

Residents' Socioeconomic Characteristics as Drivers of Willingness to Pay for Solid Waste Management Services

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Abstract

This paper examined residents' socioeconomic characteristics as drivers for Willingness to Pay (WTP) for Solid Waste Management (SWM) in Ibadan Municipality. Through systematic sampling, primary data were obtained from 294 households in the high, medium and low density areas. The study established that residents' socioeconomic characteristics varied along the line of the identified residential densities. The study identified gender, age, income, educational status and marital status as important drivers of residents' willingness to pay which is measured on a 5-point Likert scale. For education and income, the Analysis of Variance (ANOVA) results of $F_{(2, 291)} = 94.5$, $p = 0.000$, $\alpha = 0.05$ and $F_{(2, 291)} = 549.915$, $p = .000$, $\alpha = 0.05$ respectively confirmed a statistically significant variation across residential zones. Relationship between WTP and socioeconomic characteristics from mean index perspective revealed that mean indices for age, income, educational status, gender and marital status are 3.79, 3.84, 3.79, 3.85 and 3.73 respectively. The study concluded that willingness to pay for SWM services is a reflection of the residents' socioeconomic characteristics that varied across the residential densities.

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1. Introduction

Urban centres of both the developed and developing nations are faced with myriad of problems. The problems are in areas which include transportation (Thompson, 2008; Fadare, 2010; Faajir and Zidan, 2016), water supply (Hensher *et al.*, 2005; Samson, 2013; Adeleye *et al.*, 2014), housing (Abotutu, 2006; Lelkes and Zolyomi, 2010; Ayegun and Oluwatobi, 2011; Olayiwola, 2012), and solid waste management (Afon, 2005; Pires *et al.*, 2011; Abila and Kantola, 2013; Ojewale, 2014). The magnitude of these problems and the solutions that have been proffered differ in the developed and developing economies. While advanced countries of the world have been able to manage these problems to a considerable extent, the problem in developing countries is daily on the increase (Agbesola, 2013).

The emphasis of this study is on the problem of solid waste management (SWM) in urban centres of Nigeria. The environment of metropolis such as Lagos, Ibadan, Kano, Kaduna are among those characterised by heaps of uncollected solid waste. This can be attributed to low capacity of local government and municipal authorities to manage increase in solid waste generation due to population growth (Kassim, 2009). Public Private Partnership (PPP) policy was employed for resolving these problems (Aliu *et al.*, 2014). PPP has a number of advantages. These include: freedom from external interference, access to loan needed to acquire suitable equipment among others (UN Habitat, 2010). The introduction of PPP has necessitated the financial commitment of households which are the primary producers of solid waste. This will guarantee the success of PPP (Afon, 2007). Information on the level of residents' willingness to pay (WTP) which is the demand for SWM must therefore be known.

The knowledge of the residents' WTP plays an important marketing role as regard SWM services in determining the maximum amount that a household would voluntarily pay for solid waste services rather than do without them (Ezebilo, 2013). It offers an indication of priority given to solid waste management services as compared to other services such as sewage, water, electricity, among others, which can be achieved by measuring the importance attached to such service. This was done in the study of Afon (2007) in Asaba, Nigeria. The researcher concluded that the WTP for SWM was low in the region because they attached low importance to the service was low. This study of Afon (2007) was in a city which had not privatised the SWM service delivery. In the area for this research, SWM service delivery is already privatised in some sections of the city while others are not.

A number of factors have been identified to affect residents' WTP for privatised SWM. (Afon, 2007; Afroz *et al.*, 2009; Khattak *et al.*, 2009; Aggrey and Douglasson, 2010; Sumukwo, Kiptui and Cheserek, 2012; Ezebilo, 2013). Afroz *et al.* (2009) analysed household's willingness to pay for improved solid waste management in Dakah, Bangladesh. The study maintained that age, household size and income maintain an increasing function with consumers' willingness to pay for improve solid waste management system. Females were found to have positive influence on consumers WTP and males to have negative influence on consumers WTP.

Aggrey and Douglasson (2010) confirmed the findings of Afroz *et al.* (2009) by stating that the

variables and other variables like household expenditure and consumer's level of education also pose a significant influence on importance attached by consumers to SWM. These characteristics have also been found to vary across residential densities (Oluwadare, 2015). Therefore, this study employed the three identifiable residential density (high, medium and low) in Ibadan municipality. The study of the willingness to pay is found to be relevant in areas where private sector participation is about to be introduced to the SWM delivery system. It is also useful in regions where privatisation is achieving little success, especially where it has to do with low demands for the services. This study is therefore designed to generate residence preference for SWM privatised services in Ibadan Municipality.

