

Factors responsible for effective solid waste management in Oredo Local Government Area, Edo State, Nigeria

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Abstract

This research work examines the various factors responsible for effective solid waste management in Oredo Local Government, Benin City, Edo State. The objectives of this study are to access the knowledge of people towards refuse disposal and to ascertain the role of finance and equipment in the maintenance of refuse disposal programme in Benin City. To achieve the objectives of the study, data from primary and secondary sources were collected. From primary source, one hundred (100) questionnaire were administered by the researcher of which ninety (90) were retrieved successfully and used for data presentation and analysis. While the secondary source consist of textbooks, journal, manuals and other publications. Simple percentage was used for data presentation and analysis. Inferential statistical tools-chi-square analysis was employed in testing the following hypotheses: If there is or no significant relationship between people's knowledge as influence of effective waste disposal and if there is or no significant relationship between finance, equipment as it affect proper disposal of waste. From the hypotheses tested, we find out that lack of finance is a factor responsible for inadequate waste disposal in Oredo Local Government Area. It was also discovered that lack of equipment or tools such as tippers and pail loaders are major problem facing effective waste management in the local government as well as people's knowledge towards environmental sanitation in Oredo Local Government Area, Benin City.

Keywords: Solid Waste Management, Finance, Local Government, Environmental Sanitation, Effectiveness

1. Introduction

Solid waste as an inevitable product of society population, increase in commercial activities and industrialization of major cities in the world has contributed towards an increase in the volume of wastes generated. These in turn pose health danger to the populace which make waste management the most important environmental issues today. This is especially significant for cities in the developing world where population and economies are rapidly expanding but the infrastructure to handle and manage the ensuring problem is either grossly inadequate or totally unavailable. (UNEP, 2005).

In Nigeria, about 25 million metric tonnes of solid wastes are generated yearly (Ogwueleka, 2009). Sada (1984) has observed that in 1980, on the average, a balance of 100 metric tonnes of solid wastes are generated daily in Benin City, this has increase recently to 350 metric tonnes, and the maximum rate of evacuation achievable was only 250 metric tonnes daily.

According to Owoje & Okojie (2013) the ill attitude and poor understanding of the public towards solid waste management has contributed to indiscriminate disposal of solid waste in Benin City. It is common knowledge that our streets, offices, markets, motor parks, abattoirs, industries and residential areas are hardly provided with facilities such as plastic waste bins used for solid waste collection and disposal which lead to the populace (men, women and children) disposing their wastes indiscriminately into public drains, along the streets, nearby bushes and rivers leading to blocked drains, polluted water and filthy environment.

The main causes of solid waste crises in Benin City are insufficient available data. Lack of knowledge of solid waste management, funding and the resident's attitude (Ibhadode and Anyata, 2009). This is why Odun (1975) asserted that in order to effectively and efficiently handle waste management operations, everyone should be made to understand that basic ecological principles must be applied if man was to achieve and maintain a symbiotic relationship with nature.

Research shows that much attention has been given to the studies of waste and its associated effects in Nigeria. Most of the work carried out centred mainly on classification of urban solid waste), environmental impacts and consequences of solid waste generation and recycling of mixed waste plastic products (Ekwueme and Achikanu 2000. Surprisingly, little attention has been given to the effective strategies for the management of urban solid waste in Nigeria cities.

A large number of scholarly works has been produced on the solid waste collection and management crisis in the Nigerian cities. The majority of this literature is devoted to explaining the basis for high wastes generation, inefficient waste collection and management in urban areas (Agunwamba, 1998; Agwu, 2012; Igbinomwanhia, 2014; Kayode and Omole, 2011; Ogwueleka, 2009).

From all these intellectual gaps that have been observed, this study on the factors responsible for effective strategies for solid waste disposal in Oredo Local Government will properly address the problems of waste disposal in Edo State, Nigeria as a developing country.

2. Methodology

2.1 The objectives of the study

- i. To access the knowledge of the people towards refuse disposal.
- ii. To ascertain the role of finance and equipment in the maintenance of refuse disposal programme.

2.2 Research hypotheses

- H₀₁: There is no significant relationship between people's knowledge as influence of effective waste disposal and gender responses.
- H_{R1}: There is no significant relationship between finance, equipment as it affects proper disposal and settlement type of respondents.
- H₀₂: There is significant relationship between people's knowledge as influence of effective waste disposal and gender responses.
- H_{R2}: There is significant relationship between finance, equipment as it affects proper disposal and settlement type of respondents.

