Willingness To Pay For Waste Disposal in Ilorin Metropolis in Kwara State

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Abstract

This study examines willingness to pay for waste disposal in Ilorin metropolis in kwara state. Data on socioeconomic characteristic of the respondents and their opinion on waste disposal and willingness to pay for waste disposal were collected with the aid of well-structured questionnaire. A multistage random sampling technique was used to select 95 households for the study and descriptive statistics and binomial probit model were the analytical tools used. Evidence from the probit model indicated that four variables had significant influence on the households' willingness-to-pay. Of these, income is positively significant at $P < 0.01$. Age was positive and significant at the $P < 0.05$ level while sack/weeks was negative significant at $P < 0.05$. From the findings of this study, attempts should be made to improve waste management services being rendered at lowest possible service fee while government should also concentrate on awareness campaigning on the consequences of waste mishandling and benefits inherent in paying for proper management of waste.

Key Words: Waste disposal, Probit, willingness to pay

1. Introduction

Waste disposal is a significant subject which any sensible government should invest in, to keep its citizen in harmless environment and in a good health.Waste is an unwanted material, gotten rid-off while waste disposal involves storage at the source, collection from the source, transportation and final disposal of the refuse. Waste can be solid, liquid, gaseous or radioactive substances. Mostly, common waste peculiar to household is solid waste, ranges; from kitchen left-over, papers, long-used electronics, used empty cans, empty packages, toiletries trash, broken furniture as well as dispose wears. The changing economic trend and rapid urbanization complicate solid waste management in developing countries (Bartone and Berstein,1993).Also, population increase add to the complication bringing about drastic increase in waste generation in this recent years. According to Bartone and Berstein (1993), solid waste is not only increasing in quantity but also changing in composition from less organic to more of paper, empty packagings, plastics, glass, metal, among other type.

Solid waste management has been a serious issue for many societies, specifically with the increase in population along with the changes in industry and the increase in gross domestic product(GDP) (MEC,2004).An ideal waste disposal service should be able to render quality service which is evaluated in its regularity, safe and sureness of its final dispose of refuse and in adequacy of refuse collection and transportation. There are various ways or methods by which waste can be disposed. Traditionally, it can be disposed in dug pit, illegally it can be disposed on the street, open place, in a flowing stream but better still it can be disposed in modern concept; inside a provided bin which is expected to be regularly removed to a permanent storage usually out skirt of the city. The traditional method is good but is old fashion and is not advisable to be practice in cities where land availability is limited. The illegal is hazardous to man health and environment.

In order to cope with these challenges, as a result of crucial role that effective management of waste play in ensuring good health of public and protecting the environment, accomplishing effective municipal solid waste   management   should   be   a   priority   of   emerging   cities.   The   benefits   of solid waste management to household, to economic asset and environmental asset cannot be over emphasized. Also proper wastes disposal reduce treatment for all illness such as diarrhea, cholera, consequently reducing cost or money spend on health, it enhances productivity of the population and boost environmental quality. Therefore, informing people of how proper waste management can bring about improvement in environmental quality and quality of their welfare will elicit peoples` willingness to pay (Hartwick and Olewiler, 1998).

In a bid to improve the quality of wastes disposal service or management, house hold who is primary producer of significant proportion of public waste generated should be involved in decision making concerning waste management in order to understand household welfare. There is also the need to consider solid waste management service as normal economic good that can alter household welfare. But this pre-supposed the need to understand the existence of a problem and appreciate the risks they pose before the household can make a trade off decision with regards to willingness to pay (Alta and Deshaz, 1996). Also Beyene (1999) found that environmental health doesn't depend on raising public awareness and on the creation of mechanism of controlling generation of waste at the source, also sharing of responsibilities between the public (household) institutions, private sector, non-government organization and government. The major problem facing waste

management are; limited financial resource, weak institutional and legal frame work, in appropriate choice of technology and problem of structuring revenue from taxes on services provided. However, in the past most attempts to improve solid waste management have focused on the technical aspects of different means of collection and disposal (Word Bank, 1992). Hence, neglecting the aspect of demand and willingness to pay for service demanded. Some studies have shown that the willingness to pay for solid waste disposal, waste management is associated with income, education, quantity of waste generated, household size and age (Alta and Deshaz, 1996). Hitherto, the management of waste has been considered as adding to government finance by generating revenue. However, in recent years, partly as a result of austerity and structural adjustment policies and pressure from multilateral financial institution and also as a result of pressure to limit taxes, various government have increase focused on identifying specific revenue source for waste management (Longe and Ukpebor,2009)

2. Methodology

The Study Area

This study was carried out in Ilorin metropolis of kwara state Nigeria. The climate of the city is tropical continental with high temperature throughout the year. The wet season is between March and October while the dry season is between November and February. The mean annual rainfall is 1200mm.

