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Evaluation of Environmental Sanitation in Owerri West Local Government Area, Imo State

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Abstract: Sanitation is paramount to human life because it contributes to safety from communicable and non-communicable diseases as well as playing important roles in human socio-economic development and sustenance of cultural values. The aim of this paper is to monitor and evaluate environmental sanitation services in Owerri West Local Government Area. Survey method was largely used in this study with questionnaire administered on 384 of which 25 respondents each were selected from 16 small villages out of 8 major communities in Owerri West Local Government Area (LGA). The result shows that 51.3% practice monthly environmental sanitation and only 33.3% of the wastes are removed from the generation point. The common refuse disposal method is the use of sanitary bin (35.3%), open dumping (20.8%) and burning (23.3%) while about 37% are dumped around surrounding bushes. This study revealed that the general environmental sanitation in Owerri West LGA is good (71.3%). Presence of Environmental Health Officer (EHO) for policy implementation ($p < 0.005$), Frequency of EHO visit ($p < 0.005$), level of hygiene education ($p < 0.005$) and availability of environmental sanitation policy ($p = 0.008$) was significantly related to the method of waste disposal adopted and Presence of Environmental Health Officer for policy implementation (EHO) ($p = 0.034$), Frequency of EHO visit ($p < 0.005$), level of hygiene education ($p < 0.005$) and availability of environmental sanitation policies ($p = 0.001$) as well as frequency of waste removal from generation point. Basic efforts that lead to good health and longevity include taking sensible actions and precautions based on sound health information. Environmental sanitation education is needed to educate and recondition the minds and attitudes of citizens in Owerri West LGA and beyond in consonance with the norms of their environment.

Keywords: Environmental sanitation; Hygiene; Health; Sanitation.

1. Introduction

Environmental sanitation deals with appropriate methods for disposing human excreta as well as household waste water and refuse in a manner that it must be safe, hygienic, and easily accessible and must not have a negative impact on the environment. Environmental sanitation were first practiced in Europe and Asia in the middle Ages, due to outbreak of plague or "Black Death" and other infectious diseases like cholera, typhoid, small pox etc that occurred, killing millions as a result of poor sanitation practices. Such poor environmental sanitation led to increased in poverty and untold hardship on the people. As result of that, people decided to embark on environmental sanitation drive to get rid of rubbish dumps in order to check the spate of epidermis, using local materials and methods within their knowledge.

Then the term sanitation is defined by different people and organizations as a means of cleaning human environment to prevent disease and promote health. United Nations Educational, Scientific and Cultural Organization [1], opined that sanitation is act of maintaining clean, hygienic circumstances that help to avoid diseases through services such as waste collection and disposal or recycling.

United Nations Population Fund (UNPF) [2], opined that sanitation is vital to health; it generates economic benefits and contributes to dignity and social development. Due to the enormous role environmental sanitation plays in the affairs of man socially and economically, 2008 was declared the international year of sanitation (IYS) by the United Nations General Assembly through its Resolution in December 3, 2006. This was done to create awareness on the need for public support and to give impetus to the achievement of the Millennium Development Goals target on sanitation by which many countries are not yet stay on track [3].

According to World Health Organization [4] and its allies, namely UNICEF and the World Bank place so much emphasis on sanitation because of the impact on human health and productivity also World Health Organization and other agencies still championing the promotion of environmental health impact assessment of projects (EHIA) as a way of bringing sanitation practice into the concept of sustainable development. However, environmental sanitation according to WHO Sanitation [5] is defined sanitation generally as the provision of facilities and services for the safe disposal of human urine and faeces and such services to include water, food, wastes, air, vector and pest, noise.

National Water Resources Management Policy [6] defines Sanitation as dealing with the principles and practices relating to the collection, removal or disposal of human excreta, household waste water and refuse as the impact upon people and the environment. In similar view, good sanitation should include appropriate health and hygiene awareness and behaviour that should be acceptable and affordable as well as sustainable environmental sanitation services.

Amadi and Iwuala [7] reported that Nigeria should not be left out as a nation to reckon with in the African sub-region; considering the enormity of the problems of poor sanitation practices. On the same note, every communities in the countries and governments at all levels throughout the world should maintained their commitment in environmental sanitation practices for the benefit of people's health and general wellbeing [8, 9]. Osibanjo [8] opined that because of worries by the rapid rate of urban decay in the country that put Nigeria in the list of countries described as dirtiest and un-aesthetically prompted the former President and Head of State, Chief Olusegun Obasanjo at the first national forum on ecology and environment, Abuja in 1999, to deal decisively with problems of poor sanitation practices.

