An Assessment of Environmental Sanitation and Solid Waste Management in Ibadan North Local Government, Oyo State, Nigeria

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Poorly controlled and roadside dumping of wastes not only degrades aesthetic quality and beauty of the environment but also pollute soil and water resources as well as serving as potential health hazards to the populace. This study was therefore carried out to assess the environmental sanitation and solid waste management in Ibadan North Local Government of Oyo State, Nigeria. Structural functionalist theory and theory of planned behaviour were used as the theoretical framework. The study employed descriptive survey design. The sample for the study was 416 respondents selected through a combination of cluster and purposive sampling techniques. Primary data were collected through questionnaire and in-depth interviews. Quantitative data collected were analysed at both univariate and bivariate levels while qualitative data were content analysed. Findings from the study revealed that environmental sanitation and solid wastes are managed by a combination of agencies at both state and local government levels as well as private agencies. There was a significant relationship between the awareness of governmental agencies and awareness of public/private partnership ($X^2=12.887$, df=1, p<0.05). Majority of the residents acknowledged the effectiveness of the public/private partnership and there was a positive relationship between the residential wards of respondents and the means of waste disposal employed such as burning ($X^2=26.081$, df=11, p<0.05) with the exception of community dumpsites which showed a negative relationship ($X^2=17.788$, df=11, p>0.05). Also, the relationship between residential wards of respondents and the number of times solid wastes are collected was positive ($X^2=85.810$, df=44, p<0.05). The communities with inaccessible roads are hardly visited by the governmental and private agencies to collect solid wastes. The study also showed that residents in Ibadan North LGA have positive attitudes concerning some aspects of environmental sanitation but have negative attitudes towards other aspects of solid waste management. There should be continuous enlightenment of residents, strict enforcement of sanctions and rewards for good waste management practice in order to enhance the effectiveness of solid waste management in Ibadan North LGA.

Keywords: Solid waste, solid waste management, environmental sanitation, waste disposal

Introduction

It has been established that several cities in Nigeria suffer greatly from poor environmental sanitation part of which is solid waste management (Onyima, 2004; Okosun, 2011). Solid wastes are all the wastes that arise from both human and animal activities that are normally solid and are discarded as useless or unwanted (Takele, 2004). In this light, solid waste management includes the collection, storage, transportation, treatment and disposal of waste such that they are rendered harmless to human and animal life, ecology and the environment generally (Fafioye and John-Dewole, 2013). Apart from the inability of the waste management authorities to manage solid wastes as a result of inadequate workers and technology, it has been affirmed that the different categories of wastes in many Nigerian cities are most times disposed in an unsustainable manner in open dumps, streets, ravines and also drainages which then flow into
Flooding, erosion, building collapse, road accidents, pollution, intolerable vibrations, and general dissatisfaction with the aesthetic quality of the environment are the consequences that derive from poor waste management. In fact, cities like Lagos, Ibadan, Kano and so on, are, to a large extent, featured by poorly controlled and illegal roadside dumping of wastes which not only degrades aesthetic quality but also pollutes soil and water resources while also serving as potential health hazard to the urban dwellers (Okosun, 2011).

According to Ishaq (2004) and Onyima (2010), the arrangements for waste disposal have not been effective or sufficient in most urban centres in Nigeria. The wastes are often indiscriminately dumped on open plots of land, particularly along the street and on the roads such that some of the affected streets are not passable for days or weeks before the wastes are collected. It has also been established that one of the main problems facing Ibadan city which has been hard to deal with is open and indiscriminate dumping of refuse, human and animal faeces (Ishaq, 2004; Blessing, 2013). A recurrent sight in the city are the piles of decaying garbage and other wastes which are source of air and water pollution, land contamination, health hazards and environmental degradation with risks such as bad odour, aesthetic nuisance, fire outbreak, water pollution, proliferation of insects and other ailments (Ishaq, 2004).

The Federal and State Governments in Nigeria have made and are still making attempts to address the environmental problems in the country through the introduction of several measures which include the monthly national sanitation exercise introduced in 1984, the creation of the Federal Environmental Protection Agency (FEPA) under Decree No. 58 of 1988, the formulation of several national policies and national guidelines for environmental sanitation and solid waste management, the promulgation of several laws and policies for waste management at state levels and the creation of the Federal Ministry of Environment in 2000. In spite of these laws, policies and other instruments, the issue of environmental sanitation continues to pose challenges to the federal and state governments.

Ibadan city is also noted for its large population, high illiteracy level and low level of environmental sanitation programme execution in the city. Therefore, to complement the efforts of the federal government, especially as regards the monthly environmental sanitation exercise that holds every last Friday of the month, the Oyo State Government has also introduced the weekly environmental exercise which holds every Thursday between 6.00a.m and 10.00a.m.

It should be realised that even within Ibadan city, there is a degree of variability in the frequency of collection of refuse by the authorities responsible for that. Attention is given more to some areas in Ibadan North LGA such as Bodija and other various Government Residential Areas by having their refuse collected more regularly than other areas, especially those inhabited by the low income group (Ishaq, 2004; Blessing, 2013). However, despite various studies that have been carried out in the Ibadan city at various times, no known study has focused on the solid waste management programme as it takes place in Ibadan North Local Government Area of the city and the various issues arising from it. Thus, this article attempted to fill this gap by assessing environmental sanitation and solid waste management in Ibadan North Local Government Area.

