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Full Length Research

Perception of Residents of Ilepeju Industrial Estate of the Waste Management Practices of Unilever Plc in Mushin L.G.A, Lagos State Nigeria

Elenwo E.I.

Department of Geography and Environmental Management, Faculty of social Science University of Port Harcourt,P.M.B.5323, Choba , Rivers State, Nigeria.

Author's Emails ✉ : iyke2_elenwo@yahoo.com / ephraimelenwo@gmail.com / ephraim.elenwo@uniport.edu.ng

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Industrialization is key of any nations development, while the negative externalities associated with industrial location are many, ranging from vehicular traffic emissions, to waste management which is fundamental. The study examined the waste management practices of Unilever Plc as well as the state government's policies on the management of industrial waste in the study area. The adopted a cross sectional survey method. Data were collected from both primary and secondary sources. Quota sampling was employed in administering questionnaire to residents of the industrial estate as well as the employees of Uniliver Plc. Chi-square were used to test the stated hypothesis. The result indicated that there was a significant relationship between sustainable development in the industrial estate and the approach to industrial waste management by Unilever Plc. The study found out that the production process of Unilever Plc involved waste water generation as testified by 55% respondents. Regarding waste management practices adopted in the study area, most of the respondents (55.79%) agrees that LAWMA was been used, some use PSP, and others cart pushers; some burn or incineration their wastes. The study found that the waste water generated by Unilever Plc had harmful effect on the workers and residents at large. The study concludes that polluters of the environment through industrial discharge should pay compensation for the environment being damaged. It was also recommended that waste water should be treated before discharging it into the public drainages; water bodies, canals or creeks to avert the attendant health and environmental consequences. Zoning regulations and environmental laws should be enforced strictly in the industrial estate.

Key words: Perception, Residents, ILupeju, Industrial- Estate, Unilever.

INTRODUCTION

Industrial solid wastes are those solid wastes which emanates specially from industrial activities or simply put they are solid by-products of industrial activities (Sharma, 2005). These include scrap metals (Ferrous and non-ferrous) glass, tyres, bulbs, packaging materials, leather, plastics, rubber, wood, spoils from drilling muds and cuttings, demolition rubbles, etc. Industrialization is vital to a nation's socio-economic development as well as its political status in the international committee of nations. It

provides employment for a good percentage of the population in medium to highly developed economies (Shrivastava, 2015). However, industries vary according to process, technology, size and nature of products, characteristics and complexity of wastes generated. Although industrialization is inevitable, various devastating ecological and human disasters devastating ecological and human disasters have continuously occurred over the years as a result of activities of these industries which have contributed in no small measure to environmental degradation and pollution problems of various magnitudes. Though studies on industrial waste management in developed nations abound (Williams, 1999; Bewley and Li, 2000; Belal, 2001; Shearer, 2002; Antonites and De Villiers, 2003) etc. The same is not true of developing countries, particularly in Nigeria where more than 80% of the industries operating in the country discharge liquid, solids and gaseous wastes (such as suspended solids, ammonia, cyanides, phenols, phosphates, chlorides, chromium, nickel, cadmium, carbon-monoxide, nitrogen oxides, sulphur oxides, particulate matter, iron oxide, cement kiln dust, hydrocarbons, ammonia, acidic, salt flux, solvent fumes and alkaline oxide emissions) directly into the environment in which they operate without adequate treatment that meets the basic national and international standards (Guobadia, 2000; Abubaker and Naser, 2000; Omofonmwan and Osa-Edoh, 2008).