2. Literature review

Solid Waste Management (SWM) system encompasses the generation of waste, storage, collection, transportation, processing and end up at the final disposal site (Annepu, 2012). SWM is concerned with the control of generation, storage, collection, transfer, treatment or recycling and processing, disposal, cost recovery and financial planning of solid waste in accordance with the best principles of public health, economics, engineering, conservation, aesthetic, and other environmental considerations (Uriate, 2008).

These stages of SWM – generation, storage, solid waste collection and transport, treatment and final disposal – can be organised under different forms of organisational arrangements. The delivery of the services could likewise be organised in four different organisational arrangements depending on whether the service is public, private or community managed and the ownership of the assets (World Bank, 1994). First, services are organised under direct public management which involves public ownership of assets and operated as well as managed by government organisation or department in accordance with politically determined rules and procedures. The direct public mode describes service provision organisation which is publicly owned and managed.

Second, services are organised under delegated private management mode which involves public ownership with operation and management contracted out to the private sector organisation. This describes provision of services through extensive out-contracting of management tasks to a private company – in a form of private sector participation – where the public sector owned the assets. The private firms are the operators whose aim is to make profit. There are six variants of delegation to the private sector, namely service contract, franchise contract, management contract, affermage contract, build-operate-transfer and concession.

Third, services are organised under direct private management which involves private ownership of assets and management through economic markets, in which a variety of private enterprises operate for profit. The goal of this organisational mode private ownership and operation is to reduce monopolies and use market mechanisms. By isolating the natural monopoly segments of an industry, unbundling promotes new entry and competition in segments that are potentially competitive. Failure to unbundle can constrain an entire sector to monopoly provision even when the numerous activities can be undertaken competitively (World Bank, 1994).

Finally, services are organised under community and user groups involving community based

organisations (CBOs) and self-help groups (World Bank, 1994; Gidman *et al.*, 1999). The community and user groups in most cases involve informal actors in solid waste management. This however is dependent on the residents' willingness to pay.

'Willingness to pay' is an economic phrase which means 'the maximum amount a person would be prepared to pay, sacrifice or exchange in order to receive goods or services or to avoid something that is undesired' (Mariani, 2014, p. 131). WTP is often regarded as good measure to assess the feasibility of privatised solid waste collection. Post *et al.* (2003) argued that the willingness of residents to pay their dues depends on whether they receive value for money. Willingness to pay for the service can be used to determine what type of service provision should be provided in a sustainable manner if households should pay for all solid waste collection services (UN-HABITAT, 2010).

Olokesusi (1992) and Afon (2007) referred to WTP approach as a 'preventive' or 'mitigative' expenditure. This indicates the minimum value that an individual will put on the quality of an environmental issue. In other words, the value represents how much people are prepared to pay in preventing damage either to the environment or themselves. The approach, as put up by Olokesusi has the advantage of examining actual expenditures, in order to determine the importance that the individual attaches to the impact on the environment including themselves.

3. Study area: Ibadan municipality, Nigeria

Ibadan Municipality is located approximately between latitude 7°22' and 7°40' North of the equator and latitude 3°53' and 4°10' East of the Greenwich Meridian. It is located near the forest grassland boundary extends westward to Abeokuta, eastward to Ile-Ife, northward to Ilorin and southward to Lagos. The built up area of Ibadan was 38.85sq/km in 1935, 46.40sq/km in 1955, 77.70sq/km in 1965, extended to 152.80sq/km in 1977 and 214sq/km in 1988. The built up area is devoted to urban land use such as residential (61%), industrial (1%), public and commercial (16%) while educational institutions occupy only 3.45% of the total built up area. The population of Ibadan municipality is about 3.2 million according to 2011 census. The inhabitants are from different parts of the Nigeria and other parts of the world. The Ibadan Municipality is made up of five Local Government Areas (LGAs). These are Ibadan South East, Ibadan South West, Ibadan North, Ibadan North East and Ibadan North West.

