

The Economic Returns of Sanitation Interventions in the Philippines

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INTRODUCTION

The Economics of Sanitation Initiative (ESI) is a multi-country study launched in 2007 by the World Bank's Water and Sanitation Program to address major gaps in evidence among developing countries on the economic aspects of sanitation. Its objective is to provide economic evidence to increase the volumes and efficiency of public and private spending on sanitation. This research brief summarizes the key findings of Study Phase II—cost-benefit analysis of alternative sanitation options—from the Philippines.ⁱ

PROBLEM STATEMENT

The Philippines has made good progress towards the Millennium Development Goal target for sanitation. Access to basic sanitation increased from 58 percent (in 1990) to 76 percent of households (in 2008).ⁱⁱ However, this implies 22 million people still do not have access to improved sanitation facilities, of which seven million people practice open defecation. Regional inequalities exist—with coverage barely exceeding 50 percent in some

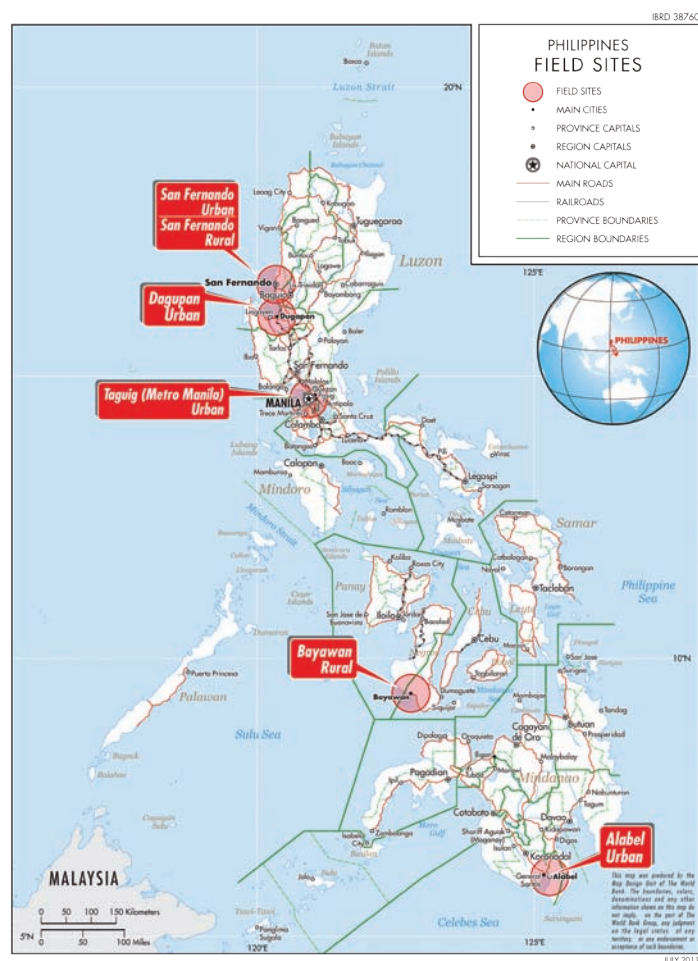


regions. Furthermore, coverage figures do not reflect the proper management of human excreta: considerably less than 10 percent of urban households have a connection to a sewerage system and the majority of the rest of urban households have a septic tank for which the rates of septage collection and treatment are still very low in the Philippines—thus causing health risks and widespread pollution to water resources.

Key messages

- **Improved sanitation is a socially profitable investment.** Pit latrines in rural areas have an economic return of at least five times the cost, and off-site treatment options in urban areas have an economic return of at least four times the cost.
- **Net benefits from low-cost sanitation options are high,** offering an affordable option to poor households.
- While investment costs account for a major share of annualized costs (i.e., costs converted to annual equivalent), **the appropriate estimation of operational and maintenance costs is crucial to the correct functioning of sanitation facilities.** Municipalities and service providers should ensure these expenses are fully accounted for in the budget.
- **Sanitation options that protect the environment are more costly to provide,** but while environmental benefits are difficult to quantify in economic terms, **the benefits are highly valued by households, tourists, and businesses.**

Economic analysis measures the broader **welfare** benefits of products and services on populations, such as value of life, time use, environmental and social benefits, as opposed to **financial analysis**, which measures the financial gains only (e.g., changes in income or cash situation).

