

# Willingness to pay bid of households for improvement in solid waste collection and disposal services in the University of Eastern Philippines

Cherry I. Ultra, PhD

Faculty, College of Education

University of Eastern Philippines, University Town, Northern Samar

Email: [cherryultra@yahoo.com](mailto:cherryultra@yahoo.com)

## Abstract

This paper determined the willingness to pay bid of households for improvement in solid waste collection and disposal services in the University of Eastern Philippines. The study made use of primary data gathered from sample households through household survey.

Majority (88.9%) of the 63 sample respondents from the three barangays were willing to pay for an improvement in solid waste collection and disposal services through a solid waste management program. The modal WTP bids in all barangays ranged from P91 to P120. Currently, no garbage collection fee is charged from households in all the sample barangays.

Based on the foregoing results of the study, the following recommendations are suggested: 1) Due to limited government budget, the Local Government Unit should collect a user charge from households in order to improve the present solid waste collection and disposal services of the three barangays in the University of Eastern Philippines; 2) The government should allocate funds for the purchase of new garbage trucks for solid waste collection and disposal services; 3) The role of the LGUs not only in the collection of wastes but also in waste disposal should be strengthened.

## Introduction:

The University of Eastern Philippines (UEP) campus is located 3 kilometers east of the capital town of Catarman and occupies an area of 419 hectares. A total of 63.8 hectares is its residential area, where its faculty, employees & students mostly reside with an estimated household population of 7,000. Considered a University town, it consists of three distinct barangays, namely: Barangay Zone I, Zone II, and Zone III. The population in the university campus is growing and it does not have a sanitary landfill to dispose the garbage properly. Thus, residents has to resort to dumping their wastes in an open dumpsite, which is located in Catarman, Northern Samar.

The present solid waste management system of the University of Eastern Philippines needs an immediate solution to its pollution. Based on the economist's point of view, pollution is a kind of externality that the polluter should have to take with responsibility. It should not be solved using only the biophysical components, but it should consider the economic aspect so the polluter should have to pay the cost of abatement if pollution is to be eliminated. Because pollution is an economic problem, it has to be priced so that the polluter has to take responsibility for it. Hence, this study determined the willingness to pay bids of selected households for improvement in solid waste collection and disposal services in the University of Eastern Philippines.

## Review of Literature

Controlling pollution means reducing the magnitude of effects on individual activities. The values that individuals place on reducing the adverse effects of pollution constitute as a measure of benefits. Individuals' preferences are taken as the basis for determining values (Freeman 1981). The benefit of an environmental improvement is the sum of the monetary values assigned to pollution effects by all individuals directly or indirectly affected by the said pollution effects. These monetary values are often referred to as "willingness to pay". An alternative is to measure values in terms of the monetary compensation that would be required to induce people voluntarily to accept adverse effects.

The distinction between benefits and damages lies in the choice of a reference point from which environmental changes are to be measured. The benefits of pollution control are measured by comparing the existing known degree of pollution with some specified hypothetical alternative where pollution has been reduced or eliminated. Benefits are the gains associated with reduced pollution. Damages represent the mirror image of benefits, that is, what is lost in moving from the hypothetical "clean" state to the existing level of pollution.

The definition of benefits as willingness to pay implies the existence of a demand curve for the effects of improved environmental quality. Benefit estimation, then, involves determining directly or indirectly the shape of the demand curve for environmental quality. If the services of the environment could be purchased in a

perfectly competitive market, estimating the demand curve would be a fairly straightforward econometric problem and environmental quality management would not be an important public policy matter.

However, environmental quality can be viewed as a kind of public good. This is because only one level of quality can be provided at a time and individuals are not free to vary independently the level of environmental quality they consume. The public good character of environmental quality leads to market failure, and without a market, there are no price and quantity data from which the demand relationship can be estimated (Freeman, 1981).

There are three basic approaches to determining the values that individuals place on improvements in environmental quality. If the price and quantity are not observable: First is to simply ask individuals through surveys and direct questioning. The second is to place proposals for alternative levels of improvement in environmental quality by referendum vote. The third approach involves analyzing data from market transactions in goods and services related to environmental quality.

Hanemann (1984) estimated willingness to pay using Contingent Valuation Method and showed that the probability of accepting a payment was a function of the difference in the utility values (logit model). This allows the Logit coefficients to be interpreted using the specification chosen for the utility function.

To derive the willingness to pay for improved environmental sanitation in a Nigerian City, Arimah (1996) used a hedonic price approach. This study presented estimates and determinants of the willingness to pay for improved environmental sanitation in the city of Lagos.

### **Research Methodology**

Primary data on the willingness to pay bid of households for an improvement in solid waste collection and disposal services were collected through personal interview of 63 sample household respondents using a structured interview schedule in the three barangays of the University of Eastern Philippines.

In addition, primary data on the present solid waste management practices of the three barangays of the University of Eastern Philippines were obtained through personal interviews of collection and administrative personnel in these communities.

To determine the households' willingness to pay for an improvement in environmental sanitation all the three barangays of the University of Eastern Philippines were chosen. The total household population and the number of sample households per barangay is shown in Table 1.

The number of households in each sample barangay was obtained from the Barangay Offices in each sample barangay. The number of households in the three barangays totalled to 1,274. The total number of household respondents in this study was determined by getting 5 percent of the total number of households in the three barangays.

Hence, 63 sample respondents comprised the total sample size (Table 1). Proportional allocation method was utilized in determining the sample size or the number of sample households in each barangay. The list of households were obtained from the chairmen of the barangays covered. Random sampling technique was used in selecting the sample respondents in each barangay.

