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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, Lao PDR, Malaysia, Papua New Guinea, the Philippines, Sri Lanka, Thailand, and Vietnam. Its goal is to strengthen local capacity for the economic analysis of environmental problems so that researchers can provide sound advice to policymakers.

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Talking Trash: Waste Disposal Services in Malaysia

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Like in many countries in Southeast Asia, Malaysia faces rapidly mounting levels of domestic waste.

To meet this challenge, it has opened up waste management to the private sector in the hope that this will produce an effective and efficient service.

A new report provides important information that should help businesses improve the scope, delivery and pricing of waste management services.

The report, by Dr Jamal Othman of the Universiti Kebangsaan Malaysia, found that households highly value improvements in →

A summary of EEPSEA Research Report 2002-RR8, *Household Preferences for Solid Waste Management in Malaysia* by Dr. Jamal Othman (Department of Agricultural and Resource Economics, Faculty of Economics, Universiti Kebangsaan Malaysia, 43600 Bangi, Malaysia; contact: jortman@pkrisc.cc.ukm.my)

Households highly value improved

→ solid waste management and would be willing to pay a premium for more frequent collections and better waste transport and disposal methods. It also found that residents would welcome recycling facilities, though they would not necessarily be willing to pay for them.

A Looming Waste Mountain

The report was carried out against a background of increasing waste generation rates in Malaysia. Some urban areas in the country are already generating more than a kilo of solid waste per person per day - similar to the levels found in high-income countries. But Malaysia's capacity to pay for waste disposal is much smaller and choices have to be made about how best to use scarce resources. In response to this problem, the privatization of Malaysia's waste management system was started in 1996. However, as market forces took hold in the domestic waste sector, it became clear that there was little information available on exactly what services the public wants and what they are willing to pay. This is particularly true for the vital areas of recycling and waste minimization and has hampered the development of effective and workable waste

management schemes. For example, only 3% of solid waste is currently being recycled. Draft concession agreements between the government and private service providers have a 22% recycling target, so there is much to do.

What Services Do People Want?

To assess the public's needs for improved waste management, Othman used two environmental valuation techniques: the Contingent Valuation (CV) and Choice Model (CM) methods. The aim of the CM was to identify what aspects of waste management services people really want. The CV was undertaken to assess the value of specific plans. This approach was

taken because most studies so far have been descriptive; little has been done on willingness to pay for improved services in Malaysia.

Two areas were selected for the research. These were the Kajang area in the state of Selangor, one of the fastest developing municipalities in the country, and the Seremban municipality, the second largest city in the southern region. Six hundred respondents were randomly selected for each part of the study. At the time of the survey, households in the research areas were required to place their waste bags in bins in front of their houses, while private collectors collected the wastes twice or three times a week. Payment for collection services was made indirectly through an annual house assessment.

Example of a Choice Set

Suppose Option 2 below is the only possible alternative to the current waste management plan (Option 1). Do you prefer to choose Option 1 or Option 2?

OPTION 1 (current system)	OPTION 2 (proposed plan)
3 times weekly, irregular	3 times weekly, regular
Separation at source not needed	Waste separation required, facilities & containers provided free
Control tipping - less environmentally-friendly	Sanitary landfill - very environmentally-friendly
Mix of conventional open trucks and compactor	Mix of covered trucks and compactor
Monthly fee: Ave. MYR 15	Monthly fee: MYR 25

ments *in solid waste management*

Choices and Charges

In the CM questionnaires, respondents were asked to choose between a number of different waste management schemes. These choices offered different levels of service based on collection frequencies (ranging from irregular to three times weekly), types of waste disposal methods (from control tipping to sanitary landfill), types of waste trucks (from open lorries to compactor wagons) and provisions for recycling. The schemes were also linked with a monthly charge (from MYR 15 up to MYR 30) (USD 3.99 to USD 7.98). The attributes that people were asked to choose between reflect real choices for waste management in Malaysia.

For the CV, respondents were asked to choose between the waste management services they currently receive and a scheme with improved levels of waste collection and better waste disposal technology and transportation. Some respondents were also given the added consideration that, if they chose the improved scheme, they would be provided with free facilities for waste separation and recycling would be made mandatory. In all cases, respondents who voted for the improved plan were also asked to

reveal the maximum monthly amount they would be willing to pay to obtain the improvement.

Cash for Quality

The study found that most respondents (52%) were dissatisfied with existing services. Most were willing to pay a premium for improvements in collection frequency, waste disposal methods, and transportation. Specifically, the CM study found that households were willing to pay an implicit price of MYR 2.57 (USD 0.68) per month for a change in collection frequency - from 3 times irregularly to either 3 times regularly scheduled or 4 times per week. It also found that they would be willing to pay MYR 3.90 (USD 1.05) if the waste disposal method was improved from controlled tipping to sanitary landfill and MYR 3.19 (USD 0.85) if transportation was improved from a mix of compactor and open trucks to either compactor or a mix of compactor and covered trucks.

Overall, the CV and CM models found that households on average are willing to pay MYR 30 (USD 8) and MYR 22 (USD 5.9) per month, respectively, for the following service improvements: rubbish collected four times a week, wastes disposed

**Municipal Solid Waste Generation
(kg/person/day)**

Sri Lanka (Colombo)	0.42
Thailand (Bangkok)	0.45
The Philippines (Manila)	0.50
Indonesia (Jakarta)	0.60
Malaysia	0.76
Singapore	0.87
Japan	1.12
Denmark	1.30
USA	1.97
United Kingdom	0.95
Sweden	1.02

of in a sanitary landfill and wastes collected in covered trucks and compacted. Currently, indirect monthly waste charges are around MYR 15 (USD 3.99). This means that households in the surveys were willing to pay a premium of up to 100% for improvements.

Recycling Reluctance

Although Othman's results make a clear case for improving conventional waste collection, this was not the case for recycling. Here results were inconclusive. The CM revealed that households feel that they do get benefits from recycling facilities and compulsory curbside

recycling. The CV, on the other hand, indicated that respondents were not willing to pay any additional charges for non-voluntarily curbside recycling. It is possible that the result was due to "strategic behaviour"- respondents were willing to pay, but gave answers that they hoped would lead the authorities to impose a low price. Whatever the explanation, more research would be needed on consumer preferences and

willingness to pay before recycling programs could be introduced.

Shaping a Better Service

These findings should help policy-makers better balance the household demand for waste collection services with affordability. For instance, should the service provider wish to improve the disposal method from controlled tipping to sanitary landfill, while keeping all other

aspects of its service the same, then the price of the service should not exceed the average willingness to pay found in the study. Policy-makers should also look at a variety of instruments to deal with solid waste problems: from market-based instruments such as a "pay per bag" fees, to infrastructure and public education.

3.8 MYR = 1 USD (November, 2002)

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