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Research Article

Assessment of solid waste management practices in Ikere local government, Ekiti State

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ABSTRACT

The study assessed solid waste management practices in Ikere local government area of Ekiti state. The purpose of the study was to find out of solid waste management practice. The descriptive survey design research was used for the study. The sample size of three hundred (300) respondents was used for the study. Five (5) quarters was selected for the study. Five (5) streets were selected from each of the quarters. The simple random sampling technique was used to select sixty (60) houses from each quarter. The instrument for the study contained twenty-nine (29) items structured questionnaire adapted from O'Leary (2014). A test-retest method of reliability was used, using Pearson's Product Moment Correlation (PPMC). A coefficient of 0.67 was obtained at 0.05 level of significance. Chi-Square (x2) was used to test the hypotheses, at 0.05 alpha level. The finding of the study on burning of refuse as a solid waste management practice revealed that, the Null hypothesis was rejected therefore the result was significant. The researcher recommended that adequate attention must be given to waste management in order to safe guard human health.

Keywords: assessment; solid waste; management; practices;

1. INTRODUCTION

Globally, millions of tons of solid waste are generated every day. Urban waste management is drawing increasing attention, as it can easily be observed that too much garbage is lying uncollected in the streets, causing inconvenience, environmental pollution, and posing a public health risk (Zia & Devadas, 2008). The problem of solid, liquid, and toxic-waste management in Africa has come with urbanization in the developing world. An important feature of the urbanization of the developing world is the rapid growth of cities and metropolitan areas. Waste management is the collective process of storage, collection, transportation and disposal at dumpsites, processing, resource recovering, recycling and disposal of final waste. However, as it is widely accepted that the management of solid waste is a global problem, it is even more pronounced in developing countries such as Nigeria where solid waste management is a major concern (Butu & Mshelia, 2014). Adeyemi, Olorunfemi and Adewole (2001) observed that solid waste constitute a major problem in most developing countries. Adeyemi added that waste management is one of the most intractable problems facing city administrators and environmental agencies. Ogwueleka, (2009) reported that solid waste management is by far one of the greatest challenges facing environmental bodies in the country. As a result of the management challenges, Babafemi and Dauda, (2009) reported a breakdown of law and order in relation to waste management. They observed that urban centres are experiencing an increased rate of environmental deterioration as a result of indiscriminate dumping of solid waste. Ogwueleka (2009) argues that some of the approaches used in tackling the waste problems in Nigeria have recorded very little success. He observed that, the approaches do not distinguish the different needs and diversities of the different cities in the country. He added that these approaches are capital intensive and bureaucratic.

The different categories of wastes being generated, solid wastes had posed a hydra-headed problem beyond the scope of various solid waste management systems in Nigeria as the streets experience continual presence of solid waste from commercial activities (Geoffrey, 2005). Various researchers have undertaken to study solid waste generation pattern in Nigeria, but most of the studies are usually a case study of a particular state or locality in Nigeria; and it seems the awareness about solid waste generation in several other cities are obscured. Oluwawemimo (2007) has observed that little or no attention is given to some traditional suburban settlements for provision of waste collection and disposal services. Abeokuta, a traditional city in Nigeria, now to be found on the lane of increasing population due to extraordinary increase in the number of higher institutions in the state and improving economy, is yet to be fully explored for adequate information and data on solid waste collection and disposal. Using the instrument of questionnaire, interview and personal observations, this study also seeks to evaluate the common solid waste disposal options, the level of awareness on waste management; the effect of gender, age and educational status on solid waste management and reasons for not using an appropriate waste collection service (WCS) in traditional cities in Nigeria, taking Abeokuta as a case study. Age, educational status, and amount charged for waste collection services had been identified as factors influencing solid waste management in highly populated cities like Ibadan and Lagos (Ajani, 2007).

Omotoso and Jegede (2009) observed that in recent years, solid waste generation in metropolitan cities has increased prodigiously. They added that major high-ways have suddenly become the dunghill for many citizens. The state seems to have acquired the unenviable status of being one of the dirtiest cities in world. It is a development that has malevolently

aided the environmental problems of the mega-city. Solid wastes could be defined as non-liquid and nongaseous products of human activities, regarded as being useless and could take the forms of refuse, garbage and sludge (Leton & Omotosho, 2004). The implication is serious when a country is growing rapidly and the wastes are not efficiently managed. Consequently, of these waste materials were not well managed, they could result to serious health hazards. In Nigeria, waste generation scenario has been of great concern both globally and locally. Solid waste management is constitutionally a local government function. This is not exactly the position in Ekiti State, where the Ekiti State Waste Management Board (EKSWMB) exists as the sole public agency responsible for waste management in the state. Ekiti State Waste Management Board came into being because, it was assumed that individual Local Government Authorities were incapable of performing the function of waste management. Moreover, at the time of its establishment, solid waste management situation in Ikere-Ekiti is chaotic and embarrassing to most of her residents.

