IOSR Journal Of Humanities And Social Science (IOSR-JHSS)
Volume 20, Issue 1, Ver. II (Jan. 2015), PP 18-24
e-ISSN: 2279-0837, p-ISSN: 2279-0845.
www.iosrjournals.org

Solid Waste Management in Enugu Metropolis: Implications for Urban Administration

*Iyida M.N.
Registry Unit Enugu State University Of Science And Technology Enugu, Nigeria.

Abstract: *This work examined the solid waste management in Enugu metropolis for urban administration. Over some period now Enugu metropolis has witnessed big volume of solid waste that adversely affected urban administrator's capacity to plan. The improper management of solid waste in Enugu metropolis constituted health hazards to the citizens. A survey research method was adopted in the study and two hypotheses guided the study. Data generated were analyzed using frequency tables, percentages and chi-square. The findings showed that irregular collection of solid waste affects urban development in Enugu metropolis and that lack of strict enforcement of environmental laws is responsible for indiscriminate dumping of solid waste. It is therefore recommended that Government should enforce strictly all the environmental related bye-laws, generate sufficient funds for solid waste management and also checkmate indiscriminate dumping of waste by the citizens and ensure timely carting away refuse dumps in the metropolis.*

Keywords: *Enugu metropolis, Refuse, Urban administration, Government and bye-laws.*

I. Introduction

It has been discovered that among developing nations in the world, Nigeria is one of the most urbanizing countries. The development of urban centers in Nigeria has a historical antecedent dating back to the pre-colonial era [1, 2, 3, 4 and 4]. That is to say, urbanization in Nigeria has been in existence before the advent of European colonization. Scio-economic and political factors such as rapid rate of population growth; viable economic enterprises and increase size of rural-urban migration played a significant role towards the development of urbanization in Nigeria [5, 5, 6 and 7].

Before, the advent of colonial rule, Nigeria had cities especially in the North and West that later transformed to urban centers [8, 9, 10, 11 and 12]. Those cities originated as either administrative or capitals, religious centers or developed through immigration of people from towns and villages perceived as backward or under-developed [13, 14, 15, 16, 17 and 18].

It has been observed that in the post-colonial period, the urge to develop and fulfill election promises as an independent nation state, the psychological trauma of the Nigerian civil war, the creation of states from 12 to 36 presently, industrialization policy and fall-out of petroleum economy, all enhanced rapid development of urbanization in Nigeria [4,6,7, 20, 21, 22 and 23]. The process of urbanization involves shifts in patterns of population settlement, shifts in the locus of power and influence from rural to the urban areas. The process of urbanization therefore, requires proper management of solid waste in urban areas such as Lagos, Abuja ,Kaduna, Enugu and Onitsha [24, 25, 26 and 27].

Today, it is believed that over 240 urban centers exist in Nigeria with a population of about 35 million people and urbanization level of 42% [13, 17, 28, 29, 30 and 31]. According to United States report (2000) Nigeria may reach an urbanization level of 61.6% by the year 2025. In fact, continue to encourage immigration from rural and pre-urban settlement. It is not doubt that due to the alarming rate of urbanization in Nigeria, it has become a complex and difficult issue for the government to maintain and handle some of its social administrative duties in the urban areas. Such duties include solid waste management which is regarded as the most disturbing phenomenon in most urban cities like Enugu. This study therefore, aims at examining the implications of solid waste management in urban administration of Enugu metropolis [32 and 33].

One of the most problematic phenomena in Nigeria cities today is solid waste management. According to Ugwu (2000), the institutional and infrastructural facilities to deal with urban wastes in Nigeria apart from being inefficient are not enough when compared to the volume of solid waste being generated in the cities. According to Elekwa (2001) the shift in the balance of population between urban and rural areas and between the developed and developing countries began about 1970 and 1990. He stated that the UN (1993) has project that the level of global urbanization figure will pass the 50% figure by the year 2005 and by the year 2025, more than 60% of the world's population will be living in urban areas.