Though the problem of lack of good environmental sanitation varies from place to place but it is more pronounced in the urban centres, especially in developing and under-developed countries or high population and poor density which result in overcrowding, inadequate planning and poor urban governance [10, 11].

Lack of sanitation, unsafe disposal or storage of waste in/around living environments or streets, and in undesignated containers may provide habitats for vectors that can cause various infectious diseases including dysentery (Bacillary and Amoebic), typhoid fever (Salmonella typhi), cholera (Vibrio), hepatitis (Viral), Meningitis (Meningococcus), Malaria and tuberculosis [12]. In Nigeria, more than 87% of the populations adopt wastage disposal methods that are generally unsatisfactory and not environment friendly such as dumping into the drains, along the road and street corners, nearby bushes, open land or undeveloped plots burrow pits; waste collection and storage in basin, open bucket, basket, wheelbarrow, polyethene bags are also common; by transportation of waste is common among underage children or employment of lunatics in hand pushed trucks or carts, wheelbarrow and transporting of waste to dumpsite in open vehicles (tipper) by unqualified contractors and personnel. All these practices create noxious conditions favourable to the breeding of flies, mosquitoes and rats which are involved in disease transmission e.g. malaria, cholera, typhoid, schistosomiasis, hookworm, rat-bite fever, leptosphosis etc, thus making the environment unattractive to tourists and visitors.

Environmental sanitation is one the powerful drivers of human development that affects quality of life, it improves health and wealth of a country. It cuts across all sectors of the economy including those that concern health, environmental protection, improvement of human settlements and services, tourism and general economic productivity. In most rural areas of Nigeria such as Owerri West, L.G.A, there is gross environmental pollution or contamination due to poor swage and refuse disposal, lack of safe and adequate water supply, poor food hygiene practices, poor housing etc. This ill condition has resulted to high death rate, infant mortality rate; morbidity rate and poor standard of health are largely due to defective environmental sanitation. It counted for reduced access to an improved source of drinking water and basic sanitation, which when compared to the baseline year for measuring the millennium development goals (MDG's) was considerably low. Therefore, the study aimed at monitoring and evaluating environmental sanitation services of the study area with the purpose of promoting the socio-cultural, economic and physical well being of all sections of the population. It will help to provide information on environmental sanitation that will ensure clean, safe and sustainable environment for promoting Public Health and well being, so that the citizens may live happily and achieve their potentials within the study area and beyond.

2. Materials and Methods

This study employed a descriptive survey design to evaluate environmental sanitation condition/status in Owerri West Local Government of Imo State. The study population consist of 400 adult males and females, who are indigenes and non-indigenes but resident in the area. A multistage sampling technique was used in selecting 8

communities and then 2 villages were chosen from the selected 8 communities through random process out of which 25 individuals from each of the 16 villages were randomly selected and consented to participate in the study.

The instrument used for data collection was the questionnaire designed by the researchers in view of the study objective. The content of the instrument was validated by research experts in environmental health for face and content in relevance of the objective of the study. The reliability of the instrument was checked during a pilot test on ten percent (10%) subjects and was found to be adequate and the data collated was analyzed and the results were reliable.

The questionnaire was administered to the subjects within one month by hand and face to face administration and those who could not understand the questions were assisted by explaining it to avoid misinterprets the questions. The collected data was sorted and imputed into Statistical Package for Social Sciences (SPSS), version 20.0. Quantitative data was presented using descriptive frequency, percentages; chart while chi-square was used for inferential analysis of qualitative data.

3. Results

The findings from the study communities on the evaluation of environmental sanitation in Owerri West LGA were presented in the below tables and charts. [Figure 1](#) below shows the distribution of the villages surveyed in the study. [Table 1](#) presented the socio demographic characteristic of the respondents. Majority 179(44.8%) of the respondents were aged 20-26 years while the least was on 34-40 years with 47(11.8%). Female 232(58%) were more than the male 168 (42%) respondents and majority 255 (63.8%) surveyed had at least tertiary education with 24(6%) having only primary education and/or no formal education. Majority (45%) of the respondents were students followed by civil servants (19%), traders (16.8%) and very few of them were labourers and health workers 8(2%).

