

PEOPLE'S PERCEPTION ON HOUSEHOLD SOLID WASTE MANAGEMENT IN OJO LOCAL GOVERNMENT AREA IN NIGERIA

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ABSTRACT

The current work examined the structure of household waste management system, collection and disposal within the context of a wider research on integrated solid waste management in households. A sample of 30 households from eleven selected residential areas with a focus group of 60 respondents in Ojo Local Government Area, Lagos State, Nigeria was used. The selected residential areas were divided into high, middle and low socio-economic strata. The research examined a range of environmental behaviours, attitude and perception of respondents on household solid waste management. The results established waste management behaviours among the respondents on solid waste management system, services, patronage of services and cost recovery methods. Public opinion and perception on solid waste management system is characterized with irregularity and inefficient collection system; with poor monitoring of the private waste service providers by the local authority. Willingness to pay for waste management services provided by the private service providers, the Private Sector Participation operators is higher among the middle and high income socio-economic groups than in the low income group. However, with the application of sustainable environmental education greater success ratio could be achieved. Level of patronage of solid waste management services is high across the three socio-economic groups but patronage is shared among the two operating service providers (formal and informal). The Private Sector Participation has the highest patronage level with 64.6% severity index while the informal sector (Cart pushers) have only 48.7% severity index both percentages translate to the agreed and neutral perception opinion ranges respectively. The paper advocates for improved solid waste management system through proper monitoring of the services of the Private Sector Participation operators by the Local Government Area for improved service efficiency. Finally the research suggests appropriate lines of action on sustainability of a private sector driven solid waste management scheme in the Local Government Area and in Lagos State in general.

Key Words: Household waste, Solid waste, Service provider, Perception, Attitude, Severity index

INTRODUCTION

Until recently, in most countries of the world, especially developing and transition countries and European social democracies, the management of waste has been considered to be the responsibility of the government, financed by general revenues. However, in recent years, partly as a result of austerity and structural adjustment policies and pressures from multilateral financial institutions, and partly as a result of pressures to limit taxes,

various governments have increasingly focused on identifying specific revenue sources for waste management.

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 (Ojeshina and Longe, 1996, Ayotomuno and Gobo, 2004). The management of solid waste is today one of the important obligatory functions of the Local Government Areas (LGAs) in the entire country. However, this very important and

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essential service had in the past gulped a lot of money out of the local authorities, that the state governments' intervention became necessary. The reason is not far fetched, the LGAs were not properly, technically and financially equipped to perform this statutory function well. The banes of the problem include but not limited to lack of financial resources, weak institutional and legal frame work. Others are inappropriate choice of technology, inadequate collection and transportation systems as well as unsafe final disposal options. The public confidence on the ability and the capability of the LGAs to play this statutory role diminished in the face of mounting heaps of refuse on major roads and highways. This is not without the ensuing environmental pollution that made the entire system unsatisfactory (Ojeshina and Longe, 1996; Longe and Kehinde, 2005). Even though the fundamental objectives of any solid waste management programme are to minimize environmental pollution, these goals become unachievable in the absence of sustained funding, affordable local technological option and lack of participatory approach to integrated solid waste management. Currently in Nigeria, household waste of different sources are mixed and co-disposed without any form of segregation and sorting (Longe and Williams, 2006). Household waste could contain hazardous and toxic waste such as expired drugs, dried cells, broken glass, syringes and thus constitute serious environmental and health hazards (Delgado *et al.*, 2007).

Willingness to pay for waste management services or facilities is very important to the success of the private sectors' participation (PSP) in (SWM) program. The willingness to or not to pay could have direct impact (positive or negative) on the reliability and success of any solid waste management strategy (Epp and Mauger, 1989, Rahman *et al.*, 2005). The question therefore has to do with the economics of household waste management especially in a developing economy like Nigeria. A number of models have been proposed on this issue (Jenkins, 1991; Skumatz and Beckinridge, 1990; Atri and Schellberg, 1995) just to mention a few. A theoretical general equilibrium model had been used to determine the optimal fees for household waste collection

(Jenkins, 1991; Sigman, 1995). In their models, the consumers had two disposal options, garbage or recycling. The optimal fees for household waste collection equal the direct resource costs plus external environmental costs. Linderhof *et al.*, 2001, based household waste collection charge on weight-based pricing in Oostzaan, Holland. Such a pricing cannot be used in developing countries where the actual volume of household waste arising is not known (Longe and Ukpebor, 2009). In Lagos State therefore, charges for household waste collection by government is based on direct charges of household. The amount to be paid by households for their own waste removal is not based on the volume of the waste generated rather on the location and type of households. The bone of contention here is the fairness of the government's decision on charges which therefore raises the readiness to pay or not to pay.

