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PHILIPPINE ENVIRONMENTAL GOVERNANCE 2 PROJECT (EcoGov 2)

# SEPTAGE MANAGEMENT IN THE PHILIPPINES: Current Practices and Lessons Learned

July 9, 2007

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The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.



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# SEPTAGE MANAGEMENT IN THE PHILIPPINES:

## CURRENT PRACTICES AND LESSONS LEARNED

by

Jeffrey Bowyer

### I. OVERVIEW OF URBAN SANITATION IN THE PHILIPPINES

#### A. Current Situation

Based on water demand, it is estimated that 7.2 million cubic meters of wastewater is generated daily in the Philippines (see table below). 5.2 MCM/day of this is generated in urbanized areas (2.4 MCM/day in Metro Manila alone). Unfortunately, due to insufficient sewage treatment and disposal, more than 90 percent of the sewage generated in the Philippines is not disposed or treated in an environmentally acceptable manner.<sup>1</sup>

The indiscriminate disposal of domestic wastewater is the main reason for degradation of water quality in urban areas, with negative impacts on health, the economy, and the environment. Statistics from Philippine Department of Health show that approximately 18 people die each day from water-borne diseases, which accounted for 31% of all reported illnesses from 1996-2000. Further, the World Bank's Philippines Environment Monitor 2003 estimates that water pollution costs the Philippine economy an estimated P67 billion (US\$1.3 billion) annually, of which P3 billion is attributed to health, P17 billion to fisheries production, and P47 billion to tourism.

**Table 1: Domestic Water Demand and Wastewater Generated**

Items	Urban	Rural	Total
Population (million)	43.6	32.9	76.5
Per capita water consumption (l/d)	150	75	-
Water demand (MCM/d)	6.54	2.47	9.0
Wastewater generated (MCM/d)	5.2	2.0	7.2

Source: Philippines Environmental Monitor, World Bank, 2003.

This bleak picture of urban sanitation in the Philippines reflects a prolonged lack of activity or investment in the sector. The Philippine national and local governments have devoted limited human, technical and financial resources to address sanitation and sewerage issues. In the last 30 years, investment in urban sanitation in the Philippines

totals only 1.5% of that spent on urban water supply.<sup>2</sup> As of 2001, Metro Manila ranked second to the lowest among major Asian cities in providing piped sewerage systems. According to the World Bank, only 7% of the population of Metro Manila was connected to a piped sewerage system at that time, compared to Dhaka, Bangladesh with 30%, Karachi, Pakistan and Phnom Penh, Cambodia with 50%.

To achieve the goals of the recently passed Clean Water Act on sewerage and sanitation provisions, it was estimated that the government needs to spend P25 billion a year for the physical infrastructure for a 10-year program in treating domestic water as well as sewage and sludge management beginning 2005.<sup>3</sup> However, the prospect of getting these funds from the national government given the current budget deficit is very low. The burden then falls to the local level.

Semi-autonomous water districts, which since the mid-70s have been mandated to operate and administer water supply and wastewater disposal systems in local communities, would seem to be well placed to handle this responsibility. They are relatively autonomous and have a tight focus on operational efficiency and cost recovery. Indeed, the Manila's Metropolitan Waterworks and Sewerage System, through their two water concessionaires—Manila Water and Maynilad Water—have had some recent success in developing sewerage networks and treatment plants (see some details about Manila Water's experience later in this paper). The concessionaires also offer septic tank desludging services.

However, outside Manila, the focus of the more than 200 operational water districts is solely on water supply, not sanitation services. 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.

This leaves Local Government Units (LGUs) with the main responsibility for providing sanitation services. The 2004 Clean Water Act encourages LGUs to establish and maintain wastewater treatment plants servicing their areas using their local property taxes and enforcement of a service fee system. By 2009, all sources of wastewater in highly urbanized cities must connect to available sewerage systems, or, if no sewerage system has been constructed, must employ a septage or combined sewerage-septage management system. The law also mandates the DPWH, in coordination with the DENR, LGUs and other concerned government agencies, to prepare the National Sewerage and Septage Management Program for domestic wastewater and sewage collection, treatment and disposal.

This is a large burden for LGUs. 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, such as meeting the deadlines contained in the Ecological Solid Waste Management Act to develop improved landfills. As a result, even in highly urbanized cities, sewerage projects tend to receive less attention than other income-generating projects, such as solid waste management and water supply. Sludge treatment and disposal facilities are nonexistent in most cities.