The rapid growth in urban population in Nigeria has far-reaching implications for waste generation and management. In 1983, the total volume of solid waste generation in Nigeria cities was about a million tones and

it was project to about 15 million tones by the year 2000 [31] . As at present, there are fears about the capability of urban administration to cope with the efficient management of solid waste.

According to Ogawa [8 and 31], environmental and waste management problem are caused by lack of technical, financial, institutional, social economic factors. He opined that these hinder the effective solid waste management in most Nigerian cities including Enugu metropolis. Similarly, the non implementation of development policies and poor enforcement of sanitation legislations by the agencies concerned may be affecting effective management of solid waste in Enugu metropolis. Some other variables that may be affecting solid waste management in Enugu metropolis include irregular collecting and disposal service, crude open dumping, industrial and commercial growth and human wricknesses. In spite of the frequent change in leadership of Enugu State Waste Management Agency, the problem of solid waste and its attendant implication is still there. There is no gainsaying the fact that problem resulting from poor solid waste management has retarded development in Enugu metropolis.

Objectives of the study

The broad goal of the study was to examine the implications of solid waste management in urban administration in Enugu metropolis, and the specific objectives were to:

- To investigate the manner of solid waste management in Enugu metropolis and its implication in urban administration.
- To ascertain whether indiscriminate dumping of solid waste in Enugu metropolis is being checked/controlled.

II. Research Design And Methodology

Area of Study

The study covered Enugu North, Enugu South and Enugu East Local Government Areas. These Local Government make up the Enugu metropolis, Nigeria.

Research Design

Survey research is used to determine the opinion, attitude and perception of respondents on solid waste management in Enugu metropolis.

Sources of Data

The study utilized two main sources in the collection of its data – primary and secondary sources. Primary sources include questionnaires, structured oral interviews and personal observations. Secondary sources were extracted from journals, government gazettes and publications, periodicals, textbooks, the Internet and magazines.

Method of Data Collection

The procedure for data collection is through questionnaire.

Population of the Study

Three local government areas namely, Enugu North, Enugu South and Enugu East (Enugu metropolis, Nigeria) form the population of the study. The combined population of the three local government areas is 722,664 according to the 2006 National Population Census. Therefore the population of study is 722,664.

Table 1: Population Distribution Table

Option	No of Male	%	No of Female	%	Total	%
Enugu North	100,000	13.8	144,852	20.00	244,852	33.9
Enugu South	78,000	10.8	120,723	16.7	198,723	27.5
Enugu East	109,089	15.1	170,000	23.5	279,089	38.6
Total	287,089	39.7	435,573	60.2	722,664	100

Source: 2006 National Population Census

Sampling Techniques

The multi- stage sampling technique was used in selecting the groups that fell in the sample. In this process, the respondents were stratified into their various categories, and in the second stage, simple random sampling were used to select the number from each stratum.

Table 2: Distribution of Sample Size

Option	No of Male	%	No of Female	%	Total	%
Enugu North	55	13.7	78	21.3	133	35
Enugu South	44	11	62	16	106	27
Enugu East	60	15	90	23	60.3	38
Total	159	39.7	230	60.3	389	100

Source: Field Survey, 2013

It is impracticable to study all the population in a work of this nature. A percentage of the population was sampled to arrive at a size appropriate and manageable in the study. To determine the appropriate sample size for the study, the Taro Yamane formula was applied.

According to Yamane (1964)

$$n = \frac{N}{1+N(e)^2}$$

Where n = sample size

N = total population (722,664)

e = significance level (0.05)

$$n = \frac{722,664}{1+722,664\ (0.05)^2}$$

$$= \frac{722,664}{1+722,664\ (0.0025)}$$

$$= \frac{722,664}{1+1806.66}$$

$$= \frac{722664}{1807.66}$$

$$= 399.77$$

The sample size is 400 approximately.

