Asian Journal of Agricultural Extension, Economics & Sociology
5(1): 46-56, 2015; Article no.AJAEES.2015.038
ISSN: 2320-7027

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Preference for Improved Solid Waste Management Attributes among urban Poor and Non-poor Households' in Delta-State, Nigeria

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Authors' contribution

This work was carried out in collaboration between the authors. Author ABO designed the study, authors AIA and ABO performed the statistical analysis, assisted with literature research. Authors ABO and AIA were both involved in writing the first and final draft of the manuscript submitted for publication. Both authors read and approved the final manuscript.

Article Information

DOI: 10.9734/AJAEES/2015/14422
Editor(s):
(1) Jamal Alrusheidat, Extension Education Department, National Centre for Agricultural Research and Extension (NCARE), Jordan.
Reviewers:
(1) Anonymous, Spain.
(2) Gregory Yom Din, The Open University of Israel, Israel.
Complete Peer review History: http://www.sciencedomain.org/review-history.php?iid=895&id=25&aid=7818

Original Research Article

Received 29th September 2014
Accepted 8th January 2015
Published 20th January 2015

ABSTRACT

This paper assessed the preference for improved solid waste management among urban poor and non-poor households in Asaba, Delta-state. A random sampling method was employed resulting in 115 households and information obtained from the state's waste management board. Descriptive statistics, Alkire and Foster multidimensional poverty methodology, choice experiment and conditional logistic regression model were employed for analysis. The average age of household heads was 39 years and literacy level was high with an average of 14 years of schooling. Multi-dimensionally, 25.20%of households are poor at dimensional cut-off k=4. Households' preference for improved waste management is influenced positively household head education, perception, number of income earners and negatively by poverty status. The mean willingness to pay estimate is **N**1546.32/ month but reduced to **N**619.80, with consideration of socio-economic characteristics. Households ranked waste separation top and collection frequency least important. This study recommends education, provision of free containers for waste separation and the introduction of graduated fees for any waste management plan.

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Keywords: Poverty; solid waste management; attributes; choice experiment; conditional logit.

1. INTRODUCTION

Population growth and rapid urbanization have led to a massive rise in the amount of municipal solid waste that is generated around the world. In urban and rural communities alike, changing lifestyles and consumption patterns, including the increased use of goods made from non-biodegradable materials, have added to the problem [1]. Like many other environmental problems, it is the poor who suffer the most as a result of improper solid waste disposal. Municipal waste collection services are rarely if ever available in shanty towns and slums, putting the residents of such neighborhoods' at far greater risk of the health hazards associated with improper solid waste management, repeated bouts of disease and chronic poor health which affect productivity and potential, robbing workers of income and keeping children out of school [2].

In Nigeria, the problem of solid waste management (SWM) has been a concern which has existed for long in Lagos metropolis and in other big Nigerian cities [3,4]. This can be attributed in part to the poverty status of the dwellers in the environment. According to [5], the poor reside in rural areas and urban slums; and these areas are characterized by the absence of social and economic infrastructure like portable water, waste management access, electricity, healthcare, good nutrition, education and other indices of well-being. Attempts to improve solid waste management in cities, has paid more attention to enhancing institutional arrangements for solid waste service delivery, with special emphasis on the privatization of the waste management sector [6]. According to [7,8], they opined that the average income of the household is a variable that could influence their perception and attitudes on solid waste management system.

The existing solid waste management system in Delta state is quite rudimentary, inefficient and unsustainable. The challenges encountered include poor state of equipment and trucks in the face of an increasing demand for waste management services across the state. Due to the overwhelming volumes of solid waste generated, the Asaba district of Delta State Waste Management Board cannot satisfactorily collect and dispose the large quantity of waste generated and as a result, there has been a gradual degeneration in the management of household waste in residential areas [9]. Currently in Asaba, most wastes are disposed into poorly managed open dump landfills with little or no pollution protection measures by the public collectors. Also the disposal sites are also not too far from residential areas [9]. This traditional disposal method creates visual dis-amenities making these dwelling places inappropriate. Therefore based on these findings, we developed some challenging objectives that purues the formation of life impacting policies towards effective waste management.

This paper attempts to:

- Estimate households willingness to pay for improved solid waste management;
- Isolate factors influencing household willingness to pay for improved solid waste management by poverty status.

2. MATERIALS AND METHODS

2.1 Conceptual and Theoretical Framework

Poverty, in its most general sense, is the lack of basic necessities such as food, shelter, medical care and security, which are thought necessary based on shared values of human dignity [10]. It is argued, however, that what is a necessity to one person is not uniformly a necessity to others. Needs may be relative to what is possible and are based on social dysfunction and past experience [11].