The indiscriminate disposal of municipal waste is increasingly becoming a prominent habit in most cities in Nigeria where wastes are usually dumped on roadsides, available open pits, drainage channels and rivers/stream channels (Yakubu & Giwa, 2006; Babayemi & Dauda, 2009; Onwughara, Nnorom & Kanno, 2010). This indiscriminate disposal of solid waste is linked to urbanization, population growth, poor governance, poverty, and low level of environmental awareness (Ogu, 2000; Adewuyi etal, 2009; Yakubu & Abdulkarim, 2015) and inadequate management of environmental knowledge (Abila & Katola, 2013). Improper solid waste management has potential negative environmental impacts such as pollution of air, soil, land; generation of greenhouse gases from landfills; health and safety problems associated with different forms of pollution (Unhabitat, 2010). Collection and safe disposal of solid waste in the cities of developing countries are great challenges for the municipalities where solid wastes are indiscriminately thrown away at different open dump sites throughout the city (Al-Khatib, 2010). These open dump sites create significant environmental problems such as polluting water resources, production of methane due to decomposition of organic waste which contributes to global warming and production of strong leachates due to biological process which pollutes groundwater resources (Awomeso, 2010).

Research questions

In an attempt to carry out the study, answers were provided to the following research questions:-

1. Is burning of refuse practice in Ikere local government area of Ekiti state?
2. Is the use of incinerators practice in Ikere local government area of Ekiti state?

Hypotheses

The following hypotheses were put forward for the purpose of this study:

1. There is no significant of refuse a practice in Ikere local government area of Ekiti state.
2. There is no significant use of incinerator practice in Ikere local government area of Ekiti state.

2. RESEARCH METHOD

The descriptive survey research design was used of for the study. The researcher considered the type of design suitable for the study because it allows a wide coverage within a limited time. It is the most widely used type of descriptive research. Survey design is very useful because it provides the 'glue' that holds the research project together (Kerlinger, 2017). The area of the study was Ikere- local government area of Ekiti State. It is one of the sixteen (16) local government areas of Ekiti State. The local government falls within Ekiti South Senatorial District of Ekiti State. It is one town local government with many farm settlements. The local government has about 202.38sq kilometers and shares boundaries in the East with Ise/Orun local Government; in the West with Ado local government; while it shares boundaries with Akure North local government in the south. Ikere-Ekiti is on longitude: 5° 14' 0" E, latitude: 7° 30' 0" N. It has garri processing industry as their main cottage industry; the common religions are Christianity, Islam and Traditional religion. The entire residents of Ikere- local government area of Ekiti State form the population of the research work. The Nigeria population censors conducted in 2006 has put the total population of Ikere local government as one hundred and forty-seven thousand three hundred and fifty-five (147,355). This figure was published on the National Population site for use. The sample size of three hundred (300) respondents was used for the study. The respondents were residents of Ikere-Ekiti local government area of Ekiti State. There are (16) quarters with over eighty (80) streets in Ikere-Ekiti. Five (5) quarters was selected for the study. Five (5) streets were selected from each of the quarters. The simple random sampling technique was used to select sixty (60) houses from each quarter.

The simple random sampling technique was used to select respondents from the houses from one street of quarter. The selection cut across men, women, old and the young ones. The instrument that was used for the study was a structured questionnaire adapted by the researcher (O'Leary, 2014). The questionnaire is made up of two sections, A and B. Section A was used to elicit information on the Bio-data of the respondents which include name of street, gender, age and the occupation. Section B was used to elicit information on the research variables. The questionnaires contained seventeen (17) items on a four- point of rating of Always, Sometimes, Seldomly and Never. The reliability of the instrument was carried out, the test-retest method of reliability were-used. Twenty (20) respondents from Ikoyi street in Ikere-Ekiti were used for the reliability test, the street did not form part of the streets that were selected for the study. The instrument was administered to respondents and after two weeks the second administration of the instrument was done. The two sets of data were analysed using Pearson's Product Moment Correlation (PPMC) to obtain a coefficient of 0.67. The administration of the questionnaire was done by the researcher and two (2) trained research assistants. The researcher and the research assistants distributed the questionnaire to the respondents after a brief interaction with the respondents, adequate time was given to the respondents to respond to the questionnaire and completed questionnaires were collected immediately. Data analysis was done using Chi-Square (x^2) to test the hypotheses at 0.05 alpha level.

3. RESULTS AND DISCUSION

Hypotheses testing

Hypothesis 1

There is no of refuse a practice in Ikere local government area of Ekiti state.

1. This hypothesis was derived from research question 1. Is burning of refuse practice in Ikere local government area of Ekiti state?

