Charging for Household Solid Waste Disposal –Ability VS Willingness to Pay

Dr. B. Vanitha
Associate Professor in Economics, Department of Economics, Bharathiar University, Nadu, India.

ABSTRACT

Household solid waste management represents a heavy financial burden for local governments in developing countries. It accounts for an estimated 0.4 per cent of GDP as per World Bank estimates. Cost recovery levels from service users are very low. Analysis of the financial records of many developing countries cities shows that the current practices for cost recovery for solid waste are very weak. Recovery rates of less than 10 percent are not uncommon. Finding successful models of cost recovery in solid waste management is difficult. However, a few interesting cases suggest that there is room for greatly improving cost recovery. Usage of electricity and water is a proxy for income and consumption leading to waste generation, and hence a reasonable surrogates for **ability to pay**. The citizens and enterprises are generally **willing to pay** for solid waste to be collected but they are often unwilling to pay the full cost of disposing the waste in a sanitary manner. Therefore the revenue recovery can also be made based on the Willingness to Pay (WTP). An attempt is made in this paper to estimate the possible recovery of cost for household solid waste management in Coimbatore city, based on ability to pay and willingness to pay and to identify the determinants of WTP.

Keywords: *Solid Waste Management, Municipal Solid Waste, Willingness to Pay, Determinants of Willingness to Pay, Ability to pay, Cost Recovery.*

1. Introduction

Solid waste has become one of the major pollution in India in recent years. As there is continuous increase in industrial growth, the production of waste has been increasing in variety and volume. Indian lifestyle has also increased garbage pollution. Moreover very few people have the civic sense of using dustbins to throw garbage.

In the developed countries it is observed that most of the goods (solid wastes) meant for recycling are supplied by the household as the segregation takes place at the household level itself. The collection of solid wastes is well organized with very high cost involvement. They use both economic and regulatory instruments for pollution control and effective management and **command and control approach** has been the predominant strategy. The system of regulation along with monetary enforcement with the application of regulatory instruments such as standards, permits, and licenses are also widely used.

Municipalities in low and middle-income countries allocate the majority of their solid waste management budget to collection and transportation services. Collection and transfer make up 70 percent of the cost, of which 80 percent is labor costs (World Bank, 2001). Final disposal costs are minimal because disposal is usually accomplished through open dumping.

2. Review of Literature

The review of the existing literature reveals that the studies on solid waste management (SWM) prior to 1970 are concentrated on the classical approach where solid waste management was totally the responsibility of the corporation. Moreover most of the studies were focused on the collection and destruction of solid waste (Melosi, 1980). The idea on SWM shifted to waste utilization and resource recovery after 1970's (Bever, 1976). There are also several studies focusing on the technological aspects of waste management (Bhatia, 1992, Appasamy, 1994 and Sarika Rathi, 2007,) but relatively few on economic and social aspects of urban pollution. (Johansson, 1990,) analyzed the willingness to pay for environmental sustainability were focused by Vredin, 1997, and Salequzzaman, M, 2000.

3. Study Area

The Coimbatore city was constituted as Municipality in 1866 with an area of 10.88 Sq.Km. and upgraded as Municipal Corporation in 1981 with an area of 105.6 Sq.Km. The present population of the city is 10.09 Lakhs (December 2006). Projected population during the year 2031 is estimated at 16.44 Lakhs. The Corporation Council has a Mayor, Deputy Mayor and 70 Councilors, all elected by people representing administrative wards. Coimbatore City is the head quarters of Coimbatore District and popularly known as 'Manchester of South India'.

3.1. Present Scenario of Solid Waste Management in Coimbatore City

Solid waste management in Coimbatore city is a major function of Health Department. The area of the city is divided in to Four Zonal Offices comprising of 72 Sanitary Wards. The entire streets in the 72 wards are put in blocks for the purpose of sweeping. 2457 sanitary workers are involved with conservancy works. Waste generated in the city is about 610 MT per day. Daily Collection of Waste is 551 MT per day (91%). Waste generation per person is 606 gms per day. Waste generated in the city is just dumped in an open dumping yard at Vellalore.

4. Statement of the Problem

Household solid waste management represents a heavy financial burden for local governments in developing countries. It accounts for an estimated 0.4 per cent of GDP (World Bank, 1999). In most developing countries, the management of municipal solid waste has traditionally been a primary responsibility of local governments. In many medium-sized municipalities, between 20 and 50 percent of the total municipal budget is used for municipal solid waste management (MSWM) (World Bank, 1999).