Generally, solid wastes refer to left-over arising from human, animal or plant activities that are normally discarded as useless and not having any consumer value to the person abandoning them [12]. The processing which is termed solid waste management is a complex process because it involves many technologies such as on-site handling and storage, collection, transfer and transportation, processing, and disposal and disciplines. All of these processes have to be carried out within existing legal, social, and environmental guidelines that protect the environment and are aesthetically and economically acceptable [13].

Solid waste management has a single problem – cost recovery and many municipalities in developing countries spend a large proportion of their budgets on the collection, transport and disposal of solid waste [6]. This because it consumes between 20 and 50 percent of

available operational budgets for municipal services, yet serves no more than 70 percent of the urban inhabitants [14]. Those who do not receive services are the low-income populations concentrated in the Peri-urban areas that either do not prioritize the importance of clean environment or are caught in the abyss of poverty and therefore have more pressing issues. Even those in decent housing areas are living next to mountains of heaps of garbage lying uncollected. The municipal authorities have not made sufficient efforts in educating them apart from asking for service charges.

There are various methods employed in literature to estimate household preference for solid waste management. These include contingency valuation, choice experiment, hedonic pricing and benefit-cost ratio. Various studies reviewed used the contingency valuation method including [15,16,17,18,19,20,21]. Few studies that employed the choice experiment are those of [22,23,21], used the Choice Experiment and the Multinomial Logit Regression to investigate solid waste management in Malaysia. Their findings were that increasing generation of solid waste requires better quality disposal options in Malaysia. They concluded that sanitary landfill is more preferred in solid waste disposal by the residents.

[24] estimated the value of improved wastewater treatment, a case study of river Ganga, in India; they used the conditional logistic model and discovered that all the coefficients are statistically significant and intuitively correct. Treated wastewater quantity and quality are significant factors in the choice of a wastewater treatment programme. These two attributes increase the probability that a wastewater treatment programme is selected. In other words, households value those wastewater treatment programmes that result in higher quality and quantity of wastewater treated.

[25], used the Conditional logistic model and the random parameter model to estimate preferences made by the respondents to improvement in solid waste management. They considered the following attributes; frequency of vat collection, covered vats, covered collection trucks and monthly increase in tax. Their findings were that the poor and the rich exhibit significantly different WTP values for each attribute. Richer households are WTP more for higher wastewater treated to a quality, whereas poorer households are WTP more for higher quantity of wastewater treated.

The choice experiment enables the researcher to obtain different information:

- Determining the attributes which influence the choice significantly,
- An implied ranking of these attributes,
- The willingness to pay for an increase or decrease in the significant attributes [26]. The conditional logistic model helps us to overcome the problem that the error terms of the utility function are independently and identically distributed (IID). A consequence of this assumption is the property of independence of irrelevant alternatives (IIA). The IIA states that the probability of choosing one alternative over the other is entirely dependent on the utility of the respective alternatives. This property may be violated by the presence of close substitutes in the choice sets as well as heterogeneity in preferences.

This study was conducted in Asaba province, located in South-East of Delta-State. The province is surrounded by water and characterized by urban and slum areas. It is divided into the eastern and western zones. Its population grew tremendously from 2,590,491 in 1991 to an estimate of 3,629,103 in 2003 and 4, 098,391 by 2006.

The study obtained information through interviews with the Oyo and Delta-state waste management boards. Personal interviews/ group discussions were conducted with some households in various areas on challenges faced and necessary attributes desired for waste management.

The sampled households were identified through a two-stage sampling procedure. The first stage was the stratification of Asaba into the two existing zones namely, east and west zone. Secondly a random selection of 115 households was made from the two zones. This comprises of 45 from the east zone and 70 respondents from the west zone due to willingness of households to partake in the research. Primary data were collected from the households through means of choice experiment. The respondents were presented with a 9 choice sets of three alternatives, totaling 27 individual profiles and were asked to choose hypothetically an option of either alternative 1 and 2 or alternative three which was the opt-out alternative. The 115 questionnaires were useful for analysis giving a total of 3105 made up of 115 by 27 observations.

Descriptive statistics, Alkire and Foster methodology for poverty estimation and a conditional logistic regression to estimate factors that influenced the households' decision were the analytical techniques used in the study.