2.3 Population of the study

Population is the total group the researcher wishes to study. It is also called the universe. Therefore, the population of this study is the estimated 1,676,132 residents of Oredo Local Government Area, Benin City. (World Population Review, 2019).

2.4 Study area

Oredo Local Government Area of Edo State was divided into zones for environmental sanitation purpose. Three out of the zones were used. There were various sectors from which refuse was collected and disposed off. Such sectors include markets, offices and residential areas. The study covered refuse collection and disposal from these areas. The areas include New Benin/Oba Market and surroundings streets, Ekewan Road and

environs and Oko Central all in Benin City. Those selected for study were the public of Oredo Local Government Area. Which comprises men, women and children.

2.5 Sample technique

Stratified sampling method was used. The Local Government Area was stratified into zones for the purpose of refuse collection and disposal. Three out of the zones were randomly selected, the zones are New Benin / Oba Market and environs, Ekewan road environs and Oko central and environs.

2.6 Sample size

The sample size of this study consist of One hundred (100) randomly selected respondents from the inhabitants of the Three (3) zones enumerated above. Forty (40) respondents from New Benin/Oba Markets and its environs, Thirty (30) respondents from Oko Central and its environs while another Thirty (30) respondents from Ekewan road and its environs making a total of One Hundred (100) respondents. These zones were carefully and randomly selected to cover the entire Oredo Local Government Area, Benin City.

2.7 Research instrument and administration

For the purpose of this research, the questionnaire method was adopted and structured to elicit vital information concerning unsanitary disposal of waste, therefore the close ended and open ended questionnaire was adopted. The close ended questions indicate the extent to which the respondent agree or disagree with a given statement on a Yes, No and No idea scale for a series of statement while the open ended question is to allow respondent to include more information and understanding of the subject to capture the intensity of their feelings for a given item.

The questionnaire was divided into two sections: A and B. Section A sought to find out the personal information of the respondents. Section B dwells on staff and inhabitants of Oredo Local Government Area pertaining to the disposal of waste in Benin City.

2.8 Data collection method

The methods of data collection used for this research were primary and secondary data sources.

2.8.1 Primary Data

This refers to information directly collected from field in their original state. The researcher adopts questionnaire method, which involves the use of printed questions. These questions are prepared to enable the researcher gain response concerning certain

information. The questionnaire are set with a view of gaining unbiased answers which will be used in testing the correctness of the problem at hand and help in proffering solutions.

2.8.2 Secondary Source

This includes existing records which contained information about waste management. This secondary written source includes published books, pamphlets, articles and bulletin on waste management.

2.9 Methods of data representation and analysis

For easy identification of collected data, the researcher presented the opinion of the respondents in a tabular form. This tabulation gave concrete picture and cases in comparison and also reveals at a glance, the differences in opinion in a more comprehensive manner, and the percentage of each opinion.

In analysing the data and testing the stated hypotheses, simple percentage and inferential analysis-chi-square was used. The interpretations of data presented were given also. All the analyses were based on the results derived from the research questionnaire. For the purpose of this study, "waste management" was treated as the dependent variable while the following were manipulated as the independent variables:

- i. People knowledge;
- ii. Finance; and
- iii. Equipment.

3. Results and Discussion

The major instrument used in the collection of the various data was questionnaire and they were administered at random to selected inhabitant of Oredo Local Government Area, Benin City. One hundred (100) copies of the questionnaire were administered and ninety (90) of them were retrieved which represent 90%.

3.1 Analysis of demographic data and relevant information

Analysis of data and relevant information collected for this research is grouped as follows:

i. Demographic characteristics of the respondents

Figure 1 reveals the gender distribution of the respondents. The respondents were evenly represented with 45 male (50%) and 45 female (50%). This implies that both genders were equally represented in the study.