Figure 1. ESI Field Sites in the Philippines

Phase I of the ESI study estimated the overall economic costs of poor sanitation in the Philippines to be US\$1.4 billion (PhP77.8 billion) per year at 2005 prices, equivalent to 1.5 percent of gross domestic product (GDP).ⁱⁱⁱ

STUDY AIMS AND METHODS

The purpose of Phase II of the ESI study is to provide sanitation decision makers with improved evidence on the costs and benefits of alternative sanitation options in different contexts in the Philippines. The study focuses on human excreta management, covering six selected field sites as well as national surveys.

Surveys were conducted in three rural and three urban sites that have recently been the focus of sanitation programs and projects (see Figure 1), involving overall 1,270 household questionnaires with focus group discussions, physical investigation, water quality, market, and health facility surveys con-

ducted in each site. Primary data were supplemented with data from other national and local surveys.

Sanitation interventions evaluated varied by rural and urban location, comparing open defecation with the range of sanitation facilities currently used by the Philippine population: dry pit latrine, urine-diverting dry toilet (UDDT), wet pit latrine (pour-flush), toilet with septic tank including septage management, and toilet with sewerage connection and treatment.

Conventional techniques of economic analysis were utilized to generate outputs such as benefit-cost ratio, cost-effectiveness ratio, net present value, internal rate of the return, and payback period of sanitation options.

Economic benefits quantified include impacts on health, drinking water, sanitation access time, and the reuse of human excreta. Environmental and social impacts of poor sanitation were not fully captured in the monetary estimates of benefit. Qualitative analyses were conducted on selected social and broader economic benefits. **Full investment and recurrent costs** were measured for each sanitation option.

STUDY RESULTS

Rural Areas:

Massive Economic Returns on Pit Latrines

Benefit-cost ratios (economic return per currency unit invested) and annualized costs per household are compiled for the three rural sites in Figure 2 and Figure 3. Among the various



Figure 2. Benefit-Cost Ratios in Rural Sites (economic return per unit of currency spent)

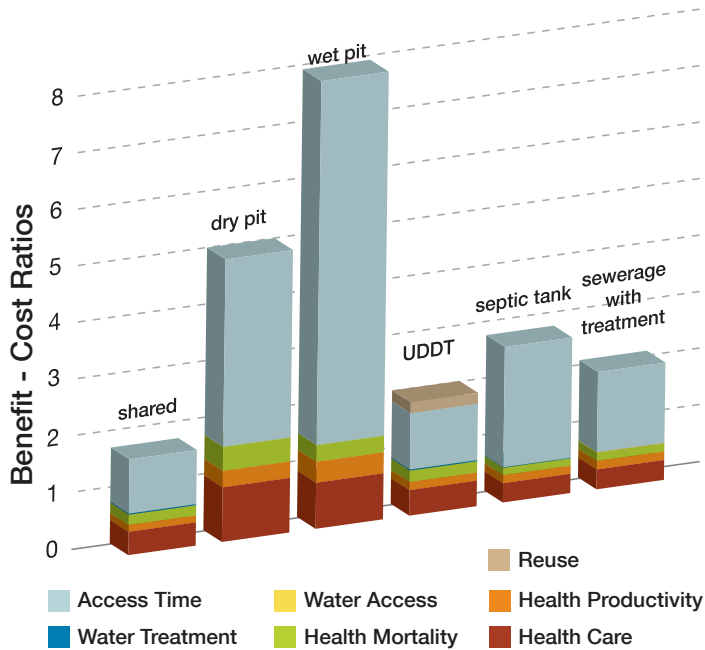
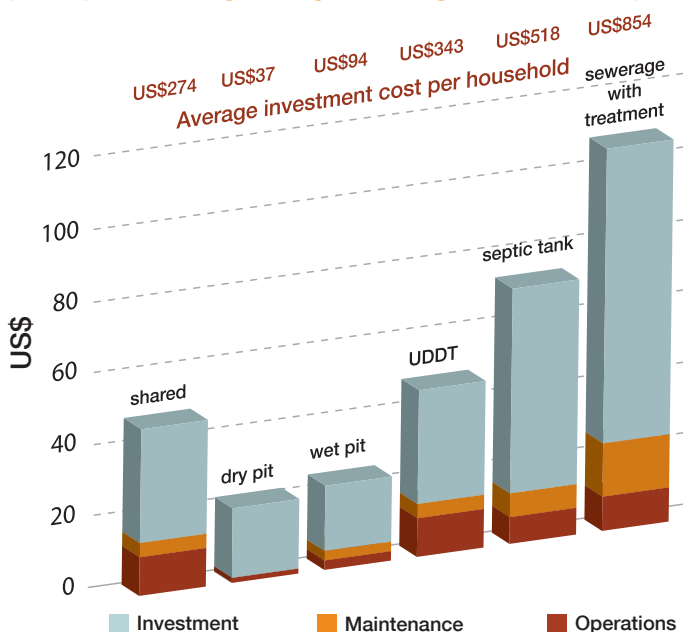