Faced with this void, urban residents have provided their own sanitation facilities. There are now huge numbers of septic tanks being used in urban areas, with more than a million in Metro Manila alone. 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. They are usually small, single chamber tanks, which provide minimal treatment and limited sludge storage.

Unfortunately, there has been little control or regulation of these private facilities in the Philippines. Many septic tanks are badly designed and constructed. Densely populated urban housing rarely has the space or ground conditions necessary for the septic drainage fields required by law. Thus, most urban households in the Philippines pipe their septic tank effluent directly to a nearby drain, canal or watercourse. In addition, very few 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. And when households do have their septic tanks emptied, the septage is usually dumped into water bodies or on land without proper treatment to kill pathogens.<sup>i</sup>

Despite these problems, it is unrealistic to expect thousands of urban households to improve their septic tanks and/or improve their maintenance overnight. Change will require substantive evidence of the environmental health risks associated with current septic tank systems. 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 it is necessary to increase investment in urban sanitation and tighten sanctions against the discharge of inadequately treated effluent.

## **B. Moving Ahead**

Given the problems and challenges described above, local governments need assistance in developing long-term strategies based on realistic targets and implemented in incremental steps to overcome the challenges of improving sanitation (e.g., the high cost of constructing treatment facilities, poor technical capacity, and low demand or willingness-to-pay for sanitation services). One key challenge in improving sanitation is to recover costs from users. With this in mind, it is important to pursue an approach that can be supported by users' WTP.

In most low-income countries, conventional centralized approaches to wastewater management (i.e., sewer systems feeding a centralized treatment facility) have generally failed. The experience in Indonesia may offer some useful lessons for the Philippines. In most cases, treatment plants that have been constructed with the help of aid agencies sit idle or are underutilized due to insufficient inflow, broken pumps, or both. For instance, the plant in Bandung operates at 30% of capacity.<sup>4</sup> At the heart of the problem is the lack of adequate cost recovery and inadequate incentives for skilled staff to remain employed in sewerage departments.

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<sup>i</sup> Septage is the mix of liquid and solids in a septic tank, which becomes a major source of pollution when it is disposed without treatment, either on land or into water bodies.

Learning from Indonesia's experience, cities in the Philippines should consider decentralized and localized approaches for wastewater treatment, reuse and resource recovery, as well as improvements in local environmental health conditions. Such approaches could ease implementation barriers due to unavailability of land for centralized treatment facilities, as well as the costs and difficulties of constructing extensive sewer networks. The concept also encourages more community participation that would allow the selection of low-cost sewer networks and treatment alternatives according to their WTP. In addition, as much as possible, decentralized systems should practice ecological sanitation, an approach that follows the natural nutrient cycle by returning the plant nutrients in urine and feces to the soil.

The city of Dumaguete offers an example of how other Philippines cities might proceed with septage management. With assistance from the Local Initiatives for Affordable Wastewater Treatment (LINAWE) project, the city is developing the first septage system in the country to be operated by an LGU. Septic tanks from the city's 22,000 households and 2,500 business establishments, including the public market and institutional buildings, will be pumped out and the septage treated in a series of eight lagoons and a constructed wetland. The lagoons will not use electricity or chemicals. Financing was secured from a local development bank and construction will be completed within 4 months.

The city has also developed a corresponding septage management ordinance and user fees that will cover the operation and maintenance costs and a portion of the capital costs of the system. The construction costs and acquisition of vacuum trucks will total approximately P15 million and the operation and maintenance costs will be approximately P46,000 per month. After three years, the city will turn over the operation and management of the facility to the water district.

Experience from the LINAWE project identified a number of success factors, including the following:

- Strong support from mayors, who committed to source funds for the construction costs and implement fee systems to cover O&M costs.
- Participatory process that involved community stakeholders, including business sector, led by a team leader and multi-sector technical working group in each city.
- Phased strategy with short-, medium- and long-term goals.
- Cities focused on large city-owned sources of pollution such as public markets and slaughterhouses before asking others to take action.
- Selection of simple wastewater treatment technologies with low construction and O&M costs.
- Reliance on mixed financing from internal sources (regular revenues), loans from local development banks and the private sector for the capital expenditures, and user fees for the operations.