Validity and Reliability of Test Instrument

The instrument that was used in data collection was validated through the under listed ways:

a) Expert/ face validation: The researcher validated the data gathering instrument through her supervisors and experts in the area of study. The essence is for them to make some correction in the instrument by face validation.

b) Pilot Text: the researcher carried out a pilot text by administering the questionnaire to a proportion of the sample others not included in the sample. The aim was to find out whether the questionnaire guide meant the same thing to all the respondents and to find out whether the questions were understood by the anticipated respondents.

c) Content Validation: This was used to ensure that the instrument captured what it was supposed to measure so as to ensure that reliable data were collected from the respondents.

d) Criterion Related Validity: This was employed by comparing test or scale scores with one or more external variables or criteria know or believed to measure the attribute under study.

III. Results And Discussion

Table 3: Distribution and Return of Questionnaire

Option	No Issued		% Issued		No Rtd		% Rtd		No not Rtd		% not Rtd		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Enugu North	55	80	13.7	20	55	78	13.7	21.	-	2	-	0.5	55	80
Enugu South	44	67	11	16.7	44	62	11	16	-	5	-	1.25	44	67
Enugu East	60	94	15	24	60	90	15	23	-	4	-	1	60	94
Total	159	241	39.7	60.7	159	230	39.7	60.3	0	11	0	2.75	15	241
	400				389								9	
							100%							

Source: Field survey, 2013

The questionnaire was administered by the researcher to the respondents using six (6) research assistants who were trained beforehand. Each assistant handled a particular area. These research assistants were undergraduate students of the Enugu State University of Science and Technology (ESUT). Instructions guiding the filling of

the instrument were explicitly given. The questionnaire instruments were made up of structured questions. A total of 400 copies of the questionnaire were administered and of this, 389 were returned.

Method of Data Analysis

The main statistical tool used for data analysis in this study was chi –square (x^2), and simple percentages.

Data Presentation and Analysis

This section is concerned with the presentation and analysis of data generated in the course of study. The hypotheses formulated for this study were tested and research questions were answered. Data gathered from respondents as well as interviews were presented and analyzed. Moreover, some preliminary questions were posted to the respondents to obtain data on their biography. The variables discussed were gender, age, qualification and work experience.

Table 4: Sex Distribution of Respondents

S/N	SEX	FREQUENCY	PERCENTAGE (%)
1	Male	120	30.8
2	Female	269	69.1
	TOTAL	389	100

Source: Field Survey, 2011

From table 4 above, out of the 389 respondents sampled in the field survey 120, representing 30.8 percent of the respondents were males while 269, representing 69.1 percent were females. So females were more in number than males.

Table 5: Age Distribution of Respondents

S/N	AGE (YEARS)	FREQUENCY	PERCENTAGE (%)
1	18-29	42	10.7
2	29-39	198	50.8
3	40-50	96	24.6
4	51-65	53	13.6
	TOTAL	389	100

Source: Field Survey, 2011

Table 5 above shows that 42 (10.7%) of the respondents were in the age brackets of 18-29 while 198 (50.8%) aged between 29-39 years. Also, 96 (24.6%) aged 40-50 years while 53 representing 13.6% were in the age brackets of 51-65 years. Thus, the age brackets of 29-39 (50.8%) formed the major population for the study.

Table 6: Marital Status of Respondents

S/N	MARITAL STATUS	FREQUENCY	PERSENTAGE (%)
1	Single	82	21
2	Married	307	78.9
	TOTAL	389	100

Source: Field Survey, 2011

Table 6 above shows that out of the 389 respondents sampled, 82 (21%) were single while 307 representing 78.9 percents were married. So, married respondents were more in number than the single ones.