**Literature Review and Theoretical Framework**

**Literature Review**

There have been various definitions for solid waste management. According to the United Nations (1997), solid waste management is the handling process of solid waste materials from generation at the source to its disposal. Also, the World Bank (2006) defined it as effective control of production, storage, collection, transportation, processing and disposal of wastes in a sanitary and aesthetically acceptable manner. Okosun (2011) noted that solid waste management is a planned system of effectively controlling all the stages in a sanitary, economic, and aesthetically acceptable manner. The National Urban Development Policy (2006) also
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defined it as the generation, separation, collection, transportation and disposal of waste in a way that takes into account public health and aesthetic quality of the environment.

According to an article by Environmental Rights Action and Oilwatch Nigeria (2012), an international workshop, which held from September 12-16, 1988 in Lagos, led to an end of the pre-1988 era. The workshop introduced the new era by setting the stage for the emergence of a National Policy on Environment which was previously non-existent. The NPE aims to achieve sustainable development in Nigeria by securing quality environment for Nigerians; conserving and using the environment for people's benefits; restoring, maintaining and enhancing the ecosystems; raising public awareness and promoting their understanding of the link between environment and development; and cooperating with foreign agents in preventing environmental pollution. It finally concluded that the policy recognises the important role citizens or communities may play in the formulation and implementation of environmental policies.

Asoegbwu (2010) opined that the need for legislation to guide the use and control of some environmental resources in Nigeria is always recognized as evidenced by an array of laws that have been put in place. But the problem is that the laws are merely proclamations that are not effectively backed by any enforcing machinery. Some of the environmental related laws according to Asoegbwu. (2010) are 1958 Oil Pipeline Act, 1963 Minerals (Safety) Regulations, 1967 Petroleum Regulations, 1968 Oil in Navigation Waters Act, 1969 Petroleum Act, Federal Environmental Protection Agency Enabling Law, National Resources Conservation Council Decree 50 of 1989, National Policy on Environment, National Environmental Impact Assessment Policy of 1992, Policies by the Ministries of Environment at Federal and State Governments, Other professional regulatory laws that aim at orderly planning, development, control and protection of the environment. Other regulations at state level in Oyo state according to ELRI (2011) include the Oyo State Environmental Protection Agency Law and Ibadan Waste Management Authority Law.

Asoegbwu (2010) further noted that these and other existing provisions contain laudable strategies that should ensure a protected and orderly environment. But contrary to expectation, the environment is battered from all directions and by every person. Land which is the base of all environmental resources is gradually becoming inhabitable and uncultivable, water bodies are polluted out of use, the air is gradually being poisoned, the cities are turning into slums adorned with rubbish heaps and the serenity of the rural areas is dis-configured by unplanned development. But the basic issue is that the present deteriorating state of affairs could have not reached the alarming status if the guidelines already in place were judiciously enforced. Ene-Ita (1984) agreed with this position when she wrote "looking at the state of affairs, it appears as if little or no cognizance is taken of the existing laws since there is no mechanism to enforce them by the government". Asoegbwu (2010) added that even if any mechanism was envisaged, such organ is at best not functioning at all. The challenge of the environment today is that enforceable mechanism must be strongly positioned to guide man's interaction with his environment in all its ramifications.

The National Policy Guidelines on Solid Waste Management was developed by the Federal Ministry of Environment in July 2005 to spell out the roles expected of all stakeholders with special emphasis on the role of the private sector for their full participation. Its aim is to improve and safeguard public health and welfare through efficient sanitary Solid Waste Management methods that will be economical, sustainable and guarantee sound environmental quality. The Policy Guidelines made a clear call to all stakeholders for adequate funding of the various strategies while also emphasizing that sanctions and enforcement mechanisms shall be strengthened and decentralized for better efficiency and rewards for best practices shall be institutionalised. It therefore aims ultimately to ensure that solid waste management is private sector driven with a potential to create employment and wealth which will enhance sustainability.

The National Policy Guidelines acknowledged the fact that the growth of human
population coupled with increased economic activities in towns and cities result in high rate of solid waste generation. In essence, solid waste is inevitable as almost every human activity involves the generation of waste in solid, liquid and gaseous forms. Also, social dynamics such as modernisation and economic development influence waste generation. Thus, the Policy Guidelines tried to achieve careful planning and adequate resource allocation to forestall a mismatch between the rates of waste generation, rate of collection and disposal as management of solid waste is far from being satisfactory in Nigeria. It is an understatement to say that many parts of Nigerian cities and towns do not benefit from any organised waste management services because wastes are unattended to, buried, burnt or disposed haphazardly. The Policy Guidelines noted that even areas where the authorities do the collection, it is often irregular and sporadic. Recycling of waste is negligible while the methods used for collection, transportation and final disposal are very unsatisfactory with the adverse effect of constituting serious health hazard, causing offensive odour, polluting underground water sources and decreasing environmental aesthetics and quality.

Basically, therefore, the National Policy Guidelines on Solid Waste Management has as its objectives: to develop Policy Guidelines for efficient and sustainable Solid Waste Management in Nigeria; to promote a healthy environment by ensuring sanitary Solid Waste Management; to minimize waste generation and promote sorting at source, reuse, recycling and energy recovery; to ensure safe and nuisance-free disposal of (urban and rural) domestic, medical, and industrial wastes in order to adequately protect public health during and after collection, transportation, treatment and final disposal; to promote effective stakeholders participation in Solid Waste Management; to generate employment opportunities, improve the standard of living and thus reduce poverty; to optimize labour and equipment in waste management to enhance increased productivity; to facilitate cost recovery in waste management investment and ensure project replication and sustainability; to build an institutional framework capable of ensuring an efficient waste management system; to evolve and maintain an indigenous waste management system based on the physical and socio-cultural characteristics of communities; and to maintain adequate and regular waste management services at affordable cost.