- Effective public awareness campaigns to educate the public about wastewater pollution and develop support for user fees.
- Close coordination among national and local government agencies and private sector greatly facilitates project implementation.
- Learn from other local government units on effective wastewater management and low-cost waste treatment technologies.<sup>5</sup>

## II. CURRENT SEPTAGE MANAGEMENT PRACTICES IN THE PHILIPPINES

This section reviews current sanitation practices in the Philippines. Most of the information provided below came from various interviews conducted in May and June of 2007. Sources were as follows:

- May 17th – Interview with Evangeline Matibag (Manager) and Ronald Muana (Associate Manager, Project Development), Manila Water, Wastewater Department.
- May 29th – Phone discussion and email interaction with Lisa Lumbao (Team Leader), Local Initiatives for Affordable Wastewater Treatment (LINA W).
- June 18th – Interview with Bobby Bostillo, EIA Specialist for LINA W
- June 21st - Interview with William Ablong (Vice Mayor) and Josie Antonio (Municipal Planning and Development Officer), Dumaguete.
- June 22nd - Interview with David Chiu, Manila Water, Wastewater Department, and Anthony Gedang (President and CEO), Envirokonsult
- June 26th & 27th – Presentations from Regional Conference on Domestic Sanitation and Wastewater Management, Davao
- Reports from World Bank, ADB, and the LINA W project

This overview is broken down into six sections as follows: 1) Action Planning and Technical Working Groups; 2) Ordinances and Incentives; 3) Institutional Arrangements; 4) Cost Recovery; 5) Desludging and Sludge Removal; and 6) Information, Education, and Social Marketing.

### A. Action Planning and Technical Working Groups

#### *LINA W Project*<sup>6</sup>

- To achieve successful project outcomes, the LINA W project found that it was critical to have strong support from the mayor and a dedicated city staff in the form of an active technical working group (TWG). LINA W consultants worked with each mayor to select TWG members and a team leader and to develop a memorandum of understanding (MOU) for the project that was signed by the mayor and approved by the city council.
- The TWGs typically consisted of members of the city government staff, including the city environment and natural resources officer, the planning officer, health officer and engineering staff, an official from the water district, and representatives from the city council and from nongovernmental organizations (NGOs).
- With assistance from LINA W, the TWGs engaged local stakeholders to identify the sources of pollution and generate ideas for short-term and medium-term

projects that would address wastewater pollution from different sources and make use of low-cost technologies. The ideas were used by the TWGs to develop action plans to guide their work. These initial stakeholder workshops also raised awareness and solicited buy-in from the stakeholders.

- Short-term projects focused on city-owned sources of pollution such as markets and slaughterhouses since the city governments felt they should “clean up their own house” first before asking others to implement improvements. Medium-term projects have focused on domestic and institutional sources (such as hospitals) using either off-site or on-site treatment facilities.

### ***Dumaguete***

- Their TWG consisted of LGU staff from a number of offices (Planning, Health, Engineering, Environment, Public Works), members of the Environment Committee of the City Council, and the private sector
- LINAW conducted orientation/workshops on septage management for TWG. The purpose was to:
  - gain a deeper understanding of septage management, including an orientation on national laws and local ordinances;
  - consider options and proposed solutions to the city’s wastewater problems, including orientation on treatment technologies;
  - determine all related investment and operating costs of the project;
  - determine the wastewater treatment fees the City will charge; and
  - determine the contents of their proposed septage management program ordinance.
- Members of the TWG went on site visits to wastewater treatment plants in Manila, including the plant in Kalookan.
- An assessment of the sources of water pollution found that raw wastewater was being discharged to land or water bodies from approximately 15,000 non-functioning septic tanks flowing into street canals, water bodies and subsoil.
- The TWG made the public and the business sector partners in wastewater management, by making them aware of and concerned about the problem and the need to do something about it, and knowledgeable about solutions and their roles
- Planning extended down to barangay level. Each of the 30 barangays developed sanitation action plans (including plans for communal facilities). These were integrated into the city’s plan