PUBLIC HEALTH SIGNIFICANCE OF INDUSTRIAL WASTE

Industries are creating fantastic array of new chemicals each year, all of which find their way to the water bodies, for most of the chemicals the formulae are not known much less their acute chronic and genetic toxicity (Onibokun, 2011). The air and soil are equally affected. For example, a public health worker in Britain called John Snow was assigned to attempt to control a cholera epidemic realized that there seemed to be an extremely high concentration of cholera cases in a part of London. Almost all the people affected drew their drinking water from a community pump in the middle Broad Street where drainage runs through a brewery. He realized that the people who worked and lived in an adjacent brewery were not afflicted. Snow recognized that the absence of cholera in the brewery might be because their source of water supply was from a private well and not the Broad Street Pump. Unable to convince his superior to ban the obviously polluted water supplies, snow simply removed the pump handle and this prevented the people from using the water. The source of infection was stopped, the epidemic subsided and a new era of public health awareness related to water began (Vesilind, 1979). In Nigeria (1988), an accidental discharge from NAFCON Rivers State ONNE Plant, caused massive killing fishes that created some socio-economic problems for the artisanal fishery industry in the surrounding villages (Plants 1, 2 and 3). Toxic substances from various chemical industries can pose threat to human health when unrestricted discharges are allowed to occur (Akankali and Abowei, 2010). For example an effluent with high BOD can be harmful to a stream if the oxygen consumption is great enough to cause anaerobic condition. Many industrial wastes run as high as 30,000 mg/l which is higher than the effluent limitation standard by (FEPA, 1988). Heavy metals such as Cadmium, Chromium, Mercury, Copper etc are discharged into water bodies by industries, e.g., Mercury from battery industry destroyed the food chain of Plankton and filter feeders as happened in the Minamata Bay disaster in Japan (1953 – 1960); Death toll 120 and many injured. A pathogenic organism excreted in the human and animal faeces or urine may pass through water to other humans if the water is not treated. Water- borne diseases such as, Ascariasis, Cholera, Bacterial Dysentery, infectious hepatitis, Poliomyelitis, River Blindness, Guinea worm, typhoid, etc. Ilupeju Industrial Estate is one of the industrial estates established in Lagos at Mushin Local Government Area. The Estate has a number of industries such as PZ Cussons Nigeria Plc; Poly Products Nigeria Plc (manufacturer of polyethylene products); Bhojsons Industries Plc; Nestles Nigeria Plc, Unilever Plc, Patplast and Allied Rubber Products Nigeria Limited, Nigeria Foundries limited, Atlantic Textile Manufacturing Company Limited; Enpee Industries; Absco Industries; Pharmchem Industries; Kiwi Industries, etc. All these industries discharge effluents into rivers, emissions into the air and solid waste residues into the soil. And water bodies. Vehicular activities are usually high on the roads within the industrial estate as a result of the industrial activities happening around the estate. It is against this back drop that this study aims to investigate the perception of residents of the estate on the waste practices of

Plate 1. Unilever Plant Plc, Ilupeju Industrial Estate, Lagos, is the scene in major industrial estates in Nigeria.

Plate 2. An outfall or discharge point at Unilever Plc is a common practice by industries in major cities in Nigeria.

Unilever Plc in the study area.

AIM AND OBJECTIVES OF STUDY

The aim of the study is to investigate the perception of residents of Ilepeju industrial estate of the waste management practices of Unilever Plc in Mushin L.G.A. Lagos State Nigeria.

The objectives are to:

(i) Examine the state government's policies on the management of industrial waste in the study area.

(ii) Identify the various agencies responsible for industrial waste management in the study Area.

Plate 3. Some of the chemicals and other debris floating at the nearby creek close to the Estate is a major scene in most water bodies in Nigeria especially in Niger Delta, Nigeria.

(iii) Identify the industrial waste management practice of Unilever Plc.

(iv) Identify the extent which the management of industrial waste by Unilever Plc affects the environment in Ilupeju Industrial Estate.

Research Questions

(a) How effective are Lagos State Government's Policies on Industrial Waste Management at Ilupeju Industrial Estate?
(b) What are the methods used in managing Industrial waste by Unilever Plc in the study area?
(c) What are the problems that hinder the effective management of industrial waste in the study area?
(d) What are the dangers which poor industrial waste management practices by Unilever could have on the environment?

Research Hypotheses

H_0 There is no statistical significant correlation between sustainable development in the industrial estate and the industrial waste management practice by Unilever Plc

H_1 There is a statistical significant correlation between sustainable development and the industrial management practice by Unilever Plc.

METHOD OF STUDY

The study adopted a cross sectional survey research method. The population for the study was made up of residents of Ilupeju Industrial Estate and staff of Unilever Plc in Ilupeju, Lagos.