The perception of one's capability is said to set a limit to what to do and ultimately what can be achieved (Holland and Rosenberg, 1996). The influence of perception which describes how a person views himself and the world around him and how it tends to govern behaviour is explained by Anomie theory (Merton, 1968) which explains that deviance can arise by accepting culturally determined goals without the acceptability of cultural means. In this case it translates to either paying for SWM services or the total rejection of its cost recovery methods.

This situation may be due to the difficulties posed by the institutionalized means, or deviance may arise through accepting the means but rejecting the goals, while sometimes it may involve rejection of both. A situation that may result is greater incidence of deviant behaviours towards SWM services as perceived or a total breakdown of waste control system. In this wise, individual's perception of (touching issues of taxes revenues, government sincerity etc) will influence the cultural values, responses, and success of the solid waste management system. Hence, people's perception on fees and on waste collection services is primordial for its willingness to pay. More importantly, when it is perceived by the people that waste services is paid for through taxes or even considered as a social service to be

paid for by the government. Unwillingness to pay could lead to illicit burning and dumping, hence, in their model, Fullerton and Kinnaman (1995) were of the opinion that household collection should be subsidized in order to prevent such external environmental costs resulting from illegal dumping. The present research work was aimed at examining the problems of household solid waste management system in Ojo Local Government Area of metropolitan Lagos as a case study.

MATERIALS AND METHODS

Area of study

The study location, Ojo Local Government is the largest of the 25 Local Government Areas (LGA) in Lagos State, Nigeria. It is situated in the south eastern part of metropolitan Lagos with boundaries with Badagry and Amuwo Odofin LGAs. The total area of Ojo LGA is 180km² out of which about 30% are made up of Riverine areas. According to 1991 census, the LGA was adjudged the most populous in the state and in the entire country with a population of 1.01million (FOS, 2006). The Ojo Local Government Area was created out of the old Badagry LGA in 1989. In 1996, Amuwo-Odofin and Ajeromi-

Ifelodun LGAs were calved out of the Ojo LGA (OLGA, 2008).

Study approach

In order to accomplish the research's objectives, information on existing household solid waste management practices and public perception on the effectiveness of the current system were gathered. In assessing the general attitude of respondents' on the existing household waste management system and on possible cost recovery methods, a sample size of 60 respondents from a random sample of multi-persons households in single-family dwellings was selected from eleven residential areas to represent the target population. The eleven selected residential areas were divided into three socio-economic strata: High, middle and low-income groups based on the State's socio-economic status index. To achieve this, a classification questionnaire with items bothering on participants' bio-data and availability of social amenities was used to generate their socio-economic status. Ten households were then selected from each stratum through non proportional random sampling. Table 1 shows the residential areas and the selected number of households in each.

Table 1: Classification of residential areas

Classification	Selected Household	Areas
High Income Areas	10	Ilufe, Mosafejo, Alaba International
Middle Income Areas	10	Tedi, Ira, Volkswagen, Agric
Low Income Areas	10	Alaba Rago, Iyana Iba, Barracks, Okokomaiko

Collection of data was based on direct questionnaire administration, personal interviews of the members of the focus group in order to obtain information on residents' general opinion on attitude and perception on household waste (HHW) handling and management, waste management services, patronage, and willingness to pay for such waste management services. The questionnaire was prepared according to the Likert Scale in order to measure the strength of the respondents' opinion on the household waste management issues under consideration (Page-Buchi, 2003; Isa *et al.*, 2005; Uebersax, 2006). The respondents were provided with several statement options such as strongly disagree,

disagree, neutral, agree, and strongly agree. By Likert's method, a person's attitude is measured by combining (adding or averaging) their responses across all items.