## **B. Ordinance and Incentives**

### ***LINAW***

- LINAW developed a comprehensive model septage management ordinance for use by the four cities and has conducted workshops in each city to begin developing a septage management program and local ordinance.
- An ordinance provides framework on how to manage wastewater generated by public and private sources. It also provides the guidelines to private operators who would like to engage in the business of wastewater collection, treatment and disposal.
- This must include a full range of requirements, including:
  - Legal Basis, Scope, and Authority
  - Definitions
  - Technical Provisions (Description of the Septage Management System, Design, Operation, and Maintenance, Septic Tanks – design and construction Req'ts, Desludging Procedures, Septage Treatment Facility)
  - Administration and Enforcement (Institutional Arrangements, Monitoring and Evaluation, Finances and User Fees, Administrative Procedures)
  - Violations and Penalty Provisions
- Septic tanks should be constructed and maintained as follows:
  - Concrete is the preferred material. They should be water tight and multi-chambered. Bottomless septic tanks should be prohibited.
  - Must be sized so that the volume is at least 1.6 times the daily flow but preferably 2 or 2.5 times the daily flow. The bigger the tank, the less frequently it will need to be desludged.
  - Must also be accessible (have a removable cover and not be located directly under the house) so they can be pumped out when the sludge level becomes too high.
  - When the 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.
  - Septage should be taken to an approved sludge treatment and disposal site by means of a vacuum tanker.
  - Small housing blocks may share a communal septic tank to reduce per household costs.
  - Households should be encouraged to minimize their use of water and be careful about what they put into their septic tanks.

### ***Dumaguete***

- Development of ordinance took nine months (from June 2005 to February 2006). Included the following steps:
  - actual writing of draft by members of the LINAW Technical Working Group using National Building Code and other laws as references;
  - presentation and discussions of draft with City Councilors (line-by-line review);

- information campaign on proposed septage ordinance, including discussions with village officials and consultations with the media. 30 barangays were organized into six groups for these meetings;
- mandatory public hearing on septage ordinance; and
- amendments to draft and final approval and adoption by City Council

### C. Institutional Arrangements

#### *World Bank's Water and Sanitation Program* <sup>7</sup>

- The following common 'factors of success' emerged from the WPEP analysis: (1) dedicated sanitation units (trained technical staff and separate sanitation budget); (2) autonomous management (political and fiscal); and (3) local political support
- There is also a need for trained sanitation inspectors who are not overburdened. Two provinces—South Cotabato and Sarangani—employed and trained Barangay Sanitary Inspectors to help ensure inspections on an honorarium basis.
- There are basically two possible service providers for a local septage management program—the LGU or water district (or a private concessionaire contracted by the LGU or water district to perform management duties). LGUs and water districts provide urban services under very different conditions.
- **LGUs:** 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. Governments are increasingly seen as facilitators, not drivers. LGUs receive government funding on top of their local revenues, but usually have no dedicated sanitation staff, limited technical capacity, and no separate budget allocation for sewerage or sanitation (making budgeting and planning of sanitation services very difficult). They are typically reliant on external assistance and user contributions whenever repairs or rehabilitation are required.
- **Water districts:** Water districts operate within government regulations, but normally receive no government funding. They instead rely on effective management of their water and sewerage systems to generate revenues. Thus, they are usually in a better position to set cost-reflective tariffs that generate reliable revenues, and to allocate these revenues according to operational and strategic priorities. The key is to develop detailed and transparent sanitation accounts, based on accurate billing and collection systems, to create a tight focus on cost recovery. When reinforced by regular performance monitoring, this can provide sound incentives for efficient management.
- The benefits of linking water and sanitation charges suggest that LGUs should encourage and assist water service providers to establish sanitation units (or link with other sanitation service providers) wherever possible to manage, monitor and regulate sanitation systems at the city level. 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.

- LGUs or water districts should also consider 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

### ***Dumaguete***

- Their septage management system will be managed by the City Septage Management Administration with the following functions:
  - Survey or inventory of septic tanks
  - Inspect construction of septic tanks
  - Issue certificates of compliance
  - Conduct of education and information campaign on septage management
  - Supervise the operation of septage treatment plant
  - Direct and supervise day-to-day operations of septage system
- The City Septage Management Authority will be composed of representatives from the following offices: 1) City Environment and Natural Resources (head office); 2) City Health; 3) General Services (will maintain trucks); 4) City Treasurer; 5) City Water District; 6) Legal Office; 7) Engineer's Office; 8) NGO (appointed by the City Chief Executive from the NGO members of the City Development Council); and 9) Other persons who may be invited to provide technical advice to the CSMA
- Fee collection will be handled by water district. Because this will require modifying their billing structure, the water district will receive 5% of total collections