The issue of SWM in Ibadan is dated back to early 1960s when Ibadan City council was responsible for monitoring the environment. Regulatory bodies were later created for the management of waste. Ibadan Waste Management Authority was established according to Gazette No. 8, vol. 22 of 16th May 1997. Its functions were to collect, transfer and dispose of solid waste. Thereafter the nomenclature of the Authority was changed to Oyo State Solid Waste Management Authority (OYWMA) after the enactment of the 'Oyo State Solid Waste Management Authority Law 2004' by the Oyo state house of Assembly in 2008.

The Authority has its headquarter in Agodi-Gate, Ibadan. The activities of the authority were increased to include management of waste generated within the State which include storage, collection,

transportation and disposal at designated dump sites; appointment, registration and control private refuse Contractors in the State; enforcement of laws and regulations concerning solid waste management and any other sanitation laws and regulations as may be in force in the State; and maintaining sanitary landfill sites around the state and to charge economic rates. Private sectors are also to be involved in solid waste collection practices in Ibadan. They are usually referred to as 'Private Refuse Contractors'. They are in three categories based on the class of generators they collect waste from: industrial, commercial and residential.

4. Materials and methods

The study utilised mostly primary data obtained through questionnaire administration on household heads in three identifiable residential densities. Multi-stage sampling technique were employed to select household heads on which questionnaires were administered in the different residential densities. The first stage was the stratification of the five LGAs into the three identifiable residential densities: low, medium and high. In the second stage, each LGA was stratified into the existing political wards delineated by INEC for the election purposes. In the third stage, a political ward was purposively selected in each residential density for study. There were 534 streets in the chosen wards and ten per cent was selected. One out of every ten in 2938 buildings identified in the chosen streets was selected using systematic sampling technique. A household in each of the 294 buildings was surveyed through questionnaire administration.

Data collected during the survey were analysed using both descriptive and inferential statistics by means of computer aided programme called Statistical Package for Social Sciences (SPSS) Version 20. Socioeconomic characteristics were analysed using descriptive statistics which is frequency distribution and cross tabulation. It should be noted that the quantitative data obtained for some socioeconomic variables were categorised due to the data type require for cross-tabulation analysis. For instance, for the analysis of the residents' age, the Oluwadare (2015) classification was adopted. Residents between the ages of 19 and 30 years were classified as youths, 31-55 years as young adult and above 56 years as adult. To analyse income of residents, the salary grades levels of Oyo State Civil Service wages were utilised. Residents' income between grade levels of 01 to 06 were grouped as low income earners (LI), those on grade level 07 to 10 as middle income earners (MI). Residents whose monthly income were above grade levels 11 were regarded as high income earners (HI).

Mean indices were generated from frequency distributions results of the data obtained for 'willingness to pay' in the course of analysis. It should be noted that residents' importance attached to the various attributes of SWM was measured in this study through index termed *Resident Importance Index* (RII). Residents rated the importance attached to SWM under the attributes using one of the five Likert scales of *Very Important* (VI), *Important* (I), *Just Important* (JI), *Not Important* (NI) and *Not at all Important* (NA).

To arrive at RII, the following steps were followed:

- (i). A weight value of 5,4,3,2 and 1 were attached respectively to each rating of VI, I, JI, NI and NA.

- (ii). Summation of weight value (SWV) was calculated. This is the addition of the product of the value attached to a rating and respective number of residents to the rating.
- (iii). SWV was divided by the number of residents

This SWV is expressed mathematically as

$$SWV = \sum_{i=1}^5 X_i Y_i \quad (1)$$

Where:

SWV = summation of weight value,

X_i = number of residents to rating i ;

Y_i = the weight assigned a value ($i = 1, 2, 3, 4, 5$).

The SWV divided by the number of residents' gives the ***RII***.

Thus:

$$RII = \frac{SWV}{\sum_{i=1}^5 i = X_i} \quad (2)$$

The average level of importance attached to SWM attributes in the study area was arrived at by the ratio of the sum of the indices to the number of attributes. Thus

$$\overline{RII} = \frac{\sum RII}{n} \quad (3)$$

Where \overline{RII} = average index for the study area

n = number of the attributes

The hypotheses generated for the study were analysed using inferential statistics following the procedure described below:

Hypothesis formulation

Null (H_0): No significant variation in treatment or group means.

$$\mu_1 \neq \mu_2 \neq \mu_3$$

Alternative (H_i): Significant variation in treatment or group means

$$\mu_1 = \mu_2 = \mu_3$$

Level of Significance

Significant level equals 0.05 ($\alpha = 0.05$).

