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FACTORS INFLUENCING UNHOLY PRACTICES OF INDISCRIMINATE DUMP SITE IN WARRI-SOUTH, DELTA STATE, NIGERIA

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ABSTRACT

The increasing number of indiscriminate dump sites in Warri-south in Delta state is worrisome and adversely affecting the living standard and health conditions of its growing populace. This study seeks to investigate the factors that influence unholy practices of indiscriminate waste disposal and to seek appropriate measures for mitigating or curbing this menace. It employs the cross-sectional research methodology. A sample size of 100 respondents from households living in Warri is used while a structured questionnaire with a three Likert scale is the research instrument for data collection. Exploratory Data analysis is employed to extract insights to explain the menace of dump site increase and the factors that significantly influence it. The results show that domestic waste such as food, paper, glass, and plastic waste is on the increase due to key influencing factors such as poor waste management laws, lack of waste facilities, poor training of waste collectors, and household attitudes towards waste disposal. Waste segregation and recycling were countermeasures to address waste disposal.

Keywords: Waste disposal, food waste, segregation, recycling, dump site

INTRODUCTION

The problem of solid waste is a universal one as waste exists in every society. Waste management problems appear more serious in developing countries due to poor management and frameworks (Nwigwe, 2008). Egun (2012) claimed that waste volume continued to increase at a faster rate than the ability of the agencies to improve the financial and technical resources needed to control waste growth. The quantity and type of waste generated are influenced by the city's economic status, socioeconomic activities performed, and the level of technological development (Alwaeli, 2012). Nigeria as a developing nation has been characterized by incompetent waste disposal, treatment, and management technologies leading to pollution (Ogamba & Bukarx, 2023). Also Alwaeli (2012) added that solid waste management is directed toward the removal of waste from urban centers and subsequently, the destruction of such waste. Later, attention shifted to waste utilization, waste reduction, re-use, and recycling (Alwaeli, 2012). The developed economies have developed a laborious waste management framework for efficient waste collection, storage, transportation, and disposal while minimizing the impacts of disposal on the environment (Alwaeli, 2012).

However, Warri, one of the fastest developing cities in Nigeria with its rich mineral deposition (oil) is experiencing high movement and concentration of people in search of jobs in recent times. With a population of over 213,280 people spread across a 1520 square kilometer land area, the lack of appropriate measures of waste control by individuals and the government is a major concern because of its health implications on human lives. The indiscriminate dumping of waste in every street, road, market, and drainage has defaced the city of Warri. Local authorities and private waste collectors solely responsible for waste collection and disposal have found theincreasing waste generated difficult to manage,thus making people think of other ways to dispose of their domestic waste.

According to Alwaeli (2012), waste management is the collection, transportation, recovery, and disposal of waste including the supervision of such operations and the after-care of the disposal site and including actions taken. Ikehi (2014) claims the problem of waste management is classified into collection and disposal. He adds that a lot of problems affects the collection process including climate problems, public attitude, the nature of waste, and transport condition. The disposal method is limited by the availability of dumping sites, incineration, and recycling.

Nygaard, (2002) noted that the world population numbering 7 billion people today, may approach 12 billion by 2020 with 93 percent of growth taking place in developing countries. The implications for population growth concerning waste generation are significant and there is a need to consider how waste can be managed effectively to generate resources rather than to cause harm to humans and the environment.

Over the past decades, uncontrolled population growth with rapid urbanization and industrialization has resulted in environmental problems in most parts of the world. One such problem is solid waste due to inadequate management practices. Nowadays, increasing public awareness of the environment compels local, state, and federal authorities to define and adopt new solutions to waste management.(

According to Keimpe (2005), waste issues should be seen as everyone's business because we all produce waste in nearly everything we do including all forms of economic activities which involves environmental impacts during production and final disposal. The Environmental Protection Agency, as cited in Environmental Science a Global Concern by the McGraw –Hill Companies (2003), states that the United States produces about 11 billion tons of solid waste each year with about half of the amount consisting of agricultural waste, while industrial waste other than mining and mineral production, amount to 400 metric tons per year and municipal waste which consists of household and commercial refuse, amount to more than 200 million metric tons a year (McGraw –Hill Companies, 2003). In addition, McGraw –Hill Companies (2003) describe the waste stream as a term used to classify or show the steady flow of varied waste we produce from domestic garbage and yard waste to industries.

