

MAXIMIZING THE BENEFITS FROM WATER AND ENVIRONMENTAL SANITATION

Implementing a City-wide Wastewater Management programme in the Philippines

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This practitioner's paper shares and discusses recent outcomes of an ongoing project that formulates and implements a city-wide wastewater management programme in four selected cities of the Philippines. The paper initially discusses the need for urban sanitation in the Philippine context, and then moves on to discuss the framework for this project and its aims and objectives. Detail is given on how the wastewater management scheme is being implemented under the Philippine government's broader umbrella policy and strategy to improve the urban and peri-urban environment. This project takes all the experiences and lessons learnt from previous projects and initiatives of a similar nature, particularly the stakeholder driven approach, and replicates them in the Philippine context.

Introduction

Adequate, affordable, and appropriate sanitation system provision, operation and maintenance is probably one of the most complex and yet important problems facing large urban settlements, both formal and informal, in all developing countries. And yet most policy makers, at both national and regional levels, including most multi-lateral and bi-lateral donors, continue to largely give it lesser significance when compared to water supply provision for understandable reasons (Mara 2003).

In some ways we can appreciate why most stakeholders are wary of seriously addressing this critical issue, as it is usually very complex in nature and contains a whole host of other interrelated issues. Consequently, it is very difficult to provide sustainable solutions that meet and solve all the socio-economic, topographic and other multi-faceted constraints. However, it must be remembered that this complex problem is only going to get worse, particularly in the case of the Philippines, for the following reasons:

- Population growth in the Philippines is among the highest in Asia, but only about 7% of the country's 85 million people are connected to sewers and very few have adequate on-site sanitation facilities (World Bank 2003);
- Continuing urban drift and shift in population from rural areas has led to the continued expansion of informal settlements, i.e., squatter camps, that have little or no sanitation services;
- Increasing population densities and congestion, coupled with lack of sanitation services and poor hygiene, has resulted in high incidences of waterborne diseases—the Philippine Department of Health reported that 31% of

illnesses over a 5-year period were due to water-related diseases.

Local initiatives for Affordable Wastewater Treatment (LINAW) Project in the Philippines

Water pollution due to inadequate wastewater collection and treatment facilities is a serious problem in the Philippines with more than 90% of the sewage generated not disposed of or treated in an environmentally acceptable manner (World Bank 2003). To address this huge problem, the Philippine government enacted the Clean Water Act in 2003 which requires local government units (LGUs) to play a central role in water quality management, including providing domestic sanitation facilities, but provides no direct funding support.

It has long been recognized that the most effective urban sanitary projects are those that are managed and implemented at a local level by largely financially autonomous community-based units that use a participatory approach to project design and system selection (Shaw and Smout 1999, Pickford 1991). Exclusive reliance on central government and/or external donors often leads to uninformed project design, implementation problems, and a limited sense of community ownership which negatively affects project sustainability (Tayler et al, 2003).

The Local Initiatives for Affordable Wastewater Treatment (LINAW) Project was created to facilitate local responses to the urgent need for sanitation services in the Philippines. Funded by the United States Agency for International Development (USAID) through the US-Asia Environmental Partnership (US-AEP), the project is assisting four pilot cities, namely Iloilo, Naga, Muntinlupa and Dumaguete, to develop and implement low-cost wastewater treatment systems to improve water quality management. The authori-

ties in these four cities recognized the detrimental impact of water pollution on the quality of life in urban areas, and consequently decided to play a proactive role in identifying and developing innovative solutions for reducing wastewater pollution. In particular, they have been pilot testing small-scale, low-cost treatment systems and developing longer-term plans and projects to tackle their domestic wastewater challenges.

Methodology

Before designing a very specific wastewater management plan for a particular city, it is best to consider a much broader framework of strategic ideas and concepts regarding the overall environmental aims the cities are trying to achieve. Hence the intention of this framework is to ensure that any citywide plan is not made in isolation to any other relevant sector (i.e. water supply sector), and fits into a coherent and logical approach to wastewater systems design. In other words, any other wastewater projects that run concurrently or at a later date than the LINAW project do not seriously conflict in technical terms with its aims and objectives.

