
EFFECTIVE WASTE MANAGEMENT STRATEGY IN STUDENTS HOSTEL IN TERTIARY INSTITUTIONS IN NIGERIA, A CASE STUDY OF UNIVERSITY OF NIGERIA NSUKKA

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ABSTRACT

Waste management (waste disposal) includes the activities and actions required to manage waste from its inception to its final disposal. This includes the collection, transport, treatment and disposal of waste, together with monitoring and regulation of the waste management process. The study aims to explore effective waste management strategy in student's hostels in tertiary institutions in Nigeria. The study was guided by the administration control theory. Cross-sectional survey design was adopted, and simple random sampling was used to select the 204 respondents across the selected study area. The instrument for data collection was questionnaire and data generated was analyzed using the statistical package for social sciences (SPSS). Chi-square statistical analysis was employed to test the relationship between variables. Finding from this study revealed that installation of waste bins (56.9%) at the hostel was the major waste management strategy adopted by the hostel authority. The waste management strategies in UNN hostels were significantly perceived to be ineffective (54.4%). The ineffectiveness of waste management strategies in UNN hostels was majorly attributed to the following: far distance between student hostel rooms and waste bins (47.5%), inadequate waste collection and disposal services (31.4%) and lack of awareness on waste management rules (54.4%). The study, there recommends that school authority in collaboration with environmental social workers should come up with implementable policies that would make waste disposal easy, safe and effective. Social workers should also engage in advocacy for adequate provision of waste disposal equipment and education geared to inculcate into the student the values of engaging in appropriate waste management and disposal practices.

Keywords: *Effective Waste Management Strategy, University Student Hostels, Social Workers, Nigeria.*

INTRODUCTION

Waste management is an important facet of sustainable development for any nation or society. Waste management (or waste disposal) includes the activities and actions required to manage waste from its inception to its final disposal. This includes the collection, transport, treatment and disposal of waste, together with monitoring and regulation of the waste management process (United Nations Statistics Division, 2017). Around the world, waste generation rates are rising. In 2016, the world's cities generated 2.01 billion tones of solid waste, amounting to a footprint of 0.74 kilograms per person per day. With rapid population growth and urbanization, annual waste generation is expected to increase by 70% from 2016 levels to 3.40 billion tones in 2050 (Tiseo, 2020). In some developed countries, management of wastes within the country is considered as part of urban activities and there are comprehensive programs for wastes management within states and cities (European Environment Agency, 2018). In USA 80% of cities and universities have their own waste management programs (Aylene, 2016). For example, during year 2007, a waste characterization study performed in the Campus "Mexicali I" of the Autonomous University of Baja California (UABC). The goal was to set the basis for implementation of a recovery, reduction and recycling waste management program at the campus (Armijo, 2018). Over the past 10 years, Sweden developed methods of repurposing waste, so less than one percent of the total waste generated in the country makes it to landfills. To accomplish this, they increasingly shifted their focus with regard to waste from disposal methods to prevention and recycling. Moving waste management up the 'waste hierarchy. Hence, they changed their perspective of garbage (Emerly, 2019).

Africa is facing a growing waste management crisis with Available data showing that 125 million tons per annum of municipal solid waste (MSW) was generated in Africa in 2012, of which 81 million tons (65%) was from sub-Saharan Africa (Cooper, 2012). This is expected to grow to 244 million tons per year by 2025. However, with an average waste collection rate of only 55% (68 million tons)(Cooper, 2012). Nearly half of all MSW generated in Africa, remains within our cities and towns, dumped onto sidewalks, open fields, storm water drains and rivers (Institute of Scrap Recycling Industries [ISRI], 2011). The average MSW collection rate in sub-Saharan Africa is lower at only 44%,

although the coverage varies considerably between cities, from less than 20% to well above 90% (ISRI, 2011). Current reasons for the poor management of waste in Africa, include, amongst others, weak organizational structures; lack of appropriate skills; inadequate budgets; weak legislation; lack of enforcement; low public awareness; corruption, conflict; political instability; and lack of political will. At the heart of the problem, is a failure in governance (Cooper, 2012). In Tema and many other rapidly growing cities, the issue of solid waste is a major source of concern owing to the inefficiency observed in the sanitation management services provided by poorly resourced regulatory authorities. Solid wastes are supply-driven, limited only to local authorities, who are much slower in adjusting to the demands of the residential areas, industries, institutions and even streets and market places despite the various charges levied by the city council (Federal Ministry of Environmental Affairs, 2015).