Most importantly, the National Policy Guidelines on Solid Waste Management listed some institutional roles for the Federal Government, State Government, Local Government, Private Sector, Civil Society Organisations and the Public to ensure adequate and effective Solid Waste Management from the grassroots to the national level. On the guidelines for efficient solid waste management service delivery at the local government level, the National Policy Guidelines on Solid Waste Management also provided some guidelines "as a broad statement to make for strategic interventions in Solid Waste Management in Nigeria". The guidelines concern waste storage, waste collection, collection equipment, transfer stations, waste transportation, waste management methods, management options, private sector participation, sanctions and enforcement mechanisms and lastly reward for best practices.

**Theoretical Framework**

The research made use of the synthesis of the Structural-Functionalist Theory and Theory of Planned Behaviour (TPB) as it presented a perfect analysis of the assessment of the agencies responsible for solid waste management in Ibadan North and the attitudes of the people towards the programme.

The functions, interdependency, necessity and complementary roles and nature of the different actors and agencies that are in charge of the Solid Waste Management programme in Ibadan North Local Government Area may be viewed in the light of sociological theory of Structural-functionalism as elucidated by Abuyuan (1999). According to the Structural-functionalist theory, institutions must survive by adapting to changing circumstances by means of interdependence on its various branches or partners. The actors and agencies in Solid Waste Management adapt to this theory well if we view the various actors as functional parts of a social
phenomenon like environmental sanitation. Here the agents or actors (Ministry of Environment, Local Government, Solid Waste Authority, Private Contractors, residents) may be seen as interdependent organs of a larger organisation or society (Ibadan North Local Government Area) each having its specialised function working as a whole towards the common goal of delivering effective service and carrying out responsibilities in ensuring a clean environment in the Local Government Area.

Theory of Planned Behaviour (TPB) was also used in the assessment of solid waste management programme in Ibadan North LGA as a framework in understanding, explaining and predicting the attitudes and behaviour of inhabitants about the programme. Thus, this research made use of Ajzen’s (1991) Theory of Planned Behaviour. The Theory of Planned Behaviour (TPB) states that an individual’s behavioural beliefs, normative beliefs and control beliefs determine his/her attitude towards a given behaviour, subjective norm, and perceived behavioural control, respectively which then collectively influence the behavioural intention and actual behaviour of the individual when participatory decisions in an action are voluntary and under an individual’s control. The theory is based on the assumption that individual behavioural intentions are directly associated with their attitudes. Thus, it is best to examine human behaviour when participation decisions are voluntary and under an individual control. Therefore, this theory was suitable to predict the inhabitants’ intent to participate in a specific behaviour in relation to solid waste management programme thereby showing their attitudes. The two theories are synthesised in the conceptual framework shown below:

![Conceptual Framework]

**Methodology**
The study was descriptive and adopted a cross sectional survey research design with a combination of both quantitative and qualitative techniques of study. The population of study consisted of (i) Officials of Solid Waste Management agencies in Ibadan North LG, (ii) Ibadan North Local Government Officials, (iii) Officials of the Ministry of Environment of Oyo State and, (iv) the residents of the twelve (12) wards in Ibadan North LGA. In all, a total of 416 respondents were selected using the Cluster sampling and purposive techniques.

A sample size of 408 respondents was selected across the existing 12 wards in the study location applying the Cluster sampling technique. Data collected from quantitative method were analyzed employing statistical tools such as frequency counts, cross tabulation.
counts and Chi-square. Bivariate analysis was used to analyze the relationship between some variables while cross tabulation count and Chi-square were used to test level of relationship/association. In measuring relationship, the precise extent of agreement was measured by means of Pearson Chi-square because it is the most relevant analytical technique when looking for relationships between nominal and/or ordinal variables.

However, each of the responses on the questions of attitudes of respondents towards solid waste management and environmental sanitation was measured on a scale of one to seven with 1 being item with positively worded endpoints while 7 represents items with negatively worded endpoints. Respondents were asked to tick one if statements are true and tick seven if statements are false. One to three represent degrees of trueness and five to seven represent the degree of falseness while 4 represents a neutral position. In analysis, the mean of each statement was calculated. A response with mean above 3.50 indicates a positive attitude and a response with mean below 3.50 means a negative attitude.

For in-depth interviews, purposive technique was used to select 8 officials from the various agencies in charge of waste management and environmental sanitation in the local government area. The qualitative data collected by tape recording were later translated and transcribed and analyzed using manual content analysis. The analysis of the qualitative data commenced with the translation and transcription of the tape-recorded interview, followed by examination and separation of various responses that threw light into the study objectives. The study had human subjects as elements of investigation and as such the principle of ethics in research was observed in the areas of confidentiality, informed consent and others.

Findings and Discussion
(a) Brief Socio-Demographic Profile
Most of the respondents (52.3%) were female while the mean age was 44.5 years. Majority (44.3%) were self-employed while the study population was dominated by Christians (60%). On marital status, 52.5% of them were single while in terms of educational status, as many as 50.2% had formal education above OND/NCE. On residential status, 73.5% were tenants while 23.8% were landlords/landladies.