2.2 Estimating the Poverty Status of Households

The level of household poverty was estimated using the Alkire and Foster methodology[1]. In this study, six dimensions were considered to account for poverty. They are education and knowledge, standard of living, asset possession, psychological condition of household head, social interaction level of the household head, and the household income. The first cutoff is a threshold point explaining the criteria for individual or household to be declared as deprived or non-deprived within each dimension and denoted by "z". The second cutoff, k, is the number of dimensions in which a household is deprived by which they are considered to be poor. We calculated the headcount ratio which is the ratio of the number of poor people to the total population which was given as;

Headcount ratio = $H = \frac{qk}{n}$

With $qk = \sum \rho k(x_i; z) = \sum \prod (c_i \geq k)$

Where *qk* is the number of poor identified according to the thresholds vector *z* and the cutoff *k,* and *n* is the total sample size.

The share of possible deprivations suffered by a poor individual (i) is given by:

$$\bar{c}(k) = \frac{1}{d}[c_i \rho k(x_i; z)]$$

2.2.1 The average poverty gap (A)

This is the ratio of total deprivations of poor persons to the population of deprived persons. This is also known as the Average deprivation share across the poor this is given as:

$$A = \frac{1}{qkd} \sum_{i=1}^{n} ci \rho k(xi; z)$$

2.2.2 The adjusted headcount (M_0)

The second measure proposed by [27], combines H and A to obtain an expression satisfying the dimensional monotonicity (unlike H). This new measure M_0 is also known as the adjusted headcount ratio is given by:

$$M_0 = HA = \frac{1}{nd} \sum_{i=1}^{n} c_i \rho k(x_i; z)$$

A useful property satisfied by this measure of poverty estimate is decomposability.

The adjusted poverty gap (M_1): = M_0*A == Adjusted Poverty Gap (HAG)

2.3 The Choice Experiment (Modeling) Method (CE/CM)

Choice experiment, an economic and environmental valuation technique which uses a surrogate market by directly eliciting consumers' preferences and willingness to pay for some proposed market conditions which offer potential improvements or avoid potential damages, is employed to elicit and estimate environmental values. It estimates environmental goods or services in monetary or market values. It is based on Lancaster's proposition that consumers derive satisfaction not from goods themselves but from the attributes they provide [28]. A common feature of this type of approach is the requirement that survey respondents consider alternatives which are described in terms of their component attributes or 'alternatives'. These alternatives are constructed by combining attributes at different 'levels'.

Choice Model (CM) has its theoretical basis in random utility theory (RUT) [29,30]. According to RUT, the i^{th} respondent is assumed to obtain utility U_{ij} from the j^{th} alternative in choice set C. U_{ij} is held to be a function of both the attributes k^{th} of the j^{th} alternative; and the characteristics of the individual, *Si.Uij* is assumed to comprise a deterministic or systematic component *V*ij and a random component e_{ij}. Whilst V_{ij} relates to the measurable component of utility, e_{ij} captures the effect of omitted or unobserved variables. Assuming that an individual's preference can be represented as a function, each choice (alternative) is represented with an indirect utility function. The utility function consists of an observable deterministic or systematic part (V) and an unobservable stochastic or random element (ε).

The attributes contained in the choice experiment is shown in the Table 1 below. Respondents were requested to choose an alternative that

[1]*For detailed exposition on the methodology, see Alkire and Foster(2007)*

reflects their preference; of which alternative 3 was constant for all the choice sets.

The following attributes were varied at different levels for the three alternatives using an orthogonal design by the use of SPSS statistical software. In all there were 27 designs generated and put into 9choice sets.

2.3.1 The econometric model: The conditional logistic model

Conditional logit model was used here since choice among alternatives is treated as a function of the characteristics of the alternatives, rather than (or in addition to) the characteristics of the individual making the choice; [31]. The conditional logit focuses on the set of alternatives for each individual and the explanatory variables include the characteristics of those alternatives. Generally, it can be written as;

$$U_{ij} = V_{ij} + \varepsilon_{ij} \quad (1)$$

Utility for option j depend on environmental attributes (Z) and socioeconomic characteristics (S) expressed as:

$$U_{ij}=V(Z_{ij},Si)+\varepsilon(Z_{ij},Si) \quad (2)$$

The individual would choose the alternative j in the choice set to any alternative m, if Uij>Uim

The model above specified that u_{i1} and u_{i2} is independent across period and have logistic marginal distribution functions.