This LINAW scheme is really a demonstration project to show how a phased and systematic approach to wastewater management need not be prohibitively expensive to yield real improvements in the environmental quality of water-courses. Hence, the overall framework for this project puts the specific ideas and strategies used under the LINAW project into the larger and more difficult context of the sustainable management of a congested city environment of a developing country. A basic project framework for a typical city is outlined and summarized below:

1. Set major objectives

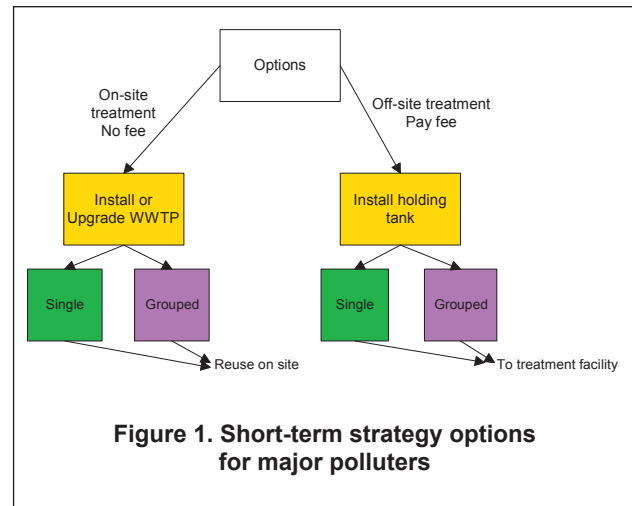
- Lower morbidity/mortality rates amongst residents of LGUs, particularly infants; improve quality of life due to cleaner environment and economic gains.

2. Preliminary investigative work

- Collect technical data on major sources of water pollution, i.e., industrial, commercial, residential, roads, drainage, etc.
- Identify local partner agencies, NGOs, CBOs, and other relevant stakeholders.
- Collate existing historical data, records, WatSan and health reports.
- Develop a phased short, medium and long-term strategy to implement the water pollution agenda highlighted under the Clean Water Act.

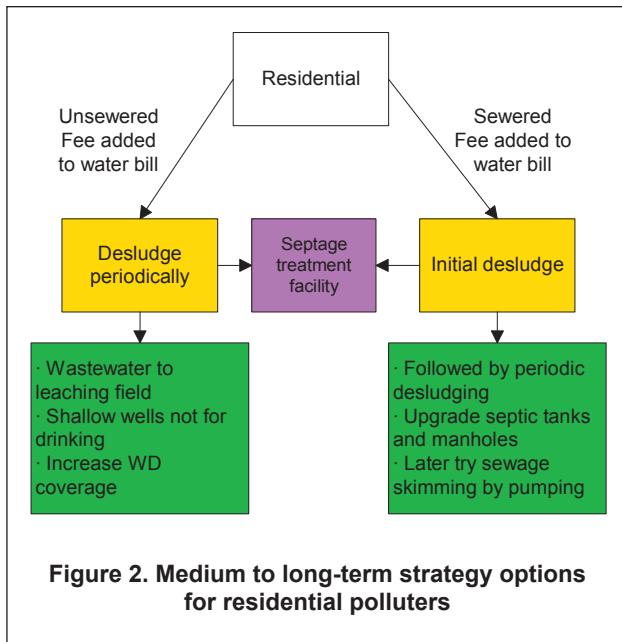
3. Technical/engineering aims

- Existing combined sewer system to receive relatively clean wastewater from various sources, i.e., encourage and foster pretreatment on-site;
- Reduction in foul flows into system through vigorous enforcement of local legislation, i.e., fines/penalties.
- Regularly clean out storm water drainage channels, i.e.,



set up eventually self-financing solid waste management agency.

- Set up sludge/septage treatment facilities, including plant operation and management agency.
 - Introduce a city-wide septage management scheme, i.e., contract out septage collection by vacuum truck, collect fees to cover operation and maintenance costs, etc.
- ### 4. Short-term pilot projects
- Tackle large city-owned sources of pollution first, such as public markets and slaughterhouses, that produce large concentrated waste streams.
 - Use the pilots to test the introduction of appropriate technologies to carry out on-site treatment of wastewater.
 - The pilots set a good example for residential and industrial wastewater generators, and they have revenue streams to pay for on-site system operation and periodic desludging.
- ### 5. Short-term strategy
- Firstly concentrate on major city-wide industrial and commercial polluters, such as large hospitals, and reduce their wastewater generation (see Fig.1).
 - Move on to SMEs.
- ### 6. Medium to long-term projects
- Concentrate on individual residential wastewater sources (see Fig. 2).
 - Build and commence operation of septage treatment facility, i.e., waste stabilization ponds.
 - Set up septage management programme and associated organization to collect and transport septage and levy user fees, etc.
 - Extend existing sewerage network using simplified sewerage technology and local financing.
- ### 7. Medium to long-term strategy: Water course clean up and rehabilitation
- Set up community river councils, particularly in squatter



settlements located adjacent to watercourses.