(b) Governmental Agencies in Charge of Solid Waste Management and Environmental Sanitation in Ibadan North LGA
(i) Respondents' Awareness of the Governmental Agencies in charge of Solid Waste Management and Environmental Sanitation in Ibadan North LGA and their duties
Result from the study shows that 38.8% of the respondents were aware of the agencies in charge of environmental sanitation and solid waste management in Ibadan North LGA while a higher percentage (57.8%) of the respondents could not identify the agencies. This was gathered to be as a result of the inseparable mixture of the overt functions of the agencies and the inability of majority of the populace to notice and discern the names of the agencies and their various duties. This buttresses the findings of Taiwo and Ajayi (2013) in their study on pollution in Bodija Market, Ibadan. Most respondents commented that they just knew that they usually saw people bring different sizes of vehicles to collect solid wastes and they just generalized them including the private contractors as working for the state government. This indicates nothing but a considerably low level of people's awareness of the Governmental Agencies and the differences in their duties.
Figure 1: Proportion of respondents by Agency particularly noticeable for Solid Waste Management in Ibadan North

- Oyo State Solid Waste Management Authority
- Ibadan North Local Government
- Ministry of Environment

90.54%
9.46%
0%

Source: Field Survey, 2015

However, those who said they were aware of the governmental agencies in charge of Solid Waste Management in Ibadan North LGA listed Oyo State Waste Management Authority (OYOWMA), Ibadan North Local Government and the Ministry of Environment. They were further asked which of the three governmental agencies was particularly noticeable and popularly known for Solid Waste Management in Ibadan North. Their responses are as shown in the bar chart above. Figure 1 clearly showed that a very large percentage (90.54%) of the respondents who were aware of the agencies in charge of solid waste management in Ibadan North LGA indicated that the most prominent agency was the Oyo State Waste Management Authority in contrast to 9.46% for Ibadan North Local Government and 0% for the Ministry of Environment. This can be said to be as a result of the fact that the Oyo State Waste Management Authority has hijacked and taken control of the management of wastes in the whole state from the Local Government Authorities. A respondent confirmed this as follows:

Well, Oyo State Waste Management Authority is controlling the entire State on Solid Waste management. The Management Authority is now decentralized into Oke-Ogun 1, Oke-Ogun 2, Ibarapa, Ogbomoso, Oyo and this office is controlling the other 11 Local Governments in Ibadan including Ibadan North. So we are the one responsible to collect the refuse in all the 11 local governments. (IDI/Male/OYOWMA/November 2014)

Furthermore, the respondents that were aware of the governmental agencies in charge of Solid Waste Management and indicated an agency as being particularly noticeable for Solid Waste Management in Ibadan North were asked if they know the duties of the agency they indicated. A high proportion (71.6%) of the respondents said they know the agency’s duties while only 15.5% and 12.9% said they do not know and made no comment respectively. However, when asked to list the duties of the agency they indicated, a large proportion of the respondents who indicated the Oyo State Waste Management Authority listed waste collection from the road media, road side refuse bins and households, kerbside sweeping, environment inspection, distribution of refuse bins and enforcement of environmental laws and sanctions.

Interestingly, these are not the exact duties of the agency but a mix-up of the different duties of the Oyo State Waste Management Authority, the Ibadan North Local Government and the private contractors—both sweeping and waste
collection contractors. A respondent put this in a clearer picture:

Oyo State Waste Management Authority is responsible for carting away refuse from various places especially the legal refuse dumpsites. If you are passing through any of the tarred roads, you will see where people just put refuse illegally, I say emphatically, illegally on the road media or the road side which is very wrong. Our people are supposed to patronise the accredited refuse contractors zoned to their area. But people like anything that does not involve money therefore they dump refuse on the roadside and it became our responsibility to go and collect those wastes in order not to allow it to cause another thing. We regulate the activities of the refuse contractors—both the sweeping contractors and the ones collecting refuse from various outlets.

(IDI/Male/OYOWMA/November 2014)

From the interview above, it can be seen that the kerbside sweepers and the household waste collectors are private contractors who charge money for their services and are just being registered and regulated by the Oyo State Waste Management. On the other hand, the Oyo State Waste Management Authority is originally not supposed to be collecting wastes but because the people of the Local Government do bring wastes to the roadsides and the roadside refuse bins, they have no choice than to collect such wastes as this cannot be done by private contractors because individuals will not pay. Thus, this mix-up of duties of the agencies by the people of Ibadan North LGA further affirms the earlier position that there is low level of awareness of the clear cut distinction of the agencies and their various duties among the people of Ibadan North LGA.

(ii) Agencies responsible for environmental sanitation and solid waste management

From the study, it was gathered there are basically three governmental agencies responsible for waste management in the study location. These are the Oyo State Waste Management Authority, the Environmental Health Department of Ibadan North Local Government Authority and the Ministry of Environment. This was confirmed by an interview respondent:

One of the Agencies is this Oyo State Waste Management Authority. Although we work in synergy with the Local Government Authority and it is the responsibility of the Government to ensure that these agencies work hand in hand in order to ensure that there is harmony. So the Oyo State Waste Management Authority, the Ministry of Environment and the Ibadan North Local Government itself vis-à-vis the Environmental Health Department are the governmental agencies in charge of Solid Wastes in Ibadan North. (IDI/Male/Ministry of Environment/November 2014)

Before now, according to Ishaq (2004), the three institutions charged with the responsibility of overseeing the environment of Ibadan city were the Ibadan Solid Waste Board, the Local Government Councils, and Ministry of Environment and Water Resources. However, with the scrapping of the Ibadan Solid Waste Board and the establishment of the Oyo State Waste Management Authority (OYOWMA) as an affiliate of the Ministry of Environment in 2008, the whole responsibility of waste management in Oyo State generally has been transferred to the new agency. This function was originally supposed to be performed by the Local Government Authorities but it was completely hijacked by the Ibadan Waste Management Authority in 1997 (Ishaq, 2004) which later transformed into what is now the Oyo State Solid Waste Management Authority through the promulgation of Oyo State environmental law by the State House of
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Assembly in 2008. A Government Official corroborated this point thus:

Actually, the issue of waste management is the responsibility of the local government but by virtue of Oyo State Waste Management Authority law, the responsibility has been given to the Oyo State Waste Management Authority to manage solid waste in Oyo State including Ibadan North. But by and large, the Local Government has Environmental Health Department that partake in the issue of solid waste management in their locality while the Oyo State Waste Management cut across all the local governments in the state. (IDI/Ma/e/Ibadan North LG/November 2014)

The duties of the Oyo State Waste Management Authority are actually the same duties the former Ibadan Waste Management Authority performed (Ishaq, 2004). However, the Environmental Health Department of the Ibadan North Local Government supports the efforts of the Oyo State Waste Management Authority in managing wastes in Ibadan North by also performing some waste management and regulatory functions. Apart from this, it was also gathered that the Local Government Authorities in Oyo State one of which is Ibadan North Local Government supports the activities of the Oyo State Waste Management Authority with financial contributions called the Counterpart Fund. This is then used by the authority to service and fuel its various vehicles and for other relevant expenses.

The Ministry of Environment, on the other hand, still performs its original functions as it is contained in its edict since 2001 (Ishaq, 2004). However, they also backup the functions of the Oyo State Waste Management Authority by going out on environmental sanitation days to support and monitor the activities of the governmental agencies, private contractors and the entire populace of the state. The involvement of various organs and units in solid waste management and environmental sanitation in the study location justifies the structural functionalist theory adopted for the study.

(iii) Public/Private Partnership in Solid Waste Management in Ibadan North LGA

The public/private partnership of Solid Waste Management is an attempt to accommodate and encourage the involvement of private individuals or contractors in the management of solid wastes together with the government. This is termed PSP—Private Sector Participation. The private contractors are actually the ones charged with the responsibility of collecting all wastes in the Local Government Area while charging some amount for their services. However, due to the reasons earlier mentioned, the Oyo State Waste Management Authority and Ibadan North Local Government also collect wastes from road media and roadside refuse bins. The private contractors are in four categories—the household waste collectors, commercial waste collectors, industrial waste collectors and highway sweeping contractors. It was gathered that the private contractors charge ₦1,000 per month for their services although the amount is subject to negotiations between the parties involved. However, it was learnt that some of the contractors had attitudinal problems concerning their approach to the populace thus limiting their acceptability among the latter.

<table>
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<th>Table 1: Respondents’ awareness of the public/private partnership of Solid Waste Management in Ibadan North</th>
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<td><strong>Frequency</strong></td>
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<td>Yes</td>
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Source: Field Survey, 2015
Furthermore, from Table 1 above, 48.5% of the respondents indicated that they were not aware of the public/private partnership arrangement in waste management in the local government while 41.8% of the respondents said they were aware of the partnership. Those who indicated that they were aware of the public/private partnership were further asked if they think the partnership was effective in managing solid wastes in Ibadan North. It was revealed that 35.3% of those who were aware of public/private partnership said that the partnership was not effective in managing solid wastes in Ibadan North. The reasons those who negated the effectiveness gave ranged from the large size of Ibadan North Local Government, the poor attitude of the people in patronizing the private contractors, the large quantity of wastes being generated daily in the local government, the continuous dumping of refuse in gutters, rivers and on the roadsides and so on. However, a higher proportion (64.7%) of the respondents affirmed that the public/private partnership was effective in managing the quantity of solid wastes in Ibadan North. Some respondents indicated that the problem that still surfaced was not due to the partnership but the lack of patronage of the private contractors by the people thus further confirming the observation by Blessing (2013) that some residential areas of Ibadan refused to pay private waste evacuators. A respondent corroborated the effectiveness of the partnership as follows:

Definitely it is effective because I think some searches and public opinions for the past three to four years indicated that there is a difference in Ibadan where you can now see that the volume of wastes on highways are not as much as before because the private contractors are doing their jobs effectively. (IDI/ Male/Private Contractor/ December 2014)

Further cross-tabulation showed that therefore there was a significant relationship between awareness of the governmental agencies in charge of solid waste management and the public/private partnership of waste management in the local government as evidenced by the Pearson chi-square value which was 12.887 and level of significance (p) which was 0.000. The p value was less than 0.05.

(c) Solid Waste Management Process in Ibadan North LGA

(i) Solid Waste Storage of Households in Ibadan North

Table 2 below shows that total of 85.5% of the respondents confirmed that they participate in cleaning their residences and surroundings on the Environmental Sanitation days while only a very small percentage (9.5%) and (5.0%) of the respondents answered no and refused to respond respectively. Also, majority of the respondents (59.03%) stored their solid wastes in dustbins, 11.61% of the respondents stored their wastes in drums and 24.52% made use of sacks for waste storage. However, 4.52% and 0.32% indicated that they just threw their wastes on backyard dumpsites and bushes respectively. Some of the respondents who used the first three types of storage do patronize the private contractors for waste collection. Drums or other waste bins were provided by the private contractors and they come to collect the wastes twice a month.

| Table 2: Residents' Participation in Environmental Sanitation in Ibadan North |
|-----------------------------|-----------------|-----------------|
|                             | Frequency | Percent |
| Yes                         | 349       | 85.5     |
| No                          | 39        | 9.5      |
| Missing                     | 20        | 5.0      |
| **Total**                   | **408**   | **100.0**|

*Source: Field Survey, 2015*
(ii) Methods of Solid Waste Disposal among residents of Ibadan North Local Government

The study also identified a number of methods of solid waste disposal as shown on the figure below:

Figure 2: Distribution of Respondents according to the means of waste disposal they make use of in their residential area

![Bar chart showing distribution of respondents according to means of waste disposal.]