Within the metropolis, the major occupation includes; distributive trading, civil services of varying cadres and persuasions and a host of informal sector services. Ilorin retains the characteristics of traditional town alongside urban centers. .

Population of this study was all households in Ilorin Metropolis of Kwara State. Multistage random sampling technique was use in selecting respondents in Ilorin metropolis. The first stage was selection of two local governments randomly which are Ilorin south and east. The second stage was the random selection of nine communities each from the two local governments which was followed by random selection of 10 respondents from each community, making a total of 90 respondents.

Both descriptive statistics and probit model were used to analyse the data collected .A probit model was used to determine the willingness to pay for waste disposal in the study areas. Probit model was also used to identify the relationship between socio economic variables and willingness to pay for waste disposal.

The probit model could be represented as:

$$Pr(Y=1/X) = \phi(X`\beta),$$

Where Y= dependent variable (1 for households who are willing to pay, 0 for households who are not willing to pay.)

Pr = Probability,

ϕ = Cumulative Distribution Function (CDF) of the standard normal distribution.

β= Estimated maximum likelihood

Also possible to motivate the Probit model as a latent variable model. Suppose there exists an auxiliary random variable

$$Y^* = X`\beta + \varepsilon,$$

Where $\varepsilon = N(0,1)$. Then Y can be viewed as an indicator for whether this latent variable is positive:

$Y=1\{Y^*>0\} = \{1 _{\text{if } Y^*>0} \text{ i.e } -\varepsilon < X`\beta,$

0 otherwise.

The independent variables include in the model are;

X1= Gender (male=1,female=0)

X2= Marital status (married =1, others =0)

X3= Education (years)

X4= Age (years)

X5= Monthly income (₦)

X6= Household size (number)

X7= Sack per week (kg)

X8= Service price per week (₦)

X9= Mean bid (₦)

X10= Expenditure (₦)

3.Results And Discussion

3.1 Socio-economic characteristics of the respondents

The socio-economic characteristics of the respondents in table 1 showed that 71.6% were male while 28.4% were female. The mean age of 39.4years indicated that majority of the respondents were in their active age. Also the marital status indicated that 62.1% of the sample population was married while others accounted for 14.7%. This implies that married people tends to generate more waste.

63.2% of the respondents had household size of 1-5 members while 34.8% had 6-10 members. The means of 4-6 members indicates that majority of the member has small family. However, 43% of the respondents had tertiary education while 20% had secondary school, 42% had primary education the remaining 41% account for other form of education.

Distribution of the Respondents by Gender.

Gender

Sex	Frequency	Percentage	Mean
Male	68	71.6	
Female	27	28.4	
Age			
20-30	31	32.8	
31-40	31	32.8	39.4
41-50	10	10.7	
>50	23	24.5	
Marital Status			
Married	59	62.1	
Single	22	23.2	
Others	14	14.7	
Household			
1-5	60	63.2	
5-10	33	34.8	4.6
>10	2	2.2	
Education			
Tertiary	41	43.2	
Secondary	19	20	
Primary	4	4.2	
Others	30	29.6	

Source: Field survey, 2011

Table 2 shows that 22.2% earn between #20,001 and #40,000, 20% earn between #60,001 and #80,000, 16% earn less than #20,000, 14.8% earn between #40,001 and #60,000, 14% earn more than #100,000, 10% earn no income while 3.2% earn between #80,001 and #100,000. The mean income is #66,284. This implies that majority of the respondents earn enough to pay for family expenditure. The result shows that 5.3% of the respondents' main occupation is farming, 15.8% is civil service, 14.7% is business, 17.9% of the respondents work in private organization, 33.7% are artisans while 7.5% engage in other kind of job. This implies that majority of the respondents engage in non-farming activities.

Table 2: Distribution of the Respondents by income.

Income	Frequency	Percentage	Mean
No income	10	10.4	
80,001-100,000	3	3.2	
>100,000	13	14.0	
Occupation			
Farming	5	5.3	
Civil Service	15	15.8	
Business	14	14.7	
Private Work	17	17.9	
Artesian	32	33.7	
Others	7	7.5	
Total	95	100	

Source: Field survey 2011

Waste and Method of Waste Disposal

<20,000	15	16.0	
20,001-40,000	21	22.2	
40,001-60,000	14	14.8	66.28
60,001-80,000	19	20.0	

Table 2 shows that 52.6% of the respondents dispose their waste through Kwara Environmental Protection Agency (KEPA), 21.1% use open dumpsite, 10.5% burn their waste, 9.5% use backyard while 5.3% use other means. This implies that majority of the respondents do dispose their waste through KEPA. ,alsot

68.4% of the respondents' major component of waste is kitchen left-over, 13.7% is paper, 6.3% is metal, 3.2% is broken bottle, while 6.3% goes to other materials. This implies that majority of the respondents generate kitchen left-over as waste.