Waste management practices

In Asaba et al, 2022 a study was conducted in Mbale city to assess the environmental and socio-economic impact of waste

management practices and a conclusion was reached that, despite employing many citizens, the present solid waste management practices in Mbale City was responsible for injuries incurred by scavengers (waste collectors), land and air quality degradation as citizens lack knowledge of proper waste management systems. Therefore, City authorities should sensitize the masses on best waste management practices like sorting and recycling and provide incentives for collection, sorting and assemblage of recyclable non-biodegradable wastes.

Solid waste management in urban centers of developing countries has been a major challenge as a result of increasing population, migration and rising standard of living. This is evident in another study that was carried out in Daura Township, Katsina State northern Nigeria to investigate this growing phenomenon and posited that challenges associated with waste management include blockage of drainages, air and land pollution, littering of streets and road sides. It is therefore recommended that adequate facilities, machineries and equipment should be provided by the State Government and public enlightenment campaign should be carried out to overcome the challenges of solid waste management in the township. (LadanS, 2023)

Currently, waste production has increased at an alarming rate over the past decades in direct response to increasing consumption and population growth. Williams and John (2005) argued that developedcountries in particular have developed massive economies founded on "quick to use, quick to discard" consumer habits. William and John (2005) believe that these practices not only demand a huge amount of natural resources but generate an endless stream of liquid and solid waste that entered the land, and aquatic environment in different ways called solid and hazardous waste. The priority of the UK Government is to reduce waste at its source; aiming at imposing tough standards on industries through integrated Pollution Control (IPC) and promoting clean technology.

This aim of this study is to identify the factors that influence unholy waste disposal in the Warri metropolis, the health implications, and possible measures of effective waste management and control.

MATERIALS AND METHODS

Research Strategy

It is argued that research strategy should be guided by research questions and objectives as well as the extent of existing knowledge, the amount of time and other resources you have available, and your philosophical learning (Mark and Philip,2012). There are different types of research strategies but this work employs the survey and case study research strategy. Survey research allows the collection of data about the same thing from a large number of people in a cost-effective manner, thereby making it possible to generate findings that will represent the whole population at a lower cost than collecting the data from the whole population while the case study is particularly good at enabling the researcher to get a detailed understanding of the context of the research and the activity taking place within that context (Mark and Philip, 2012). Both methods are suitable because they ask questions such as Who? what? where? how much? and how many?' which is useful for descriptive and exploratory research.

Research instrument

A structured questionnaire of three Likert scales response is used for collecting data from the respondents.

Research approach

Deductive research approach is used in this study. According to Mark and Philip (2012), the distinction between deduction and induction approaches depends on the choice of theory use in the literature (using existing theory). Deductive research is a conceptual and theoretical structure developed and then tested by empirical observation, thus particular instances are developed from general inference while inductive research is a study developed from the observation of empirical reality thus general inferences are induced from the particular instances (Jill and Roger, 1997)

Sample techniques and sample size

Simple random sampling is used in this study because it is a type of probability sampling in which each member of the population has an equal chance of being selected at random and included in the sample (Mark and Philip, 2012). A sample size of 100 households in Warri using the random sampling technique forms the source of data collection.

Data analysis

Simple frequency distribution, bar chart, and regression analysis were used for data analysis. The Statistical Package for Social Science was the choice software to implement the analysis in this study.

