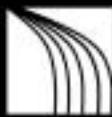


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Urban Sewerage and Sanitation

Lessons learned from case studies
in the Philippines

with our partners
in the Philippines



Department of the Interior
and Local Government



AusAID
Australian Agency for
International Development

Field Note
June 2003





About the cover:

Pondering the water pollution problem – about 70 per cent of the total organic pollution of Philippine waters comes from untreated domestic wastewater. This serious threat to the country's freshwater sources and public health is something we just cannot afford to sit on.

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Lessons learned from case studies
in the Philippines

World Bank Water and Sanitation Program
East Asia and the Pacific

in partnership with The Government of the Philippines
and The Government of Australia

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Urban Sewerage and Sanitation

Lessons learned from case studies in the Philippines

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Summary

Urban sanitation is one of the most serious challenges facing the Government of the Philippines. As a result of rising urbanization over the last twenty years, more than half the population now live in densely populated cities and towns. By some estimates, about 80% of these urban households have access to adequate sanitation, such as toilets, but the vast majority of them are reliant on private sanitation facilities.

Less than 8% of the households in Metro Manila have sewer connections, and coverage is lower still in the rest of the country. Only three of the 1,500 cities and towns in the Philippines contain functioning public sewerage systems, and these are now old, undersized, and in need of major rehabilitation. A few communal toilets have been constructed in low-income urban areas, but there is little evidence of any other public sanitation services.

Faced with this void, urban residents have provided their own sanitation facilities. Many households now own a private toilet and an individual septic tank, while more expensive housing developments often include private sewerage systems and communal septic tanks. Unfortunately, there has been little control or regulation of these private facilities, and many are badly designed and constructed. All too often, poorly maintained septic tanks discharge

inadequately treated sewage and effluent¹ directly into stormwater drains, waterways and streets, with serious consequences for both water quality and public health.

This bleak picture of urban sanitation in the Philippines reflects a prolonged lack of activity or investment in the sector. WHO studies confirm that sanitation is the most effective single intervention for reducing diarrhoeal disease, which is one of the biggest killers in the East Asia & Pacific region. Yet, in the last 30 years, investment in urban sanitation in the Philippines totals only 1.5% of that spent on urban water supply. At least fourteen sewerage feasibility studies have been conducted in Philippine cities in recent years, but none have come to fruition.

However, there are signs of renewed interest in the sector, driven by growing evidence of environmental decline and fears of its impact on valuable tourist assets, and, by new approaches arising from institutional and technological innovations. In order to encourage this trend, and to frame the key issues in the sector, the Water Supply and Sanitation Performance Enhancement Project (WPEP) commissioned a study of Urban Sewerage and Sanitation in the Philippines. This field note summarizes the findings of the WPEP Phase II Study², in which seven case studies of urban sewerage and sanitation systems in the Philippines were used to investigate 'factors of success' and key constraints within the urban sanitation sector.

¹ Effluent = wastewater flow from a sanitation facility (e.g. sewage treatment plant or septic tank)

² Robinson and EDCOP (2003) 'Urban Sewerage and Sanitation: Final Report', Manila: WPEP

The Water Supply and Sanitation Performance Enhancement Project (WPEP)

WPEP is an action research project in the Philippines, which is jointly funded by AusAID (the Australian Government's aid program), the Water and Sanitation Program of the World Bank and the Government of the Philippines (GOP). The executing agency for the GOP is the Water Supply and Sanitation Program Management Office of the Department of Interior and Local Government (WSSPMO-DILG), with support from the Water and Sanitation Program – East Asia and the Pacific (WSP-EAP). The goal of the project is "to enhance the access of the under-served rural and urban poor to adequate water and sanitation services on a sustainable basis."

The WPEP action research agenda is demand driven through consultation with a broad range of water supply and sanitation sector practitioners in the Philippines. In Phase I, WPEP funded six background studies, which provided the basis for the learning agenda. Following consultation on these studies, WPEP Phase II commissioned local consultants to undertake four field-based studies on the following topics:

- Small Towns Water and Supply Management Models (STWSMM);
- Urban Sewerage and Sanitation (USS);
- Small Scale Independent Providers (SSIP);
- Rural Water: Models for Sustainable Development and Sector Financing (RWSFin)

This field note is one of a series summarizing the results of the WPEP research program.

"Luxurious" open sea toilets – a luxury the country cannot afford.
Less than U\$30M is invested in sanitation every year, despite annual estimated losses of over U\$590M as a result of declines in tourism and fish production and health costs related to water quality problems.