[Table 2](#) depicted the waste management practice where majority 205(51.3%) of the respondents practice monthly communal environmental sanitation, 129(32.3%) practice weekly while 4(1%) were undecided on any communal environmental sanitation practice. The sanitation usually last for 4 hours 197(49.3%). The waste bin was the most common practiced waste disposal methods adopted in the study area with 141(35.3%), open dumping recorded 83(20.8%) while burning has 93(23.3%). The period of waste removed from generation point; everyday had 133(33.3%), once a week was 107(26.8%), twice a week has (24.3%) while 55(13.8%) reported monthly. The point of defecation was mostly on toilet with 332(83%), 48(12%) use of bushes and 12(3%) engaged on open ground.

[Figure 2](#) presented the responsibility for waste removal to final disposal; Environmental transportation commission (ENTRACO) reported 43.8% responsible for waste removal, 34.5% were done by individual community members, 13% by voluntary organizations and only 8.8% was done by private agencies. Majority (37%) of the generated wastes were dumped around surrounding bushes, 23.5% used it as manure while only 5% of sewage disposal was dumped inside nearby river as [figure 3](#) presented.

[Table 3](#) showed the personal observations on policy implementation on waste management where the rate of provision of communal latrine was good 191(47.8%), 114(28.5%) reported fair and 95(23.8%) said poor. Rating the provision of drainage; 54.7% reported it was good, 83(20.8%) were fair on their perception of provision of drainage in the community. About 357(89.3%) agreed to the presence of an Environmental health Officer (EHO) for policy implementation in the local area and the Officers visits once a while (64.3%). The general environmental sanitation practice is good 285(71.3%) and 58.5% uses personal protective devices (PPE) during environmental sanitation moderately. Only 139(35.8%) agreed that culture could affect environmental sanitation and about 286 (71.5%) acknowledge the presence of environmental sanitation guiding policies in the local government.

[Figure 4](#) depicted the level of hygiene education in the local government was moderate (66%), 68(17%) said the level of hygiene education is high and 69(17.25%) acknowledged the level of hygiene education to be low.

The general environmental sanitation standard in the studied Area as [figure 5](#) presented where fair (36.5%) and good (35%) recorded than others. Only 20.8% sees the standard as being satisfactory.

The [table 4](#) presented the relationship between some management variable and waste disposal adopted in the study. The analyzed data showed a significant relationship between presence of EHO for policy implementation ($\chi^2= 69.6$; $p < 0.001$), frequency of EHO visit ($\chi^2= 132.4$; $p < 0.001$), level of hygiene education ($\chi^2= 39.05$; $p < 0.001$) and presence of environmental sanitation guiding policies ($\chi^2= 26.74$; $p=0.008$) and method of waste disposal adopted in the study area.

Also [table 5](#) showed the relationship between management variables and frequency of waste removal from generation point, therefore, the analyzed data gave a significant relationship between presence of EHO for policy implementation ($\chi^2=16.668$; $p=0.034$), frequency of EHO visit ($\chi^2= 58.993$; $p=0.000$), level of hygiene education ($\chi^2= 55.594$; $p=0.000$) and presence of environmental sanitation guiding policies ($\chi^2= 26.863$; $p=0.001$) and the frequency of waste removal from the generation point in the study area.

4. Discussion

The findings of this study revealed that the general environmental sanitation in the studied area was good which could be as result of health education from environmental health officers working in the state. The finding contradicts the report of another study in Owerri Municipal which recorded poor environmental sanitation. Then the variation of environmental sanitation in different was supported by [Aremu \[13\]](#) who opined that sanitation access in Nigeria varies widely as low in some areas and higher in some other places. This study proved a consistent with

Banerjee and Morella [14] which reported that Nigeria is currently part of the countries whose sanitation coverage rates are on increase. More importantly, boosting sanitation in public places could lead to the attainment of other MDGs in terms of health, education and economic development [15].

The high rate of environmental sanitation practice in this study might be due to the presence of Environmental Health Officers for policy implementation because they acknowledged the presence of environmental sanitation guiding policies in the area. Despite the high environmental sanitation practices, some of the wastes generated are still dumped openly in the surrounding bushes, along street roads respectively. This could be attributed to the fact that majority of the Environmental health Officers only come for inspection once in a while. This also supported by a significant relationship between the frequency of visit of EHOs and waste disposal method adopted in the study which indicated that the more EHOs visits the less of open dumping practice.