Figure 3. Annual Costs per Household in Rural Sites (2009 prices, using average exchange rate with US\$)



sanitation options, the most favorable economic performance was found for wet pits, followed by dry pits. These interventions have the highest benefit-cost ratio of 8.0 and 5.0, respectively, and an annual economic rate of return of more than 100 percent, thus requiring less than one year to recover the economic value of the initial investment costs.

Due to higher investment and operational costs per household, shared toilets did not perform as well as private pit latrines, with a benefit-cost ratio below 2.0.

Sanitation options with improved excreta management, such as reuse through ecological sanitation (UDDT) and constructed wetland—have benefit-cost ratios of around 2.0. The reuse value is relatively small compared to health and time benefits. The annualized cost of urine-diverting dry toilets-ecological sanitation (UDDT) option is US\$80, which is four times that of a pit latrine. The annualized cost of a constructed wetland is the highest at US\$120 per household.

The findings suggest that low-cost technologies, particularly improved pit latrines, are worth pursuing especially for low-income groups. Although wet pit latrines have a higher initial investment cost, a longer expected life leads to similar annualized costs. The most important benefits for all options are time savings and health improvements. For private pit latrines, the annual equivalent cost is repaid by the saved health care costs alone.

Under actual program conditions, there is a small decline in performance for all sanitation options. This is due to non-use by some households or household members of the facilities. For example, the benefit-cost ratio of dry pit latrines declines from an economic return per currency unit spent of 5.0 to 4.7; for wet pit latrines it declines from 7.9 to 5.7.



Figure 4. Benefit-Cost Ratios in Urban Sites (economic return per unit of currency spent)