In Nigeria, waste management has been a major challenge especially since post-independence era (Baynes, 2019). Waste generation has consistently expanded both in volume and complexity this is due to the rapid increase in population over the years, increase in socioeconomic development, industrialization, technology advancements, changing lifestyles and consumption patterns. Sadly, these developments have not been matched by adequate provision including funding and infrastructural facilities to sustainably manage this ever growing quantum of waste (Akpen, Tyagher & Ogori, 2015). Consequently, this has led to a poor state of our environment as all manner of wastes clog our drainages, litter our streets, high-ways, market places, public places and in fact most open places. Solid waste management in Nigeria is characterized by inefficient collection methods, insufficient coverage of the collection system and improper disposal. Disposal in most Nigeria cities include, co-disposal of hazardous and municipal waste in open, unlined dumps, open burning of municipal solid wastes, dumping on water bodies and in other unauthorized places. The situation is so bad, that presently Nigeria cannot boast of even a single properly engineered sanitary landfill for its municipal solid wastes (Akpen, Tyagher, & Ogori, 2015).

In order to fill these seeming gap and promote sustainable solid waste management in Nigeria, the Federal Ministry of Environment has

over the years embarked on intervention programmes to assist the state and local governments manage their municipal solid waste in environmentally sound and sustainable manner. The Ministry conducted studies in year 2001/2002 on waste generation and characterization in Fifteen (15) Nigerian Cities. The outcome of the above studies led to a National stakeholder's workshop in year 2006 after which an Integrated Waste Management Facility option was recommended for Nigerian major cities with private sector participation. The project is based on public private partnership with various components such as, material recovery facility, plastic recycling plant, compost plant, leach ate treatment plant, biomedical waste incinerator etc. The project is presently being implemented in some cities (Chung & Lo, 2014). Waste management in Nigeria is still bedeviled by several constraints. These include inadequate funding, lack of political will especially on the part of local authorities charged with this responsibility, inadequacy of existing policy, legal and regulatory frame work at all levels of Government, attitudinal problems, inadequate Infrastructures and human capacity, inappropriate technology, insufficient information on the quantity and composition of waste (Chinwe, 2010). It is against these backdrops that this study is set to explore effective waste management strategy in student's hostels in tertiary institutions in Nigeria.

STATEMENT OF THE PROBLEM

The increasing volume and complexity of waste associated with the modern economy is posing a serious risk to ecosystems and human health. Every year, an estimated 11.2 billion tons of solid waste is collected worldwide and decay of the organic proportion of solid waste is contributing about 5 per cent of global greenhouse gas emissions (International Environmental Technology Centre [IETC], 2014). Thus, a lot of non-biodegradable waste (that is substance that cannot be broken by bacteria) are generated and since non-biodegradable are not easily absorbed or diluted naturally such waste accumulate in heaps along major streets. The stinking odour and blackish liquid effluence emanating from such heaps especially during the rainy season constitute environmental hazards and degrade the aesthetic values of our environment. Poor waste management, ranging from non-existing collection systems to ineffective disposal, causes air pollution, water and soil contamination. Open and unsanitary landfills contribute to contamination of drinking water and can cause infection and transmit

diseases. The dispersal of debris pollutes ecosystems and dangerous substances from electronic waste or industrial garbage puts a strain on the health of the dwellers and the environment. They as well encourage breeding of mosquitoes and communicable diseases. Therefore, the rate of generation of solid waste is not matched with the rate of evacuation as a result of problems ranging from lack of funds and professional experience staffs of bureaucracy and redtapism (Akowe, 2015). Hence, the dreaded nature of poor waste management has attracted the interest of researchers to delve into the study. Much work have been done in the area of waste management in Nigeria, but are very much limited to history and nature of waste management in Nigeria (Chung & Lo, 2014). Solid waste management in the capital city of Abuja, (Akowe,2015) and the socio-cultural factors influencing waste disposal in Nigeria (Akpen, Tyagher, &Ogori, 2015).This therefore becomes imperative for this study which seeks to find out the effective waste management strategy in student's hostels in tertiary institutions in Nigeria.

Theoretical Orientation

The administration control theory forms the theoretical orientation of this research. The theory was put forwards by Useem and reisig in 1999. The theory explains the situation whereby the authorities neglect their administrative responsibility, rather than their lack of awareness of it. Using this theory to explain the experiences faced by students in hostels, particularly students in government owned tertiary institutions. One could say that, departments such as the works department, environmental department and soon have to a large extent neglect their responsibilities of providing clean and sustainable environment for the students through proper and effective waste management methods, thereby living most students with lot of health and psychological issues, which often affect their level of understanding.