Where the conditional indirect utility function is estimated as

$$V_{ij} = \alpha + \beta_1 Z_1 + \beta_2 Z_2 + \ldots\ldots\ldots + \beta_k Z_k + \varepsilon_{ij} \quad (3)$$

The α representing the Alternative Specific Constant (ASC) was introduced to take up any variation in choices that cannot be explained by the attributes .k is the number of attributes and β is the estimated coefficient of the vector of attributes.

2.3.2 The Basic Empirical Model

$$V_{ij}= ASC + \beta_1 Collection_j + \beta_2 Separation_j + \beta_3 Disposal_j + \beta_4 Provider_j + \beta_5 Container_j + \beta_6 Price_j \quad (4)$$

This model looks at the utility derived from the attributes considered.

2.3.3 The Extended model

$$V_{ij}= ASC + \beta_1 Collection_j + \beta_2 Separation_j + \beta_3 Disposal_j + \beta_4 Provider_j + \beta_5 Container_j + \beta_6 Price_j + \alpha_1 ASC*Educ_j + \alpha_2 ASC*Age_j + \alpha_3 ASC*Occupation_j + \alpha_4 ASC*Gender + \alpha_5 ASC*Perception_j + \alpha_6 ASC*Poverty_j + \alpha_7 ASC*Working\ members_j \quad (5)$$

This model considered the attributes together with some selected socio-economic variables. The ASCs capture the mean effect of the unobserved factors in the error terms for each alternative. This provides a zero mean for the error terms and causes the average probability of selecting each alternative over the sample to equal the proportion of respondents actually choosing the alternative.

Where:

V_{ij} = Utility of household from the jth option (1 = choice option, 0 = non choice)

ASC = Alternative Specific Constant

3. DEFINITION OF INDEPENDENT VARIABLES

3.1 Collection

Collection frequency: Currently, households face irregular collection and the proposal is to improve it to twice, four and six times per month and ensuring regularity as a major concern.

Table 1. Example of a choice set

Attributes/month	Alternative 1	Alternative 2	Alternative 3
Collection frequency	Twice	Four times	Irregular
Separation of waste	Not needed	Needed	Not needed
Disposal method	Open dumping and burning	Incineration	Open dumping and burning
Disposal container	open waste bin	thick bags	Open waste bin
Service operators	Public	Private	Public operators
Cost of disposal	N1000	N1200	N500 – 2500.00
SELECT AN OPTION			

3.2 Separation

Separation of waste: Currently wastes are lumped up and the separation of waste would lead to effective recycling and wealth generation.

3.3 Disposal

Waste disposal method: The open dumping and burning is presently being practiced but the use of sanitary landfill, recycling and incineration is proposed.

3.4 Provider

Service provider or operator: Besides provision of services by public collectors of the DSWMB, improved service provision by private collectors (Contractors) is to be introduced which would encourage effective waste management.

3.5 Container

Waste container: The container used presently is disposable trash bags and open bins and the proposal is to use closed containers and thick sacks.

3.6 Price

Cost of disposal/ Price of delivery: The payment for SWM services by households identified by survey of existing prices by the state waste management boards of two other states (Lagos and Ibadan), and personal interview of the households in the study area.

Education of household head	Number of years spent in school
Age	Age of respondent in years
Occupation of the household head	1 if employed in the formal sector; 0 otherwise.
Gender of household head	1 if female, 0 otherwise
Perception	Total number of response counts.
Poverty status of household	1=poor, 0=otherwise
Number of working members	Working household members

The part-worth value or Implicit Prices of attributes was also estimated. This is the marginal value of a change in a waste management attribute, which can be estimated as a ratio of coefficients, which represents the marginal rate of substitution between the monetary variable and the waste management attribute in question, or the marginal welfare measure (willingness to pay (WTP)) for a change in that attribute. This gives us the part-worth (or implicit price) formula. The WTP are estimates of the price (implicit prices) that respondents will pay for a unit increase in the attribute of concern. It is also known as the mean willingness to pay and is given by;

Willingness To Pay (Part-worth (implicit price) =

$$-2\left(\frac{\beta attribute}{\beta\ monetary\ attribute}\right) \quad (6)$$

4. DISCUSSION

4.1 Socio-economic Characteristics of Households

The percentage of men and women were 66.09% and 33.91% respectively as shown in the Table 2. This agrees with the pattern of family heads in developing countries where most family heads are male. About 75.70% of them were married with about 89.50% employed in the formal sector. About 95.69% have spent at least nine years in school, indicating a high literacy level in the area. The mean age of head of households is 39.28 years old and is classified as being economically active [32]. The mean household size is 4 showing moderate sizes.