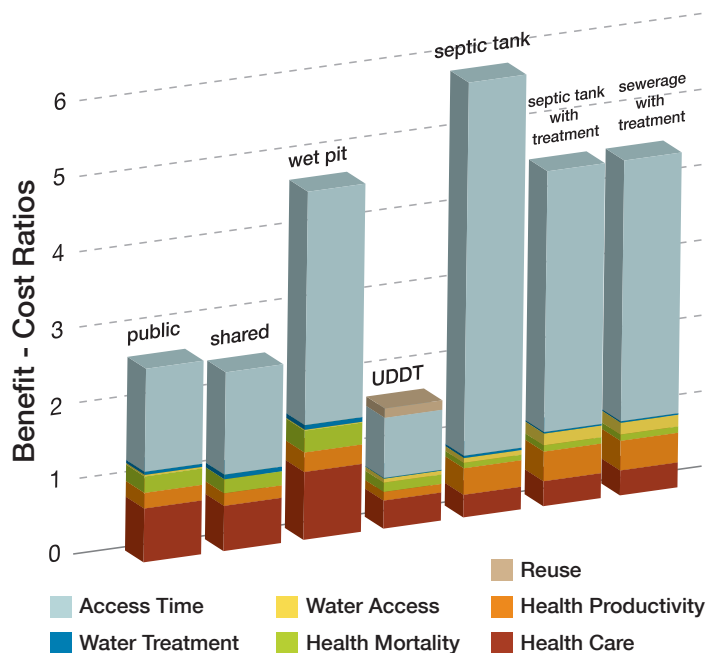
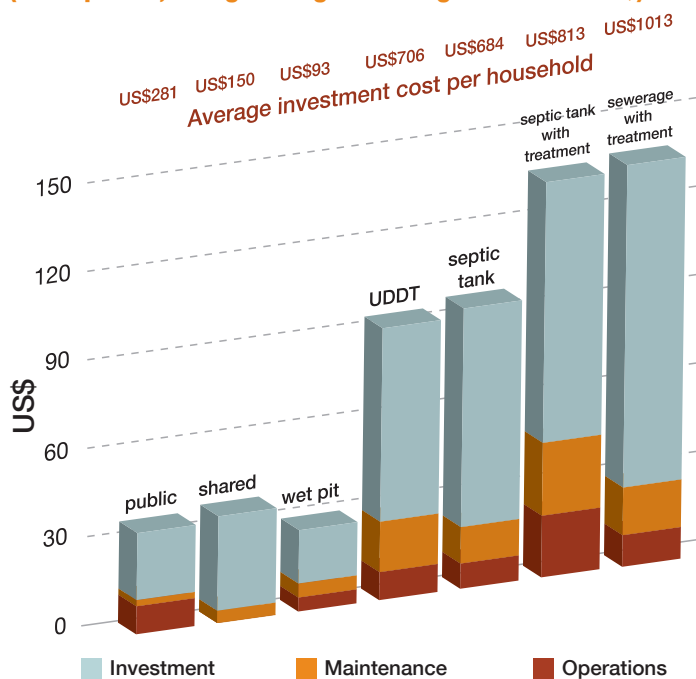


Figure 5. Annual Costs per Household in Urban Sites (2009 prices, using average exchange rate with US\$)



Urban Areas: Off-Site Treatment Options Deliver High Returns

Benefit-cost ratios and annualized costs per household are compiled for the three urban sites in Figure 4 and Figure 5.

Unlike rural areas, the most favorable economic performance was found for toilets with septic tank (no septage management)—with a benefit-cost ratio of 5.6 and an annual return of more than 100 percent, thus requiring less than one year to recover the economic value of the initial investment cost. Wet pit latrines also have a high economic return with 4.5 currency units spent per unit, followed closely by septic tank with septage management and sewerage. However, while the economic return was found to be higher for septic tanks without septage management, the environmental benefits of septage management and wastewater treatment were not fully reflected in this study. While currently common in the Philippines, septic tanks without septage management are not an environmentally sustainable sanitation solution for the Philippines.

Due to their higher investment and operational costs, community and shared toilets did not perform as well as private toilets with septic tanks or private wet pits, with benefit-cost ratio of approximately 2.5.

Sanitation options with improved excreta management had a wide variation in economic performance, shown in Figure 4. The ecological sanitation option (urine-diverting dry toilet) has a benefit-cost ratio of 1.5. The annualized cost of the UDDT option is over US\$80, which is three times that of a wet pit latrine. The higher benefit-cost ratios of septage management and sewerage are largely due to higher unit values of time savings in the more advanced urban centers, compared to the urban center where UDDT was evaluated.



The findings suggest that low-cost technologies, particularly improved wet pit latrines, are worth pursuing, especially for low-income groups where these options are feasible. However, in densely populated urban centers, with limited options for building UDDT structures and reuse options, the septic tank with septage treatment and sewerage with treatment are both economically attractive options. The environmental benefits of improved sanitation have not been fully captured in this study; including them would make treatment options even more economically attractive.

Under actual program conditions, there is also a significant decline in economic performance. Septic tank with septage management reduces from 4.3 to 3.4 and wet pit latrine from 4.5 to 2.8. This is due not only to non-use by some households or household members of the facilities, but also off-site treatment facilities being utilized at well below their engineered capacity.