Background

The Philippines consists of a chain of over 7,000 islands, dominated by the three island groups of Luzon (in the north), Visayas (in the center), and Mindanao (in the south). The islands are heavily populated, with a population density more than double the average for the East Asia & Pacific region. The majority of the 76 million inhabitants now live in urban areas, but urban growth has not been matched by economic development, and per



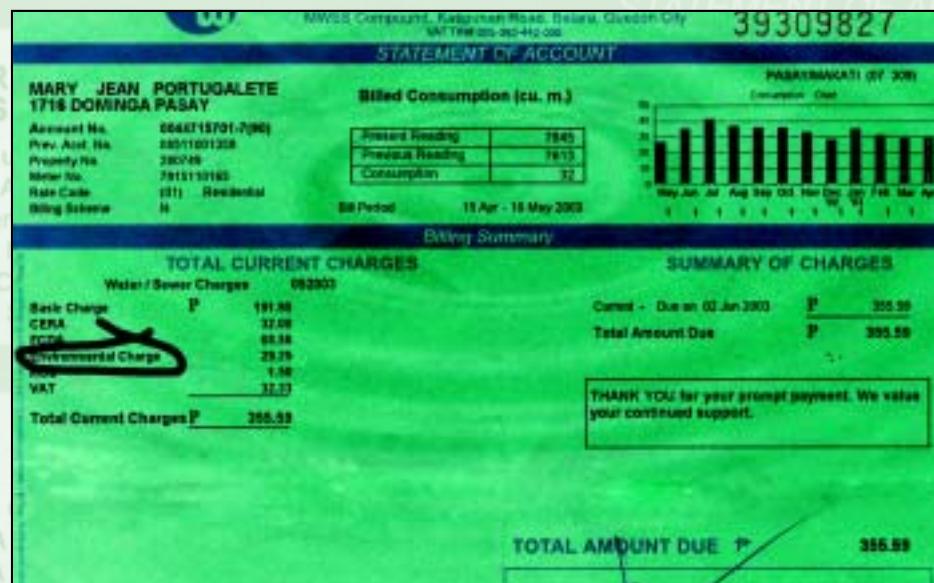
capita incomes lag behind those of its neighbors (see comparative regional data on page 5).

Development potential in the Philippines rests largely on the abundant natural resources and well-educated workforce, with major economic challenges coming from rapid population growth, high levels of poverty and inequality, low productivity and intensified global competition. The Asian financial crisis, triggered in mid-1997, hindered the Philippine economy, leading to a loss of foreign exchange reserves, a higher debt burden and falling share prices. There have since been signs of recovery, with GDP growth increasing from 0.1% in 1998 to 3.0% in 2000, but the Philippine Peso continues to lose value¹, and both oil prices and interest rates have risen sharply.

The economic difficulties have been heightened by serious political and security problems. Charges of corruption and inefficiency have affected many agencies, delaying projects and discouraging investment. However, a new administration took office in January 2001, and it has initiated a gradual economic recovery, leading to improved stability and confidence.

¹ The official exchange rate has fallen from P40 = US\$1 in early 2000, to P53 = US\$1 in early 2003

Privatization of Urban Sewerage & Sanitation in Metro Manila



The service area of the Metropolitan Waterworks and Sewerage System (MWSS) was divided into East and West Zones, and two separate concession contracts were let. The contracts required the concessionaires to carry out the following sewerage and sanitation activities:

Total Current Charges P 355.59

- Manila Water Company (East Zone Concessionaire) to expand coverage of Central Sewerage System and implement sanitation programs in densely populated urban areas (including septage collection, barge loading station, septage treatment plant, rehabilitation of sewage pumping station and sewage treatment plant)
- Maynilad Water Services (West Zone Concessionaire) to rehabilitate and upgrade existing sewerage systems, expand sewer network and improve management of sewerage services (including construction of two sewage treatment plants, evaluation of alternative methods of sludge disposal)

Sewerage Targets ¹	2001	2006	2011
East Zone	3%	16%	51%
West Zone	16%	20%	21%

¹ Sewerage coverage targets are expressed as a percentage of the total number of households connected to the MWSS water system

Sewerage charges were planned to increase from 50% to 150% of household water bill, and the 10% environmental fee (charged to MWSS customers without sewer connections) was to be replaced by a sanitation charge equal to 75% of the water bill. However, as of early 2003, these increases have not taken place.

Adapted from Ancheta, 2000 and David, 2000

Comparative regional data

Country	Population (millions)	Urban population	Pop. density (per sq.km)	GNP per capita (US\$)	Female literacy ¹	Urban sanitation ²
The Philippines	76	59%	253	\$ 1,040	95%	88%
Thailand	61	22%	119	\$ 2,000	93%	98%
Malaysia	23	57%	71	\$ 3,380	82%	100%
<i>East Asia & Pacific</i>	<i>1,855</i>	<i>35%</i>	<i>116</i>	<i>\$ 1,060</i>	<i>78%</i>	<i>61%</i>

Source: World Development Report 2001/02

¹ Percent of literate adult women (aged 15 and above)
² Percent of urban population with access to sanitation (1996)

Urban sewerage & sanitation sector

In the early 1970s, the establishment of the Metropolitan Waterworks and Sewerage System (MWSS) marked the end of central government control of urban water supply and sanitation services in the Philippines. MWSS was tasked with providing services in Metro Manila and its contiguous urban areas, whilst management of provincial and municipal water and sewerage systems in the 1,500 other cities and towns was passed back to local government.