4.2 Poverty Status of Households

The result of the estimated household poverty index is presented in Table 3. Following Alkire and Foster [27], a poverty cut-off of k=4 was chosen, which shows household's deprivation in at least four dimensions. At k = 4, the MPI is 0.178. In all, 29 households representing 25.2% of the sample, were classified as poor with MPI greater than or equal to 0.178 and others were classified as non-poor. As k increases the number of poor households' decreases, although the intensity of poverty among the poor increases.

4.3 Household Mean Willingness to Pay

Table 4 reveals the mean willingness to pay of households with respect to each of the attributes assuming a linear-linear-additive model, for all the attributes under the basic model is **N**1546.32 (USD 9.90)/household/month) and is higher than

that of the extended model N619.80 (USD 3.95/ household/month). This means that without regard for their socioeconomic characteristics, the amount households are willing to pay is high. The socioeconomic characteristics were introduced to observe the true amount households are willing to pay, due to heterogeneity in household's poverty status and socio economic characteristics, the amount they are willing to pay reduced. The mean willingness to pay by households reveal that separation of waste at source has the highest contribution, followed by availability of waste container for disposal. A possible reason is due to the fact that some waste can be recycled and serve as source of income.

4.4 Factors Affecting Households Willingness to Pay

The household's willingness to pay (WTP) was estimated following equations 4 and 5 and the results of the basic and extended models are presented in Table 5. The Chi-square statistic showed that the equations are significant at 1 percent and therefore the null hypothesis that the attributes are not significant determinants of willingness to pay is rejected. The log likelihood is 1819.74 and 954.01 for the basic and extended model respectively, indicating that both models are a good fit of the data.

All attributes in the basic model are significant and agree with apriori signs, while five of the attributes and all but one of the socioeconomic variables are significant at not less than ten percent in the extended model. In both models, separating waste at source, the price, availability of container for disposal, type of service provider and the collection frequency have positive and significant influence on the probability of choosing an improved SWM plan.

The collection frequency is significant, implying the more frequent the services provided, the more households are WTP for an improved plan. The coefficient for separation is positive and significant implying that the households are willing to pay to have their waste separated. The waste container used for disposal is significant which means that households are willing to pay in other to make use of an improved waste storage bins. The service provider is positive and significant implying their preference for private collector as against the public collectors. While the method of disposal is significant in the basic model, it is not in the extended model. This shows that different users differ on the method of waste disposal and it does not affect their willingness to pay uniformly. The price at which the improved services will be rendered is negative implies that higher levies decrease the probability of choosing an improved option.

The coefficient of education, number of working household members, employment in formal sector, having a female as household head, perception of households towards the current solid waste management and age is positive and significant implying that they have positive impact on preference for improved SWM. The age coefficient is positive contrary to the findings of Yusuf et al. [18]. This indicates that the probability of a household adopting an improved

method increases as the age increases. As respondents advance in age, they tend to be more conscious of their health and are really concerned about managing their waste. They prefer improved options of waste management option. The poverty status is negative and significant at 1 percent. This implies that poorer households are not willing to adopt an improved method of SWM compared with non poor households. This also implies that the poor are of the opinion that government should take care of environmental issues. This is a similar finding with [25].

4.5 The Equilibrium Value for Non-monetary Attributes

The tradeoff between the non-monetary attributes that will leave households on the same utility level, and the ranking of the attributes is shown in Table 6. It reveals that the households under both the basic and extended model rank the separation of waste as the most important attribute of concern and collection frequency and method of waste disposal as the least. The waste disposal attribute under the extended model is not significant and thus has the least importance. This implies that in order of importance of attributes, separation ranks first, followed by the waste container, disposal method, service provider and collection frequency.

Table 2. Socio-economic and demographic characteristics of household heads

Characteristics	frequency	Percent
Gender		
Females	39	33.91
Males	76	66.09
Marital status		
Single	23	20
Married	87	75.7
Widowed	5	4.3
Household size		
1 – 2	24	20.9
3 – 4	30	26.1
5 – 6	54	46.9
7 – 8	6	5.2
9 – 10	1	0.9
Mean household size		4.29
Primary occupation		
Farming	1	0.9
Civil servant	91	79.1
Public servant	12	10.4
Self-employed	9	7.9
Unemployed	2	1.7
Number of years spent in school		
No formal education	2	1.72
Adult literacy training.	2	1.72
1 – 5 years	1	0.87
9 – 12 years	13	11.35
13 - ≥ 16 years	97	84.34
Age (Years)		
< 30 yrs	12	10.4
30-39 yrs	53	46.1
40 - 49 yrs	34	29.6
50 - 59 yrs	14	12.2
60-70 yrs	2	1.7
Mean household head age		39.278