5. Conclusion

Environmental sanitation standard reported in this study is fair and although no such study (if any) has been published earlier to evaluate the change in standard in the area. The study reveals that community environmental sanitation practice was on monthly basis that reflected to the visit of the officers for inspections purposes.

Recommendations

Based on these findings, the study proffered some solutions which if considered will help in improving the level of waste collection and urban cleanliness in the area. Despite the shortcomings experienced in the study, results obtained will serve as useful adjuncts not only to informed decision on how to improve waste collection services and sanitation in Owerri west LGA. The following recommendations are important;

- Environmental sanitation education will no doubt help in educating and reconditioning the minds and attitudes of citizens in consonance with the norms of their environment.
- Development policies, plans and also assist Governments at all levels in implementing plans of action towards accelerating progress for achieving sanitation.
- Government should invest more on Environmental sanitation and encourage states and LGAs to do so.
- Every major market should have a resident EHO or sanitation officer.
- Available Environmental Health laws and policies should be vigorously enforced;
- Sanitation offenders may need to pay heavily as a way to discourage them from indiscriminate disposal of refuse and sewage around the environment.

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Conflict of Interest

All authors of this article have no conflicts of interest throughout the period of this work.

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Figure-1. Name of villages in the studied Communities

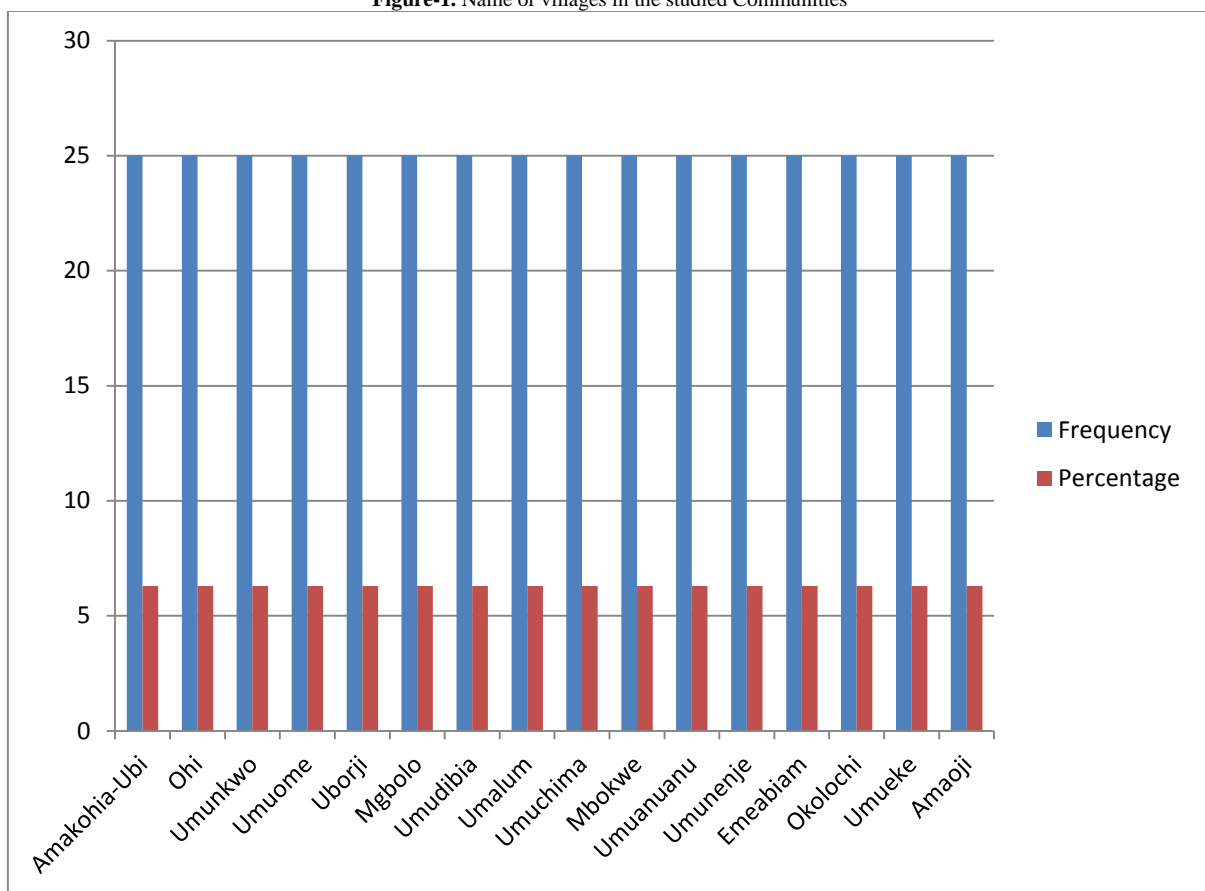


Table-1. Socio-demographic characteristics

Variables	Frequency	Percentage
Age bracket		
13 - 19 years	52	13.0
20 - 26 years	179	44.8
27 - 33 years	67	16.8
34 - 40 years	47	11.8
41 years and above	55	13.8
Gender		
Male	168	42.0
Female	232	58.0
Level of Education		
No formal education	24	6.0
Primary	24	6.0
Secondary	97	24.3
Tertiary	255	63.8
Occupation		
Civil servant	76	19.0
Trader	67	16.8
Farmer	20	5.0
Health worker	8	2.0
House wife	28	7.0
Student	180	45.0
Labourer	8	2.0
Artisan	13	3.3

Table-2. Waste management practice in Owerri West L.G.A.

Variables	Frequency	Percentage
Frequency of community Environmental sanitation practice		
Daily	15	3.8
Weekly	129	32.3
Monthly	205	51.3
Yearly	32	8.0
Not at all	15	3.8
undecided	4	1.0
Duration of environmental sanitation		
2 hours	131	32.8
4 hours	197	49.3
8 hours	41	10.3
10 hours	12	3.0
No idea	19	4.8
Method of waste disposal adopted in Owerri West LGA		
Open dumping	83	20.8
Inside a sanitary waste bin	141	35.3
Burning	93	23.3
Composting	28	7.0
Incineration	36	9.0
Sanitary landfill	15	3.8
Hog feeding	4	1.0
Frequency of waste removal from generation point		
Everyday	133	33.3
Once in a week	107	26.8
Twice in a week	97	24.3
Monthly	55	13.8
undecided	8	2.0
Point of defecation		
Toilet	332	83.0
Bush	48	12.0
Open ground	12	3.0
Undecided	8	2.0