Sample Size and Sampling Technique

The residents comprised of people from diverse works of life spread across twenty streets that make up the industrial estate with an estimated population of 233,543 (Lagos State Ministry of Commerce and Industries, 2015). Quota sampling method was preferred to other sampling methods in the selection of participants from the different streets since this method gave representation to every street to be selected based on their numerical strength. Simple Random Sampling technique was also adopted to select staffs of Unilever Plc, as they were listed according to their departments and units. The

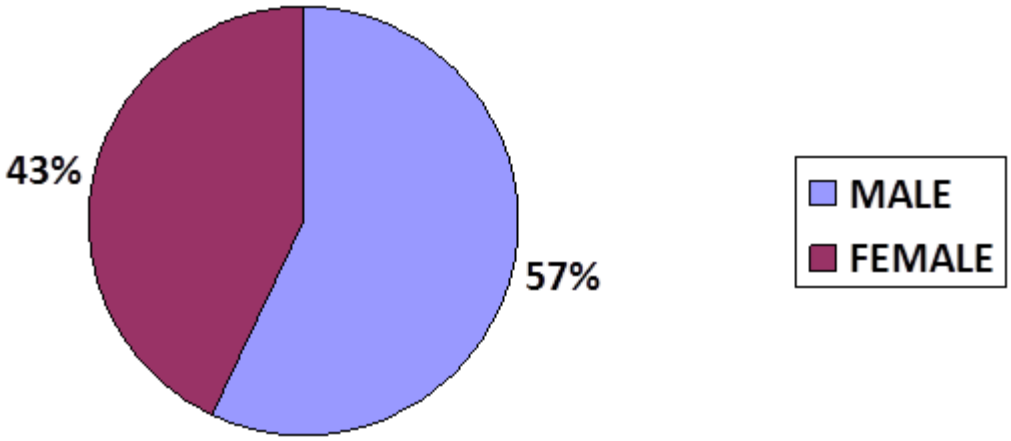

Figure 1. showing gender of respondents.

sample size was gotten by application Taro Yamane formula (1967):
as follows: n =

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

Where n = sample size
N = Population size
e = level of precision = 0.05 at 95% confidence level.
Therefore, n = $\frac{223{,}543}{1 + 223{,}543\,(0.05)^2}$
= 399.99
Therefore, sample size is 400.

DATA ANALYSIS

The data for this study was analyzed using both descriptive and inferential statistics. Objectives 1, 2, 3, and 4 were analyzed with descriptive statistical techniques such as mean, percentage, and charts. Objective 5 was realized by adopting the chi-square test (X^2). The Likert scale was weighted in the questionnaire as follows:
Strongly Agree ( ) 1 Point
Agree ( ) 2 Points
Undecided ( ) 3 Points
Disagree ( ) 4 Points
Strongly Disagree ( ) 5 Points
Weighted Mean: This was arrived at by adding all the points and dividing by the number of options. For example, (5+4+3+2+1) ÷ 5 = 3.0. This implies that item mean lower than 3.0 will be accepted, while those higher than 3.0 will be rejected.

RESULTS

Demographic information of Respondents

The Figure 1 shows that about 57% were females, while 43% were males from the sampled respondent.
The Figure 2 below shows the age categories of respondents. The figure reveals that most of the respondents were between 55 years old and above (38%), while those between ages bracket 46-55years was (24%), age bracket 36-45 years was 21% respondent respectively. Furthermore, on educational qualifications, it varied accordingly from (SSCE) holders to OND, B.Sc. and so on as can be seen in Figure 3 below.

Furthermore, direct observation and interviews revealed that a lot of water is used at the plant in operations for processes such as purification, washing and rinsing of packaging, cleaning of product mixing tanks and piping, steam production and cooling. The wastewater will be further treated with bleaching powder and eventually discharged into neighboring low land or creek. According to (Tchobanoglous, 1991), Wastewater is the primary area of concern at the food and beverage industry, with the exception of some toxic cleaning products, wastewater from food-processing facilities is organic and can be treated by conventional biological technologies. The company also produces solid waste which includes ingredient containers, damaged product containers, shrink or stretch film that holds palletized products together, bio-solids from wastewater drainage system, and damaged