## **D. Costs and Cost Recovery**

### ***World Bank's Water and Sanitation Program***<sup>8</sup>

- Neither local authorities nor water districts have the necessary capital or leverage to finance expensive sewer networks or sewage treatment facilities. Thus, major sanitation improvements are dependent on a mix of government funding, external assistance and increased user charges. Project design should incorporate institutional building and financial viability.
- Obtaining funds and enacting necessary reforms (e.g., linking revenues with expenditures) requires careful negotiation and cooperation between local stakeholders, especially when elected officials are sensitive to popular concerns regarding tariffs.
- Multi-sourcing of funds can be used to effectively reduce the funding requirements of LGUs by encouraging project investment and O&M costs<sup>ii</sup> from

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<sup>ii</sup> Operation and maintenance (O&M) expenses for septage management programs typically include the following: labor, overhead (e.g., benefits, employment taxes), utilities, transportation for processed and incoming materials, vehicles and other equipment maintenance, taxes, disposal costs for dried cake, licenses and permits; insurance, testing and other monitoring, and miscellaneous supplies.



other stakeholders. However, in the Philippines and the region, there are few cases where sufficient revenue is generated to fully cover O&M costs. Political approval and effective administration of such taxes and charges have proven to be too difficult.

- In most cases, cities in the Philippines that have some type of wastewater/septage management program partially recover their O&M costs through a small fee added to the water bill. Charges can be linked to water consumption, and disconnection of water supply provides an effective sanction against non-payment. The disadvantages are that the water service provider is not always willing (or able) to collect sanitation charges, and, while there are strong synergies in financial management, sanitation services require different skills and resources to those needed for water supply.
- Government funding is also 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.
- Apart from Dumaguete (see below), none of the Philippine cities 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.
- 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.
- Other cities charge a flat rate (or zero) tariffs, collect revenues lower than their O&M costs and, are dependent on subsidies from the LGU or, where managed by a Water District, on cross-subsidies from water supply income.
- The other part of the arrangement is between the STF and LGU (or the contractor collecting the septage). The tipping fee is perhaps the only variable of the facility's financial system. Calculating the desired tipping fee requires "working backwards." The cost to process the septage is determined by the facility's monthly operating expenses.
- The tipping fee (per unit basis) is determined by dividing the total tipping revenue by cubic meters of incoming septage. Therefore, to determine the tipping fee, the tipping revenue must first be calculated using the following equation: Tipping Revenues = Operating Expenses + Profit Margin - Material Revenues (i.e. end-product sales of processed materials)

### ***Manila Water***

- Sewerage and sanitation programs are funded partly by 10% environmental fee charged to all MWSS customers on the water bill. Households covered by sewerage are also assessed 50% of household water bill. This is not enough to cover O&M of sewerage (perhaps only 60-70%). There is also some cross-subsidization from water supply income
- PhP 803 for emergency desludging – Mater Water lobbying to increase this

- Sewerage charges were planned to increase from 50% to 150%, and the 10% environmental fee was to be replaced by a sanitation charge equal to 75% of the water bill. However, these increases have not taken place.
- The Metro Manila Development Authority also buys cheap treated water from the Metropolitan Waterworks and Sewerage System to water vegetation around the metropolis
- The cost per cubic meter of septage was estimated as follows:
  - Desludging cost – PhP 350 (original bid was PhP 625)
  - Septage Treatment – PhP 55
  - Biosolids Application – PhP 644 (10 cum of septage produces 1 cum of biosolids for disposal 120 km from Metro Manila)

### ***Baguio City***

- City government signed MoA in 1995 with water district, whereby the latter would add sewerage charges to the water bills of those with sewer connections and return this sewerage revenue to the city government.
- 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. Prior to implementation, the water district decided that their collection fee was inadequate and called off 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.

### ***Dumaguete***

- Estimated O&M costs (in pesos) were as follows:
 

○ Salaries and Wages	- P 0.96M
○ Repair and Maintenance	- 0.30M
○ Fuel and Oil	- 0.30M
○ Supplies, Com., Transportation	- 0.02M
○ Analysis of Samples	- 0.03M
○ Monitoring	- 0.12M
○ Interest/bank loan charges	- 1.53M
○ Total	= P 3.26 M (P3.3M)

Dumaguete will cover its O&M costs for its septage treatment facility through a user fee of PhP 2/m<sup>3</sup> on the water bill. This user fee will cover both capital and operating costs, as well as funding an environmental fee. Water District has data bank on water users and a water billing and collection system.