RESULTS AND DISCUSSIONS

Table 1: Demographic distribution of respondents

		Frequency	Percent
Gender	Male	21	33.9
	Female	41	66.1
	Total	62	100.0
Employment status	Unemployment	11	17.7
	Employed	21	33.9
	Self Employed & Students	30	48.4
	Total	62	100.0
Household Size	1-3	10	16.1
	4-6	31	50.0
	7+	21	33.9
	Total	62	100.0

The frequency table shows the gender group of 21(33.9%) males and 41(66.1%) females from 62 respondents. Large numbers of respondents were female compared to male.
Also, 11(17.7%) respondents are unemployed, 21(33.9%)are employed and 30(48.4%.)are self-employed. The number of self-employed respondents is more than unemployed and employed. This shows that in the research area people who are self-employed are more.
10(16.1%)of household is between 1-3, 31(50%)of household is between 4-6 and 21(33.9%) household has above 7. This indicate more resident in Warri South LGA has a household size of between 4-6

Table 2: Food waste and its usefulness

		Frequency	Percent
Biogas as an alternative source of cooking gas	Agree	48	77.4
	Neither	13	21.0
	Disagree	1	1.6
	Total	62	100.0
Bio-fertilizer	Agree	43	69.4
	Neither	18	29.0
	Disagree	1	1.6
	Total	62	100.0
More than one bag of food waste	Agree	42	67.7
	Neither	4	6.5
	Disagree	16	25.8
	Total	62	100.0
Food waste segregation and electricity generation	Agree	35	56.5
	Neither	22	35.5
	Disagree	5	8.1
	Total	62	100.0
Food waste recycling service in Warri	Agree	12	19.4
	Neither	2	3.2
	Disagree	48	77.4
	Total	62	100.0
Supporting animal feed production from food waste	Agree	53	85.5
	Neither	9	14.5
	Total	62	100.0
Local waste collector to manage food waste	Agree	9	14.5
	Neither	9	14.5
	Disagree	44	71.0
	Total	62	100.0
Food waste recycling law in Warri	Agree	3	4.8
	Neither	14	22.6
	Disagree	45	72.6
	Total	62	100.0
The market for biogas production in Warri	Agree	18	29.0
	Neither	27	43.5
	Disagree	17	27.4
	Total	62	100.0
Food waste recycling and health benefit	Agree	54	87.1
	Neither	6	9.7
	Disagree	2	3.2
	Total	62	100.0

As shown in Table 2, 48 (77.4%) respondents agree, 13(21.0%) respondents neither agree nor disagree and 1(1.6%) respondent disagrees. It is believed that biogas can be an alternative fuel for cooking gas.
Also, 43(69.4%,) agree, 18(29.0%) neither agree nor disagree and 1 (1.6%) disagree that food waste segregation will encourage bio-fertilizer production for agriculture. The result shows more respondents agreeing to support food waste segregation.
42(67.7%,) agree, 4(6.5%) neither agree nor disagree and 16(25%) disagree that their household produces more than one bag of food waste every week. This gives insight into the numbers of waste generated in tons weekly in Warri.
42(67%) agree, 22(35.5%) neither agree nor disagree and 5(8.1%) disagree that food waste segregation will encourage the recycling of renewable energy such as electricity.
12(19.4%) agree, 2(3.2%) neither agree nor disagree and 48(77.4%) disagree that there is no recycling service in Warri 53(85.5%) agree and 9(14.5%) neither agree nor disagree with producing animal feed from food waste.
9(14.5%) agree, 9(14.5%) neither agree nor disagree and 44 (71%) disagree that local waste collectors are not adequately trained to manage food waste collected in Warri.
3(4.8%) agree, 14(22.6%) neither agree nor disagree and 45(72.6%) disagree this show there is no law guarding food recycling in Warri.

18(29.0%) agree, 27(43.5%) neither agree nor disagree and 17(27.4%) disagree that there is a market for biogas production in Warri.