Cost recovery levels from service users are very low. Analysis of the financial records of many developing country cities shows that the current practices for cost recovery for solid waste are very weak. Recovery rates of less than 10 percent are not uncommon (World Bank, 2001). Finding successful models of cost recovery in solid waste management is difficult. However, a few interesting cases suggest that there is room for greatly improving cost recovery.

The citizens and enterprises are generally willing to pay for solid waste to be collected but they are often unwilling to pay the full cost of disposing of the waste in a sanitary manner. Therefore the revenue recovery can also be made based on the **Willingness to Pay (WTP).** An attempt is made in this paper to estimate the possible recovery of cost for household solid waste management in Coimbatore city.

5. Objective of the Study

To estimate the possible cost recovery for the household solid waste management based on **Ability to Pay Principle** and **Household's Willingness to Pay** for cleaner environment in Coimbatore city.

6. Method of Sample Selection

For the purpose of the present study 175 respondents were interviewed, 35 each from five different area (one each from four zones and one from the Vellalore area where the landfill for dumping municipal solid waste is situated). The maximum amount of money the household would be **Willing to Pay (WTP)** per month for obtaining environmental improvement was calculated using **Contingent Valuation Method.**

The areas chosen for the study are,

Table: 1: Areas Selected for the Study

Area	Zone	Characteristics
Race Course	East	Core area with mixed income group (mostly elite group).
Flower Market	West	Old core area, mixture of shops, markets and residence.
Bharathi Colony	North	New core area, which is the developing area with active participation of residents association.
Ukkadam	South	Periphery area, which is the most congested and neglected area.
Vellalore	Out skirts	Most neglected area and where the landfill is situated.

7. Willingness to Pay

After explaining about the importance of solid waste management and the effect of improper management on the society, questions about Willingness to Pay (WTP) to avoid pollution by the solid waste were asked by quoting some values ranging from zero to Rs.50 and above. Zero bids were also made legitimate and stressed that it is equally important as any other amount quoted. The respondent was asked to think well before quoting WTP values.

Table: 2: WTP as Monthly Tariff (Area wise)

S.No.	Area	No of Cases	Probability of WTP	Monthly Tariff
1.	Vellalore	35	0.6	5.50
2.	Ukkadam	35	0.7	5.20
3.	Flower Market	35	0.6	9.60
4.	Bharathi Colony	35	0.8	32.80
5.	Race Course	35	0.8	58.50
Overall		**175**	**0.7**	**20.20**

Table 2 shows the data pertaining to households WTP as monthly tariff for proper SWM in the city. The choice of the households towards the payment differed among different households. Out of 175 respondents interviewed 121 were WTP therefore the overall probability of WTP was 0.7. The average amount the sample households were WTP worked out to Rs.20.20 per month. The area wise data reveal that respondents of outskirts area of Vellalore were WTP Rs.5.50 per month where the probability of WTP was 0.6. In Ukkadam the monthly tariff, which the households were WTP, was Rs.5.20 where the probability was 0.7. The residents of Flower Market were WTP Rs.9.70 per month. In the core and new core areas with the probability of 0.8 viz. Race Course and Barathi Colony,

the residents were WTP Rs.58.50 and Rs.38.80 per month respectively. Thus the respondents of the Race Course being the affluent people were ready to contribute the maximum amount as monthly tariff towards SWM.

Table: 3: Recovery of Garbage Fee Based on Income

S.No.	Category of Beneficiary	No of Households	Monthly Fee	Projected Estimation Of Garbage
1	Low Income group	68147	10	681470
2	Households other than low income group	160562	30	4816860
3	Total	228709	20	5498330

As per the official records of Coimbatore Municipal Corporation there are about 228709 households of which 68147 households belong to low-income group and the rest belong to other than low-income group. On an average if the corporation charges Rs. 10 per month per household belonging to low income group and Rs.30 per month per household belonging to other than low income group based on their wiliness to pay, the corporation would be in a position to recover Rs. 54,98,330 per month by way of garbage fees from the households (Table 3).

On the other hand if it fixes on an average Rs. 20 per household per month as reflected in the households WTP, the corporation can recover Rs. 45,74,180 per month by way of garbage fees. The recovery of garbage fee will be much more if the other establishments are also included in the list.

However, Coimbatore Municipal Corporation has proposed to link the garbage fee with the property tax which is not at implemented due to very strong opposition in the council.