- PhP 2/cum septage user fee was calculated as follows:
  - Capital and O&M Costs – PhP 4.4Million (total estimated annual capital and operating cost) / 5.7 million cum (total city annual water consumption) = PhP 0.90 per cubic (rounded up to PhP 1.00/cum) +
  - Environmental Fund – PhP 1.00 per cubic meter (to fund future wastewater management and sanitation projects)
- For those non-metered domestic consumers, the average consumption of metered households shall be used as basis for computing water consumption.
- For commercial establishments with own sources of water, production meters shall be installed from which reading will be used as basis.

### **Indonesia<sup>9</sup>**

- Almost all of the sewer systems rely on government subsidy to meet operations and maintenance costs, despite the fact that capital investments have been financed through central government or bilateral grants to the provincial or local governments
- In Yogyakarta, the provincial government fully subsidizes the cost of operating the treatment plant. Large annual subsidies are also required in Medan, Tangerang, and Surakarta. This is due to the following: failure to make the planned number of connections, low or no tariffs; sewerage facilities are operated without a proper commercial incentive framework.
- Current tariffs
  - Bandung - 30% surcharge on water bill
  - Cirebon - 15% surcharge on water bill, including for those without sewer connection. Additional 25% environmental fee, payable to the city.
  - Jakarta - Based on floor area and type of building use (e.g., residential, commercial)
  - Medan - Based on water use and floor area and type of building use
  - Surakarta - Propose to bill based on water use
  - Tangerang - Not billed
  - Yogyakarta - Based on number of residents and type of building use. Those outside city are not billed.

## **E. Desludging and Sludge Disposal**

### **General lessons/experience**

- In most cities, desludging is done only when requested by households and usually when the septic tank overflows. Costs are paid by the household directly to a private desludging company
- To implement a city-wide septage management program, there is a need for the LGU and/or water district to develop a system to ensure that all septic tanks are

desludged regularly and that the septage removed is treated. Each LGU should develop a system that works for them

- The LGU/water district could collect fees from the households and pay the contractor for each truck-full of septage brought to the treatment facility. This would give the contractor an incentive not to simply dump the septage, as is currently being done
- In case sewage, septage, or sludge is collected, transported, treated & disposed by a third party, the final disposal of the treated sewage, septage or sludge shall comply with relevant DOH stds.
- In case sewage, septage, or sludge is collected, transported, treated & disposed by a third party, the final disposal of the treated sewage, septage or sludge shall comply with relevant DOH stds.
- Reuse of treated sludge for agric purposes shall comply with stds set by DENR & DA

### ***Manila Water***

- World Bank has provided Manila Water with septic tank desludging equipment, septage treatment facilities, and sewage treatment plants that treat the septic tank effluent. Conventional centralized sewerage works are too expensive. Two septage treatment facilities recently were opened – FTI plant in the south (814 cum/day) and San Meteo plant in north (586 cum/day). In addition, plant funded by ADB will soon open in Antipolo (600 cum/day). From 2001 to 2006, desludgings by Manila Water have increased from 4,380 to 162,069. In that time, number of trucks increased from 14 to 53 (sizes are 1.5, 5, and 10 cum).
- Manila Water has come up with a novel approach to conduct voluntary and “free” desludgings that builds on the close community relationships they have forged from its water service. Desludgings are not really free, since customers pay a 10% environment fee. Program also funded through water bill, but service appears to be free from customers’ perspective.
- Desludgings are decentralized. Manila Water has divided their concession area into eight business areas, each with a management team. Each team has one Desludging Operations Manager, one Wastewater Coordinator and 2-3 Sanitation Officers. Desludgings should occur every five years.
- First step is to schedule desludgings by barangay in their business area. Typically one week before starting the desludgings, the management team typically holds an event with the barangay to inform residents about the service.
- Sanitation officers (former drivers of Manila Water) then work with barangay officials to survey the area and go door-to-door to offer the service. Manila Water then forwards the job order to their desludging contractor, who coordinates their desludging schedule with the barangay.
- Homeowners are informed to open their septic vaults a couple days before the desludging company arrives. If the septic tank is not accessible (e.g. further than