Table 7: Occupational Distribution of Respondents

S/N	EDUCATIONAL QUALIFICATION	FREQUENCY	PERCENTAGE (%)
1	FSLC	43	11
2	WASC	124	31.8
3	OND/NCE	86	22.1
4	HND/B.Sc/BA	128	32.9
5	M.Sc /Ph.D	8	2
	TOTAL	389	100

Source: Field Survey, 2011

From Table 7 above, out of the 389 respondents sampled, 43 (11%) have the First School Leaving Certificate (FSLC) while 124 (31.8%) have the West African School Certificate (WASC). Also from the table 7 above, 86 (22.1%) were holders of OND/NCE, 128 (32.9%) have first degree (HND/B.Sc/BA) while 8 (2%) of the respondents have higher degrees of M.Sc/Ph.D. Therefore, all the respondents could read and write.

Table 8: Occupational Distribution of Respondents

S/N	OCCUPATION	FREQUENCY	PERCENTAGE (%)
1	Self – Employed	131	33.6
2	Private –Sector Employed	88	22.6
3	Public- Sector Employed	157	40.3
4	Others (student, retired etc)	13	3.3
	TOTAL	389	100

Source: Field Survey, 2011

Table 8 above shows that out of the 389 respondents sampled, 131 (33.6%) were self-employed while 88(22.6%) were employed in the private sector. The table also shows that 157 (40.3%) of the respondents were civil servants (Public-Sector Employed). Only 13 (3.3%) of the respondents were either students, retired from service or out of work.

Table: 9 Rate of solid waste collection in Enugu Metropolis

Option	SA	A	UD	SD	D	TOTAL
M	41	34	25	26	33	159
F	60	45	40	40	45	230
TOTAL	101	79	65	66	78	389

Source: Field Survey, 2013

From the table above, 101 respondents representing (26.0%) Strongly agreed that the irregular collection of solid waste in Enugu metropolis affects urban development, 79 respondents representing 20.3% agreed, 65 were undecided, 66 respondents representing 16.9% strongly disagreed while 78 respondents representing 20.1% agreed. Therefore, majority of the respondents in Enugu metropolis were of the view that irregular collection of solid waste affects urban development.

Table 10: Methods of solid wastes management adopted

Option	SA	A	UD	SD	D	TOTAL
M	26	25	34	41	33	159
F	40	40	45	60	45	230
Total	66	65	79	101	78	389

Source: Field Survey, 2013.

Table 10 above showed that 66 (16.9%) of respondents strongly agreed that the methods of solid waste management adopted in Enugu metropolis affects urban development, 65 (16.7%) of respondent agreed, 79 (20.3) were undecided, 101 (26.0%) strongly disagreed while 78 (20.1%) of the respondents agreed. In view of the above, a greater percentage of the respondents disagreed that the methods of solid waste management adopted in Enugu metropolis, affects urban development.

Table 11: Indiscriminate Dumping of Solid Waste

Option	SA	A	UD	SD	D	TOTAL
M	41	34	25	26	33	159
F	60	45	40	40	45	230
Total	101	79	65	66	78	389

Source: Field Survey, 2013.

From the table above, 101 (26.0%) respondents strongly agreed that indiscriminate dumping of solid waste affects urban development in Enugu metropolis, 79 agreed, 66 strongly disagreed, 65 were undecided, 66 strongly disagreed while 78 (20.1%) disagreed. Thus, majority strongly agreed that indiscriminate dumping of solid waste hindered urban development in Enugu

Table 12: Knowledge of Environmental Laws

Option	SA	A	UD	SD	D	TOTAL
M	41	34	25	26	33	159
F	60	45	40	40	45	230
Total	101	79	65	66	78	389

Source: Field Survey, 2013.

Table 12 above showed that 101 respondents representing 26% strongly agreed that Enugu metropolis were aware of the Environmental laws, 79(20.3%) agreed, 65 (16.7%) were undecided, 66 (17%) strongly disagreed while, 78 (20%) disagreed. Therefore, Enugu metropolis were aware of the Environmental laws.