Metro Manila has grown rapidly over the last thirty years, and in the 1990s MWSS admitted that it was struggling to attract the investment needed to expand and improve its services. Therefore, in 1997, MWSS took the bold step of signing 25-year concession contracts with two private consortia for the provision of water supply and sanitation services to Metro Manila. These contracts included ambitious targets for expanding sewerage and sanitation coverage (see box on previous page). To date, the concessionaires have focused on water supply, with little progress toward the sewerage or sanitation targets, and the success of the privatization is now being questioned following tariff increases and the recent application by one of the concessionaires to withdraw from its contract.

Most of the water supply and sanitation systems outside the capital were in poor

Sanitation in the Philippines

The term 'sanitation' usually refers to any service or facility that maintains public health by safely disposing of human (or other) waste. However, the term 'sanitation' is used slightly differently in the Philippines: disposal systems are classed as either 'sewerage' (pipe networks to off-site treatment and disposal), or 'sanitation' (on-site facilities such as toilets and septic tanks).

In this fieldnote, 'sanitation' has been used in its more general form, referring to all services and facilities that safely dispose of human (or other) wastes, including sewerage systems.

condition when handed over, and the relevant Local Government Units (LGUs) rarely had the capacity, technical knowledge or funds needed to manage or improve their systems. Therefore, in 1973, LGUs were given the option to form semi-autonomous Water Districts to manage their urban water supply and sewerage systems, using support and financing from the specially created Local Water Utilities Administration (LWUA). More than 400 Water Districts have now been formed, but their main concern is water supply, and very few are actively involved in the provision of sanitation services. This leaves LGUs responsible for sanitation services in most urban areas.

Access to urban sewerage and sanitation

Sadly, urban sewerage and sanitation does not appear to be a priority of local government. Outside of Metro Manila, public sanitation services are almost non-existent. The three public sewerage systems that still operate (in Baguio City, Zamboanga City and Vigan City) predate independence, having been built by the Americans in the late 1920s and early 1930s. These aging systems provide

sewage to a communal septic tank. Whatever the system, be it individual or communal, septic tanks in the Philippines rarely use the effluent disposal systems required by national regulations, and are seldom deslужed (see box on Septic Tanks, next page).

There are now huge numbers of septic tanks being used in urban areas, with more than a million in Metro Manila alone. Despite this, sludge treatment and disposal facilities are scarce, and

Sanitation services in the Philippines

	Population (million)	Access to sanitation services		
		Sewerage	On-site	None
Metro Manila (MWSS service area)	13.3	4%	41%	55%
Other urban and rural areas	63.0	0%	88%	12%
<i>National</i>	<i>76.3</i>	<i>1%</i>	<i>74%</i>	<i>25%</i>

Source: ADB, 2001

On-site sanitation = sanitary toilets, septic tanks etc.

limited residential coverage, as their sewer networks are centered on the downtown business districts and have seen little expansion over the last seventy years.

The absence of sewerage or other public sanitation services leaves the urban population with few options for safe excreta disposal. Non-poor urban households have responded by building their own sanitation facilities. Flush (or pour-flush) toilets are popular in the Philippines, and the majority of urban households have connected their toilets to private septic tanks. Many private housing developments now construct small 'independent' sewer networks, which serve those within the development, and pipe their

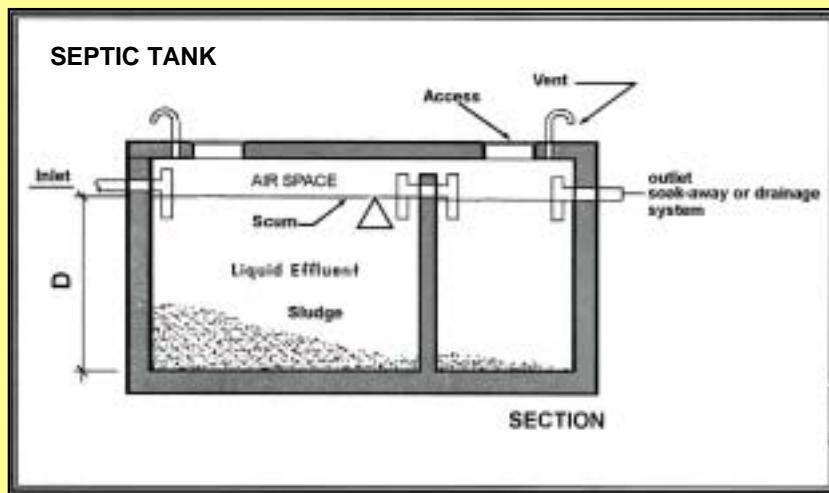
there is little or no control of effluent discharge. As a result, indiscriminate disposal of inadequately treated effluent and untreated sludge are widespread, with serious consequences for both water quality and public health¹.