- 80 meters from street) or the homeowner does not wish to avail of the service, the homeowner is asked to sign a waiver.
- Manila Water has given the desludging contractor, Envirokonsult, a 2-year contract. They bid the job out. Eight bids were received. Originally, they chose three contractors to service different areas, but two of these could not effectively do the job, so the job was given exclusively to Envirokonsult.
  - They pay them Php 350 per cubic meter for them to conduct the service. The contractor maintains the trucks, which are owned by Manila Water. They also source spare parts and keep an inventory of parts. Each truck can usually service 3 septic tanks per day. Before outsourcing, Manila Water could usually only accomplish two per day.
  - They do not desludge industrial areas, hospitals or morgues and only desludge restaurants if they determine that the grease traps are working.
  - Manila Water has found that size of trucks can be problematic. They have procured more 1.5 cum tankers but sometimes these are also too large. They have also upgraded their vacuum pumps so it can operate up to 350 meters from septic tank (currently max is 80 meters).
  - According to contractor, the lifespan of a truck is only 5 years, more if effective preventive maintenance. Manila Water also found that the material of the hose is critical. Must be light and flexible (otherwise is difficult for desludging crews), while also durable.
  - Must have skilled labor. Need mechanic that can maintain and fix a vacuum. Also, operators must know how to properly maintain a vacuum. Operators receive hazard pay (+ 25%). Each truck has one driver and one helper. Started with driver and 2 helpers.
  - Manila Water has a problem with what to do with grit and plastics that is included in the septage but cannot be pumped into the STF
  - Best Practices include the following: 1) Assure quality service; 2) Decentralization; 3) Waiver documentation; 4) Retain solids; 5) Dilute septage with water; 6) Anti-rabies

### ***Other Philippine Cities (from WSP)<sup>10</sup>***

- The Baguio City sewerage system is the only case study that safely disposes of the sewage and wastewater that it collects. Thanks to a JICA grant, the 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.

## F. Information and Education Campaign

### *LINAW*

- LINAW project is assisting cities in planning and implementing a social marketing, information, and education campaigns (SMIEC). The campaigns run parallel to the implementation of wastewater management projects of the city and focuses on the major generators of waste water—the households, commercial establishments and institutions as its primary target market.
- LINAW's approach is based on the premise that wastewater management is a complex social product due to the numerous ideas and practices involved (e.g. incidence of diseases, design/role of septic tanks, importance of inspecting and desludging septic tank, paying of fees). Campaign includes positioning strategies, creative strategies, taglines, and promotional strategies.
- Important to repeat 3-5 messages over and over. Two types of messages. The first are selling points (or banner points). These differ depending on the city but typically include nostalgia, relaxation, family, and health. In Dumaguete, the story is the boulevard along the ocean, in Marikina it was quality of the river for swimming.
- Second type of message is key messages. These are usually the same in each LGU. Includes the importance of desludging and proper septic tank construction and maintenance.
- First step of SMIEC involves getting to know the target audience through knowledge, attitudes and practices (KAP) surveys, both through focus group discussions and surveys. Sample size per barangays is equal to proportion of barangay population to overall city population. 15-20 minute survey can be conducted by barangay health workers (such as in San Fernando) or by volunteers (such as in Marikina). From these surveys, the storyline (or selling points) of the SMIEC can be crafted.
- Once SMIEC materials are developed, important to pre-test them for power of the images with 6-8 respondents. Test for appeal, meaning, comprehension, and call-to-action.
- One limitation is that LGUs typically do not have capacity to produce materials. Many do not have Photoshop. Most cities do not have ad executive, unlike Muntinlupa
- SMIEC is done in phases in order to introduce ideas and practices gradually and in a phased manner so they can be properly understood and retained by the target audience. These phases are as follows:
  - Phase 1 – Awareness Raising: This short (1 to 2 month) phase is aimed at generating high awareness and a sense of alarm or concern about the problem situation that directly affects the target audience, and the need to deal with it. It consists of easy to grasp messages (e.g. disease incidences from contaminated water are rising) that can be communicated instantly through short advertisements in various media or communication channels.

- Phase 2 – Educational Phase: This 3-4 month phase is designed to deepen the knowledge and appreciation of the target audience. Information and educational approaches are employed to stress the importance, among other things, of properly designed septic tanks and periodic septic tank inspections and desludgings every 3-5 years.
- Phase 3 - Continuing Education and Action Promotion Phase: This phase is a continuing education and promotional phase with short campaigns at least once a year. Calls to action will dominate this phase, accompanied by aggressive mobilization and promotional push activities to trigger the actual adoption of the practices being marketed.
- The campaign uses a number of different communication channels, including radio and TV spots, posters, and flyers. In addition, barangay assemblies are important educational parts of this campaign. Important to remember that the formula is not the same in all cities.
- Radio is typically P10,000 per placement (twice a day over one month). Ideal to have 4 radio spots a day. Also, cable can be cheaper than leaflets. Wallpaper in internet cafes can be another effective strategy.