Table 13**: Lack of Strict Punishment**

Option	SA	A	UD	SD	D	TOTAL
M	41	34	25	26	33	159
F	60	45	40	40	45	230
Total	101	79	65	66	78	389

The above table showed that 101 (26%) strongly agreed that Enugu metropolis have not strictly punished the indiscriminate dumpers of solid waste, 79 (20.3%) agreed, 65 (16.7%) were undecided, 66 (17%), strongly disagreed while 78 (20%) agreed. Thus, majority believed that Enugu metropolis have not punished the indiscriminate dumpers of solid waste. The results of this research showed that the rate of solid waste management in Enugu metropolis does not promote urban development. Also, lack of strict punishment of indiscriminate dumpers of solid waste affects urban development in Enugu metropolis. It was also found that solid waste management methods adopted in Enugu metropolis is not effective and the alarming rate of deterioration of solid waste in Enugu metropolis is coursed by inadequate funding.

IV. Conclusion

Based on the findings made in the course of this study, the following conclusion could be reached. First and foremost, solid waste management has grave role implication in urban administration in Enugu metropolis such that it has become a standard measuring rod for the effectiveness of urban administration in the metropolis. It is also the conclusion of the study that problem associated with management of solid waste in Enugu metropolis has to do with the lackadaisical attitude on the part of most urban residents towards the issue of proper and regular collection of solid waste.

The study also concluded that effective management of solid waste generated in Enugu metropolis poses a big challenge to urban administrators in the area. Finally, the study also concludes that there are a number of problem areas the administrators of Enugu metropolis should address towards realizing effective solid waste management as a vital aspect of urban administrators in the metropolis.

Recommendations

Based on the findings made in the course of this study and the conclusion reached thereto, the study hastens to make the following recommendations.

- Urban administrators in Enugu metropolis should ensure regular collection of solid waste.
- The study also recommended that the residents of Enugu metropolis should be strictly punished for indiscriminate dumping of solid waste.
- The residents of the Enugu metropolis should be educated on how to manage solid waste in a much more sustainable manner.

In addition to the call that government should give priority attention to the provision of adequate funds to urban administration for effective and efficient management of solid waste being generated in the metropolis, the various ministries, Agencies and Departments (MDAs) should strive to expand their revenue bases instead of present habit of waiting for fund from government.

References

[1]. Agunwamba, J.C (2001) *waste Engineering and management tools*, Enugu: immaculate pub. Ltd.

[2]. Atuegbu, B. C. (2007). Waste Generation and management in Enugu city", unpublished B. Sc. Project, Department of Geography and Regional planning, University of Benin, Nigeria.

[3]. Chukwu, A.O. (2002). The effects of indiscrimination disposal of plastic waste in the Environment: A case study of Enugu" An Unpublished BURP Dissertation of the Department of Urban and Regional Planning, University of Nigeria Enugu Campus

[4]. Chukwu, K. e. (2007). Recycling of used plastic products: its sanitary and commercial production in Enugu State" *paper presented at a stakeholders work- Shop on converting waste to wealth through waste Recycling organized by ESWAMA* January 30-31, 2007.

[5]. Chukwuemeke, E.O. (2012), " The challenges of waste management to Nigeria's Sustainable Development: *A case study of Enugu State International" journal Of Research Studies in management, vol.1 No .2, pp 81*

[6]. Ekengwu, R. O. (2001). Urbanization in Nigeria" *Daily Independent*, December 7

[7]. Elekwa, N.N. (2010). The concept and nature of Cities in Developing and industrial Societies and Emerging Tends in City Management" in Ezeani E. and

[8]. Elekwa. N.N. (2001), *in Urbanization and urban Administration in Nigeria*, Enugu: Jamoe Enterprises.

[9]. Emeribe, A.C. (2000). *Environment solid waste management for sustainable development in Nigeria: some New perspectives, policy and contending Issues in Nigerian National Development Strategy*, Enugu: John Jacobs Classic pub. Co.