Figure-2. Responsibility for waste removal to final disposal

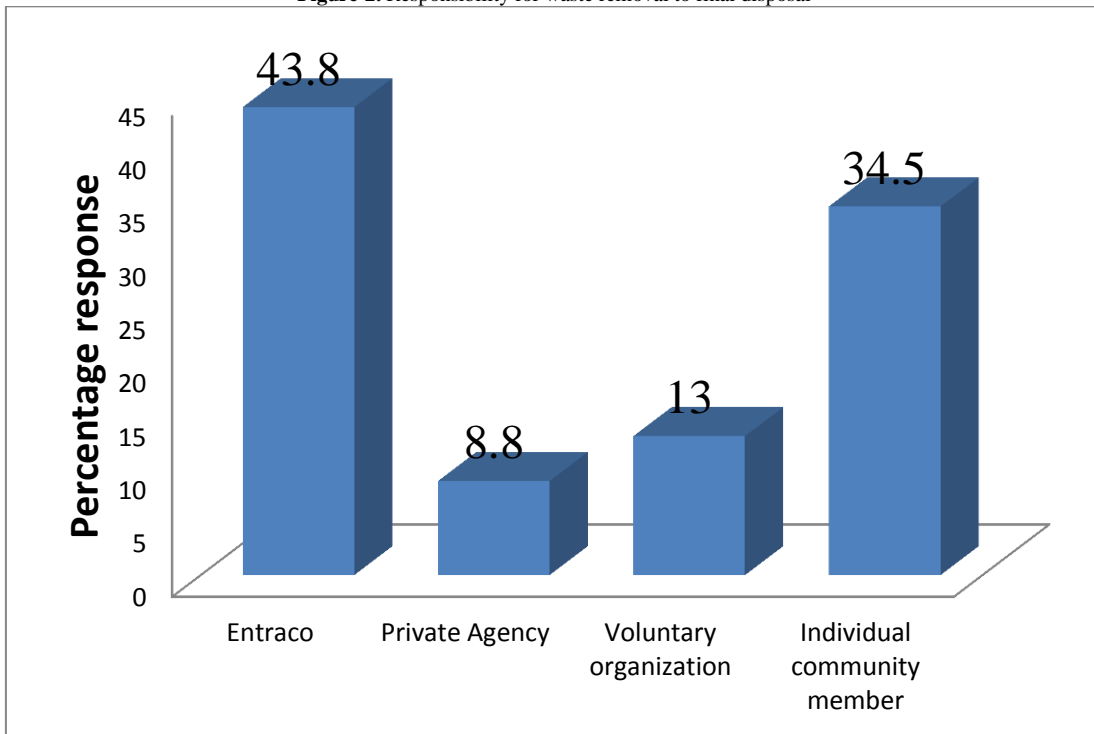


Figure-3. Method of sewage disposal

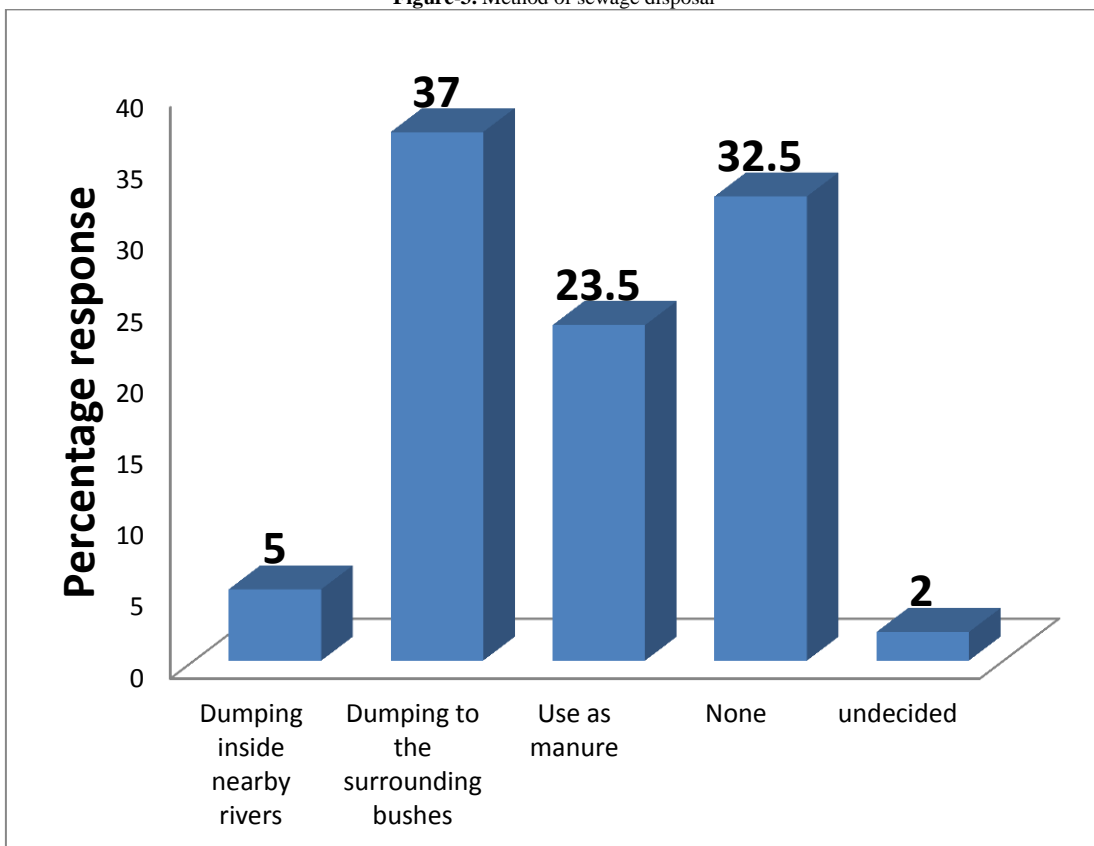


Table-3. Personal observations on policy implementation on waste management

Variables	Frequency	Percentage
Rate for provision of communal latrine		
Poor	95	23.8
Fair	114	28.5
Good	191	47.8
Rate for provision of drainage		
Poor	87	21.8
Fair	83	20.8
Good	219	57.5
Presence of Environmental health Officer (EHO) for policy implementation		
Yes	357	89.3
No	39	10.8
Frequency of EHO visit for policy implementation		
Always	40	10.0
Once a while	257	64.3
Not at all	16	4.0
Rarely	44	11.0
Not applicable	43	10.8
General environmental sanitation practice		
Good	285	71.3
Not good	115	28.8
Rate for the use of personal protective devices (PPE) during environmental sanitation		
Moderate	234	58.5
Low	166	41.5
Culture affects environmental sanitation		
Agree	139	35.8
Disagree	261	65.3
Presence of environmental sanitation guiding policies		
Yes	286	71.5
No	114	28.5