Test-Statistics

Analysis of Variance (ANOVA) using the F-Distribution.

Degree of Freedom:

$$df = n - 1$$

Decision Rule:

Accept H₀ if probability value is greater than to 0.05 ($p > 0.05$) and accept H_i if is less or equal to 0.05 ($p \leq 0.05$).

5. Results and discussion

5.1 Residents' socioeconomic characteristics

The important socioeconomic attributes of residents considered in this study were residents' gender, age, level of education and income. These socioeconomic characteristic were considered important because the works of Afon (2007), Sumukwo *et al.* (2012) and Ezebilo (2013) claimed that willingness to pay is grossly influenced by the socioeconomic attributes of the study population. The findings on these socioeconomic attributes are presented on the basis of the three identified residential densities. The findings are as presented in Table 1. The study revealed that 37.8% of the respondents were male while 62.2% were female. It was discovered that 76.5% of the household heads in Ibadan Municipality were young adults that is, the age group between 31 and 60 years. Descriptive analysis revealed that the mean age of the respondents in Ibadan Municipality was 43 years. The minimum age was 24 years while the maximum age of respondents was 65 years in the study area.

Table 1. Socioeconomics Characteristics of Residents in Ibadan Municipality

Socioeconomic Characteristics	Low Density	Medium Density	High Density	Ibadan
	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)
Gender				
Male	28(48.3)	47 (51.1)	36(25)	111(37.8)
Female	30(51.7)	45 (48.9)	108(75)	183(62.2)
Age				
18-30 (Youth/Dependency)	0(0)	23(25)	19(13.2)	42(14.3)
31-60 (Young Adult)	56(96.6)	69(75)	100(69.4)	225(76.5)
60 above (Old Adult)	2(3.4)	0(0)	25(17.4)	27(9.2)
Marital Status				
Single	0(0)	17(18.5)	10(6.9)	27(9.2)
Married	56(96.6)	74(80.4)	115 (79.9)	245(82.6)
Widow	2(3.4)	1(1.1)	15(10.4)	18(6)
Separated	0(0)	0(0)	4(2.8)	4(1.8)
Level of Formal Education				
No formal	0 (0.0)	0 (2.2)	29 (20.1)	31 (10.5)
Primary	0 (0.0)	4 (4.3)	79 (54.9)	83 (28.2)
Secondary	6 (10.3)	13 (14.1)	11 (7.6)	30 (10.2)
Tertiary	52 (89.7)	73 (79.3)	25 (17.4)	150 (51.0)
Income				
Low Income Earners	0(0)	11(12)	116(80.6)	127(43.2)
Middle Income Earners	0(0)	26(28.3)	12(8.3)	38(12.9)
High Income Earners	58(100)	55(59.8)	16(11.1)	129(43.9)

Findings likewise confirmed that 89.5% of the household heads had one form of formal education or the other. The proportion of residents in the study area without any form of formal education was 10.5%. It was revealed that the minimum number of years spent in pursuit of formal education was 0 while the maximum was 26 years. It was also evident that 100% of respondents in the low density areas earned above ₦54,001, that is, they were high income earners. It was also established that 63% and 11.1% were high income earners in the medium and low densities areas respectively. While 31.5% and 17.4% were medium income earners in the medium and low densities respectively.

5.2 Hypotheses testing for socioeconomic characteristics across residential densities

Owing to the significance of education and income dimensions in the economics of SWM, hypotheses were put up to assess the variation of the two socioeconomic characteristics were across the three residential densities employed for this study.

Hypothesis One

H_{01} : there is no significant variation in educational level of residents across the three residential zones in Ibadan Municipality.

H_{11} : There is a significant variation in educational pursuit of residents across the residential zones in Ibadan Municipality.

Hypothesis Two

H_{02} : There is no significant variation in income of residents across the three residential zones in Ibadan Municipality.

H_{12} : There is a significant variation in income of residents across the residential zones in Ibadan Municipality.

As provided by Analysis of Variance (ANOVA) results ($F_{(2, 291)} = 94.5$, $p = 0.000$, $\alpha = 0.05$) for education across residential zones, the null hypothesis was rejected (see Table 2). This implies that the variation in the years spent in pursuit of formal education was statistically significant. Similarly, for income across residential zones, the results of the ANOVA ($F_{(2, 291)} = 549.915$, $p = .000$, $\alpha = 0.05$) confirmed the rejection of the null hypothesis (see Table 2). This ascertains that the difference in income of respondents across the residential densities was statistically significant.