[10]. Eze Phli, P.O (2001). Urban Environmental Problems in Nigeria in Ezeani E. and Elekwa. N.N (eds), *issues in Urbanization and Administration in Nigeria*,Enugu: Jamoe Enterprises.

[11]. Eze, H.O. and Asadu, E. C. (2003). Sustainable waste management in Enugu" A paper presented at the 34th Annual conference of the Nigerian institute of Town Planners Abeokuta, October 22-24.

[12]. Eze,N.N. (2010). *A Critical Evaluation of Urban Problems and Prospects in Nigeria*, Enugu: Mega publication.

[13]. Ezeodili W.O.(2013). *Urban Administration in Nigeria*, Enugu: Densar Walters Enterprises.

[14]. Graiser, S. (2007). The Best way to manage solid waste in Developing Nations", *International Journal of Environment, 4 (3). Pp 39-40*

[15]. Khalil, N. Khan, M. (2009). A Case Municipal Solid Waste Management System for a Medium Sized Indian City, Aligarh" *Journal of Environment and Urbanization* vol. 14, pp 177-182
[16]. Mabogunje, A.J. (1988). *Urbanization in Nigeria,* London: Heineman Publishers.
[17]. Nwachukwu, M.U.(2009). Solid Waste Generation and Disposal in a Nigerian city: An Empirical Analysis in Onitsha Metropolis", *Journal of Environmental Management and safety (JEMS),* Vol. 1 No .1, pp, 2
[18]. Ogbalu (2003).*Urbanization in Nigeria,* Enugu Nigeria, John and sons Enterprises.
[19]. Ogbalu, A .I (2004). Refuse Management: the role of health education" *Environmental studies and research journal* vol. 4 No.2. pp,11-12
[20]. Ogbor, K. C. and Okosun, A.E (2003). The role of cavengers in urban solid waste management in Nigeria", *Environmental studies and research journal,* Vol. 4 No.2 pp 5
[21]. Ogbor, K.C. (2009). Sustainable Financing of Environmental management in Nigeria", *Journal of Environmental management and safety (JEMS) vol.1 No.1, pp22*
[22]. Okeke, C.C (2011*). Foundations of Education and Behavioural Research*: *issued and Methology:* Enugu Academic Publishing Company.
[23]. Okeke, D. (2009). Alternative strategic plan for urban sanitation in Nigeria", Journal *of Environmental Management and Safety (JEMS), vol.1 No.1 December*
[24]. Okeke, D.I (2009). *Urbanization and waste management in Nigeria,* Enugu: Grace and John Publisher.
[25]. Okezie J.C. (2008). Urban Solid waste problem in Nigeria" *National Vanguard,* January 14
[26]. Rodgers, M. (2011). *Fundamental of development Administration:* London: S.k. Publishers.
[27]. Sanda, L. (2008). *The Organization and efficiency of solid waste collection:* Toronto: Lexington Books
[28]. Uchegbu, S. N. (2007). *Environmental and protection,* Enugu, Precision printers.
[29]. Udeh, C. (2009). Environmental management strategies for city Authorities", *Journal of Environmental Management and safety (JEMS), Vol.1 No.1, pp1-3*
[30]. Ugwu S. C. (2000). *Issues in Local Government and Urban Administration in Nigeria,* Enugu: Echrisi & Company.
[31]. Uwadiegwu, B.O. and Chukwu, K.E. (2010). Strategies for Effective Urban Solid Waste Management in Nigeria, *Unizik Journal of Environmental management,Vol.3 No.5*
[32]. Uwakwe, G. N. (2010). Public Agency system in solid waste management: A comparative Analysis of Umuahia and Owerri Experiences" B.SC Dissertation, Enugu State University of Science and Technology ESUT, Enugu.
[33]. Vladmir, K. and Haran, D.U (1977). *System theory,* London: Longman.