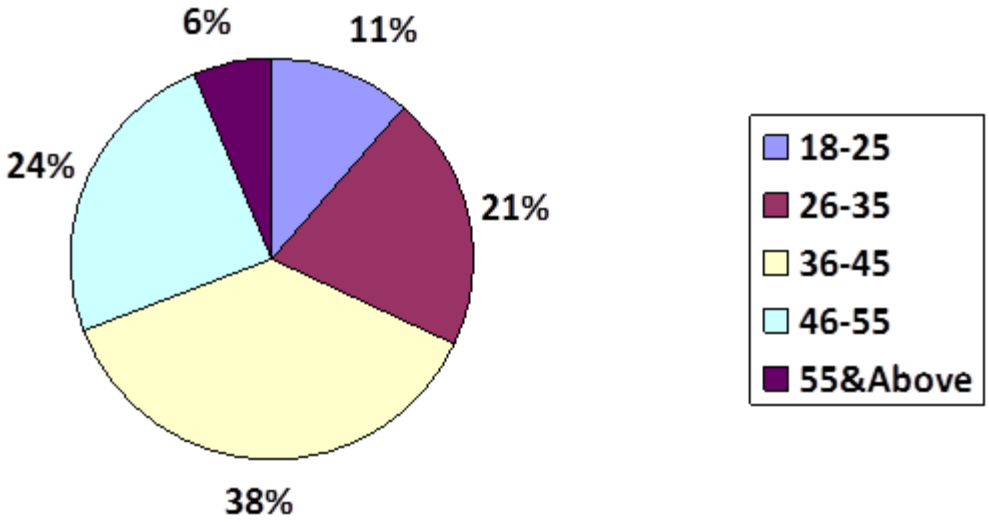

Figure 2. Age categories of Respondents.

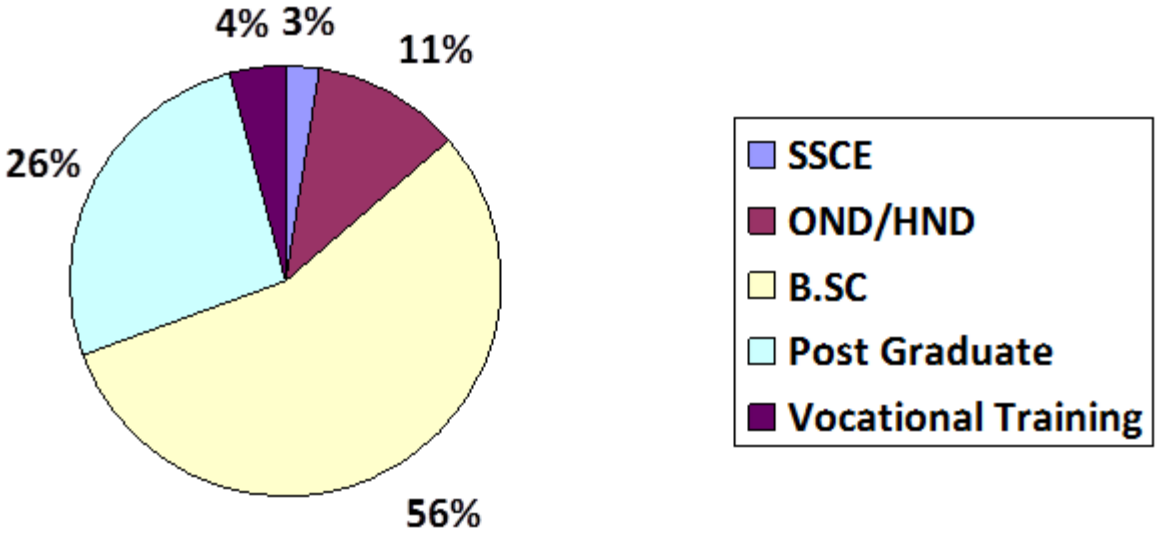

Figure 3. Educational attainments of respondents.

packaging materials. The waste discharges can be seen in Plates 2 and 3 above. Also questionnaire interview showed that 36% of respondents attested that the byproducts of the company are solid wastes, 9% say they are gaseous, while 55% say they are mostly waste water, this can be seen in Figure 4 below.

The Table 1, below shows the opinion of residents on likert scale. The analysis shows that 42% of respondents disagree that policies government has not been effective, while 30% agrees, while 20% strongly disagrees. These assertions mean that a lot need to be done with regards to policy implementation on the part of government.

