



Economy and Environment Program
for Southeast Asia
Tanglin PO Box 101
Singapore 912404

Phone: (65) 6831-6854
Fax: (65) 6235-1849
E-mail: dglover@idrc.org.sg
Web site: www.eepsea.org

The Economy and Environment Program for Southeast Asia (EEPSEA) was established in May 1993 to support training and research in environmental and resource economics across its 10 member countries: Cambodia, China, Indonesia, Laos, Malaysia, Papua New Guinea, the Philippines, Sri Lanka, Thailand, and Viet Nam. Its goal is to strengthen local capacity for the economic analysis of environmental problems so that researchers can provide sound advice to policymakers.

EEPSEA Policy Briefs summarize the key results and lessons generated by EEPSEA-supported research projects, as presented in detail in *EEPSEA Research Reports*.

EEPSEA Policy Briefs and Research Reports are available online at <http://www.eepsea.org>

Funding Solid Waste Disposal: A Study From The Philippines

EEPSEA POLICY BRIEF • No. 2005-PB10

The treatment of solid waste is a major priority in countries across Southeast Asia.

Economic development and population growth, particularly in the region's mega-cities, have made the challenge more acute. This is particularly true in the Philippines, where the legacy of dangerous open dump sites such as 'Smokey Mountain' have kept the issue high on the political agenda. ➡

A summary of EEPSEA Research Report 2005-RR10, *Modeling Choices For Ecological Solid Waste Management in Suburban Municipalities: User Fees In Tuba, Philippines* by Antonia Corinthia C. Naz and Mario Tuscan N. Naz. Address: Resources, Environment and Economics Center for Studies, Inc (REECS), Suite 405, The Tower at Emerald Square, corner P. Tuazon and J. P. Rizal Sts. Project 4, Quezon City, Philippines 1104. Tel. No. (632) 438-8858. Telefax (632) 995-0556. Email: c_naz13q6810@yahoo.com and parengtuscky@yahoo.com or reecs@reecsph.bayandsl.ph

"The law sets . . .

➔ A new report looks at how a municipal government in one of the Philippines's provinces should organize its solid waste management plans to meet strict new national targets. It recommends that the local government charge user fees for its waste collection & disposal services and recommends a level of service that will reflect people's preferences. However, even with this level of charges, the study warns of a funding gap and says that the local government may have to divert as much as 25% of its development fund to pay for it.

Local Government's Waste Dilemma

The study was carried out by Antonia Corinthia C. Naz and Mario Tuscan N. Naz from the Resources, Environment and Economics Center for Studies, Inc (REECS). It responds to problems that local governments in the Philippines are having meeting the country's latest regulations on solid waste management. These are set out in the Philippines' Republic Act (RA) 9003, otherwise known as the Ecological Solid Waste Management (ECOSWAM) Act. This act requires local government units (LGUs) to formulate and implement ECOSWAM plans. The law set very ambitious goals. It bans the use of open dumps and requires all LGUs to use only sanitary landfills by the year

Attributes of an Ecological Solid Waste Management Service	Options	
	1	2
A. Collector of Waste	Municipal workers with garbage truck 	Barangay workers with hired jeepney 
B. Waste Segregation at Source *	Waste Segregation not required • Workers will be hired to segregate wastes after they are collected 	Waste Segregation required • No segregation, no collection 
C. Frequency or No. of Times of Waste Collection in a Week	Twice	Once
D. Location of Waste Collection and Mode of Payment of Fee *	Curbside and "Pay to the barangay treasurer"	Modified pick-up and "Pay as you throw"
E. Garbage fee in Philippine Pesos, PhP	20 per week Or 80 per month	5 per week Or 20 per month

Please check your choice ☐ ☐

2006. Meeting these targets will be a major challenge; it has been estimated that compliance will add PHP 150 billion (USD 3 billion) to waste management costs over the next ten years. As a result, many local governments are in a dilemma as to how to finance the upgraded services.

Tuba's Trash Problem

The municipality of Tuba in Benguet Province does not yet have a municipality-wide solid waste collection and disposal system. Each household and business establishment is responsible for its own solid waste management. Rubbish is currently disposed of by burying, composting, burning, feeding to animals, open

dumping and other means. Twelve high-density housing subdivisions are under construction in Tuba and this is likely to further increase the municipality's waste management problems.

To bring waste management up to the standards required by the ECOSWAM legislation, the Tuba Mayor revamped the ECOSWAM board in August 2004 and created the ECOSWAM Technical Working Group, with technical assistance from the EEPSEA research team.

How Much To Take The Rubbish Away?

Requiring households to pay fees to have their refuse removed can be a

very ambitious goals”

viable method for funding waste management, while at the same time encouraging waste reduction. However, gauging how much people will be willing to pay for such services is difficult, since the services have many different attributes (such as frequency of collection and removal methods) that affect people's willingness to pay.