Source: Field Survey, 2015

From the figure above, majority of the respondents (61.1%) employed community dumpsites bins provided by the government while only 38.9% indicated they do not dispose their solid wastes inside the community dumpsites bins. Furthermore, because of the big size of their vehicles and the impenetrable roads that characterize most neighbourhoods in Ibadan North, people most times dump their solid wastes in the communal depot refuse bins like that in Figure 3 below located at strategic places by the government which are more often found by the roadsides for waste collection by the agencies (Taiwo et al., 2013).

Figure 3: The communal depots refuse-bin used by the residents to dump solid wastes at Agodi Gate, Ibadan North Local Government

![Image of communal depot refuse-bin.]


This was followed by 31.0% of the respondents who said they burn their solid wastes. Although 69.0% indicated that they do not engage in burning, the 31.0% for those who burnt theirs is significant when compared to those who employed other means of waste disposal. A total of 22.8% of the respondents also noted that they have backyard dumpsites that they make use of,
in their residential areas. This finding is in contrast to another study by Benneh et al. (1993) where it was observed that 83% of population in an African city dump refuse illegally in their neighbourhoods due to inadequate street or compound waste bins. Only 10.6% and 9.8% of the respondents said they do dump their wastes inside gutters and rivers respectively as shown in Figure 4 while 9.8% said they make use of other means of waste disposal such as the dumping of wastes on the road media as shown in Figure 5 below:

Figure 4: Showing a river with solid wastes dumped in it by residents at Yemetu Oja, Ibadan North Local Government

![Figure 4](image1)

Source: Field Survey, 2015 (27/11/2014)

Figure 5: Showing the disposal of solid wastes on a road medium in front of University of Ibadan, Ibadan North Local Government

![Figure 5](image2)

Source: Field Survey, 2015 (8/12/2014)

In terms of the relationship between residential ward and burning of wastes, the chi-square value is 26.081 and the significant value of 0.006 is less than 0.05. This shows that there is a relationship between the ward of respondents and the burning of solid wastes in Ibadan North. However, there is no relationship between the residential ward of respondents and the use of backyard dumpsites in Ibadan North as the significant value of 0.106 is greater than 0.05. The significant values of 0.005, 0.048 and 0.002 are lower than 0.05 and they show that there is relationship between residential wards and dumping of wastes in rivers, gutters and other means like road media respectively in Ibadan North Local Government. On the other hand, there is no relationship between the residential wards of respondents and the dumping of solid wastes in community dumpsites as the significant value of 0.087 is greater than 0.05.

Respondents were asked if there was any sanction for those who engage in wrong storage or disposal of Solid Waste in their residential area. Although a higher proportion (56.0%) of the respondents said there was sanction for wrong storage or disposal. A considerably high number of respondents (41.3%) indicated that there was no sanction whatsoever in their community and this buttresses the findings of Taiwo et al. (2013) and Blessing (2013).
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The inference from this is that though there are environmental laws, the enforcement is generally weak and ineffective. This again confirms the earlier findings of Asoegbwu (2010), Ene-Ita (1984) and Sule (1981). From those who responded yes, it was gathered that the Environmental Department of Ibadan North Local Government and the Health Officers of the Oyo State Solid Waste Management Authority usually go round on Environmental Sanitation days to check people’s participation and they do arrest or sanction those who store or dispose their solid wastes in the wrong way. Apart from the sanctions of the governmental agencies, the Landlord Associations of the different communities in Ibadan North also warn and sanction those who do not engage in proper sanitation in their various communities.

(iii) Solid Waste Collection Process in Ibadan North

Higher percentages of the respondents said no to the different means of waste collection such as block, house to house, communal depots, kerb side sweeping and other systems. This supports studies that have shown that of the solid waste generated within most cities in developing countries, a large percentage are not collected (UNESC, 1997; NEST, 1991). However, out of all those who indicated yes to the means of waste collection, collection through communal depots took the highest percentage of 42.3% followed by the block system of 28.0%, 22.8% for house to house collection, 10.8% for kerbside sweeping and only 4.5% of the respondents indicated that the agencies collect wastes in their areas through other ways. The 22.8% for house to house collection indicates the means through which the private contractors collect wastes from their patronisers while the 28.0% for the block system applies to another means both the government agencies and private contractors use in collecting wastes. However, the reason for a higher percentage for the collection through the communal depots is the fact that the governmental agencies like Oyo State Waste Management Authority collect the lion share of the solid wastes generated in Ibadan North Local Government.

Concerning the number of times solid wastes were collected in a week by the governmental agencies in Ibadan North Local Government, majority of the respondents (31.8%) said that the wastes were collected daily while a lower percentage of 23.3% said the governmental agencies never come to their areas at all. One of the reasons for this might be the impenetrable communities in terms of poor road network. However, 10.8%, 14.5% and 13.5% of the respondents indicated 2 days, 3 days and more than 3 days in a week respectively as the number of times the governmental agencies come to collect wastes in their residential areas. The reason for the 6.3% missing might be the inability to observe or know the number of days the agencies come for waste collection in a week by the respondents. Thus, a test for the relationship between the wards of residence of respondents and the number of times wastes are collected was done. The Pearson’s Chi-square value was 85.810 and the significance level (p) was 0.000 which is less than 0.05. Therefore, there is a relationship between a respondent’s ward of residence and the number of times the governmental agencies collect solid wastes in such areas.

(iv) Transportation of Solid Wastes in Ibadan North Local Government

After the collection of solid wastes from different areas of Ibadan North Local Government by both the government and the private contractors, the transportation of the wastes from their points of collection to the various dumping sites is very important. The study revealed the issue of unhealthy spread and dispersal of wastes including the prevention of free flow of traffic when these vehicles transport solid wastes.