Industrial Waste Management is a serious Environmental problem in Ilupeju Industrial Estate and the residents are aware of it. Furthermore, (Atsegbua, 2010) also observed that the problem associated with industrial waste management in Nigeria does not appear to be a problem of the

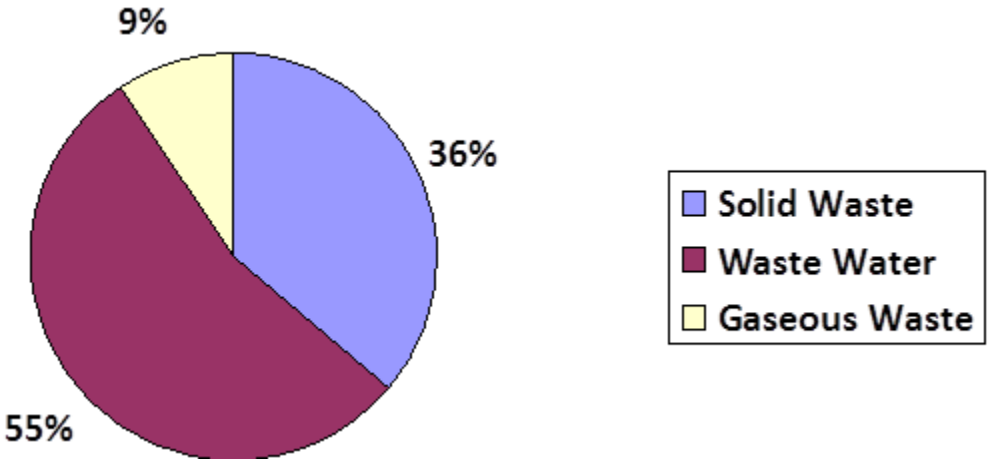

Figure 4. Types of industrial waste generated by Unilever Plc.

Table 1. Perception of residents on effectiveness of government policies on industrial waste management in the study area.

Variables	Frequency	%
SA	19	05
A	114	30
UD	11	03
D	160	42
SD	76	20
TOTAL	**380**	**100**

absence of legislative framework for industrial waste management but other factors such as incompetent and ill-equipped regulatory workforce.

Table 2 below clearly shows respondents' views on the agencies responsible for industrial waste management at Ilupeju Industrial Estate. Likert scale was weighted the item mean lower than 3.0 was accepted, while those higher than 3.0 were rejected. The Table 2 below shows the total number of responses. For Item 1; 212 (55.79%) reported strongly agree, 119 (31.31%) shows agree, 12 (3.16%) were undecided, 20 (5.26%) disagrees, while 17 (4.48%) strongly disagrees that the Lagos State waste management authority (LAWMA) was responsible for Industrial waste management in the study area. For Item 2; 186 (48.95%) showing strongly agree, 132 (34.74%) shows agree, 20 (5.26%) were undecided, 22 (5.79%) disagrees while 20 (5.26%) strongly disagrees that the Private Sector Participants (PSP) are responsible for Industrial Waste Management in the study area. Item 3 however shows that 262 (68.95%) strongly agreed, 86 (22.63%) agreed, 16 (4.21%) were undecided, 12 (3.16%) disagreed, and 4 (1.05%) strongly disagreed that the Lagos State Environmental Protection Agency (LASEPA) was responsible for Industrial Waste Management in the study area as can be adjudge from the likert scale measurement.

On the method of industrial waste management practice adopted by Unilever Plc to dispose industrial waste are shown in Figure 5 below, 42% of the respondents say they use Private Sector Participants (PSP) for its waste disposal, 35% say they engage the services of the Lagos State Waste Management Authority (LAWMA) for its industrial waste disposal, while 14.7% say they use industrial incinerator, whereas 8.3% say the company uses Cart Pushers to dispose their waste. In a related study conducted by (Adewumi, 2011) in Agbara Industrial Estate, Lagos; concluded that most of the industries in Lagos State engages the services of PSP for their waste management, some use LAWMA, whereas others made use of waste burning or incineration, this also corroborates the findings of this study. The Figure 5 below explains more.