RESEARCH METHODOLOGY

Design of the study

The design for this study was cross sectional survey research design. In medical research and social science, a cross-sectional study (also known as cross- sectional analysis, transverse study, and prevalence study) is a type of observational that analysis's data from a population or a representative subset, at a specific point in time – that is a cross-sectional data (Lee, 1994). A cross- sectional survey collects data to make inferences about a population of interest (universal) at one point in time

cross sectional survey has been described as snapshots of the populations about which they gather data.

Area of the Study

The area of the study was university of Nigeria, Nsukka, in Nsukka LGA Which is located in the Northern part of Enugu state of the south east, Nigeria with people who are mostly Christians and African Traditional Religion (ATR). The main campus is located at Nsukka (University of Nigeria, Nsukka, UNN) bears three other campuses (university of Nigeria Enugu campus UNEC), Itukwu-Ozalla (University of Nigeria Teaching Hospital, UNTH) and Aba (University of Nigeria Aba Campus UNAC). The University of Nigeria is recognized as the first full-fledged indigenous and technically became the first university of Nigeria. The university has 15 faculties which bears 102 academic department the university offers 82 undergraduate programmes and 211 post graduate programmes. It has 10 faculties that make up Nsukka campus, Nsukka campus has 871hecters (2150 acres). University of Nigeria Nsukka is made up of 36000 students (UNN, 2019). There different categories of students found in the campus; they include undergraduate students, graduate and post graduate (masters) students, PhD students etc (Ogunsola, 2014). The focus of this study will be undergraduate's students due to the fact that they constitute majority of the students. The researcher choice of studying University of Nigeria Nsukka is not far from the reason that the university has a considerable population, that are very much knowledgeable about the processes of carrying out an academic research, as such will pose no much challenge to the researcher during the research process and will enhance objectivity in the research.

Population of the study

The population of this study was undergraduate students of university of Nigeria, Nsukka, which is 25657 of all regular, registered undergraduate students in university of Nigeria, Nsukka (UNN, 2018). This figure became the target population for the study.

Sample size

A sample size 204 was statistically determined using Taro Yamane's formula for determining sample size. This sample was drawn from undergraduates of four hostels in the University of Nigeria, Nsukka.

In order to share this figure among the four (4) hostels selected, a total of 51 questionnaires was assigned to Alvan Hostel, Eni-Njoku, Okpara hostel, and Marry-Slaso hostel respectively. This summed the total sample size for the study to 204 respondents.

Sampling Techniques

The study adopted a multi stage sampling procedure. This entailed successive selection of hostels and respondents that was involved in the study using cluster and simple random sampling. There are 12 hostels in the Nsukka campus of UNN. As such, the study area was assembled into 12 clusters in accordance with the existing 12 hostels with each hostel forming a cluster. Simple random sampling (SRS) (balloting) was used to select four hostel and the hostel selected are Alvan Hostel, Eni-Njoku, Okpara hostel, and Marry-Slaso hostel. Also, availability and purposive sampling techniques was used to select the respondents that are available and ready to engage in the process.

Instrument of data collection

The questionnaire served as the instrument for data collection. The questionnaire was for 204 respondents and also the questionnaires contained open-ended and close-ended questions. The questionnaires consisted of two parts; the section "A" elicited information socio-demographic characteristics of the respondents such as age, religion, educational qualification, place of resident, marital status and occupation among others. Section "B" focused on the major research issue.

Administration of the instruments

The questionnaire was administered by the researcher with the help of two research assistants who were second year students of Department of Social Work, UNN. The research assistants were trained by the researcher for a period of one day on the objective and method of data collection. The questionnaires were distributed to the respondents at their various hostels and even at their lecture classes with the approval of lecturers involved.

Method of data analysis

The data collected using the questionnaire were sorted, assembled, coded and analyzed using Statistical Package for the Social Sciences (SPSS). Descriptive statistics like frequency tables and percentages were

used for easy interpretation of the data. The chi-square (χ^2) inferential statistics was used to determine the relationships that exist between the dependent and independent variables.

RESULTS AND DATA PRESENTATIONS

This section focused on analyses, presentation and interpretation of data collected in the field. Data collected will be analyzed using frequency distribution tables. The study was undertaken in three parts which included: First, the demographic variables which consist of the following: gender, hostel, religious affiliation, ethnic group, faculty, level of study. The second part focused on the view of the respondent on the issues raised in the research work, and the third part dealt with testing the relationship between variables using chi-square. The process of data collection had 100% return rate. The 204 questionnaire that was distributed were validly filled and returned. This was possible because of the immense effort of the researcher and the research assistants towards a close monitoring of the process.