54(87.1%) agree, 6(9.7%) neither agree nor disagree and 2(3.2%) disagree that food waste recycling has a health benefit

Table 3: Paper waste

		Frequency	Percent
Paper recycling into children's learning materials	Agree	53	85.5
	Neither	4	6.5
	Disagree	5	8
	Total	62	100.0
Household paper waste generation	Agree	36	58.1
	Neither	4	6.5
	Disagree	22	35.5
	Total	62	100.0
Paper waste reduction through the production of wallpapers	Agree	52	83.9
	Neither	5	8.1
	Disagree	5	8.1
	Total	62	100.0
Paper waste segregation and recycling of tissue papers	Agree	42	67.7
	Neither	15	24.2
	Disagree	5	8.1
	Total	62	100.0
The market for recycled paper waste in Warri	Agree	41	66.1
	Neither	7	11.3
	Disagree	14	22.6
	Total	62	100.0
Laws promoting paper waste segregation in Warri	Agree	11	17.7
	Neither	12	19.4
	Disagree	39	62.9
	Total	62	100.0
Reduction of paper waste through paper bags production	Agree	50	80.6
	Neither	9	14.5
	Disagree	3	4.8
	Total	62	100.0
Waste collectors are trained to manage paper waste	Agree	6	9.7
	Neither	12	19.4
	Disagree	44	71.0
	Total	62	100.0
Job creation through paper waste recycling	Agree	52	83.9
	Neither	8	12.9
	Disagree	2	3.2
	Total	62	100.0
Local paper waste recycling plant in Warri	Agree	6	9.7
	Neither	3	4.8
	Disagree	53	85.5
	Total	62	100.0

Table 3 presents an analysis of paper waste. 53(85.5%) respondents agree, 4(6.5%) neither agree nor disagree and 5(8%) disagree that recycling pepper waste help reduce the amount of paper waste generated in households.

36(58.1%) respondents agree, 4(6.5%) neither agree nor disagree and 22(35.5%) disagree that their household generates more than one bag of paper waste.

52(83.9%) respondents agree, 5(8.1%) neither agree nor disagree and 5(8.1%) disagree that producing wallpaper from paper waste will help reduce waste paper in the environment.

42(67.7%.) respondents agree, 15(24.2%) neither agree nor disagree and 5(8.1%) disagree that paper waste segregation will encourage recycling of paper products in Warri.

41(66.1%) respondents agree, 7(11.3%) respondents neither agree nor disagree and 4(22.6%) disagree that there is a market for recycled paper goodsin Warri.

11(17.7%,) respondents agree, 12(19.4%) neither agree nor disagreeand 39(62.9%) disagree that there is no law promoting paper waste segregation in Warri.

50(80.6%) respondents agree, 9(14.5%) neither agree nor disagree and 3(4.8%) disagree that producing bags from paper waste will help reduce paper waste.

6(9.7%) respondents agree, 12(19.4%) neither agree nor disagree, and 44(71.0%) disagree that waste collectors are adequately trained to manage the paper waste they collect in Warri.

52(83.9%) respondents agree, 8(12.9%) neither agree nor disagree and 2(3.2%) disagreethat paper waste recycling will help create jobs.

6(9.7%,) respondent agrees, 3(4.8%) neither agree nor disagree and 53(85%) respondentsdisagree that there is a local recycling plant in Warri where paper waste is recycled.