Furthermore on the challenges facing the effective management of industrial waste in the study area as collated from responses from the questionnaire shows that weak and ineffective regulatory agencies

Table 2. Respondents perceptions of agencies responsible for industrial waste management at Ilupeju industrial estate

S/N	AGENCY	SA	A	UD	D	SD	X	REMARK	RANK
1	LAWMA	212(55.79%)	119(31.31%)	12(3.16%)	20(5.26%)	17(4.48%)	1.7	Accept	2
2	PSP	186(48.95%)	132(34.74%)	20(5.26%)	22(5.79%)	20(5.26%)	1.8	Accept	3
3	LASEPA	262(68.95%)	86(22.63%)	16(4.21%)	12(3.16%)	04(1.05%)	1.4	Accept	1
4	Cart Pushers	92(24.21%)	114(30%)	38(10%)	110(28.95%)	26(6.84%)	2.6	Accept	4
5	Others	32(8.42%)	14(3.68%)	236(62.11%)	82(21.58%)	16(4.21%)	3.0	Reject	5

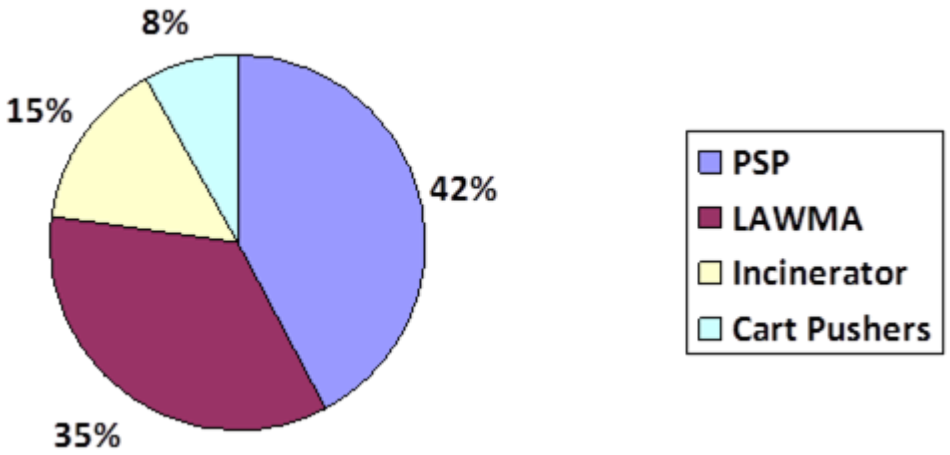

Figure 5. Methods of industrial waste disposal adopted by Unilever Plc.

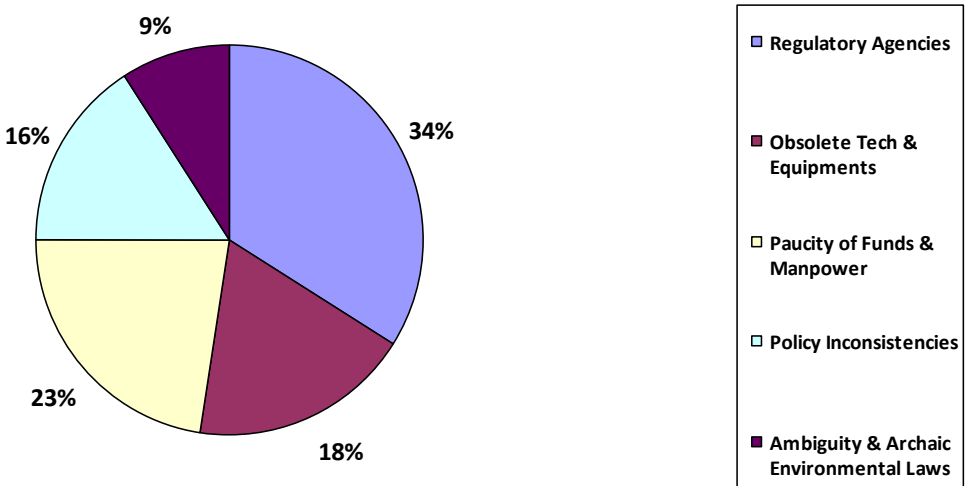

Figure 6. Challenges facing the effective management of industrial waste in the study area.

was the major impediment (34%), Paucity of funds and manpower (23%), ambiguity and obsolete environmental laws (18%) while policy inconsistency and obsolete tech equipment were (16%) and (9%) respectively. This was further explained in Figure 6 above.