Table 1: Demographic characteristics of respondents

Characteristics	Frequency (N=204)	Percentages (100)
Gender		
Male	103	50.5
Female	101	49.5
Hostel		
Alvan	51	25.0
Mary Slessor	51	25.0
Eni-Njoku	51	25.0
Okpara	51	25.0
Religion		
ATR	3	1.5
Christianity	200	98.0
Atheism	1	.5
Faculty		
Biological Science	29	14.2
Pharmaceutical Science	11	5.4
Arts	33	16.2
Physical Science	15	7.4
Social Science	43	21.1
Engineering	19	9.3

Health Science & Technology	7	3.4
Basic Medical Science	7	3.4
Education	17	8.3
Vertinary medicine	3	1.5
Vocational Technical Edu.	6	2.9
Agriculture	14	6.9
Level of study		
100 Level	101	49.5
200 Level	41	20.1
300 Level	28	13.7
400 Level	30	14.7
500 Level	4	2.0

Source: Field work, 2021

Table 1 shows that greater proportion of the respondents (50.5%) was male. The hostel accommodation of the student had equal representation, thus: Alvan (25.0%), Mary Slessor (25.0%), Eni-Njoku (25.0%), and Okpara (25.0%). Over 98% of the study respondents were christens. Greater proportion of the study respondents (98.0%) were from the faculty of the social science. In addition, greater proportions of the study respondents were 100 level students.

Table 2: Substantive Issues of the Research

Substantive Issues	Frequency (204)	Percentages (100)
Waste management strategies		
Yes	150	78.5
No	54	26.5
Strategies adopted		
Installation of waste bin at strategic points	116	56.9
Construction of drainages	8	3.9
Establishment of waste management department	20	9.8

Burning of waste	6	2.9
Awareness on waste management rules		
Yes	93	45.6
No	111	54.4
Effectiveness of strategies		
Effective	64	31.4
Not effective	140	68.6
Factors that influence effective waste management		
Level of study	2	1.0
Gender	14	6.9
Distance between hostel and waste bin	97	47.5
Awareness on appropriate waste disposal	83	40.7
Lack of drainage system	2	1.0
Lack of discipline	2	1.0
Attitude of neglect	2	1.0
All of the above	2	1.0
List of challenges		
Lack of equipment	54	26.5
Waste littering & odour	42	20.6
Bad attitude	22	10.8
Inadequate waste collection	64	31.4
Over population	2	1.0
Good drainage system		
Yes	82	40.2
No	122	59.8

Source: Field work, 2021

The result of the study in table 2 shows that 78.5% of the study respondents indicated that UNN hostels adopted waste management

strategies in an effort to manage the university hostel waste. Greater proportion of the respondents (56.9%) revealed that the most adopted waste management strategy was installation of waste bin at strategic points. Again, greater proportion of the study respondents (54.4%) were of the view that hostel authorities does not give students awareness on waste management rules at the beginning of the semester. This implies that there is awareness gab on appropriate methods of waste disposals. A majority of the study respondents (54.4%) indicated that the waste management strategies adopted by UNN hostels was not effective, and a greater proportion of the student (47.5%) agreed that far distance between hostel and waste bin was the major factor responsible for the ineffectiveness of waste management strategies in UNN hostel. Furthermore, greater proportion of the study respondents (31.4%) were of the view that the greatest challenge of waste management strategies in the UNN hostel was inadequate waste collection and disposal services among university authority. The study also revealed that the UNN hostels do not have good drainage system (59.8%).

Table 3: Effectiveness of waste management strategies by availability of good drainage, availability of properly planned dumpsters, and awareness of waste management rules

Waste management strategies	Availability of good drainage		p value
	Yes	No	
Effective	36(43.9%)	28(23.0%)	.002
Not effective	46(56.1%)	94(77.0%)	
	Availability of strategic dumpster		
	Yes	No	
Effective	42(42.4%)	22(21.0%)	.001
Not effective	57(57.6%)	83(79.0%)	
	Awareness on waste management rules		
Effective	45(48.4%)	19(17.1%)	.000
Not effective	48(51.6%)	92(82.9%)	

Source: Field work, 2021

Table 3 presented a chi-square test of the relationship between the following variables: availability of good drainage and effectiveness of waste management strategies, availability of properly placed dumpsters and effectiveness of waste management strategies, and awareness of waste management rules and effectiveness of waste management strategies. It can be observed that deficiency in the following variables: availability of good drainage ($p = .002$), availability of properly placed dumpsters ($p = .001$) and awareness of waste management rules ($p = .000$) were significantly associated with ineffective waste management strategies in UNN hostels.