Table 1. Chi-square (x^2) analysis of responses on burning of refuse practice

S/n	Items	Always	Never	Total	Df	x² Cal	x² Critical.	Results
1	I....practice refuse burning in my home	240	60					
		(60)	(15)	300				
2	Burning of commercial waste on a business premises or	196	104					
	farmyard is .....done in my community	(60)	(15)	300	3			S
3	Burning of waste in a barrel or exposed heap (born fire)	236	64				7.815	
	in a yard or garden is .....practice in my environment	(60)	(15)	300				
4	Burning of refuse is ...done because I think it is the	241	59			2862.71		
	safest method for refuse disposal	(60)	(15)	300				
	Total	913	287	1200				

Table 1 revealed that x^2 calculated value was 2862.71 and the x^2 critical value was 7.815. Since x^2 calculated value was higher than x^2 critical value at 0.05 level of significance and degree of freedom (df) 3, the Null (Ho) hypothesis was rejected therefore the result was significant. This implied that burning of refuse practice is significant.

Hypothesis 2

There is no significant use of incinerator as a solid waste management practice in Ikere local government area of Ekiti state. This hypothesis was derived from research question 2. It aims at finding out if the use of incinerator is a solid waste management practice in Ikere local government area of Ekiti state.

Table 2. Chi-square (x^2) analysis of responses on use of incinerator

S/n	Items	Always	Never	Total	Df	x² Cal.	x² Critical.	Results
1	I .....make use of incinerator in my home	179	121					
		(44.75)	(30.25)	300				
2	Use of incinerator is .....carried out under controlled	205	95					
	condition	(44.75)	(30.25)	300				
3	Incineration plants .....use filters to trap dangerous	222	78		3		7.815	S
	gases	(44.75)	(30.25)	300				
4	The usage of incinerator .....helps individual	252	48			3135.11		
	household to be tidy and neat	(44.75)	(30.25)	300				
	Total	858	342	1200				

Table 2 revealed that x^2 calculated value was 3135.11 and the x^2 critical value was 7.815. Since x^2 calculated value was higher than x^2 critical value at 0.05 level of significance and degree of freedom (df) 3, the Null (Ho) hypothesis was rejected therefore the result was significant.

Hypothesis 3

There is no significant dumping of waste in the bush as a solid waste management practice in Ikere local government area of Ekiti state. This hypothesis was derived from research question 3. It aims at finding out if dumping of waste in the bush is a solid waste management practice in Ikere local government area of Ekiti state.

Discussion

The purpose of the study was to investigate the assessment of solid waste management practices in Ikere local government area of Ekiti state. The analysis of hypothesis 1, (**Table 1**) implied that burning of refuse was significantly great as a solid waste management practice in Ikere local government area of Ekiti state. Though Nnorom and Oji-nnorom, (2005) and Nnorom, etal., (2010) revealed that Burning of polystyrene foam in incinerators might release harmful air pollution also ash from incineration is also major obstacle to the construction of waste-to-energy facilities, because small concentrations of heavy metals are present both in the air emission (fly ash) and residue (bottom ash) from the facilities. It was also supported that remote areas scavenging by people and animals, natural biodegradation of organic wastes, burning at the initial point of disposal, and local self-help are well known solid waste disposal practices (Hashmi, Malik & Usman 2007; Nisar, Ejaz, Naushad & Ali, 2008). The researcher supported that the practice seems to provide a cheap option of disposing refuse and thereby causing air pollution in the community.

The results obtained in hypothesis 2, (table 8) has shown that there was a significant of use of incinerators. Though Narayana, (2009) stated that incineration does not eliminate waste but reduce and transform it into new forms which also

require disposal in landfills. Selk, (2007) revealed that waste management by incineration is estimated to cost about 7 times more than landfilling. Recycling of MSW is widely practiced in developed nations. There are great concerns about incinerators due to aesthetic issues such as foul odors, noxious gases and gritty smoke. Additionally, air quality deterioration, toxicity, disposal of produced ash and potential leaching of heavy metals from fly ash are critical concerns about incineration (Nkwachukwu,Chidi & Charles, 2010). In developing nations where waste composition is mainly organic, incinerators require the supply of excess fuel for waste combustion due to high moisture content of solid waste (Zhang, Herbell & Gaye-Haake, 2004; Ogwueleka, 2009). The researcher is of the opinion that incineration is not suitable for developing nations due to health risk posing on the environment.

4. CONCLUSION

Base on the findings of the study, the following conclusion were drawn. The burning of refuse as a solid waste management practice was significant in Ikere local government area of Ekiti state. The study revealed that many respondents in the studied area were formed in the practices of burning of refuse. The use of incinerator was also significant as a solid waste management practice in Ikere local government area of Ekiti state. The answers of the respondents revealed that the use of incinerator could expose people to health risk. The dumping of waste in the bush as a solid waste management practice was significant in Ikere local government area of Ekiti state. The findings of the study revealed that residents of studied area were preferred dumping of waste in bush than other methods of waste disposal. The study has also revealed that some respondents supported that dumping of waste in the gutter should be practiced to move wastes away from the dumping point.

AUTHOR'S CONTRIBUTIONS

All authors discussed the results and contributed to from the start to final manuscript.

CONFLICT OF INTEREST

The authors declare that they have no competing interests.

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