**Table 2: Communication channels targeted at households**

<b>Phase 1 (1-2 months)</b>	<b>Phase 2 (3 months)</b>	<b>Phase 3 (ongoing)</b>
<ul style="list-style-type: none"> <li>▪ Local Cable TV ads (30 seconds)</li> <li>▪ National broadsheet print ads and</li> <li>▪ Local newspaper ads</li> <li>▪ Billboards</li> <li>▪ Tarpaulin posters mounted on jeepney tops</li> <li>▪ <i>Recorida (roving announcements and ads)</i></li> <li>▪ Leaflets in churches, markets, plaza and, barangays (thru the <i>recorida</i>)</li> </ul> <p><b>NEWS AND PRESS RELEASES</b></p> <ul style="list-style-type: none"> <li>▪ News releases in print, radio and TV</li> <li>▪ Discussions by radio commentators</li> <li>▪ Guesting in radio programs</li> </ul>	<ul style="list-style-type: none"> <li>▪ National TV ads (30 seconds)</li> <li>▪ National broadsheet print ads</li> <li>▪ Local newspaper ads</li> <li>▪ <i>Komiks</i></li> <li>▪ Primers</li> <li>▪ <i>Recorida</i></li> <li>▪ Barangay assemblies (with mascot)</li> <li>▪ House-to-house visits (with mascot)</li> <li>▪ Radio/TV public affairs show guesting</li> <li>▪ Short film/video showing in theaters</li> <li>▪ Sunday mass announcements</li> <li>▪ Continuing billboards, tarpaulin posters</li> </ul> <p><b>NEWS AND PRESS RELEASES</b></p> <ul style="list-style-type: none"> <li>▪ Continuing news releases in print, radio and TV</li> <li>▪ Continuing discussions by radio commentators</li> <li>▪ Feature articles in national broadsheets and magazines</li> </ul>	<ul style="list-style-type: none"> <li>▪ Occasional radio, TV, print ads</li> <li>▪ Continuing komiks,</li> <li>▪ Continuing primers</li> <li>▪ Continuing house to house visits</li> <li>▪ Continuing short film showing in theaters</li> <li>▪ Continuing billboards</li> <li>▪ Continuing Sunday mass announcements</li> <li>▪ Continuing but less frequent assemblies</li> <li>▪ Continuing but less frequent <i>recorida</i></li> </ul> <p><b>NEWS AND PRESS RELEASES</b></p> <ul style="list-style-type: none"> <li>▪ Continuing tri-media news releases</li> <li>▪ Continuing feature articles</li> </ul>

- LINAW also has a monitoring and evaluation plan to ensure that activities and placements are followed properly. In addition, household and telephone surveys are conducted to gauge the level of awareness of the target audience and the effectiveness of the campaign
- Household surveys are to be conducted after Phase 1 and towards the end of Phase 2. Also towards the end of Phase 2, focus group discussions (one in each of the nine barangays of the city) are to be conducted among households to further explore the depth of their knowledge about the subject of the campaign and the nature of their responses to the campaign's thrusts.
- Typical campaign can cost between P150,000 to P300,000 per city (Phases 1 and 2 only). This also excludes cost of barangay assemblies.

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## ENDNOTES

<sup>1</sup> World Bank. Philippines Environmental Monitor, 2003.

<sup>2</sup> World Bank Water and Sanitation Program. *Urban Sewerage and Sanitation: Lessons Learned from Case Studies in the Philippines*. June 2003.

<sup>3</sup> Calumpita, Ronnie. *Reporter*. SPECIAL REPORT : Sewage and sanitation; P67B down the drain due to poor sewage treatment.

<sup>4</sup> Sukarma, Risyana and Richard Pollard. Asian Development Bank. Indonesia: Overview of Sanitation and Sewerage Experience and Policy Options

<sup>5</sup> Final Report, Local Initiatives for Affordable Wastewater Treatment (LINAW) Project, Phase 1

<sup>6</sup> Ibid.

<sup>7</sup> World Bank Water and Sanitation Program.

<sup>8</sup> Ibid.

<sup>9</sup> Sukarma, Risyana and Richard Pollard.

<sup>10</sup> World Bank Water and Sanitation Program.