- Identify sources of incoming pollution.
- Initiate community-based and financed sanitation program to upgrade and/or repair existing systems to requisite standards, and to install new systems where necessary, i.e., communal pour flush latrines and septic tanks (Cairncross and Feachem 1983).
- Close off direct river discharge latrines; dredge the river bed to remove accumulated solid waste; remove aquatic vegetation growth due to eutrophication; where technically and financially possible install manual bar screens at outfalls; initiate health and hygiene promotion activities.

The strategic planning process for LINAW

After setting up a generic framework, the LINAW project helped each city develop strategic interventions and solutions based on a participatory action planning process where city officials and stakeholders worked together to identify and develop priority projects. The LINAW project is assisting the four LGUs in this complex process by providing:

- Targeted technical assistance, including project design and packaging support;
- Site visits to other regional countries to learn about best practices and technology options;
- Participatory planning workshops;
- Information and resource materials on technology and financing options;
- Assistance in developing and implementing public awareness campaigns; and
- Sharing project results in both local and national forums.

Operating under a two-track programme, LINAW has been supporting the development of “rapid response” solutions

that address immediate pollution problems through specific on-the-ground interventions. For the second track, LINAW and the cities are addressing more significant wastewater challenges that require more comprehensive assistance in planning, project design, technology and financing solutions, project packaging, and outside funding where required. At all times the major stakeholders are the drivers for the development of each city framework and strategic planning process with the LINAW project team acting as facilitators and technical advisors.

Current projects and activities

Dumaguete City’s overarching goal is to improve the quality of the water in the oceanfront along the city’s popular boulevard promenade. To achieve this, the city is building an offsite treatment facility consisting of a series of eight lagoons to treat septage from the city’s septic tanks, from over 21,000 households and all commercial establishments, schools, hospitals, the public market, and city hall. The city also plans to undertake onsite effluent treatment for the public market and a collection and treatment system for wastewater from three of the outfalls flowing into the sea along the boulevard.

In Muntinlupa City, a wastewater treatment facility is being built at the public market that will allow for 25% of the treated water to be reused. A pilot project is being developed for a housing subdivision in which the homeowners have purchased prefabricated septic tanks and a piping system that will allow for the effluent to be collected and treated onsite. Three informal communities within Barangay (village) Sucat will build community-based sanitation centers with three toilets and three baths each, using labour from the community and building materials donated by the local Rotary Club and Barangay.

In Iloilo, a septage management program is being designed for a community of 150 households, and a decentralized treatment system is being developed for a private hospital. Two or three communities along the coast will develop community-based sanitation systems with toilets and baths.

In Naga, treatment systems are being developed for the public market for wastewater current flowing directly into the Naga River, and the public slaughterhouse. Two communities will develop community-based sanitation systems with toilets and baths.

Other project activities include:

- A training course on operating and maintaining wastewater treatment systems was held in February and a course for local engineers on designing low-cost wastewater treatment facilities will be held in May.
- Information, education and communication campaigns are starting in each city to raise awareness of the extent of the problem, the need for action, and develop support for septage treatment user fees.
- City representatives and key stakeholders have participated in study tours to Indonesia and the US to learn about the effective low-cost technologies.

Conclusion

Although the LINAW project does not in itself claim to introduce any new ideas, management tools, organizational strategies or low-cost technologies in the context of urban sanitation provision, it is a genuine stakeholder-driven initiative with only limited central government and external donor financial input. This is largely due to the recognition that local pollution generation should be dealt with locally including local financing of all strategic interventions. Consequently it is hoped that if the LINAW approach proves successful in the context of these four pilot cities, it can be extended to other Philippine cities. To achieve this, the project is enlisting the support of the League of Cities of the Philippines to share the information with their members, and training local engineers on designing low-cost wastewater treatment systems for LGUs.

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