When asked about the vehicles used in transporting solid wastes in Ibadan North, 22.8%, 19.8% and 18.5% of the respondents said these vehicles cause unhealthy spread and dispersal of wastes sometimes, often times and always respectively. This makes a total of 61.1% of the respondents who positively agreed to the unhealthy spread and dispersal of waste when transporting solid wastes compared to the 17.5% and 18.3% for those who indicated hardly and never respectively to the question while only 3.3% did not answer the question. The respondents mainly noted that wastes usually
fall on the roadside as a result of some types of vehicles used by the private contractors and the government agencies. The major issue about this is that it was gathered that the wastes smell so much that it disturbs pedestrians and the water from the wastes drips from the vehicles. It was further revealed that contrary to the government directive, some of the drivers do not normally cover their trucks with tarpaulins when conveying wastes to the dumping yards. A private contractor put this in a better light. His words:

...It is right. Even the government came up with a policy then that said all wastes trucks should be covered. It helps with a lot of things. I think if your truck is covered, probably wastes will not be spilled out—that is one. And if you are going on the way, wastes cannot be spilling out to distract people’s activities and litter the road—that is two. But the contractors refused that where will they get the money to do all that. (IDIIMalelPrivate Contractor/December 2014)

Also, a total percentage of 59.8% of the respondents agreed that the vehicles do cause hold up on roads when they transport solid wastes from the point of collection to their various destination. It was also gathered from the respondents that the prevention of free flow of traffic usually occurs when the vehicles brought to collect wastes are big and the roads are narrow.

(v) Final Disposal of Solid Wastes by Waste Agencies in Ibadan North LGA
After the collection of solid wastes from the different points in Ibadan North by the governmental agencies and the private contractors alike, the wastes are then transported to the various dumpsites maintained by the government. The Oyo State government has four dumpsites which are located in four Local Governments namely Ido, Oluyole, Ona-Ara and Akinyele Local Governments. The dumpsites are valleys that are filled up with wastes being dumped there. The private contractors are given tickets before they can make use of the dumpsites. Concerning the nature of the dumpsites, a respondent answered thus:

The dumping sites are natural valleys like depressions that need to be filled. We call it filling. The dumpsites are not meant for dumping and forgetting about it. You see, after dumping you are supposed to carry soil to put on it so that it will not create flies. After depositing daily, you put soil on it. Then you can live it for 3 to 5 years to allow it to solidify and you can build on it. (IDIIMalelIbadan North LGI November 2014)

However, concerning the recycling and other processing of these solid wastes, it was gathered that scavengers are given the opportunity to sort out some materials that can be reused or amended but a formal waste to wealth scheme is not yet in place in Ibadan North LGA.

(d) Attitudes of residents towards Solid Waste Management and Environmental Sanitation in Ibadan North
Table 3 below shows the means of the responses about each of the statements meant to understand and measure the overall attitudes of residents of Ibadan North Local Government towards Solid Waste Management and Environmental Sanitation. Each statement was measured on a scale of 1 to 7 with 1 being items with positively worded endpoints while 7 represents items with negatively worded endpoints.
### Table 3: Attitudes of Residents towards Solid Waste Management and Environmental Sanitation in Ibadan North

<table>
<thead>
<tr>
<th>Base: <strong>All Respondents</strong></th>
<th>Total Mean</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Storing solid wastes in dustbins makes the environment looks neater</td>
<td>Storing solid wastes in dustbins does not make the environment look neater</td>
<td>7 1.51</td>
</tr>
<tr>
<td>1 Storing solid wastes in dustbins is convenient for me</td>
<td>Storing solid wastes in dustbins is not convenient for me</td>
<td>7 2.19</td>
</tr>
<tr>
<td>1 Burning solid wastes is not better than dumping it community dustbins</td>
<td>Burning solid wastes is better than dumping it community dustbins</td>
<td>7 2.96</td>
</tr>
<tr>
<td>1 Burning solid wastes is inconvenient for my neighbours</td>
<td>Burning solid wastes is convenient for my neighbours</td>
<td>7 3.20</td>
</tr>
<tr>
<td>1 Burning solid wastes makes the environment looks dirty</td>
<td>Burning solid wastes does not make the environment look dirty</td>
<td>7 2.98</td>
</tr>
<tr>
<td>1 Dumping solid wastes in rivers and gutters is not cheaper and faster than dumping it in community dustbins</td>
<td>Dumping solid wastes in rivers and gutters is cheaper and faster than dumping it in community dustbins</td>
<td>7 2.50</td>
</tr>
<tr>
<td>1 Dumping solid wastes in rivers and gutters causes environmental health hazards to people</td>
<td>Dumping solid wastes in rivers and gutters does not cause environmental health hazards to people</td>
<td>7 1.84</td>
</tr>
<tr>
<td>1 I feel bad when I dump solid wastes into rivers and gutters</td>
<td>I do not feel bad when I dump solid wastes into rivers and gutters</td>
<td>7 2.09</td>
</tr>
<tr>
<td>1 When the community dustbins are full, keeping the solid wastes till another time is good</td>
<td>When the community dustbins are full, keeping the solid wastes till another time is not good</td>
<td>7 4.35</td>
</tr>
</tbody>
</table>

**Source:** Field Survey, 2015

From the table, overall respondents felt that storing solid wastes in dustbins makes the environment looks neater (1.51) and it is convenient for them to store their solid wastes in dustbins (2.19). Respondents also felt that burning solid wastes is not better than dumping it in community dustbins (2.96), that it is inconvenient for their neighbours (3.20) and that it makes the environment looks dirty (2.98). It can also be seen that overall respondents felt dumping solid wastes in rivers and gutters is not cheaper and faster than dumping it in community dustbins (2.50), that it causes environmental health hazards to people (1.84) (Ishaq, 2004) and that they feel bad when they dump solid wastes into rivers and gutters (2.09) including when others dump solid wastes on the ground, in rivers or in gutters (1.89).