The urban poor remain excluded from sanitation services. Sewer networks do not reach the slum and squatter settlements found in most Philippine cities, and their inhabitants seldom have enough space or cash to construct private facilities like septic tanks. Communal toilets have been provided in some densely populated low-income areas, but these typically serve small groups of households and are rarely well-managed. Instead, most urban poor rely on unsanitary toilets, or defecate in the open.

¹ A recent MWSS report estimates that 60% of the pollution load in the Pasig River and Laguna Bay derives from septic tank effluent and domestic wastewater discharges

Septic Tank Systems

Operation: a septic tank is a water-filled box designed to collect and partially treat toilet wastes (feces and urine). When the toilet is flushed, the wastes flow through a pipe into the top of the septic tank. Heavy solids, such as feces, settle to the bottom of the tank, while liquids pass through before overflowing into a disposal system. Over time, bacteria within the septic tank break down some of the organic matter, thus the larger the tank is, and the more chambers it has, the better the treatment provided. Nevertheless, however well the septic tank functions, both the solids within the tank and the liquid that overflows from it contain harmful pathogens, hence are a potential source of infection and disease. For this reason, the effluent liquid must always be safely disposed of, either by allowing it to soak into the ground (away from water sources), or by passing it into a sewer network.



Maintenance: settled solids gradually accumulate at the bottom of the septic tank. When this sludge, or septage, occupies two-thirds of the depth of the tank, it needs to be removed, otherwise there is a risk that excreta will pass directly through the tank and overflow into the disposal system. The sludge is smelly, wet and highly pathogenic, so should always be removed by mechanical means (e.g. using a vacuum tanker) before being taken to an approved sludge treatment and disposal site.

Practice: two types of septic tanks are found in the Philippines: private septic tanks, which collect wastes from individual household toilets; and communal septic tanks, which collect wastes from a number of household toilets, generally through a small sewer network. Private septic tanks are the most common - usually small, single chamber tanks, which provide minimal treatment and limited sludge storage. Very few of these private septic tanks are regularly desludged, which reduces the level of treatment provided, and heightens the risk of untreated sewage and effluent finding its way into the local environment. According to the 1975 'Code on Sanitation of the Philippines', all private septic tanks should pipe their effluent to a 'sub-surface adsorption system' (or other treatment device), but this type of soakaway system requires additional space and investment, thus most urban households in the Philippines prefer to pipe their septic tank effluent directly to a nearby drain, canal or watercourse.

Case Studies

In 2003, WPEP completed a study of urban sewerage and sanitation in the Philippines. This study combined participatory community assessments (made using the MPA¹) with case studies of seven urban sewerage and sanitation systems in five Philippine cities. The objectives of the study were to:

- assess the performance of the different urban sewerage & sanitation systems
- analyze the parameters that underlie their successful or unsuccessful performance, and
- provide recommendations for the

introduction of sustainable and large-scale sewerage and sanitation systems in the Philippines

The case studies included examples of the following sanitation models:

- public sewerage systems (three case studies)
- independent sewerage systems serving small housing developments (two case studies)
- communal toilets in low-income urban areas (two case studies)

Case study details

Location	Urban population	System	Management	Population served	System coverage*
Baguio City	252,000	Public sewerage	LGU	5,300	2%
Zamboanga City	402,000	Public sewerage	Water District	3,700	1%
Vigan City	45,100	Public sewerage	Water District	1,360	3%
Bacolod City	429,000	Independent sewerage	LGU	1,030	0.2%
Dagupan City	130,000	Independent sewerage	LGU	990	0.2%
		Communal toilet	LGU	308	0.2%
		Communal toilet	LGU	204	0.2%

* Proportion of the urban population served

¹ Methodology for Participatory Assessments (MPA) provides indicators and tools that allow assessors (including the community themselves) to measure the sustainability and use of community water and sanitation services, and the process whereby they were established

1. Access to sanitation

It is clear that the case study systems have had little impact on access to sanitation. They cover only a fraction of their host cities and serve an insignificant proportion of the urban population.

Four of the case studies involve small systems: the two independent sewerage systems in Bacolod City serve housing developments, each containing less than 200 households, while the two communal toilets in Dagupan City are used by some 40 – 60 households. The three public sewerage systems cover larger areas, including substantial numbers of commercial properties, but even these systems serve less than 3% of their urban populations.