All data collected was then analyzed using statistical tools for simple percentages, frequency analysis and severity index calculations. The answers to questions were displayed on a 0 to 4 point Likert Scale while the severity index (SI) was calculated using the following equation after Al-Hammed & Assaff (1996):

$$SI = \frac{\sum_{i=0}^4 a_i x_i}{4 \sum_{i=0}^4 x_i} (100\%) \quad (1)$$

Where:

a_i = the index of a class; constant expressing the weight given to the class

x_i = the frequency of response

$i = 0, 1, 2, 3, 4$ and described as below: where:

x_0, x_1, x_2, x_3, x_4 are the frequencies of response corresponding to

$a_0 = 0, a_1 = 1, a_2 = 2, a_3 = 3, a_4 = 4$, respectively.

The rating classification was adapted after Majid & McCaffer (1997):

a_0 = Strongly disagree	$0.00 \leq SI < 12.5$
a_1 = Disagree	$12.5 \leq SI < 37.5$
a_2 = Neutral	$37.5 \leq SI < 62.5$
a_3 = Agree	$62.5 \leq SI < 87.5$
a_4 = strongly agree	$87.5 \leq SI < 100$

In order to assess the general attitude of respondents to waste collection and disposal, related questions on the issue from the questionnaires were grouped as follows for ease of ease of analysis.

Group (1): Public opinion and perception on solid waste management system.

Group (2): Willingness to pay for solid waste management services.

Group (3): Level of patronage of available solid waste management services.

On the point scale, the ratings given to each group are as follows: strongly disagree (0), disagree (1), neutral (2), agree (3), strongly agree (4). For ease of interpretation, each rating is given the following denotation:

Strongly disagree	(SD)
Disagree	(D)
Neutral	(N)
Agree	(A)
Strongly Agree	(SA)

Only the responses to the questionnaires directly related to the scope of the present study have been analyzed and discussed.

RESULTS

The gender profile indicates that 62% of those interviewed were males while only 38% were females (Fig.1).

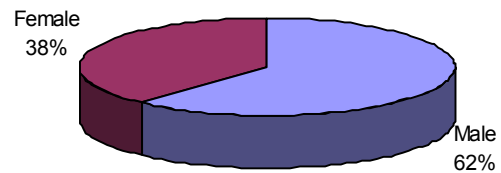


Fig. 1: Gender distribution of respondents

The data on age is presented in Fig. 2, of the 60 respondents, those aged between 15 and 20 years represented 7%. The age bracket of 21 to 25 years constituted only 15%, while those aged between age brackets 26 to 35 years and 36 to 55 years represented 35% and 25% respectively. Respondents above 55 years constituted only 18%.

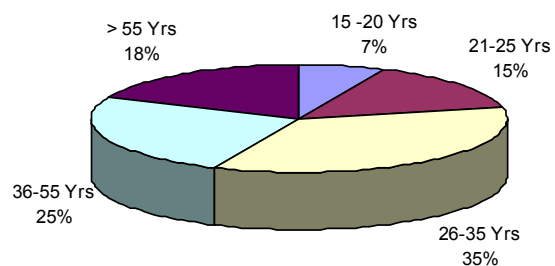


Fig.2: Age distribution of respondents

Another important factor considered to influence people's perception on household waste (HHW) management is the level of educational attainment. About 52% of the respondents had tertiary education (University or Polytechnic graduates), while 20% had secondary or higher school education level. Respondents with vocational training and primary education represented 3% and 12%, respectively. The remaining 13% had no form of educational background (Fig. 3).

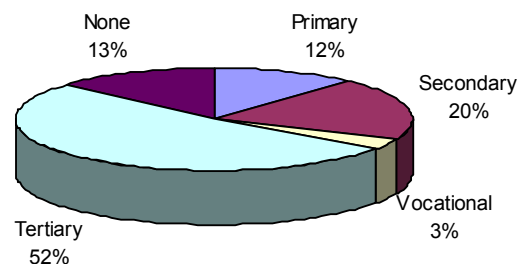


Fig. 3: Educational attainments of respondents

The average monthly income of respondents was also considered an important variable that could influence people's perception and attitude on solid waste management system. From the data obtained (Fig. 4), only 7% of the respondents earn more than US\$580/ month while the lowest income earners of US \$89/month, made up of 17% of the respondents