Table 4: Plastic waste analysis

		Frequency	Percent
Plastic waste recycling creates job	Agree	59	95.2
	Disagree	3	4.8
	Total	62	100.0
Reducing plastic waste through paying plastic waste collectors	Agree	38	61.3
	Neither	15	24.2
	Disagree	9	14.5
	Total	62	100.0
Analysis of plastic Waste collector and waste reduction	Agree	51	82.3
	Neither	5	8.1
	Disagree	6	9.7
	Total	62	100.0
Massive opportunities for plastic waste recycling	Agree	46	74.2
	Neither	12	19.4
	Disagree	4	6.5
	Total	62	100.0
Household generation of plastic waste	Agree	8	12.9
	Neither	22	35.5
	Disagree	32	51.6
	Total	62	100.0
Local capacity building needed for plastic waste recycling	Agree	51	82.3
	Neither	4	6.5
	Disagree	7	11.3
	Total	62	100.0
The market for recycled plastic waste	Agree	45	72.6
	Neither	9	14.5
	Disagree	8	12.9
	Total	62	100.0
A law promoting recycling in Warri	Agree	10	16.1
	Neither	12	19.4
	Disagree	40	64.5
	Total	62	100.0
Plastic waste collector training	Agree	5	8.1
	Neither	7	11.3
	Disagree	50	80.6
	Total	62	100.0
Plastic waste recycling and environmental sustainability	Agree	55	88.7
	Neither	3	4.8
	Disagree	4	6.5
	Total	62	100.0
Glass waste recycling as a pillar of efficiency and sustainability	Agree	51	82.3
	Neither	8	12.9
	Disagree	3	4.8
	Total	62	100.0

Table 4 presents the analysis of plastic waste from responses from the respondents.

59 (95.2%)of respondents agree and 3(4.8%) disagree that plastic waste recycling can create jobs for residents in Warri.

38(61.3%) respondents agree that paying local waste collectors will reduce plastic waste, 15(24.2%) neither agree nor disagree and 9(14.5%) disagree

51(82.3%) respondents agree that waste segregation will encourage recycling, 5(8.1%) neither disagree nor agree and 6(9.7%) disagree.

46(74.2%) respondents agree plastic waste recycling will create massive employment for people, 12(19.4%) neither agree nor disagree and 4(6.5%) disagree.

8(12.9%) respondents agree, 22(35.5%) neither agree nor disagree and 32(51.6%) disagree that their household produces more than one bag of plastic waste every week

51(82.3%) respondents agree, 4(6.5%) neither agree nor disagree and 7(11.3%.) disagree that more awareness is needed in encouraging waste recycling

45(72.6%) respondents agree, 9(14.5%) neither agree nor disagree and 8(12.9%) disagreethat there is a market for recycled plastic products in Warri.

10(16.1%) respondents agree, 12(19.4%) neither agree nor disagree and 40(64.6%) disagree that there is recycling law in Warri.

5(8.1%)respondents agree, 7(11.3%) respondents neither agree nor disagree and 50(80.6%) disagree that local waste collectors are not adequately trained to manage the plastic waste they collect.

55(88.7%) respondents agree, 3(4.8%) neither agree nor disagree and 4(6.5%)disagree that plastic waste recycling will help sustain the environment.

51(82.3%) respondents agree, 8(12.9%) neither agree nor disagree and 3(4.8%) disagreethat recycling glass waste is a way of sustaining the environment.

Table 5: Glass waste

		Frequency	Percent
Household generation of glass waste	Agree	6	9.7
	Neither	6	9.7
	Disagree	50	80.6
	Total	62	100.0
Glass waste segregation and recycling	Agree	51	82.3
	Neither	7	11.3
	Disagree	4	6.5
	Total	62	100.0
producing products from glass waste as a way of environmental sustainability	Agree	48	77.4
	Neither	10	16.1
	Disagree	4	6.5
	Total	62	100.0
Glass waste collectors and training	Agree	4	6.5
	Neither	13	21.0
	Disagree	45	72.6
	Total	62	100.0
Glass waste recycling plant in Warri	Agree	11	17.7
	Neither	12	19.4
	Disagree	39	62.9
	Total	62	100.0
A law promoting glass waste recycling	Agree	9	14.5
	Neither	17	27.4
	Disagree	36	58.1
	Total	62	100.0
The market for glass products in Warri	Agree	34	54.8
	Neither	18	29.0
	Disagree	10	16.1
	Total	62	100.0
Glass waste reduction from glass materials production	Agree	48	77.4
	Neither	10	16.1
	Disagree	4	6.5
	Total	62	100.0
Glass waste as a source of raw materials for other sectors	Agree	50	80.6
	Neither	8	12.9
	Disagree	4	6.5
	Total	62	100.0

6(9.7%,) respondents, agree 6(9.7%) neither agree nor disagree and 50(80.6%)respondents disagree that their household produces less glass waste compared to food and paper waste

51(82.3%) respondents agree, 7(11.3%) neither agree nor disagree, and disagree 4(6.5%) that segregating glass waste from other domestic waste will encourage recycling.