Overall respondents however felt neutral or negative about keeping solid wastes when community dustbins are full till another time (4.35). This was because majority of the respondents felt that it is bad to carry solid wastes to the community dustbins and then return it home. So they said that the best thing for them to do when they see that the community dustbins are full, instead of pouring it on the bins, is to wrap the waste up and then place it by the side of the community dustbin. Figure 6 below shows a good example of this.
Concerning the payment of waste collection charges, overall respondents felt that it will ensure effective management of solid wastes in Ibadan North (2.59) while they somewhat agreed or were neutral about feeling obligated or convenient when asked to pay for waste charges (3.58). This was captured better in the words of some IDI respondents as follows:

Although there are many contractors operating now but people are not patronizing them. They will say we have not eaten and you want us to be paying for waste. They said it is the responsibility of the state and the local government to carry their wastes for them so people are not patronizing the contractors well. (IDI/Male/Ibadan North LG/November 2014)

The attitudes of the people towards waste collection are not encouraging because they saw it as the social responsibility of the government and government alone cannot do it. That is always an eyesore and the smell it emits is very disturbing. This supports the findings of Okosun (2011).
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why we allow private sector to participate. (IDI/Male/Ministry of Environment/November 2014)

This is because they felt that the collection and disposal of solid wastes by the governmental agencies is a right of the citizens and duty of the government which thus should be free of charge and further supports the arguments of Blessing (2013). This therefore justifies the adoption of the theory of planned behaviour adopted for this study.

On the whole, from table 5, respondents felt that people's participation in environmental sanitation helps beautify the environment (1.27) while they indicated that they care about the beauty of their residential areas and workplaces (1.62) and they do not feel inconvenient or forced when it comes to participating in environmental sanitation (2.18). However, respondents generally felt they are threatened or pressured by the sanctions against wrong solid waste storage and management (3.13). This means they do not hesitate to pay fines when they are sanctioned as they are somewhat afraid of being caught and thus try as much as possible to obey environmental rules, steer clear especially when the environmental health officers are around or bribe their way out. Generally, respondents felt that giving rewards for good wastes management will encourage people to observe the proper management of solid wastes (1.64) and it will also motivate and encourage them personally to properly manage their solid wastes (1.88). From the above, it could be seen that residents of Ibadan North LGA have positive attitudes concerning some aspects of environmental sanitation but have negative attitudes towards other aspects of solid waste management.

Table 5: Attitudes of Residents towards Solid Waste Management and Environmental Sanitation in Ibadan North continued

<table>
<thead>
<tr>
<th>Base: All Respondents</th>
<th>Total Mean</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>People’s participation in Environmental Sanitation helps beautify the environment</td>
<td>1.27</td>
<td>392</td>
</tr>
<tr>
<td>I care about the beauty of the environment of my residential area or workplace</td>
<td>1.62</td>
<td>391</td>
</tr>
<tr>
<td>Participating in environmental sanitation does not make me inconvenient and forced</td>
<td>2.18</td>
<td>390</td>
</tr>
<tr>
<td>I feel bad when others dump solid wastes on the ground, in rivers or in gutters</td>
<td>1.89</td>
<td>389</td>
</tr>
<tr>
<td>I feel threatened or pressured by the sanctions against wrong solid waste storage and management</td>
<td>3.13</td>
<td>388</td>
</tr>
<tr>
<td>Rewards for good waste management will encourage people to observe the proper management of solid wastes</td>
<td>1.64</td>
<td>381</td>
</tr>
<tr>
<td>Rewards for good waste management will motivate and encourage me to properly manage my solid wastes</td>
<td>1.88</td>
<td>389</td>
</tr>
</tbody>
</table>

Source: Field Survey, 2015

In term of theoretical discussion, it could be seen that the agents or actors (Ministry of Environment, Local Government, Solid Waste Authority, Private Contractors, residents) involved in environmental sanitation may be seen as interdependent organs of a larger organisation or society (Ibadan North LGA) each having its specialised function working as a whole towards the common goal of delivering
effective service and carrying out responsibilities in ensuring a clean environment in the local government area thereby justifying the structural functionalist theory. Also, the behavioural beliefs, normative beliefs and control beliefs of the residents of Ibadan North LGA determine their attitude and level of involvement in the environmental sanitation of their area. Therefore, the theory of planned behaviour was suitable to predict their intent to participate in keeping the local government clean.

Conclusion

Environmental sanitation and solid waste management are very important for maintaining the aesthetic beauty of human environment as well as reducing health hazards, but it could not be effectively done without the involvement of all stakeholders in the process. This study has identified various agencies and stakeholders and partnership arrangement in promoting environmental sanitation and solid waste management in the local government area. The study also investigated the processes involved in solid waste management in the local government area which included solid waste storage at household level, methods of waste disposal, solid waste collection process, transportation process and final disposal by waste agencies in the study area. The study also revealed that residents in the Ibadan LGA had positive attitudes to solid waste management and sanitation. Based on the findings from this study, government should ensure better monitoring of waste disposal and management in Ibadan North LGA, and should embark on waste-to-wealth scheme so that some of the wastes can be officially re-processed and recycled for better use. Finally, government is challenged to intensify efforts at creating more awareness to the general public on various ways to properly manage and dispose off their wastes.

References