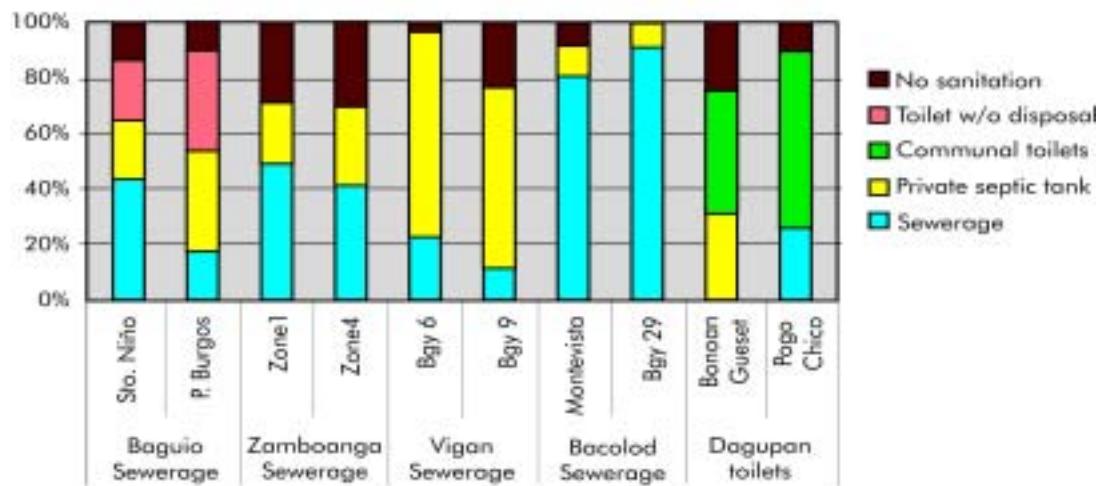
The case study systems have seen little expansion or improvement during their lifetime, with most operating at or beyond their capacity for some time. The Baguio City sewerage system is the exception, thanks to the 1984 JICA grant

that enabled construction of a sewage treatment plant and rehabilitation of parts of the sewer network. Since then, the city government has funded further improvements and rehabilitation, and overseen a 30% increase in the number of sewer connections. However, despite these efforts, residential coverage remains very low (2%).

MPA research conducted in small communities¹ (refer to Figure 1) within the service areas of the case study systems shows that, on average, 92% of households have access to piped water supplies or to private water facilities, while 82% have access to sanitation facilities. The socio-economic data indicates that some of those without water supply are middle class families that share water supplies with their neighbors, whereas poor² households are the only ones without sanitation facilities. The MPA also reveals that, even in neighborhoods where public sanitation services are readily available, a significant proportion of the community has invested in private septic tanks.

Figure 1

Access to sewerage & sanitation services



Note: Toilet w/o disposal = pour-flush toilets without septic tanks or pits (no effluent disposal)

¹ Two sample communities were surveyed at each of the five case study locations

² 'Poor' as defined by the participants during the MPA process



The Philippines already has one of the lowest per capita water availability in Southeast Asia. Unabated dumping of untreated wastewater in the country's water courses further reduces the available resource for water supply

Focus group discussions suggested that poor households lack access to sanitation services for the following reasons:

- uncertain land tenure (limiting investment by both residents and service providers)
- high cost of services (notably connection fees)
- insufficient space for facilities (no room for septic tanks; no route for sewer lines)
- marginal location (below main sewer line; on slopes too steep for sewers)

2. Financial sustainability

None of the Philippine case studies have capital or financing costs to repay, as the sewerage and sanitation systems are all either more than twenty years old, or were wholly government (or grant) funded. Despite this, only one of the case studies generates sufficient revenue to cover its operation and maintenance (O&M) costs.

Metro Zamboanga Water District sets its sewerage charges at 50% of the water bill, and has a 99% collection rate, allowing it to fully recover its O&M costs. All of the other systems charge flat rate (or zero) tariffs, collect revenues lower than their costs and, are dependent on subsidies from the LGU or, where managed by a Water District, on cross-subsidies from water supply income.

3. Institutional arrangements

The public sewerage systems examined are managed at the city level, by either the city government or Water District, while smaller sewerage and sanitation systems are generally run by lower level LGUs, such as Barangay Councils¹, or by some form of residents' association.

Water Districts and City LGUs provide urban services under very different conditions. Water Districts operate within government regulations, but normally receive no government funding, thus rely on effective management of their water

¹ Barangay is the smallest administrative unit in the Philippines (20– 100 barangays per city)

Tariff Collection Arrangements, Baguio City

In Baguio City, the Public Utilities & Safety Office (PUSO) manages the technical aspects of the sewerage system. Billing and collection are carried out by the City Treasurer's Office, while the City Accounting Office handles disbursements and accounts. In 1995, Baguio City government signed a Memorandum of Agreement (MoA) with the Baguio City Water District, whereby the Water District would add sewerage charges to the water bills of those with sewer connections, and return this sewerage revenue to the city government. The sewerage charges were to be set at 60% of the water bill, and the water district was to receive a collection fee equal to 10% of the sewerage revenues to recompense for its administrative costs. Unfortunately, immediately prior to implementation, the Water District decided that their collection fee was inadequate, and called off the agreement.

