer, is a plastic receptacle specially designed to minimize odor. It is designed to have sufficient volume for usage by a typical family for three days, after which it is collected by service providers and discharged in proposed local acceptance facilities. The waste from these acceptance facilities will be periodically desludged by vacuum trucks and transported to a wastewater treatment facility.

PRIVATE TOILET WITH SEPTIC TANKS AND SEPTIC TANKS ONLY



Private toilets with septic tanks are the most prevalent sanitation facility in the Philippines, though the quality of their design and construction varies widely. The cost of a standard/improved septic tank, which is typically an underground two-chambered reinforced-concrete tank, is prohibitive for many poor households. Innovations in septic tank design include small-footprint septic tanks made of plastic or fiberglass that can be installed faster and more cheaply than conventional concrete tanks. The study presented two options: a low-cost private toilet with septic tank for households without toilet, and, for households that had an existing toilet or an unimproved pit, a low-cost septic tank only. The costs as presented included the concrete floor, septic tank, and — for the first option — the toilet bowl.¹⁵ Households were informed that these systems require emptying every three to five years and require land around the house to be built.

COMMUNAL TREATMENT



Private toilets with communal treatment, often referred to as decentralized wastewater treatment systems, exist in some new private-sector developments, small commercial areas, and in other developments such as old government housing projects. In the Philippines, these have been built in the Quezon and La Union Province, Dumaguete, San Fernando.¹⁶ In Indonesia, they are common in dense low-income urban areas that have little space for individual septic tanks. There are 14,000 community-scale sanitation systems built by government and donor funded programs.¹⁷ Typically, household toilets are connected to a network of sewer pipes that discharge into small treatment facilities, which can be improved septic tanks, anaerobic baffle reactors, or simple decentralized wastewater treatment systems sized to treat a number of households. Since the facilities are usually managed by the community rather than a wastewater authority, the community needs to work together to support their operation and to fund minor costs, such as regular desludging.

Endnotes

1. "Progress on Drinking Water, Sanitation and Hygiene, 2017 Update and SDG Baseline," *World Health Organization and the United Nations Children's Fund*, 2017, Geneva. Available at: <http://www.who.int/mediacentre/news/releases/2017/launch-version-report-jmp-water-sanitation-hygiene.pdf>
2. Rodriguez UE., Jamora N., and Hutton G, *Economic Impacts of Sanitation in the Philippines*. World Bank, *Water and Sanitation Program*, 2008, Washington D.C. The World Bank Water Sanitation Program estimated the economic cost of poor sanitation and hygiene in urban areas in the Philippines at \$1.4 billion per year, with the impact on health the largest source of quantified economic costs
3. Philippines Unified Financing Framework for Water Supply and Sanitation
4. Rodriguez, Jamora, and Hutton. *Economic Impacts of Sanitation in the Philippines*. World Bank, *Water and Sanitation Program*.
5. The Philippines Statistical Authority established the 2016 poverty level in different provinces: Pampanga (19,670 Philippine pesos), Laguna (20,175 Philippine pesos), Metro Manila (20,344 Philippine pesos), and Rizal (20,742 Philippine pesos).
6. Imputed per capita income has been calculated through the SWIFT tool, which estimates consumption levels or imputed per capita income for the overall sample of 800 households based on poverty levels. The average consumption levels or imputed per capita income provides an idea of the average income levels of the households in the survey.
7. "Economic Impacts of Sanitation in the Philippines. Economic Assessment of Sanitation Interventions in Indonesia," *World Bank*, 2017. A six-country study conducted in Cambodia, China, Indonesia, Lao PDR, the Philippines, and Vietnam under the Economics of Sanitation Initiative (ESI) Water and Sanitation Program.
8. The Philippines Statistical Authority.

9. Willingness to pay was measured by a household's response to three questions: 1) What is the maximum acceptable amount beyond which respondents would consider the service to be too expensive to be acceptable? 2) What is the minimum acceptable amount below which respondents would consider the service to be too cheap and quality questionable? 3) What is the standard amount or normal amount that respondents would consider reasonable or fair?
10. A household is defined as poor if household income is less than the poverty line set per province.
11. Frankhauser S. and Tepic S., "Can poor consumers pay for energy and water? An affordability analysis for transition countries," *European Bank for Reconstruction and Development*, 2005.
12. An umbrella term for innovative mechanisms that disburse subsidies after results have been verified. Resources are disbursed not against individual expenditures or contracts on the input side, but against demonstrated and independently verified results that are largely within the control of the service provider. Risk is therefore transferred to the service provider.
13. [Water.org](https://water.org). Available at <https://water.org/our-impact/philippines/>
14. Program in Ghana and Laguna: <http://www.toiletboard.org/our-impact>. Trial in Haiti: <https://www.oursoil.org/what-we-do/dignified-sanitation>.
15. To manage costs, funds for the toilet walls and roofing were removed. Households could then construct those two pieces in line with their budget.
16. "East Asia and the Pacific Region Urban Sanitation Review: Philippines Country Study." *World Bank*, 2013, Washington D.C.
17. Mitchell C. and Ross K, "Findings and Recommendations: A Synthesis for Key Stakeholder Community Scale Sanitation in Indonesia," *Prepared by the Institute for Sustainable Futures, University of Technology Sydney*. Available at: <http://communitysanitationgovernance.info/research-outputs/>

The exchange rate used in this study is 1 USD=46.75 Philippines pesos — cited by the average IMF exchange rate from June to July 2016

Poverty line by province has been given by the Philippine Statistical Authority

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Manila Water Foundation (MWF) was established in 2005 by Manila Water Company (MWC), Inc. as an avenue to serve beyond the given mandate to provide water and used water services in the East Zone of Metro Manila. MWF is guided by the vision to become the enabler of change that will uplift the quality of life of Base of the Pyramid (BOP) communities, which are the poorest of the poor, through the provision of sustainable water and used water services. As the corporate social responsibility arm of the Manila Water group of companies in the Philippines, it is in a unique position to establish programs that provide water, the vital source of life, to those who do not have access to this basic need; educate people on water, sanitation and hygiene issues; and provide sustainable livelihood opportunities to community groups, with the support and commitment of MWC and its subsidiaries.

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PHOTO CREDITS

Ronald R. Muaña, Manila Water Foundation

CONTACT US

For more information, please email inclusivebusiness@ifc.org
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