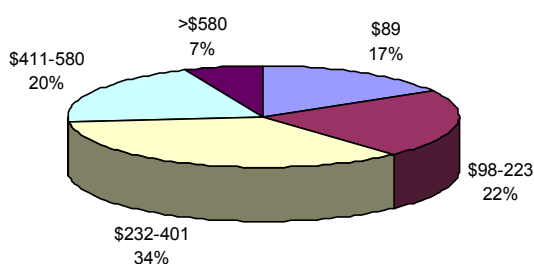


Fig.4: Average monthly income of respondents

The results on the assessments of the general attitude of respondents to waste collection and disposal are presented in tables 2 to 4. Table 2 presents calculated values of severity indices related to public opinion and perception on solid waste management. The values ranged between 46.67 and 51.25%.

The result of the respondents' opinion on willingness to pay for solid waste management services is shown on Table 3. From this data, severity index values obtained range between 55 and 64.2%.

Survey results of level of patronage of solid waste management services show that respondents that patronize the State Government recognized PSP operators have SI value of 64.6% while those who engage the services of the State banned informal private sector (the Cart Pushers) have S.I value of 48.75%, respectively.

Table 2: Respondents' opinion and perception on solid waste management system

S/N	Item	Frequency analysis						(SI) %
		SD (0)	D (1)	N (2)	A (3)	SA (4)		
1	There is an organized waste disposal programme in my area (OG)	NR	5	23	4	21	7	50.8
		PR	8	38	6	36	12	
2	I enjoyed the services of the service provider in my area (ES)	NR	10	21	10	15	4	46.67
		PR	16.7	35	16.7	25	6.6	
3	Sacks/nylon bags for waste collection should be provided 'free' to people by PSP (WC)	NR	10	7	16	14	13	51.25
		PR	16	12	26	24	22	

(NR): Number of respondents, (PR): Percentage of respondents, (SD): Strongly Disagree, (D): Disagree, (N): Neutral, (A): Agree, (SA): Strongly Agree

Table 3: Respondents' opinion on willingness to pay for waste management services.

S/N	Item	Frequency analysis						(SI) %
		SD (0)	D (1)	N (2)	A (3)	SA (4)		
1	I am ready to pay for the disposal of waste I generate (PD).	NR	13	10	6	14	17	55.0
		PR	21.7	16.7	10	23.3	28.3	
2	I am not ready to pay for the disposal of waste I generate (AP).	NR	2	17	2	23	16	64.2
		PR	4	28	4	38	26	
3	Earning more income will encourage payment for waste disposal services (EI)	NR	8	4	10	25	13	62.9
		PR	14	6	16	42	22	
4	The amount charged by PSP operators is too high (AC)	NR	8	12	3	20	17	60.8
		PR	14	20	4	34	28	

(NR): Number of respondents, (PR): Percentage of respondents, (SD): Strongly Disagree, (D): Disagree, (N): Neutral, (A): Agree, (SA): Strongly Agree

Table 4: Respondents' opinion on patronage of solid waste management services.

S/N	Item	Frequency analysis						(SI) %
		SD (0)	D (1)	N (2)	A (3)	SA (4)		
1	I patronize the PSP operators	NR	6	11	15	23	15	64.6
		PR	10	18	8	38	26	
2	I engage the services of the Cart pushers in my area (EC)	NR	15	12	8	19	6	48.75
		PR	24	20	14	32	10	

(NR): Number of respondents, (PR): Percentage of respondents, (SD): Strongly Disagree, (D): Disagree, (N): Neutral, (A): Agree, (SA): Strongly Agree

DISCUSSION

Socio-economic profile

Even though the proportion of males to females' respondents is 62% to 38%, one does not expect this disparity to greatly influence the people's attitude and perception on household waste management. Recent findings however suggest that gender difference could influence people's perception on solid waste management (Ehrampoush and Moghadam, 2005). Age is expected to play a significant role as maturity could affect level of awareness on environmental health and sanitation (Bradley *et al.*, 1999; Eagles and Demare, 1999). The data on age shows that subjects are matured adults whose reasoning level as regard household waste and management is expected to be high and thus facilitate public involvement in solid waste management process. The influence of educational attainments could as well be an important factor that could influence people's perception on HHW management. Only 13% of the respondents had no form of education. This percentage even though small, could negatively influence their perception and attitude on HHW management in general and affect recovery cost of waste management services in particular. The poor average income of respondents is considered a very important variable that could influence people's perception and attitudes negatively on solid waste management system (Parfitt *et al.*, 1994). From the data obtained (Fig. 4), economic consideration also appears to play a major role in people's orientation and perception as well as attitude to solid waste management practices in general.