48(77.4%) respondents agree, 10(16.1%) neither agree nor disagree and 4(6.4%) disagree.that producing items from glass waste is a way of sustaining the environment

4(6.5%) respondents agree, 13(21.0%) neither agree nor disagree and 45(72.6%) disagreethat glass waste collectors are not well-trained to manage the waste they collect.

11(17.7%) respondentss agree, 12(19.4%) neither agree nor disagree and 39(62.9%) disagree that there is no recycling plants in Warri.

9(14.5%) respondentss agree, 17(27.4%) neither agree nor disagree and 36(58.1%) disagree that there is no recycling law in Warri.

A total of 34(54.8%) respondents agree, 18(29.0%) neither agree nor disagree and 10(16.1%) disagree that there is a market for recycled glass products in Warri.

48(77.4%) respondents agree, 10(16.1%) neither agree nor disagree and 4(6.5%) disagreethat producing glass waste materials from glass waste will help reduce waste

50(80.6%) respondents agree, 8(12.9%) neither agree nor disagree and 4(6.5%) disagreethat recycled glass can serve as a source of raw material for other sectors in Warri.

Discussion

Households in Warri generate more degradable waste (food) than any other domestic waste (paper, plastic, and glass). This

kind of waste when decomposing releases harmful gas (methane) into the atmosphere which harms residents' health and the environment. However, residents in Warri agree to produce biogas and bio-fertilizer from their waste if encourage doing so with the needed law and enabling environment.The results from the study show a positive response on the part of the resident to segregate their domestic waste if waste binsare provided with colour coding to differentiate one type of waste from the other to encourage recycling. Residents agree to segregate their food, paper, plastic, and glass waste to encourage recycling as a way of creating more jobs for people through direct engagement in recycling activities.The research finding shows a negative response to the waste recycling law in Warri South LGA promoting waste recycling thus leading to poor or no training of waste collectors which has resulted in poor environmental waste management and pollution.The finding shows that there is a market for recycled products in Warri if wastes are recycled.At the household level, resident claims greater awareness of local capacity building is needed in getting household involve in recycling their waste.The finding shows that waste is a pillar of efficiency and sustainability rather than an end to a line i.e.some of the generated waste in Warri can be an input for other areas and sectors of the economy, comparably, a study by Foday et al. (2013) on environmental and health impact of solid waste disposal in free town of Sierra Leone indicated that, the residents near and those far away from the Granville damp site suffered from diseases like malaria, chest pains and cholera due to location of the damp site closer to their settlement. This study's weakness was that it only considered one solid waste management practice called open damping and ignored other solid waste management practice. In Gumisiriza and Kugonza (2020), in Mbarara city of Uganda, solid waste management has employed many people including but not limited to municipal technical officials, garbage truck drivers and their turn boys, garbage sorters and factory owners while recycling and open dumping were the major solid waste management practice blamed for environmental pollution, disclosing nothing about the social impacts of solid waste management practice in the area.

CONCLUSION

The dangers of indiscriminate doping of waste in fast-developing cities in Nigeria such as Warri is a major call of concern to individuals and the government because it risks human lives. In this study, four major classes of waste comprising food, paper, plastic, and glass were identified. The lack of efficient waste collectors, poor awareness of waste conversion to biogas and biofertilizers, and lack of waste recycling laws on waste management and control were some of the factors that influence the increasing unholy attitudes towardwaste generated from householdsin Warri. The residents concord that waste segregation and recycling were measures to address waste issues. It is suggested that future studies should cover ways and techniques required in waste conversion at the domestic level. Another study could look into gender and its effect on waste generation.

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