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# Stakeholders' Involvement as Correlates of a Successful Solid Waste Management Strategy in the Niger Delta Region of Nigeria

by

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#### Abstracts

The study aimed at assessing Stakeholders' involvement as correlates of a successful solid waste management strategies in the Niger Delta Region of Nigeria and the hypothesis stated that successful waste management is significantly dependent upon stakeholders' participation. The questionnaire method and participant observations made up the primary sources of information. Research hypothesis formulated was tested using chi square statistical tool. The findings of the study suggest that stakeholders' participation influenced the waste management strategies adopted. Based on the findings of this study, it was recommended that government and those involved in waste management should ensure compliance with existing laws and regulations on waste management through effective monitoring and enforcement, encourage and mobilize all stakeholders to ensure wastes minimization, reuse, recycling and recovery strategies among others.

Key words: Stakeholders' Involvement, Solid Waste Management, and Solid Waste Management Strategy.

### 1) Introduction

Waste generation dates back as far as man started roaming the earth. The abandonment of the nomadic life in later years led to the creation of permanent communities. Until recently, waste was given a low priority in most municipalities, conference rooms and government offices responsible for public health and safety (Angaye and Abowei, 2017). It was only way into the 19th century that the idea of collecting and disposing of garbage in a systematic fashion became part of the general drive to improve public health (Ohimain and Izah, 2017). In today's cities, solid waste is either sent to disposal or is reprocessed for subsequent use.

One of the most promising methods of environmental protection in settlements is community-based waste management. This approach is concerned about radical change of attitude and habits towards solid waste collection and disposal. It places more emphasis on the fact that more income opportunities in recycling should be created as the only way

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to have sustainable waste collection service. However, for this to become a reality, community leaders and organisations must be able to initiate and enforce lasting changes of habits. Thus the ability of formal and informal leaders to influence and organise their community members is of primary importance underlying such a successful waste management programme (Okey, Umana, Markson and Okey, 2019). It is worth noting that garnering the benefits of every aspect of environmental cleanliness and protection serves as a drive to holistic waste management. Thus, treating every waste as a resource will be pivotal to driving sustainability.

In the Niger Delta Region of Nigeria, solid waste management is one of the main responsibilities of both urban and rural communities and the fundamental objective of solid waste management programmes is to minimise the pollution of the environment as well as utilising "waste" as a "resource". Even though per capita waste generation rates in the Niger Delta Region and other developing countries is less than in higher-income countries, the capacity of the responsible local authorities to manage waste from collection, to recycling or reuse and disposal, is limited (Ubouh, Nwawuike and Ikwa, 2020). Targets can be achieved using methods that can be afforded by the community over the long term and with less risk to the persons involved. An input of universally valid skills or techniques, or a set of similar culture, neutral attitudes defines management itself, while management of waste requires particular kind of intellectual insight, which would be expected to yield value specific solutions to local problems (Kapoor, 2019).

The economically viable and environmentally acceptable disposal of municipal solid waste is a major concern in the Niger Delta Region and many industrialised countries. The problem facing stakeholders and policy makers in the waste management sector is how to predict the amount and the composition of SW that is likely to be generated in the near future in order to devise the most appropriate treatment/disposal strategy (Ndubuisi-Ololo, 2016). The problem of solid waste especially solid waste in the Niger Delta region, developing and industrialized countries has been the cause of growing concern in recent years, becoming one of the main areas of the environmental policy debate. But now, because of the growth in waste volumes, the environmental consequences of past disposal practices, there are raised concerns about the economic viability and environmental acceptability of the current waste-disposal methodologies. Therefore, the present study is to establish stakeholders' involvement as correlates of useful strategy in the management of solid waste in the Niger Delta Region of Nigeria.

The problems associated with solid waste generation and its management has been the focus of considerable environmental attention during the last quarter of the twentieth century as communities all over the world have begun to recognize the hazards that its management entails (Mudiare, 2019). In recognition of the monumental challenges of SWM in the Niger Delta region, the government has attempted to tackle municipal waste management issues through several approaches such as the "task force" approach. This approach involves- the designation of solid waste collection centers on major and public markets, and the use of local contractors/ agencies to evacuate the waste generated.