Unable to charge based on actual water consumption, the LGU uses a flat rate sewerage tariff (based on average water consumption in four categories). However, there is no effective sanction for non-payment of sewerage fees, and less than 25% of costs were recovered in 2001. The City Treasurer's Office recently declared that commercial customers would not receive their business permit until they paid their annual sewerage fees, but this appears to have had little impact on revenues to date.



Sewerage and sanitation is often an after-thought in the development of Philippine towns. Crowded cities allow insufficient space for the establishment of sewer lines or septic tanks.

Environmental performance						
Case study	Sewage treatment	Treatment facility	Sludge disposal	Effluent disposal	Effluent testing	
Baguio City	Full	Sewage treatment plant	Drying beds	River	Yes	
Zamboanga City	None	None	None	Sea outfall	No	
Vigan City	Partial	Communal septic tanks	None	River/fields	No	
Bacolod City	Partial	Communal septic tank	None	Creek	No	
Dagupan City	Partial	Communal septic tank	None	Open drain	No	
	Partial	Septic tank	None	Soil	No	
		Septic tank	None	Swamp	No	

and sewerage systems to generate revenues. As a result, Water Districts use relatively sophisticated systems for setting, billing and collecting tariffs, and carefully monitor performance and expenditure. In contrast, City LGUs receive substantial government funding on top of their local revenues, but usually have no budget allocation for sewerage or sanitation, and no dedicated sanitation staff. To make matters worse, the financial results of LGU sewerage and sanitation systems are combined with those of its other government offices, making budgeting and planning of sanitation services very difficult.

Small LGUs have even less success in managing sewerage and sanitation systems. Typically, they have very low revenues from their systems, negligible government funding, no sanitation staff and limited technical capacity. Therefore, they are reliant on external assistance and user contributions whenever repairs or rehabilitation are required.

4. Environmental sustainability

Environmental sustainability is a serious problem. The Baguio City sewerage system is the only case study that safely disposes of the sewage and wastewater that it collects. Thanks to the generous JICA grant received, the Baguio City sewage treatment plant now produces treated effluent suitable for disposal into the nearby river, and has sludge thickeners and sludge drying beds that yield dried solids suitable for use as agricultural fertilizer.

The other case study systems offer no sewage treatment, other than the limited treatment and solids removal provided by their septic tanks, and have no facilities to safely dispose of the sludge collected, or to test the quality of the septic tank effluent flowing from their systems into local watercourses and fields.

5. User satisfaction

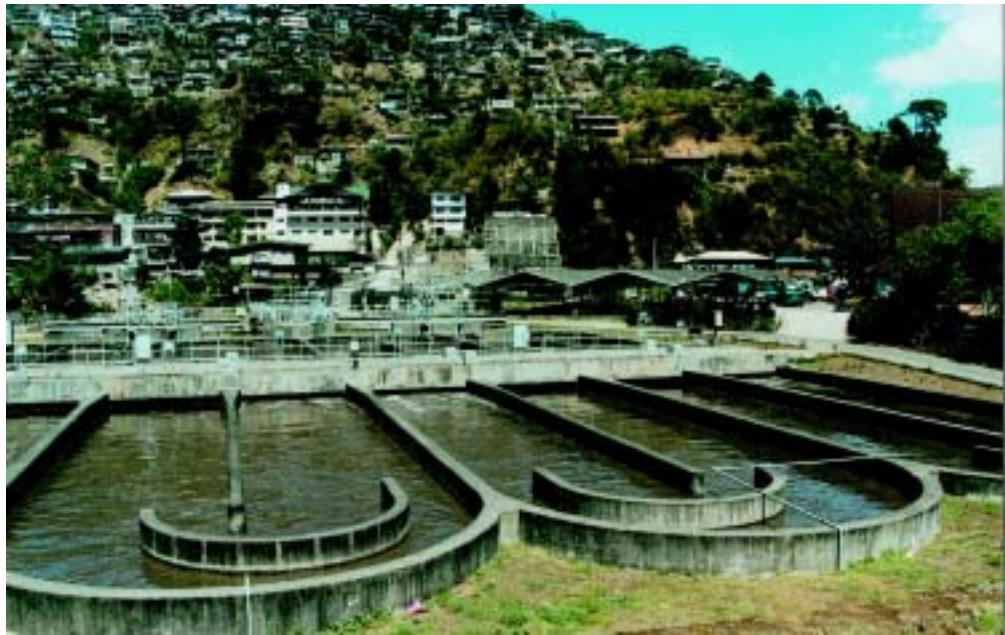
The MPA investigated user satisfaction with existing sewerage and sanitation services. These satisfaction levels reflect, among other things, the performance of the system, the level of service provided, and the cost of the service. The highest satisfaction levels were found among users of heavily subsidized LGU sewerage systems, while the lowest were among users of the communal toilets. Both poor and non-poor households remarked that they expect a high standard of service when they have to pay for it, and users of the two Water District managed sewerage systems stated that the current sewerage charges were too high for the quality of service provided.