Property tax per year		Garbage fee per month
• Households paying less than Rs.500	-	Rs.10
• Households paying Rs.500 to Rs.1000	-	Rs.20
• Households paying more than Rs.1000	-	Rs.30

8. Ability to Pay

With current urbanization and lifestyle trends, the business-as-usual scenario on waste management, finances would be increasingly unsustainable. The situation, in short, is that a large number of poor remain without the service, local authorities and private sector remain short of expected cost recovery, and adverse environmental and health consequences remain unabated. Since the property taxes are very weak in developing countries, the cost recovery rates will also be quite low. Therefore the electricity and water

consumption are better proxy for income and consumption leading to waste generation, of any household. Therefore, they can be held as reasonable surrogates for deciding a garbage fee of the household.

In over 90 percent of cities worldwide where there is a **garbage fee**, it is collected with the property tax bill, usually as a separate item (Bartone, 2001). Since property taxes are so weak in developing countries, the cost recovery rates are quite low. A better practice is to collect garbage fees with another utility bill. The **electricity** and **water charges** are the best proxies for utility bill. For example, in Colombia and Eastern Europe, some cities have a single utility bill that covers multiple services such as water, sewage, telephone, electricity, and solid waste (Bartone, 2001). It can be argued that electricity or water consumption is a proxy for income and consumption leading to waste generation, and hence a reasonable surrogate.

Table: 4
Proposed Recovery of Garbage Fee Based on Ability to Pay

S.No.	Area	WTP (in Rs. month)	Average Electricity Charges (month)	5 % of Electricity Charges	Average Water Charges (month)	10 % of Water Charges
1	Vellalore	5.50	72.00	3.60	55.00	5.50
2	Ukkadam	5.20	103.00	5.00	55.00	5.50
3	Flower Market	9.60	178.00	8.90	94.00	9.40
4	Bharathi Colony	32.80	768.00	38.40	196.00	19.60
5	Race Course	58.50	946.00	47.80	232.00	23.20
	Average	**20.20**		**20.72**		**12.64**

As given in the table 4 if the corporation takes electricity bill as a proxy for income and consumption of the household and collects five per cent surcharge as garbage fee, the estimated recovery is more or less equal to the household's WTP and amounts to an average of Rs.20.72 per month (in Equador the government allows to attach a surcharge of 10 - 12 per cent to electricity bill towards the cost of solid waste management). On the other hand if water charges are kept as base, then the corporation has to plan for a higher percentage of surcharges to be collected as garbage fee i.e. 10 per cent. Even then the average garbage fee works out Rs.12.64 per month, per household. This is because of the practice of supplying 1000 liters of water per household at free of cost. Therefore for the recovery of cost for SWM, the Coimbatore Municipal Corporation can plan to link the garbage fee with the electricity bill of the household and collect five per cent of it as monthly garbage fee. The Coimbatore Municipal Corporation is providing door-to-door waste collection service and do not levy any charges exclusively for SWM. Now it is essential to consider the cost recovery for the services by levy of garbage fees from the beneficiaries. However Coimbatore Municipal Corporation has already planned to link the garbage fee with the property tax, which is yet to be implemented by the Corporation.

9. Conclusion

There are various options available for the recovery of cost viz. user charges, volume or weight based fees, tipping fees, business licenses, utility surcharges, and general fund subsidies. Recovery of cost based on polluters to pay will hurt the poor the most, and at the same time, poor payment leads to a further deterioration of service quality. Property tax as a base for charging garbage fee from the household is inefficient as the properties are not properly valued. The consumption of electricity and water can be held as reasonable surrogates for deciding the garbage fee.

If the corporation takes electricity bill as a proxy for income and consumption of the household and collects five per cent surcharge as garbage fee, the estimated recovery is more or less equal to the household's WTP and it amounts to an average of Rs.20.72 per month.

If water charges are kept as base, then the corporation has to plan for a higher percentage of surcharges to be collected as garbage fee i.e. 10 per cent. Even then the average garbage fee works out only to Rs.12.64 per month, per household.

On an average the households are willing to pay Rs.20.20 per month. As nearly 70 per cent of the people were WTP a minimum amount, garbage fee can also be collected from people based on willingness to pay so that people will get used to paying for pollution control. Thus the charges adopted for avoiding pollution and money obtained out of recycled waste would cover the cost of treatment, initially and in the long run they would prove to be profitable also. Therefore the existing institutions should be strengthened and made responsible to solve the problem. Moreover flexible options, defined rules and strict monitoring could help a long way in tackling the problem of SWM. Scope for privatization of SWM can also be explored.

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