However, this approach has been found to be counter-productive in the long run as it created more problem due to lack of coordination on the part of government and inadequate solid waste management knowledge of the responsible agencies. Solid waste dumped along roadsides are usually left over a long time to decompose naturally (by micro-organisms), eaten by animals, picked by scavengers or washed away by the flood into larger creeks and rivers, thus affecting the surface water quality (Nweke, 2020).

Subsequently, other methods employed include the semi mechanical system, Contract system and house-to-house collection system. Until 2001, there exists the block collection system whereby the use of collection vehicles for disposal was employed. This system caused individuals to resume indiscriminate dumping of refuse at corners of streets, and road junctions while contractors are lined up with the authorities of collecting the refuse from these indiscriminate dumpsites. As such the study seeks to assess stakeholders' involvement as it influences waste management strategies in the Niger Delta Region of Nigeria.

### 2) **Objectives of The Study**

The research aimed at evaluating Stakeholders' involvement as correlates of a successful solid waste management strategies in the Niger Delta Region of Nigeria.

The specific objective was to; establish the extent to which stakeholders' involvement affect the success of solid waste management in the area. This was achieved in part by testing the Research Hypothesis thus:

Ho: Successful waste management is significantly dependent upon stakeholders' participation

### 3) Study Area

Niger Delta is situated on the Gulf of Guinea in the southern part of Nigeria, it covers an area between latitude 3° N and 6° N and longitude 4°E and 8° E. The Niger Delta basin is bounded to east and west by the Calabar Flank and Benin, the Gulf of Guinea to the south and in the north by older tectonic structures like Anambra Basin, Abakiliki uplift and Afikpo Syncline. A 2015 World Bank Technical Report gives the total land area of the Niger Delta as 20,000 sq. km. located in south eastern Nigeria (World Bank, 2015). The broader Niger Delta region, which includes all oil-producing areas and others considered relevant for reasons of administrative convenience, political expedience and development objectives, extends the land area to 70,000 square kilometres (Tamuno, 2018).

The Niger Delta is the delta of the Niger River sitting directly on the Gulf of Guinea on the Atlantic Ocean in Nigeria. It is located within nine coastal southern Nigerian states, which include: all six states from the South South geopolitical zone, one state (Ondo) from South West geopolitical zone and two states (Abia and Imo) from South East geopolitical zone.

It is a very densely populated region sometimes called the Oil Rivers because it was once a major producer of palm oil. The area was the British Oil Rivers Protectorate from 1885 until 1893, when it was expanded and became the Niger Coast Protectorate. The delta is a petroleum-rich region and has been the center of international concern over pollution that has resulted principally from major oil spills of multinational corporations of the petroleum industry. From the map, the selected capital cities are fast growing, hence waste generation is inevitable.



Fig. 1: Niger Delta Region of Nigeria highlighting the states of Rivers, Akwa-Ibom and Cross-River and their capital cities (Port Harcourt, Uyo and Calabar)

# 4) Materials and Methods

# Research Design

The research design adopted in this study was survey design. This involved the collection of data to accurately and objectively described existing phenomena. The choice of survey in this study was because it is cost effective in the sense that the study of the representative sample would permit inference from generalization to the entire population that would have been too expensive for the study.

# Sources of Data

Qualitative and quantitative data was obtained from primary and secondary sources respectively. The primary source comprises the first hand information obtained from respondents in the process of field work.

# Study Population and Sample Size

The population of the study according 2006 population census as projected to 2022 is 5,156,000. In the breakdown, Uyo has a population of 1,200,000, with growth rate of 5.63%, Calabar has a population of 631,000 with growth rate of 4.30%, while Port Harcourt has 3,325,000 with growth rate of 4.86%. To draw a representative sample for the study, Krejcie & Morgan table (1970) was used for determining sample size for a given population. The sample size will therefore become 1081.