Furthermore, hostels that do not have good drainage (77.0%) were found to have ineffective waste management strategies. Again, hostels that do not have properly placed dumpsters (79.0%) were found to have ineffective waste management strategies. In addition, hostels that the students do not have awareness on waste management rules (82.9%) were found to have ineffective waste management strategies.

DISCUSSION OF FINDINGS

Degradation of the environment is among the key problems of today's life. A need to protect the surroundings and the environment has become more important than anything else (Olusegun, 2014). However,

generation of waste is one of the important contemporary environmental problems in urban areas as well as colleges (Pattnaik & Reddy, 2010). Hence this study aims at exploring effective waste management strategies in student's hostels in tertiary institutions in Nigeria. Findings from this study revealed that greater proportion 73.5% of the respondents indicated that there were waste management strategies adopted by UNN, these findings is consistent with the findings of Kenobi (2015) whose findings revealed that there is efficient waste management in the University of Calabar. Also findings from this study revealed that the predominant waste management strategies adopted by UNN hostels was installation of waste bin at strategic points. This finding is consistent with the findings of Kenobi (2015) which noted that the management practice in place in the University of Calabar is daily collection and disposal with waste bins being posted at strategic points across the main campus, library, hostel and staff quarter areas. These bins are being emptied and disposed off when they become full.

Findings from this study revealed that hostel authorities do not give students awareness on waste management rules at the beginning of the semester. This finding is consistent with the findings of Navarro et al (2017) which noted that public awareness of waste management technique is significantly low in many developing countries campuses. The study also found out that waste management strategies in UNN hostels were not effective. This finding is strongly in agreement with the findings of Ezerie (2017) which stated that efforts to improve waste management in Aba have not recorded significant success.

Findings from this study also revealed that the far distance between hostel and waste bin was the major factor that that leads to ineffective waste management in UNN student's hostel. This finding is in contrast with the findings of Akowe (2015) which stated that poor public education or enlightenment has no doubt led to the ineffectiveness of the various waste management strategy adopted by the federal capital administration. Also the study found out that UNN student hostel does not have good drainage system. This finding is consistent with the findings of Navarro (2017) which stated that poor drainage and disposal system are challenge confronting solid waste management in many institutions in developing countries.

Furthermore, the study revealed that student hostels that reported poor drainage were found to have ineffective waste management strategies compared to those who reported good drainage. Similarly, student hostels that reported lack of strategically placed dumpsters were found to have ineffective waste management strategies compared to the hostels that reported that they have strategically placed dumpsters. In addition, hostels that the students were not inculcated with the awareness of waste management rules were found to have ineffective waste management strategies. This invariably implies that a concerted effort to address poor drainage, lack of strategically placed dumpsters and lack of awareness of waste management rules will produce effective waste management strategies in UNN hostels and other Universities around the Nation.

IMPLICATION OF THE FINDING TO SOCIAL WORK PRACTICE IN NIGERIA

Base on the findings of this study, it is obvious to state here that social workers have plethora of roles to play in ensuring that waste is properly disposed. Advocacy is one of the tools used by social workers in effecting the desired change. Therefore, social workers in Nigeria can help in advocating for the right and waste management strategies and for those who are faced with issues of proper waste management. It was established from the findings of this research that the distance between hostel and waste bin was the major factor that influences the ineffective waste management in UNN student's hostel. Hence, the need for social workers to advocate the plight of the students to the school authority. Also social workers could educate the students about proper waste management and the negative effective of not complying. Furthermore social workers should influence policy makers to come up with policy measures that will help to improve the waste management system of tertiary institution in Nigeria.

CONCLUSION

Conclusively, waste management in the University of Nigeria Nsukka hostels has shown to be ineffective, due to factors such as far distance of waste bin and student hostel rooms and residential areas, lack of education of students about waste management, inadequate waste collection and disposal and the poor drainage system all around the student hostels. Hence efforts should be made to address the various issues pointed out as the contributory factors to the ineffectiveness of

waste management in various tertiary institutions in the country. The study therefore, recommends that school authority in a multi-professional team work with environmental social workers should come up with implementable policies that would make waste disposal easy, safe and effective. Value-added recycling of waste should be given precedence over open dumping of waste. Environmental social workers should engage in advocacy for the provision of efficient and adequate waste disposal equipment and education geared to sensitize the students on appropriate waste management and disposal.

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