Urban households using septic tanks were generally very satisfied, noting that the facilities were reliable and almost maintenance free, whereas sewer connections were perceived to be expensive and to require frequent maintenance. The only drawbacks relating to septic tanks were found among those living in more marginal areas: the urban poor in riverine and coastal neighborhoods, where high water levels cause frequent blockages; and, households living on steep slopes, which make building and maintaining adequately-sized septic tanks difficult.



Public toilets visited by the study team were so ill-maintained, it was no wonder their users were the least satisfied of all.

Factors of Success



Baguio City can look forward to continuing income from tourism, thanks to foreign aid and subsidies. What will other cities do that are not so lucky?

Whilst the negligible benefits or impacts achieved by the sewerage and sanitation systems examined by the WPEP study inevitably limit the positive lessons learned, the following common 'factors of success' emerged from the analysis:

- dedicated sanitation units (trained technical staff and separate sanitation budget)

- autonomous management (political and fiscal)
- local political support

In most cases, those managing urban sewerage and sanitation systems are local government officials or Water District staff, with many other duties and responsibilities, and little time or incentive to improve the provision of

sanitation services. The establishment of a sanitation unit comprising trained staff, whose main responsibility is the effective management of the sewerage or sanitation system, clearly improves the chances of success. However, small systems can rarely afford to employ specialist sanitation staff. Instead, they require professional support and monitoring, which is currently unavailable in most Philippine cities and towns.

The importance of the autonomous management of water supply and sanitation services is well-recognized, being the central idea behind the creation of Water Districts. The freedom to set cost-reflective tariffs that generate reliable revenues, and to allocate these revenues according to operational and strategic priorities, are vital for the effective financial management of sanitation services. Detailed and transparent sanitation accounts, based on accurate billing and collection systems, create a tight focus on cost recovery and, when reinforced by regular performance monitoring, provide sound incentives for efficient management.

Political support is essential to the financing of new sanitation facilities, and to their sustainability. Neither local authorities nor Water Districts have the necessary capital or leverage to finance expensive sewer networks or sewage treatment facilities. Therefore, major sanitation improvements are dependent on a delicate mix of government funding, external assistance and increased user charges. Obtaining these funds, and enacting the reforms needed to manage the systems sustainably, requires careful negotiation and

good cooperation between local stakeholders, especially when elected officials are sensitive to popular concerns regarding tariffs.

Key Constraints

The scarcity of success stories reflects the massive constraints upon the urban sanitation sector in the Philippines. Key constraints identified by the WPEP study include:

- limited demand for alternatives to septic tanks (users are satisfied with their systems)
- shortage of financially viable options for urban sanitation improvements
- low awareness of environmental health impacts of present sanitation arrangements
- ineffective enforcement of sanitation regulations or user charges
- competition from urban water supply (for funding, resources, political support)

There are also institutional constraints. LGUs are currently unable to provide efficient sanitation services. They lack technical capacity, and are run by elected officials with strong incentives to keep tariffs low and allocate funds to other more popular activities. Water Districts appear to offer an alternative, being relatively autonomous and having a tight focus on operational efficiency and cost recovery. Unfortunately, inflexible government financing rules give Water Districts few incentives to invest in either sanitation services or infrastructure in low-income areas, which greatly limits their ability to provide sanitation services to the urban poor.

Conclusions

There are few upbeat conclusions that can be drawn from this examination of urban sewerage and sanitation in the Philippines. Aging public sanitation systems provide variable services to a tiny minority, while the urban poor remain largely without adequate sanitation. Participatory appraisals confirm that most non-poor urban households have invested in private sanitation facilities, and are satisfied with their simple septic tank systems, despite external concerns about the environmental health risks associated with inadequately treated septage and improperly disposed septic tank effluent.

Conventional alternatives to this status quo generate minimal interest. Urban households appear reluctant to pay for public sanitation services when there seems little wrong with their private facilities, leaving service providers with few incentives to make the huge investments involved in starting city-wide sewerage systems from scratch. Breaking this deadlock will require a much wider awareness of the problems caused by inadequate sewage and wastewater treatment, plus access to lower cost sanitation technologies, and the use of more demand-responsive approaches to implementation.

Urban sanitation services are often lumped together with water supply, and supplied by the same provider. Sadly, sanitation services are less popular with politicians, so always lose out in

the competition for funding and resources. This was borne out by the case studies, which generally lacked funding and support. The few successes involved relatively large sewerage systems, whose managers had sufficient funds to set up autonomous sanitation units, with their own resources and budgets. However, it was also clear that both 'independent' sewerage systems and communal toilets are viable options for urban sanitation on a smaller scale, provided that demand is genuine, and that sustainable local financing and management can be established.