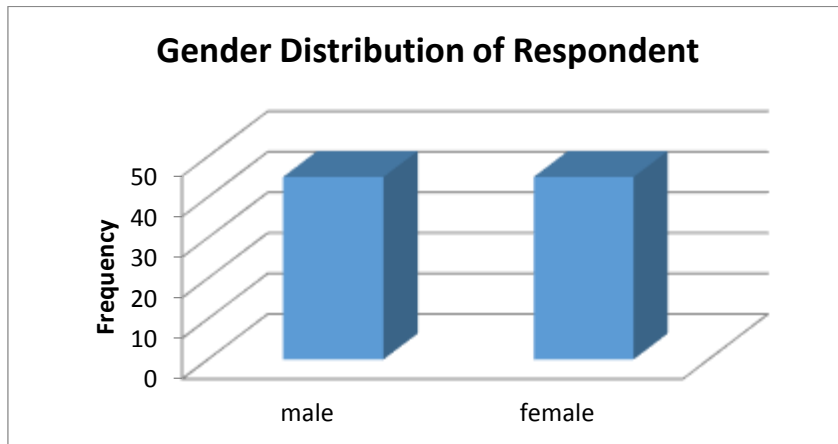


Figure 1: Distribution of respondents' Gender

Figure 2 shows the Age Range distribution of the respondents. As shown in the figure, majority of the respondents are within the age range of 31 – 45yr (43.3%), this is followed by the 18 – 30 yr (24.4%), 11 – 17 yr (15.6%), 46yr & above (14.4%) while 6 – 10 yr (2.2%) was the least age range . This implies that the majority of the respondents were those within the age range of 31 – 45 years old.

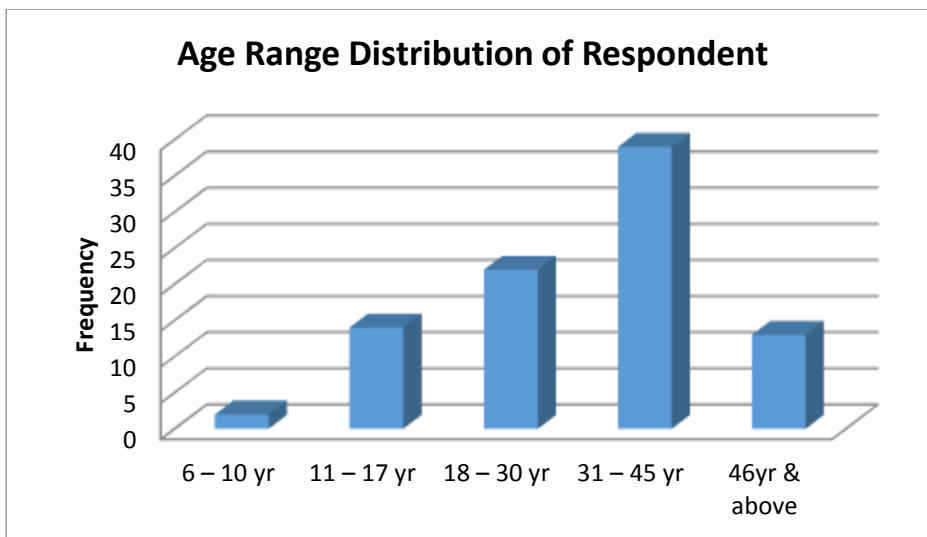


Figure 2: Distribution of respondents' Age Range

Figure 3 reveals the occupation distribution of the respondents. Majority of the respondents in this study were civil servant (42) and represented 46.7% of the total respondents, this is followed by student (22) 24.4%, then Business (20) 22.2% while those without any occupation- None (6) 6.7% were the least. This implies that majority of the respondents were civil servants. The implication is that majority of the respondents are of matured mind whose right sound decision is certain.

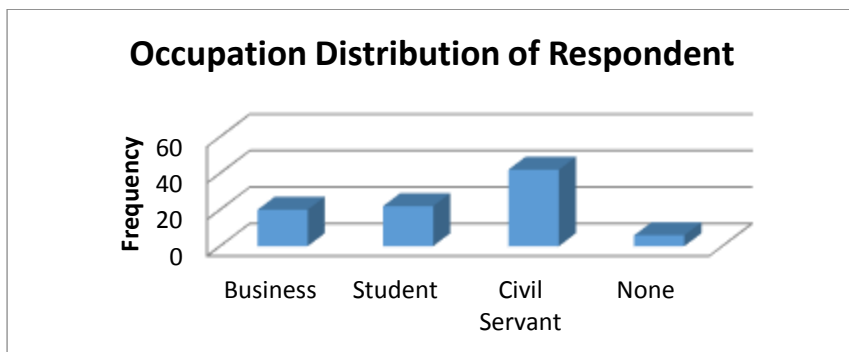


Figure 3: Distribution of respondents' Occupation

Figure 4 shows the Academic Qualification distribution of the respondents. As shown in the table, majority of the respondents 46 (51.1%) are First Degree and above holders. This is followed by 19 (21.1%) belonging to S.S.C.E holders, O.N.D holder is next with 13 (14.4%), followed by No formal Education with 7 (7.8%) while Primary School leaving Certificate holder is the least with 5 (5.6%). This implies that the majority of the respondents holds a First Degree.