Sampled City	Population	Sample size	Percentage	Growth rate
			(%)	%)
Uyo	1,200,000	351	32.5	5.63
Calabar	631,000	346	32	4.30
Port Harcourt	3,325,000	384	35.5	4.86
Total	5,156,000	1081	100	

Source: NPC 2022 Projection Data

#### Sampling Techniques

Systematic sampling techniques was used. In the first stage, simple random sampling technique was used in selecting three major cities where Uyo, Calabar and Port Harcourt in the Niger Delta region. Areas in each of the selected cities were carried out using the systematic sampling approach. Questionnaire was administered to respondents who is above 18 years at the interval of every 10<sup>th</sup> (tenth) household.

Selected Cities	Selected Areas	Respondents
Uyo	Anua Offot	88
	Itiam Etoi	88
	Afaha Oku	88
	Ikot Offiong	87
	Total	351
Calabar	Abang Asang	86
	Edim-Otop	86
	Essien Town	87
	Ediba	87
	Total	346
Port Harcourt	Elekohia	96
	Abuloma	96
	Rainbow	96
	Okuru	96
	Total	384

Table 2: Selected Areas for Sampling Using Systematic Sampling Technique

Source: Researcher's Field Survey 2022

# Methods of Data Analysis

Hypothesis of the study was tested using Chi-square statistical tools. The hypothesis was stated in null form; Successful waste management is significantly dependent upon stakeholders' participation.

# 5) **Results and Discussion**

Stakeholders' involvement (Government agencies, private organizations, joint government and private, individuals, contractors) have not influenced waste management (Waste minimization, Recycling, composting, Waste separation, Availability and positioning of receptacle bins, Waste separation, Waste collection, Waste treatment, Waste evacuation, Energy generation, Land filling, Open dumping, Compliance and monitoring) developed.

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The independent variables in this hypothesis was categorised into five, which was Stakeholders' involvement (Government agencies, private organisations, joint government and private, individuals, contractors) while the dependent variable categorised into twelve which was waste management strategies (Waste minimization, Recycling, composting, Waste separation, Availability and positioning of receptacles, Waste separation, Waste collection, Waste treatment, Waste evacuation, Energy generation, Land filling, Open dumping, Compliance and monitoring). The contingency Chi-square ( $X^2$ ) statistic was used to test this hypothesis at 0.05 level of significance and the result is presented in Table 3. The categorisation of the waste management strategies based on stakeholders' involvement into these twelve groups is guided based on literature and the effectiveness of such waste in making more harm to man and his environment.

Variable	Government Agencies	Private Organization	Govt & Private	Individuals	Contractors	Total	Cal X <sup>2</sup>
Waste Minimization	4	16	15	13	7	55	
	(7.3)	(29.1)	(27.3)	(23.6)	(12.7)	100	
Recycling	2	8	6	6	0	22	
	(9.1)	(36.4)	(27.3)	(27.3)	(00)	100	
Composting	5	13	16	5	12	51	
	(7.8)	(5.9)	(19.6)	(43.1)	(13.7)	100	
Waste Separation	15	45	25	20	24	129	
	(11.6)	(34.9)	(19.4)	(15.5)	(18.6)	100	
Positioning of	13	22	26	18	9	88	
Receptacle	(14.8)	(25.0)	(29.5)	(20.5)	(10.2)	100	72.61
Waste Recovery	8	11	12	5	8	44	75.01
	(18.2)	(25.0)	(27.3)	(11.4)	(18.2)	100	
Waste Collection	6	15	12	7	4	44	
	(13.6)	(34.1)	(27.3)	(15.9)	(9.1)	100	
Waste Evacuation	24	38	54	28	17	161	
	(14.9)	(23.6)	(33.5)	(17.4)	(10.6)	100	
Energy Generation	8	13	31	11	9	72	
	(11.1)	(18.1)	(43.1)	(15.3)	(12.5)	100	
Landfilling	8	50	28	11	11	108	
	(7.4)	(46.3)	(25.9)	(10.2)	(10.2)	100	
Open Dumping	20	35	46	32	10	143	
	(14.0)	(24.5)	(32.2)	(22.4)	(7.0)	100	
Compliance and	1 16	58	49	18	23	164	
Monitoring	(9.8)	(35.4)	(29.9)	(11.0)	(14.0)	(100)	
Total	129	324	320	174	134	1081	