To get meaningful information on this – and to help shape the delivery of SWM services in the province – choice modeling was used to examine the demand for ECOSWAM services.

To design the survey instrument, focus group discussions, one-on-one interviews and workshops were held with local officials, residents and businesses. The following service attributes were chosen for analysis: the type of vehicle used to collect waste; the frequency of waste collection; the type of waste segregation employed and the garbage fee levied. These attributes were then placed into choice sets, which were used to get people's feedback.

Setting Out The Choices

Two sets of questionnaires were designed – one for households and a second for business establishments. Each of the choice sets presented a 'base case' (minimum improvement) option for waste collection along

with one alternative. This alternative was varied across choice sets. Three alternative ECOSWAM service scenarios or options were assessed alongside the base case – all the scenarios that were under consideration by the Tuba authorities.

The base case waste management option involved the collection of rubbish by Barangay workers using a hired jeepney. This is the simplest and cheapest option that would meet the minimum requirements of RA 9003. The current status quo of burning and open dumping of waste was not chosen as the base case since it is not acceptable under the new law.

Random cluster sampling was used to choose households and businesses for questioning. Three barangays (neighbourhoods) were chosen for the survey. In each, the researchers sampled every third household. The household survey consisted of 604 respondents or at least 200 respondents from each of the three barangays. The researchers also sampled 150 business establishments

from the three barangays.

Can Solid Waste Pay For Itself?

The study also calculated the potential revenues that the Tuba municipal government could collect for its waste management services through user fees. Each of the waste management options (including the base case) was assessed in this way. The study also calculated the annual maintenance and operating costs for the base case and alternative scenarios.

By calculating the difference between the marginal revenues (MR) and the marginal costs (MC) per year per scenario, it was possible to estimate the funding gap that would exist for the provision of solid waste management services. This is the amount by which the Tuba municipal government would have to subsidize its ECOSWAM services.

The study found that the people of Tuba ranked solid waste management as the number one environmental problem in the region

Funding Gap: Marginal Costs vs. Marginal Revenues

To move from	Marginal Revenues MR (PHP)	Marginal Costs MC (PHP)	Marginal Gap = MR-MC (PHP)	% Cost Recovery
Base Case to Scenario 1	1,198,800	3,456,200	(2,257,400)	35%
Base Case to Scenario 2	1,166,100	5,221,800	(4,055,700)	22%
Base Case to Scenario 3	1,908,000	5,781,800	(3,873,800)	33%
Scenario 1 to Scenario 2	(32,700)	1,765,600	(1,798,300)	-2%
Scenario 2 to Scenario 3	741,900	560,000	181,900	132%
Scenario 1 to Scenario 3	709,200	2,325,600	(1,616,400)	30%

but that they were not willing to pay a high price to help address this problem. They were willing to pay user fees that would only cover 22-35% of the costs of ECOSWAM services.

Households were, however, willing to pay slightly more for better service. For example they were willing to pay an additional PHP 17 (USD 0.30) per month (above the base case) for their waste to be collected twice a week. This is roughly equivalent to the cost of three-fourths of a kilo of rice.

The same applied to businesses. They were willing to pay an additional PHP 4 (USD 0.08) per bag of waste or PHP 17 (USD 0.30) per month (above the base case), for their waste to be collected twice a week and a similar amount for their waste to be collected by municipal workers with a garbage truck. This is roughly the cost of a litre of gasoline.

A Changing Picture

These calculations presented a "snapshot" of the situation. As the

population increases, the amount of waste also increases. Yearly costs are also expected to increase due to wear and tear on SWM equipment, vehicles and facilities. It is therefore expected that, unless garbage fees are increased after an initial period, the funding gap will widen.

The study recommends that local governments consider charging user fees to partially finance the costs of ECOSWAM services. It also recommends that the Tuba municipal government adopt the option with the smallest funding gap, the lowest maintenance and operating costs and the highest level of cost recovery. This scenario is characterized by once-a-week collection of residual waste by municipal workers with a garbage truck. Even with user fees, this option will still cost the Tuba municipal government at least PHP 2 million per year in maintenance and operating expenses. This implies that the Tuba municipal government will have to divert as much as 25% of its development fund to provide these

services. In comparison, if no user fees are collected, it will have to spend about 40% of its development fund or 15% of its total budget for these services. In either case, it will have to make trade-offs between waste management and other social services such as education, health and basic infrastructure provision.

For economic efficiency, the study recommends that neighboring local governments should form 'clusters' to provide joint ECOSWAM services and thereby achieve economies of scale; that the national government should provide matching grants to local governments; and that there should be greater private sector participation in ecological solid waste management. It also suggests that policy makers revisit RA 9003 and related laws in order to allow local governments time to adjust.

EEPSEA is an international secretariat administered by Canada's International Development Research Centre (IDRC) on behalf of EEPSEA's sponsors:



Canadian International
Development Agency

Agence canadienne de
développement international



Swedish International Development
Cooperation Agency