### **Analytical Procedure**

The households' willingness to pay a certain percentage of their household income to have an improved solid waste collection and disposal services through solid waste management program was determined through the Contingent Valuation Method (CVM) with the willingness to pay format. The benefit valuation technique relies on estimating the willingness to pay for an improvement in environmental sanitation. This was done by asking the respondents in each sample barangay how much they were willing to pay for an improvement in solid waste collection and disposal services during the household surveys. Mean and mode estimates of the willingness to pay were computed. The mode values are preferred to the mean values since the mean values might be affected by outliers which might either pull down the mean. The estimated mode value could be used as the user charge that could be imposed to residents in the three barangays of the University of Eastern Philippines for waste collection and disposal practices.

**Table 1.** Total household population and the number of sample households per barangay, three Barangays of the University of Eastern Philippines

Barangay	Total Household Population	Proportion of Households Per barangay To total Household Population In the three Barangays of The University Of Eastern Philippines	Number of sample households
Zone 1	356	28.0	18
Zone II	268	21.0	13
Zone III	650	51.0	32
	1,274	100.0	63

#### Households' Responses With Regard to their Willingness to Pay for an improvement in Solid Waste Collection and Disposal Services through a Solid Waste Management Program

Majority (88.9%) of the 63 sample respondents from the three barangays were willing to pay for an improvement in solid waste collection and disposal services through a solid waste management program. About 11.1 percent said that they were not willing to contribute to the improvement in solid waste collection and disposal services in the three barangays of the University of Eastern Philippines. Of the 18 sample respondents in Barangay zone 1, 94.4 percent were willing to pay (Table 2). Among the Barangay Zone II respondents, 76.9 percent of the 13 sample respondents agreed to contribute to the improvement of the solid waste collection and disposal services in the University of Eastern Philippines, while for the Barangay zone III, 90.6 percent of the sample respondents answered positively when asked about their willingness to pay to a common fund to improve the solid waste collection and disposal services through a solid waste management program.

Considering all the three barangays, the willingness to pay bids of the 63 households interviewed during the household survey ranged from 0 to P200 and above per month with an average of P148, with all zero bids included. About 56 respondents (88.9%) expressed their willingness to pay bids while the rest (7 sample respondents or 11.1%) were not willing to pay any amount at all.

More than (94.4%, 76.9% and 90.6%, respectively) of the sample respondents who were willing to pay in Brgy. Zone 1, Brgy. Zone II, and in Brgy. Zone III considered the benefits to be derived from improvement in waste solid waste collection and disposal services especially for the future generation as the most important factor that influenced their decision to pay for the solid waste management program in the University of Eastern Philippines.

**Table 2.** Respondents' responses on their willingness to pay for an improvement in solid waste collection and disposal services through a solid waste management program in selected households of the University of Eastern Philippines, 63 survey household respondents, 2012.

RESPONSE	UEP Zone I		UEP Zone II		UEP Zone III		ALL	
	No	%	No	%	No.	%	No.	%
Willing to Pay	17	94.4	10	76.9	29	90.6	56	88.9
Not Willing to Pay	1	5.6	3	23.1	3	9.4	7	11.1
<b>TOTAL</b>	<b>18</b>	<b>100.0</b>	<b>13</b>	<b>100.0</b>	<b>32</b>	<b>100.0</b>	<b>63</b>	<b>100.0</b>

Only 11.1% of the sample respondents in the three barangays were not willing to pay. The respondents considered the credibility of the implementing agency as one of the factors which influenced their decision to pay for the improvement of the solid waste collection and disposal services in the University of Eastern Philippines.

### Recommendations

Based on the foregoing results of the study, the following recommendations are suggested:

1. Due to limited government budget, the Local Government Unit should collect a user charge from households in order to improve the present solid waste collection and disposal services of the three barangays in the University of Eastern Philippines
2. The government should allocate funds for the purchase of new garbage trucks for solid waste collection and disposal services
3. The role of the LGUs not only in the collection of wastes but also in waste disposal should be strengthened.

### References

- ANEX, R. 1995. A Travel Cost Method of Evaluating Household Hazardous Waste Disposal Services. *Journal of Environmental Management*. Academic Press Limited. 45: 189-198.
- ARIMAH, B. 1996. Willingness to Pay for Improved Environmental Sanitation in a Nigerian City. *Journal of Environmental Management*. Academic Press Limited. 48: 127-137.
- BULAYOG, MA. SALOME, 1998. Economic Implications of Biodiversity Preservation in Mount Pangasugan, Philippines. PhD Thesis. University of the Philippines at Los Banos, College, Laguna.
- DIXON, J. et al. 1994. *Economic Analysis of Environmental Impacts*. Earthscan Publications Limited, London 210 pp.
- FREEMAN, M. 1981. *The Benefits of Environmental Improvement. Theory and Practice*. The John Hopkins University Press. Resources for the Future. Washington D.C.
- HANEMANN, W.M. 1984. Welfare evaluation in contingent valuation experiments with Discrete responses. *American Journal of Agricultural Economics* 66. 332-341.
- LOOMIS, J. AND P. VAIR, 1993. Household Valuation of Alternative Levels of Hazardous Waste Risk Reductions: An application of the Referendum Format Contingent Valuation Method. *Journal of Environmental Management*. Academic Press Limited. 39, 143-155.
- PEARCE, D., et al. 1994. *Economic Values and the Environment in the Developing World. A Report to the United Nations Programme*.
- PEARCE, D. and R. Turner, 1990. *Economic of Natural Resources and the Environment*. The John Hopkins University Press, Baltimore Maryland, 378 pp.
- TANPOCO, E. 1997. *The Solid Waste Management System of Metro Manila: An Economic Analysis*, Undergraduate Thesis. University of the Philippines at Los Banos.