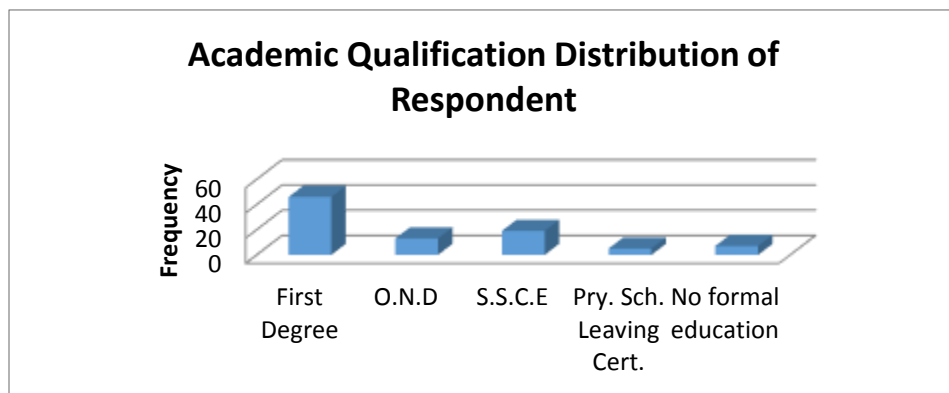


Figure 4: Distribution of respondents' Academic Qualification

Figure 5 reveals the Marital Status distribution of the respondents. Majority of the respondents in this study were Married (51) and represented 56.7% of the total respondents, this is followed by Single (37) 41.1%, while Divorced and Widowed with (1) each represented 1.1% and 1.1%. This implies that majority of the respondents were Married.

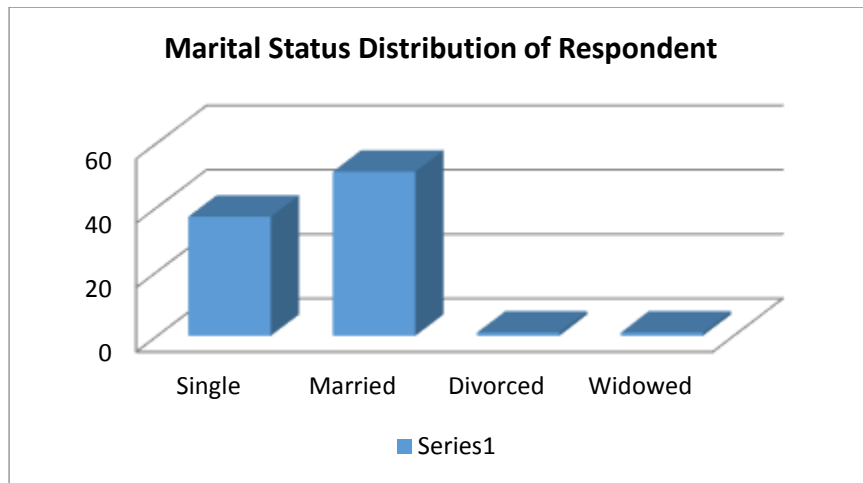


Figure 5: Distribution of respondents’ Marital Status

ii. Rating of respondents Views

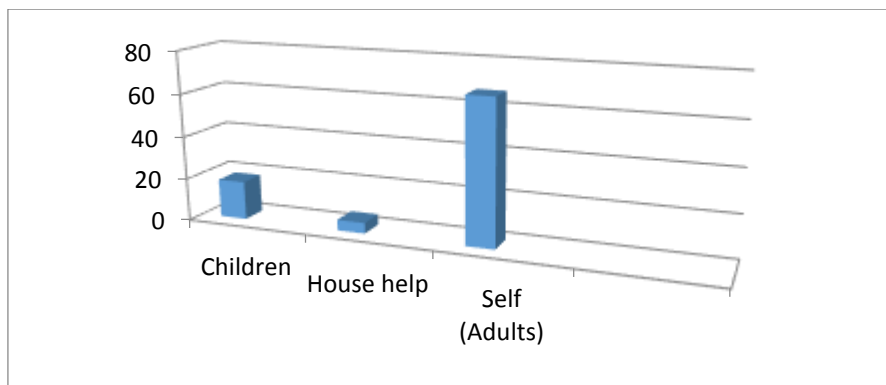


Figure 6: Respondents view on who dispose waste at home

Figure 6 shows that 18 (20%) of the respondents believed that those who dispose waste in various home are children, 5 (6%) were of the view that house help are responsible for disposal of solid waste at home while 67 (74%) believed that adults dispose waste by themselves. Therefore, based on the majority of respondents, one can categorically state that adults are responsible for waste disposal.