KEY FINDINGS AND RECOMMENDATIONS

This study finds that all sanitation interventions have benefits that exceed costs, when compared with “no sanitation facility or open defecation.” The high net benefits from low-cost sanitation options, such as wet pit latrines in urban areas and all types of private pit latrine in rural areas, suggests these technologies should be considered first for sanitation



improvement plans, especially in situations where funds are scarce. However, in densely populated areas, pit latrines have limited feasibility. Also, to improve quality of life in increasingly populous cities, decision makers should be aware of the economic benefits from improved conveyance and treatment options. If they can afford them, populations prefer options that transport waste off-site. Indeed, appropriate treatment and/or isolation of waste is key to the future sustainable development of the Philippines.

SANITATION LINKS TO TOURISM AND ECONOMIC DEVELOPMENT

Other key linkages of sanitation with economic development were evaluated under ESI.

The tourism survey of 189 holiday and business visitors found that the general sanitation conditions can still undergo considerable improvements, especially for the capital city (Metro Manila) scoring under 3.0 on a scale of 1.0 to 5.0. On the question of toilet availability in public areas, 14 percent of visitors said they could not find a toilet at a time of need. A quarter of the survey respondents said they had gastro-intestinal problems during their stay, incapacitating the tourist for an average of three days. The amount they could have spent during those days of illness represents foregone earnings for the tourism industry. Despite the negative comments about environmental sanitation in the Philippines, nine in ten visitors expressed an intention to return to the

country and 82 percent said they would recommend the country as a tourist destination to friends. Poor sanitation accounted for 40 percent of visitors' hesitancy to return.

The business survey of 17 firms mostly operating around Laguna Lake (near Metro Manila) confirmed the availability of clean water was important to business. This is especially the case for resort owners, food processing industries, and fish pond/cage owners. Owners of travel agencies said sanitation a whole mattered to their business because it affects the desired destinations of their clients. About a third of the respondents also said they would expand their operations if sanitation conditions improved considerably. A typhoid outbreak in Calamba (Laguna) in 2008 financially affected resort owners in the area who were heavily dependent on tourists.

RECOMMENDATIONS

1. Intensify efforts to cover the entire Philippine population with basic improved sanitation access. Sanitation investments should not be seen just as an expense, but instead leading to economic benefits that pay back the investments several times during the lifetime of the sanitation facility.
2. Go beyond basic sanitation provision. In many municipalities and districts of the Philippines, funds could be raised to provide more sustained and quality services, which better captures the full environmental and health benefits and respond to the population's wish for a clean, livable environment.
3. Promote evidence-based sanitation decision making: Variations in economic performance of options suggests a careful consideration of site conditions is needed to select the most appropriate sanitation option and delivery approach. Decisions should take into account not only the measurable economic costs and benefits, but also other key factors for a decision, including intangible impacts and socio-cultural issues that influence demand and behavior change, full environmental impacts, availability of suppliers and private financing, and actual household willingness and ability to pay for services.



Economic assessment of sanitation interventions in the Philippines. Rodriguez, UP., Hutton, G., Jamora, N., Ockelford, J., Harder, D., Galing, EK., World Bank, Water and Sanitation Program. 2011.

⁶The sanitation part of the combined water and sanitation MDG target was to halve by 2015 the proportion of the global population without access to basic sanitation in 1990. The figures cited are those those reported by the WHO/UNICEF Joint Monitoring Programme.

⁷Economic impacts of sanitation in the Philippines. Rodriguez, UE., Jamora, N., Hutton, G., World Bank, Water and Sanitation Program. 2008. Available for download at www.wsp.org.

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About us

The Water and Sanitation Program (WSP) is a multi-donor partnership created in 1978 and administered by the World Bank to support poor people in obtaining affordable, safe, and sustainable access to water and sanitation services. WSP provides technical assistance, facilitates knowledge exchange, and promotes evidence-based advancements in sector dialogue. WSP has offices in 24 countries across Africa, East Asia and the Pacific, Latin America and the Caribbean, South Asia, and in Washington, DC. WSP's donors include Australia, Austria, Canada, Denmark, Finland, France, the Bill and Melinda Gates Foundation, Ireland, Luxembourg, Netherlands, Norway, Sweden, Switzerland, United Kingdom, United States, and the World Bank.

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