Table 2. ANOVA Summary

Socioeconomic Characteristics	Residential Densities	Sum of Squares	df	Mean Square	F	Sig.
Year spent	Between Groups	6639.807	2	3319.904	94.506	.000
	Within Groups	10222.560	291	35.129		
	Total	16862.367	293			
Monthly Income	Between Groups	1372061958884.801	2	686030979442.400	549.915	.000
	Within Groups	363029017033.567	291	1247522395.304		
	Total	1735090975918.367	293			

5.3 Socioeconomic characteristics as drivers of willingness to pay for SWM services

The importance attached to each attribute by residents were arrived at quantitatively. The average residents' index for each socioeconomic attribute was also computed. The attributes were then divided into two. These are the SWM attributes above the average index computed for each socioeconomic characteristics and the ones below it.

In this study, priority is given to the ones above the average because they were considered to be of

higher importance in influencing residents WTP. The next step to arrive at the influence of socioeconomic characteristics as drivers of WTP for SWM services was the identification of SWM attributes that were above the average indices of socioeconomic characteristics. SWM attributes common to every socioeconomic characteristic are then considered as the most important in the study area. These are attributes that both Government and private operators should consider in ensuring a constant demand for SWM services.

The results of analysis explained above are presented in Table 3 and 4. These revealed the level of importance attached to the various SWM attributes by the different categories of the socioeconomic class. The age group analysis showed that the young and young adult attached the same level of importance to SWM services while the level of importance attached by the retired was lower. Analysis of the income group revealed that the higher the income the higher the level of importance attached to SWM. Education Status also has the same progression as the income group. The most literate group has the highest mean index (4.00) of importance attached to SWM services. Male respondents attached more importance to SWM services under the gender category. Analysis of the marital status revealed that married respondent attached more importance to the different attributes of SWM services.

Further analysis revealed that the mean indices of the age groups; income groups; educational status; gender and marital status were 3.79, 3.84, 3.79, 3.85 and 3.73 respectively. The SWM attributes that were with indices above the mean (3.79) that were common to the three age groups were four in number. They include cost relative to service provided, safety perception of collectors, control of infectious diseases and land pollution control. Income group and educational status had two attributes that were above the mean for each category. These were cost relative to service provided and control of infectious diseases. Gender had for SWM attributes that were above the mean index of the category. These include cost relative to service, control of infectious diseases, enhancement of environmental beauty and air pollution control. Marital Status had the same SWM attributes above the mean index as income group and educational status.

Of importance to this study are the SWM attributes that were above the mean index in all the socioeconomic characteristics. These attributes are two. They are cost relative to service and control of infectious diseases. These are the attributes that are utmost importance to the residents of the study area concerning service delivery of SWM services. Paying utmost attention to these attributes will increase the willingness to pay of the residents.

Table 3. Relationship between Residents' Socio-Economic Characteristics and the most Important Attributes of SWM in Ibadan Municipality