3.2 Analysis of the research questions

This section presents the analysis of the two research questions raised in this study.

i. Research Question One:

Do people’s knowledge influence effective waste disposal?

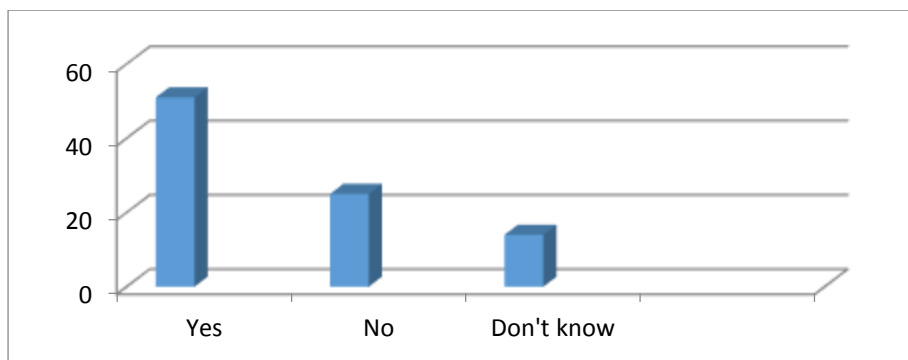


Figure 7: Can any person’s knowledge influence the way he/she disposes waste?

Figure 7 shows the responses for the question “Can any person’s knowledge influence the way he/she disposes waste?” As shown in the table, majority of the respondents 51 (56.7%) responded “yes” to the question. This is followed by 25 (27.8%) belonging to the ‘No’ response while the “Don’t know” response accounts for 14 (15.6%) is the least. This implies that the majority of the respondents believe that a person’s knowledge influences the way he/she disposes waste.

ii. Research Question Two: Does finance and equipment affect proper disposal of wastes?

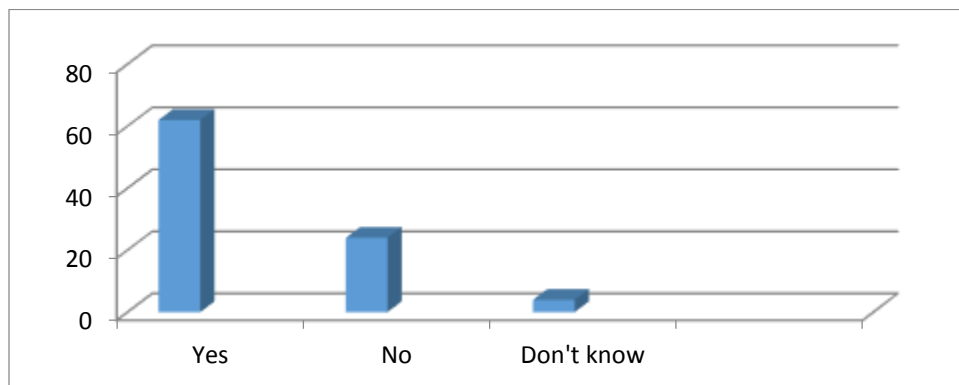


Figure 8: Can lack of finance affect the way waste is being disposed?

Figure 8 shows the responses for the question “Can lack of finance affect the way waste is being disposed?” As shown in the table, majority of the respondents 62 (68.9%) responded “yes” to the question. This is followed by 24 (26.7%) belonging to the ‘No’ response while the “Don’t know” response accounts for 4 (4.4%) is the least. This implies that the majority of the respondents believe that lack of finance affect the way waste is disposed.

3.3 Testing the hypotheses.

Decision Rule

If P-value (calculated) is less than threshold value 0.05 we reject the null hypothesis and accept the alternative hypothesis but if the P-value (calculated) is greater than the threshold value 0.05 we fail to reject Ho (null hypothesis).

Hypothesis One:

- HO₁** There is no significant relationship between people’s knowledge as influence of effective waste disposal and gender responses.
- HO₂** There is significant relationship between people’s knowledge as influence of effective waste disposal and gender responses.

In analysing the above hypothesis, question thirteen (13) of the questionnaire was used. Variables measured for the hypothesis are:
 People’s knowledge (independent variable) waste management (dependent variable).