Table 3: Contingency Chi-square ( $\chi^2$ ) Analysis of Stakeholders' Involvement in the Solid Waste Management Strategies Adopted (N=1,081)

Not significant at 0.05; df = 44; critical  $X^2$ -value = 28.14

Df = (R-1) (C-1). Where R = number of rows, C = number of columns

In this case, the number of rows is 12 and columns is 5, thus

Df = (12 - 1) (5 - 1) = 11 x 4 = 44, Df = 44

The result in Table 2 suggests that stakeholders' involvement influenced the waste management strategies adopted. This is because the calculated  $\chi^2$ -value = 73.61 was greater than the critical  $\chi^2$ -value of 28.14 at 0.05 level of significance with 44 degrees of freedom. This finding is in collaboration with that of Zaini *et al.* (2020) who opined that the integrated strategy in waste management requires participation at all levels: government, industries, public and the waste management concessionaires. However, those that participated also specified, they were involved in ensuring compliance enforcement through assembly's statutory committee meetings on sanitation and environment; education and law enforcement and; implementation of ideas generated at management meetings.

The indicated that stakeholder involvement and cooperation in waste management could be a panacea to effective waste management strategies. It is increasingly becoming common in major cities of the Niger Delta region and Nigeria to see waste indiscriminately disposed in the environment. To address the waste management issues and to achieve sustainable waste management, it is incumbent to assess the various roles, interests and power structures in waste management. Countries where there is cooperation and co-ordination between stakeholder groups such as government, city council, service users, community based organizations, nongovernment organizations, the private sector and donor agencies, there have been indications of increased sustainability in waste management.

This is in line with the study of Sutandyo (2019) who propose community participation in waste management in peri-urban areas of Jakarta. Dahiya (2020) discussed the case of peri-urban area of Chennai, where community driven development took place, community not only pressurize elected members to give facilities for waste management, but also contribute to manage waste by promoting self-help primary waste collection to compost waste generated in all surrounding areas and involve active women participation in this waste management process. By composting more than 80 per cent of waste generated in Shri Shankara Nagar and surrounding neighbourhoods, they make the process of solid waste management economically and environmentally sustainable.

The study revealed that the stakeholders considered waste and its management as a serious problem in the major cities of Nigeria. It is, therefore, eminent that the fastest growing cities in Nigeria in recent years are gradually becoming slums despite being adjudged the cleanest cities in different occasions. The stakeholders considered improper disposal or indiscriminate dumping of waste by individuals as the major problem. This response is consistent with Oberlin (2019) and Okot-Okumu and Nyenje (2017) that reported that high percentage of urban solid waste do not reach the legal disposal points but end up in unapproved areas in the environment. Similar observations were previously made by Benneh *et al.* (2015) in Accra, where they argued that because the capacity to handle all of the household waste generated was weak, about 83% of the population dump refuse in either authorized (open dump sites) or unauthorized sites in their neighbourhood.

This was consistent with Adewole (2019) who recorded "poor attitude among academics and other stakeholders towards waste management. The schools, markets, hospitals, local and state government responsible for raising awareness on solid waste management issues often adopt seminars, conferences, workshops, training sessions as the most common techniques in creating awareness observed in the course of the survey in addition to environmental management topics included within junior secondary schools syllabus". Ukpong, I. E., Ansa, I. E and. Udom, I. C.

### 6) Conclusion and Recommendations

This study demonstrated that some respondents had poor knowledge and stakeholders' involvement in waste management practices. It also suggests that the promotion of environmental information and education of the public is a key to enhancing the effectiveness of waste management strategies adopted. This can take on diverse forms, including community self-help programs, through regular community clean-up campaigns, as well as effective law and regulatory enforcement.

Based on the findings of this study, the following are recommended for policy action:

- i. Ensure compliance with existing laws and regulations on waste management through effective monitoring and enforcement.
- ii. Encourage and mobilize all stakeholders to ensure wastes minimization, reuse, recycling and recovery strategies.
- iii. Develop an infrastructural capacity building process for sound environmental management of waste.
- iv. Carry out periodic evaluation of progress achieved in the implementation of the recommendations listed herein.

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