Figure-4. Level of hygiene education

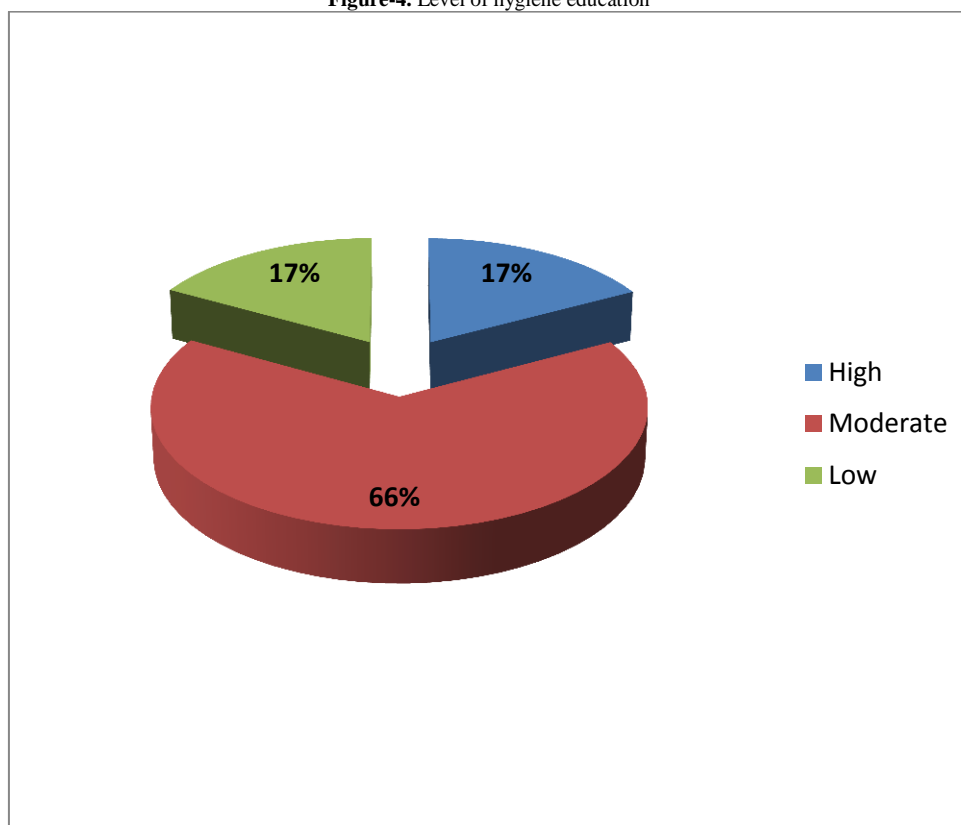


Figure-5. Environmental sanitation standard in Owerri west LGA

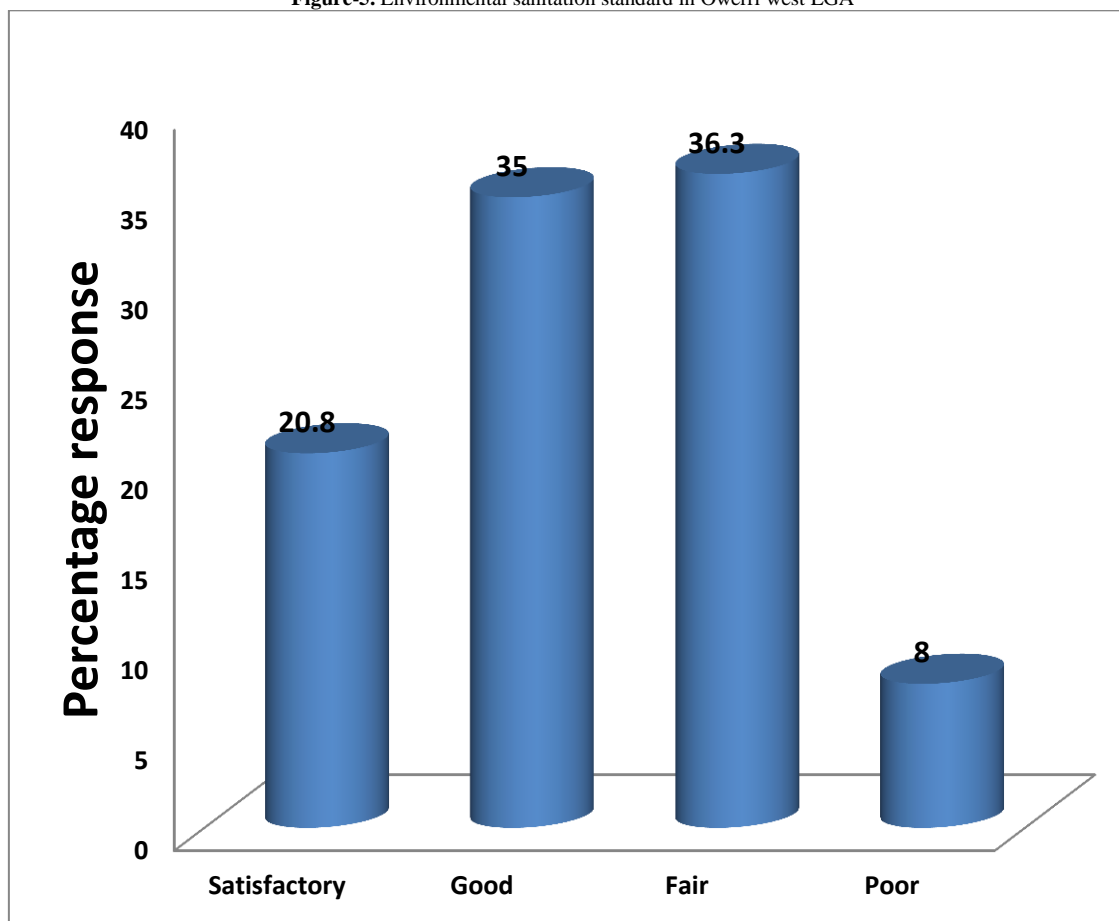


Table-4. Relationship between some management variable and waste disposal adopted in Owerri West LGA

Variable	Method of waste disposal adopted in Owerri West LGA							χ^2	p-value
	Open dumping	Inside a sanitary waste bin	Burning	Composting	Incineration	Sanitary landfill	Hog feeding		
Presence of EHO for policy implementation								69.6	0.000
Yes	75	130	85	16	32	15	4		
No	8	11	8	8	4	0	0		
Frequency of EHO visit									
Always	0	16	12	4	0	4	4	132.4	0.000
Once a while	59	86	69	8	28	7	0		
Not at all	0	12	0	4	0	0	0		
Rarely	16	16	4	0	4	4	0		
Not applicable	8	11	8	12	4	0	0		
Level of hygiene education								39.05	0.000
High	7	27	23	4	8	0	0		
Moderate	48	102	58	16	24	11	4		
Low	28	12	12	8	4	4	0		
Presence of environmental sanitation guiding policies								26.74	0.008
Yes	55	97	71	20	28	15	0		
No	28	40	22	8	8	0	4		

Table-5. Relationship between management variables and Frequency of waste removal from generation point

Variables	Frequency of waste removal from generation point					χ^2	p-value
	Everyday	Once in a week	Twice in a week	Monthly	undecided		
Presence of EHO						16.668	0.034
Yes	122	87	89	51	8		
No	11	16	8	4	0		
Undecided	0	4	0	0	0		
Frequency of EHO visit						58.993	0.000
Always	8	4	24	4	0		
Once a while	90	71	53	35	8		
Not at all	4	8	0	4	0		
Rarely	20	4	12	8	0		
Not applicable	11	20	8	4	0		
Level of hygiene education						55.594	0.000
High	34	15	12	4	4		
Moderate	87	84	61	31	0		
Low	12	8	24	20	4		
Presence of environmental sanitation guiding policies						26.863	0.001
Yes	109	75	67	31	4		
No	24	28	30	24	4		
Undecided	0	4	0	0	0		