RII	Age Group			Income Group			Educational Status				Gender		Marital Status			
	Youth	Young Adult	Retired	Low	Middle	High	No Formal	Primary	Secondary	Tertiary	Male	Female	Single	Married	Widow	Separated
1	4.93	4.93	4.88	4.88	4.92	4.97	4.90	4.83	4.97	4.97	4.96	4.91	5.00	4.92	4.89	5.00
2	3.83	3.69	3.27	3.36	3.65	3.98	3.29	3.31	3.73	3.93	3.77	3.61	3.74	3.69	3.50	3.00
3	3.76	3.72	3.23	3.48	3.58	3.91	3.39	3.42	3.83	3.86	3.77	3.63	3.70	3.69	3.61	3.50
4	3.93	3.89	3.77	3.72	3.76	4.09	3.68	3.72	3.97	4.01	4.03	3.81	3.89	3.93	3.33	4.25
5	3.55	3.83	3.88	3.73	3.87	3.82	3.81	3.71	3.83	3.82	3.79	3.79	3.67	3.82	3.56	4.00
6	3.86	3.85	3.92	3.78	3.87	3.92	3.74	3.79	3.93	3.89	3.77	3.91	3.78	3.87	3.83	3.50
7	3.62	3.72	3.15	3.33	3.79	3.93	3.06	3.28	3.97	3.92	3.71	3.62	3.85	3.68	3.06	3.25
8	3.90	4.01	4.11	3.97	3.94	4.04	3.94	3.99	4.13	4.00	3.99	4.01	3.81	4.02	4.00	4.00
9	3.83	3.68	3.27	3.36	3.67	3.98	3.29	3.31	3.73	3.93	3.77	3.61	3.74	3.69	3.50	3.00
10	3.76	3.81	3.27	3.48	3.58	4.08	3.39	3.42	3.90	3.99	3.85	3.69	3.70	3.78	3.61	3.50
11	3.98	3.83	3.73	3.74	3.82	3.95	3.65	3.78	3.80	3.93	3.89	3.85	3.96	3.86	3.33	4.30
12	3.67	3.90	3.96	3.76	3.97	3.96	3.81	3.75	3.83	3.97	3.92	3.85	3.70	3.91	3.61	3.75
13	3.86	3.85	3.92	3.77	3.87	3.99	3.74	3.79	3.93	3.89	3.77	3.91	3.78	3.67	3.88	3.50
14	3.86	3.92	3.27	3.76	3.84	3.94	3.19	3.49	3.67	4.16	4.03	3.74	3.96	3.88	3.27	3.75
15	3.68	3.45	3.00	3.13	3.29	3.79	3.03	3.02	3.47	3.75	3.28	3.54	3.41	3.50	3.06	2.00
(RII)	3.87	3.87	3.64	3.68	3.83	4.02	3.59	3.64	3.91	4.00	3.87	3.83	3.85	3.86	3.60	3.62
	$\overline{RII}_{ag}=3.79$			$\overline{RII}_{ig}=3.84$			$\overline{RII}_{es}=3.79$				$\overline{RII}_{gd}=3.85$		$\overline{RII}_{ms}=3.73$			

SWM Attributes

- | | |
|---|---|
| 1. Cost Relative to service provided | 9. Maintaining a clean environment |
| 2. Politeness of Collectors | 10. Providing a healthy environment |
| 3. Environmental Friendliness of Collectors | 11. Enhancement of Environmental Beauty |
| 4. Reliability of service | 12. Air Pollution Control |
| 5. Assurance of safety disposal | 13. Land Pollution Control |
| 6. Safety perception of collectors | 14. Control breeding of Mosquitoes |
| 7. Availability of service | 15. Control breeding of flies |
| 8. Control of infectious disease | |

Table 4: Socioeconomic characteristics of indicators rated above the mean index

RII	Age Group	Income Group	Educational Status	Gender	Marital Status
1	1	1	1	1	1
6					
8	8	8	8	8	8
11				11	
12				12	
13	13				
	$\overline{RII}_{ag}=3.79$	$\overline{RII}_{ig}=3.84$	$\overline{RII}_{gd}=3.79$	$\overline{RII}_{ms}=3.85$	$\overline{RII}_{ls}=3.73$

SWM Attributes

- | | |
|---|---|
| 1. Cost Relative to service provided | 9. Maintaining a clean environment |
| 2. Politeness of Collectors | 10. Providing a healthy environment |
| 3. Environmental Friendliness of Collectors | 11. Enhancement of Environmental Beauty |
| 4. Reliability of service | 12. Air Pollution Control |
| 5. Assurance of safety disposal | 13. Land Pollution Control |
| 6. Safety perception of collectors | 14. Control breeding of Mosquitoes |
| 7. Availability of service | 15. Control breeding of flies |
| 8. Control of infectious disease | |

6. Conclusion

The willingness of residents to pay is very essential to having a sustainable private sector participation in SWM services. The findings of this paper established that residents' socioeconomic characteristics drive the importance attached to the various SWM attributes which in turn affects their willingness to pay. The discussion revealed that the cost of the service provided is a major factor in the willingness of residents to pay. This means affordability of the service must be given utmost priority.

In consideration of the various income group in the study area, fee subsidisation should be considered to encourage the low income earners participate in the private sector services. More so, a form of environmental education for the less literate residents is recommended. This is to increase their level of willingness to pay. This can be done through media, landlord association, newspaper, among others. The study concluded that willingness to pay for SWM services is a reflection of the residents' socioeconomic characteristics that varied across the different residential zones.

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