Public opinion and perception on solid waste management system.

From the survey results the respondents expressed their concerns about the solid waste management system in Ojo LGA and its associated problems. The severity index values for the public opinion and perception on solid waste management which range between 46.67% and 51.25% are found within the neutral opinion range of $37.5 \leq SI < 62.5$ (Majid and McCaffer, 1997; Isa *et al.*, 2005). With this opinion range the respondents affirm the existence of an organized solid waste management system in the LGA. The SWM

system is however perceived by the respondents to be characterized with irregularity in waste collection by the assigned PSP operators. This perception is stronger among the low income socio-economic group.

At this present level of people's perception, a slight change could tilt the balance to the unfavourable side (Isa *et al.*, 2005). It therefore behooves on the authorities to pay keen attention to problems arising from the management of solid waste by the LGA and the perceptions of the citizens at different socio-economic levels (Rahman *et al.*, 2005).

Willingness to pay for solid waste management services

In order to develop the habit of willingness to pay for the services and to recover the expenses incurred by collection of solid waste from the households and for subsequent disposal at municipal landfills, a system of payment of service charges by the LGA has been developed. The service charge which is based on the tenement rate system is determined by the type of household and its location. At present the individual household's monthly payments vary from US\$17 to US\$ 34. This survey results indicate that the rate of willingness to pay is relatively high across the three socio-economic strata. The values are found within the agreed opinion range of $62.5 \leq SI < 87.5$ (Majid and McCaffer, 1997; Isa *et al.*, 2005). This result corroborates the findings of Salequezzaman *et al.*, (2001), in their study of the willingness to pay for community-based solid waste management and its sustainability in Bangladesh. The results therefore clearly show that the people of Ojo LGA are ready to pay for the services if regularly provided and this perceived rate of willingness is bound to increase with higher income earnings and adequate environmental education of the populace.

Level of patronage of available solid waste management services

There is a noted divided opinion in respondents' opinion on patronage of waste management services contrary to their agreed opinion on willingness to pay for the waste management services. Those that currently patronize the

State Government recognized PSP operators are found within the agreed opinion range of 64.6% severity index. Those who engage the services of the state banned informal sector (cart pushers) are found within the neutral opinion range of $37.5 \leq SI. < 62.5$. Even though the severity index of the respondents who engage the services of the cart pushers is only 48.75%, this value represents a very significant proportion of the people interviewed. This proportion could negatively affect the smooth running of the current solid waste management system if not fully integrated into the private sector driven scheme.

Finally, the current solid waste management system in Ojo LGA is a sound process that could be improved upon despite the challenges and problems identified in this research. The current identified inadequate service coverage, lack of timely household waste collection are teething problems associated with new schemes. The willingness of the people to pay for waste management services shows the acceptability of the current scheme by the people of Ojo LGA, and hence, a pointer that the scheme could be sustained. However, the local authority should give attention to performance monitoring and control of the services of PSP operators in order to enhance and sustain good service delivery.

One way to achieve this is to streamline private sector participation in SWM services to professionals only and as well guarantee soft loans for purchase of waste collection vehicles. The following lines of actions are suggested for an effective solid waste management system and for sustainability of the PSP participation in the overall solid waste management process in the entire state. Modern waste management methods that place emphasis on waste reduction, recycling and re-use should be encouraged in the LGA and in the entire State with legislative backing.

Increase awareness and re-education household waste minimization and sorting before collection should be encouraged. The line ministry should introduce training and re-training and re-orientation programme for the PSP operators and the waste generators respectively on issues of waste management techniques as a matter of urgency in order to enhance the overall success of the current SWM system.

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