The magnitude of the urban sanitation problem in the Philippines cannot be overstated. It requires careful targeting of the limited resources available, and a more incremental approach to sanitation improvements. Low-cost sanitation technologies will be vital, in tandem with the provision of improved services to smaller areas, using 'neighborhood approaches' to build local consensus and demand. Sanitation improvements will also need more local and national support, through dedicated local sanitation units, enforceable regulations, and strategic planning. More government funding is essential, notably for the provision of sanitation services to the urban poor, who remain excluded from public sanitation services, and unable to develop private alternatives.

Recommendations



1. Financing urban sanitation improvements

The central problem is that urban sanitation improvements are expensive, and the market for these services is small. Most septic tank users are non-poor urban households, who pay no sanitation charges. As a result, sanitation service providers have lost their main revenue base.

Densely populated urban housing rarely has the space or ground conditions necessary for the septic drainage fields required by law. However, it is unrealistic to expect thousands of urban households to stop using their private septic tanks simply because others believe that the effluent is harmful. This sea change will require substantive evidence of the environmental health risks associated with current septic tank systems, to pave the way for enforceable sanctions against the discharge of inadequately treated effluent. Until awareness of the environmental health risks increases dramatically, it will be very difficult to persuade either the Philippine public, or its political representatives, that more investment in urban sanitation is necessary.

A more practical solution is to begin charging septic tank users for their discharges (based on the 'polluter pays' principle), and then use this revenue to develop sludge and effluent collection, and treatment facilities. Political approval and effective administration of such an environmental tax will be difficult but, if successful, would create considerable demand for improved sanitation services. In Manila, households without sewer connections already have a 10% environmental tax added to their water bills, which is helping to fund the development of free septic tank desludging and sludge disposal services.

2. Management models for urban sanitation

Urban sanitation charges are most successful when added to water bills, as charges can be linked to water consumption, and disconnection of water supply provides an effective sanction against non-payment. However, as the Baguio

City case illustrates, the water service provider is not always willing (or able) to collect sanitation charges. Furthermore, whilst there are strong synergies in financial management, sanitation services require different skills and resources to those needed for water supply, and thus benefit from being managed by an autonomous unit.

The fact that LGUs have the final responsibility for urban sanitation services, and the importance of local political support, recommends that LGUs retain overall control of their local services. However, this does not mean that LGUs have to be service providers. LGUs need to establish sanitation units to monitor and regulate (at the city level), while contracting out as many sanitation services as possible, including: billing and collection of sewerage and sanitation charges; desludging and sludge treatment services; and, effluent testing. The benefits of linking water and sanitation charges also suggest that LGUs should encourage and assist water service providers to establish sanitation units (or link with other sanitation service providers) wherever possible.

3. Low cost sanitation facilities for the urban poor

The majority of the urban population has access to adequate sanitation services, even if these services currently lack appropriate treatment or disposal. However, most of the urban poor living in slum and squatter housing throughout the Philippines have no access to sanitation services. The urban poor bear the brunt of the environmental and health costs caused by inadequate sanitation and, therefore, the top priority for the urban sanitation sector must be to provide sanitation services to these disadvantaged groups.

Those with no sanitation facilities rarely have sufficient space or legal tenure to allow the construction of private septic tanks, whether they can afford them or not. Most also lack the reliable water supply required to flush wastes through a sewer network. This leaves few

immediate options for sanitation improvements, other than communal toilets. The lessons learnt from the case studies suggest that communal toilets can be successful, if sited according to demand and willingness to pay, with strong community involvement and the establishment of sustainable management. Meanwhile, longer-term efforts should focus on developing viable low cost sanitation systems for the urban poor, while improving the water supply, land tenure and microfinance options that will enable private sanitation facilities to develop in low-income areas.

4. Neighborhood solutions to urban sanitation problems

A neighborhood approach, whereby urban sanitation problems are solved on a local scale, breaks the enormous challenge of improving citywide sanitation coverage down into more manageable units. Neighborhood solutions require participatory appraisal of sanitation priorities, with local NGOs and community groups providing intermediation between user groups and service providers, in order to build local consensus and demand for improved services.

The independent sewerage systems currently in use by private housing developments are good examples of neighborhood solutions, and prove that private demand for sewerage exists. These systems have the potential to be combined into larger urban systems, or upgraded with low-cost sewage treatment facilities. The development of technologies capable of upgrading individual septic tank systems and incorporating them into low cost sewer networks will enable more neighborhoods to opt for this sort of improved local sanitation.

Neighborhood solutions allow a more incremental (and flexible) approach to sanitation improvements, with progress depending on the demands and capacity of each neighborhood and its service provider. They also provide a method of targeting sanitation investments more closely, and thus of ensuring that benefits reach excluded groups like the urban poor. This incremental and targeted approach helps to spread the cost of sanitation facilities over time, while the demonstration effect of successful local systems gradually increases the number of households willing to pay for sanitation services. Eventually, these combined effects may persuade local and national government that investment in urban sanitation services is both vital and affordable.



Despite a high level of awareness in proper hygiene among all the communities, this did not translate into improvement in sanitation behavior. The underlying reason is the lack of access to sanitary disposal facilities.

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