Table 3. Poverty status of households

Cutoff k no of deprivations	Number of households	Headcount ratio *H*	Intensity of poverty (A)	Multidimensional Poverty Index (MPI) adjusted head count
1	104	0.904	0.425	0.386
2	83	0.722	0.490	0.355
3	50	0.443	0.593	0.262
4	29	0.252	0.726	0.178
5	7	0.061	0.836	0.051

Table 4. Mean willingness to pay of households

Attributes	Basic Model (N)	Extended Model (N)
Attributes	WTP	WTP
Collection frequency	148.17	48.10
Separation of waste at source	721.28	318.90
Method of waste disposal	221.23	28.70
Service provider	207.09	87.75
Waste container for disposal	227.55	136.35
All attributes	1546.32	619.80

*Note: **N**156.27 = 1USD (2013)*

Table 5. CLM estimates for Households choice for SWM

Attributes	Basic model		Extended model	
	Coefficient	Standard error	Coefficient	Standard error
Collection frequency	0.1899***	0.0624	.1858*	.1065
Separating waste at source	0.9242***	0.1466	1.2316***	.2215
Method of waste disposal	0.2835***	0.0785	.1108	.1024
Service provider	0.2654**	0.1186	.3389**	.1642
Container for disposal	0.2916**	0.1315	.5266***	.1784
Price	-.0013***	0.0002	-.0039***	.0003
Educational status			.6648***	.0675
Age			.0348***	.0077
Occupation			.3651*	.1869
Gender			.2417**	.1197
Household Perception			.0869**	.0416
Poverty status			-.4080***	.1509
Working household members			.3709***	.0954
Pseudo R^2	0.0661		0.4104	
LR chi2(6)	257.66		1989.12	
Probability chi^2	0.0000		0.0000	
Log likelihood	-1819.7398		-954.01238	
No of Observations/Responses	3105			

Table 6. Equilibrium values for non-monetary attributes

Attributes	Basic model 1 (units)	Ranking	Extended model	Ranking
Collection	1	5	1	4
Separation	0.2054	1	0.151	1
Disposal	0.6698	3	1.676	5
Operator	0.7155	4	0.548	3
Container	0.6511	2	0.353	2

5. CONCLUSION

About two third of the household heads are men as typical in African settings and over 90 percent are literate. The mean age of head of households is 39.28 years old and is classified as being economically active. A quarter of the households are poor. Irrespective of poverty status, the use of garbage trucks at specific dumpsites and burning are the common methods of waste disposal.

All attributes which are the separation of waste at source, higher levies for collection, availability of container for disposal, private service provider and the increased collection frequency have positive and significant influence on the probability of choosing an improved SWM plan. However, when considered along with their socioeconomic characteristics, method of disposal is not important. The factors that have positive influence on preference for improved SWM are education, number of working household members, employment in formal sector, having a female as household head, perception of households towards the current solid waste management and age. The poverty status is negative which implies lower probability of poor households to adopt an improved method of SWM.

The mean willingness to pay of households with respect to all the attributes without regard for household socioeconomic status is **N**1546.32 (USD 9.90)/household/month) and is higher than N619.80 (USD 3.95/ household/month) when socioeconomic status are considered assuming a linear, additively-separable indirect utility function. The separation of waste at source has the highest contribution to the mean willingness to pay by households, followed by availability of waste container for disposal. A possible reason is due to the fact that some waste can be recycled and serve as source of income.

In order of importance of attributes to household's willingness to pay, separation ranks

first, followed by the waste container, disposal method, service provider and collection frequency

The paper recommends that the improved SWM option to be proposed to households must include separation of waste and provision of waste containers. Since the consideration of socioeconomic characteristics reduces the mean willingness to pay, the proposed fee for SWM should not be uniform for all categories of households. Due regard should be given to the poverty status of households in the different communities in the state.

ACKNOWLEDGEMENTS

The authors acknowledges the Oyo and Delta State Waste management Board for their willingness to disseminate information on current outcomes of waste management, Ayodele Fashagbon for his statistical tools tutoring and review of paper, Roseline Akinlade for guidance and reviewing of paper, Yusuf Adesina for review of the complete work, Modebei Mark for efforts rendered, and all as sundry who contributed in various capacities not mentioned.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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