Table 1: Gender, people's knowledge as influence of effective waste disposal Cross tabulation

			People's knowledge as influence of effective waste disposal			Total
			Yes	No	Don't know	
Gender	Male	Count	24	12	9	45
		% of Total	26.7%	13.3%	10.0%	50.0%
	Female	Count	27	13	5	45
		% of Total	30.0%	14.4%	5.6%	50.0%
Total		Count	51	25	14	90
		% of Total	56.7%	27.8%	15.6%	100.0%

Table 2: Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1.359 ^a	2	.507
Likelihood Ratio	1.376	2	.503
N of Valid Cases	90		

The chi square results from Table 2: $X^2 = 1.359$, $df = 2$, $p = 0.507$ shows that there is no statistically significant relationship between people's knowledge as influence of effective waste disposal, and Gender because the p-value is larger than the threshold value of 0.05. This therefore implies that the null hypothesis (H_{01}) will not be rejected, hence we conclude that there is no statistically significant relationship between people's knowledge as influence of effective waste disposal and their gender. In other words being a male or female do not affect people's knowledge as regarding effective waste disposal.

Hypothesis Two:

HO₁ There is no significant relationship between finance, equipment as it affects proper disposal of wastes and the settlement type of respondents.

HO₂ There is significant relationship between finance, equipment as it affects proper disposal of wastes and the settlement type of respondents.

Variables measured for the hypothesis:

Finance/equipment (independent variable) waste management (dependent variable).

**Table 3: Settlement type * finance, equipment as it affects proper disposal of wastes
Cross tabulation**

		Yes	No	Don't know		
Settlement type	Urban	Count	38	0	0	38
		% of Total	42.2%	0.0%	0.0%	42.2%
	Semi Urban	Count	12	16	0	28
		% of Total	13.3%	17.8%	0.0%	31.1%
	Rural	Count	12	8	4	24
		% of Total	13.3%	8.9%	4.4%	26.7%
Total		Count	62	24	4	90
		% of Total	68.9%	26.7%	4.4%	100.0%

Table 4: Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	40.622 ^a	4	.000
Likelihood Ratio	47.774	4	.000
N of Valid Cases	90		

The chi square results from Table 4 : $X^2 = 40.622$, $df = 2$, $p = 0.000$ shows that there is a statistically significant relationship between finance, equipment as it affects proper disposal of wastes and the settlement type of respondents because the p-value is smaller than the threshold value of 0.05. This therefore implies that the null hypothesis (H_{01}) will be rejected, hence we conclude that there is a statistically significant relationship between finance, equipment as it affects proper disposal of wastes and the settlement type of respondents. In other words the settlement type does influence finance and equipment as it affects proper disposal of wastes.

The findings of this study revealed that lack of finance is a major factor responsible for inadequate waste disposal in Oredo Local Government which calls for adequate financing by appropriate government towards environmental sanitation in Oredo.

Lastly, it was discovered that lack of equipment is a major problem facing the environmental sanitation unit of Oredo Local Government Area, Benin City.

5. Conclusion and Recommendations

5.1 Conclusion

This study is to investigate the factors responsible for effective solid waste management in Oredo Local Government Area. The study was carried out in order to examine the problem and proffer solution to unsanitary disposal of solid waste in Oredo Local Government

Area, to achieve the aim and objective of this study, which are; to access the knowledge of the people towards refuse disposal, to ascertain the role of finance and equipment in the maintenance of refuse disposal programme in Oredo Local Government Area. Out of one hundred (100) questionnaires that were given to traders, residents and staff of environmental sanitation unit of Oredo Local Government Area, ninety (90) of the questionnaire were retrieved from resident, staff and traders in Oredo Local Government Area.

Therefore, the call to increase financial allocation, equipment, enlightenment and involvement of grassroots in all aspects of waste management in Oredo Local Government Area for proper waste management cannot be overemphasized.

5.2 Recommendations

Based on the findings from this study, the following recommendations are put forward:

1. Adequate funding should be provided by all tiers of government to enhance the purchase of more materials and equipment as this will go a long way in enhancing effective waste collection and management.
2. It is important that more assistant be given to the local government by the state government. This could be done by encouraging the ministry of works to assist the local government by providing them tippers and pail loaders from time to time for prompt evacuation of solid waste materials.
3. There should be regular public enlightenment programme on mass media (Television Radio and Newspaper) to encourage community participation and improved peoples' knowledge towards refuse collection and disposal.
4. Conclusively, more equipment and tools such as plastic waste bins should be provided by the local government authority and well to do individuals at various designated areas for effective waste collection and evacuation into waste van for onward transportation to government approved dumpsite.

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