Table3: Distribution of Respondents by Method of Waste Disposal

Method of waste disposal	Frequency	Percentage
KEPA	50	52.6
Open Dumpsite	20	21.1
Burn	10	10.5
Backyard	9	9.5
Others	5	5.3
Major Waste Component		
Major Component Of Waste	Frequency	Percentage
Kitchen Left-Over	65	68.4
Paper	13	13.7
Metal	6	6.3
Broken Bottle	3	3.2
Others	6	6.3
Total	95	100

Source: Field survey, 2011.

Determinant of willingness to pay for waste disposal

Table4shows Probit analysis that determine the willingness to pay for waste disposal. The independent variables of this model are; mean of various price bids, sex, marital status, age, education, expenditure, income per month, sack of waste generated per week and service price for waste disposal per week.The result reveals that mean of various price bids ,sex, household size, education, expenditure and service price for waste disposal per week do not significantly affects willingness to pay for waste disposal while marital status, age, income per month and sack generated per week significantly affect willingness to pay for waste disposal.

Marital status is negatively related to willingness to pay for waste disposal. This depicts that married respondents are less likely to pay for waste disposal in the study area.Age is positive and statistically related to willingness to pay for waste disposal. This depicts that the older respondents are willing to pay than the younger respondents in the study area.Income per month of the respondents is positive and statistically related to willingness to pay for waste disposal. This depicts that the respondents with high income are more likely to pay than the respondents with low income in the study area. Sack generated per week is negatively related to willingness to pay for waste disposal. This depicts that the more the sack generated per week the lesser the probability to pay for waste disposal in the study area.

Table 4 Determinant of willingness to pay for waste disposal.

Variables	coefficient	t- value
Constant	-1.498	-1.486
Mean bid	0.395	-0.676
Sex	0.185	0.531
Marital status	-1.273	-2.681***
Age	0.536	2.018**
Household size	0.107	0.800
Education	0.286	0.754
Expenditure	-0.286	-0.395
Income/month	0.625	1.686*
Sack/week	-0.165	-2.216**
Service price/week	0.127	1.088
No of observation	95	
Degree of freedom	10	
Significant level	0.83	
Log likelihood	-43.404	
Chi squared	30.09	

*   Statistically significant at 10%

**   Statistically significant at 5%

*** Statistically significant at 1%

Source: Field survey, 2011

4. Conclusion

The study showed that Kwara state protection agency (KEPA) is being well patronized in the study area and household are willing to pay for waste disposal. However the willingness to pay for waste disposal is affected by age, marital status, income and sack generated per week while education, expenditure, sex, mean bid, household size and service price do not affect willingness to pay in the study area.

5.Recommendation

Since households in the study area are willing to pay, KEPA need to maintain and improve on the provision of services. KEPA should not increase their fee from ₦200 and ₦500 which are being presently paid on weekly basis, because any further increase in price will discourage households in Ilorin metropolis to pay. However nylon and sack should be given free and also KEPA should announce time of collection before collection day.

REFERENCES

Alta, A.A and Deshaz, O.J,(1996): "Household demand for improved solid waste management", a case study of Gujarwala Pakistan. World Development,24 (5): 857-868

Bartone, C.L and Bernstien, J.D (1993): "Improving Solid Waste Management in the Third World Countries", Resource, Conservation and Recycling,8;43-45.

Beyene, G. (1999): "Managing Solid Waste in Addis Ababa". Paper presented at the 25th WED   Conference on Integrated Development for water supply and sanitation. Addis Ababa, Ethiopia 76-78pp.

Hartwick, W.O and Olewiler, B(1998): The economics of household demand for water. The case of Kandy municipal, Sri Lanka.

Longe, E.O and Ukpebor, E.F.(2009): "Survey of household waste generation and composition in Ojo Local Government Area, Lagos State". Nigeria Int. J of Geotechand Environment, 1(1):41-54.

World Bank (1992): World Development Report "Development and Environment, New York. Paper no 13

World Resource (1998-1999): The provisioning of African city. http: www. meridian world data.com/product overview.