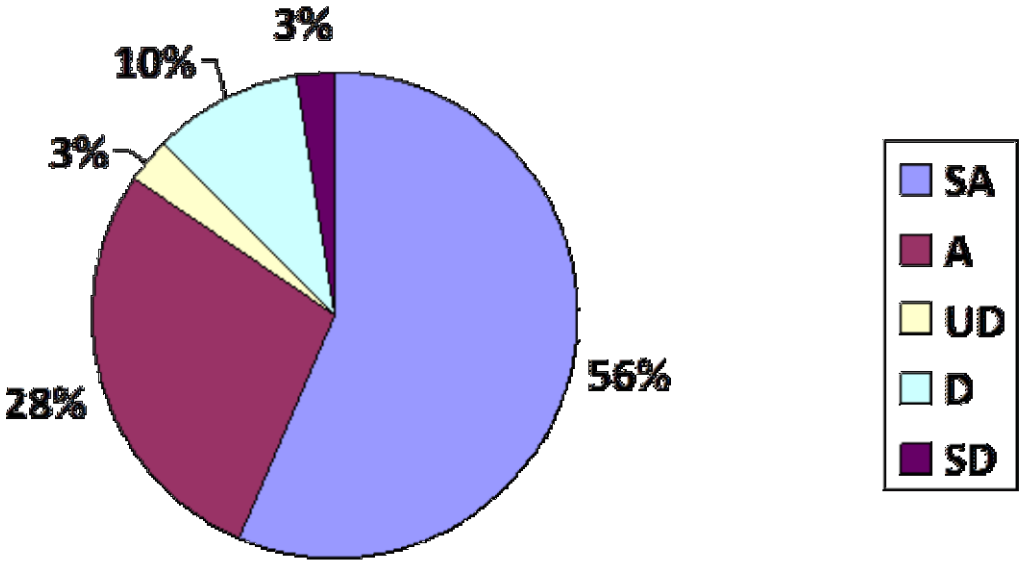

Figure 7. Effect of Unilever Plc's improper waste management practices and its effect on the Sustainable Development and the environment.

More so, on the effect of improper industrial waste management practice by Unilever Plc and its effect on sustainable development in Ilupeju Industrial Estate

A cursory look at Figure 7 above shows that 53.68% of the respondents strongly agree that the improper industrial waste management practice by Unilever Plc affects the sustainable development of Ilupeju industrial estate. Another 28.2% of respondents however simply agree with the assertion that the improper industrial waste management practice by Unilever Plc affects the sustainable development of the industrial estate, while 3.15% were undecided, while 9.72% disagreed, and 5.25% strongly disagree. The assertion by respondents was on public health grounds and the practice unregulated could lead to a deplorable state of the environment. Figure 7 above, explains more.

Testing the Hypothesis

H_o There is no significant correlation between sustainable development in the industrial estate and the approach to industrial waste management by Unilever Plc

H_1 There is a significant relationship between sustainable development in the industrial estate and the approach to industrial waste management by Unilever Plc.

Where SA = Strongly Agree
A = Agree
UD = Undecided
D = Disagree
SD= Strongly Disagree

Note: The above hypothesis will be tested at 0.05 level of significance.

Using Chi-Square ($\chi 2$) = $\Sigma \frac{(fo - fe)^2}{Fe}$

Where:
fo represents Observed Frequencies
fe represents the Expected Frequencies

Expected Frequency (Eij) = $\frac{RT \times CT}{GT}$

Where RT = Row Total
CT = Column Total
GT = Grand Total

$\frac{\sum (O-E)^2}{E}$ = 1,854.04

Therefore: Chi-Square calculated is 1,854.04
Degree of Freedom (df) = (C-1) (R-1)
(2-1) (5-1)
= 1 x 4 = 4:
Reject H_o, if Chi-square calculated is greater than Chi-square table value and accept H_o if otherwise.

Inference: Chi-square (X^2) calculated = 1,854.04. Chi-square (X^2) tabulated = 9.49. Therefore, H_1 is accepted and H_0 rejected because (X^2) calculated is

greater than X^2 tabulated which is 9.49 .The result was such that the null hypothesis (H_0) was rejected, while the Alternate hypothesis (H_1) was upheld.

DISCUSSION OF FINDINGS

The industrialization of Ilupeju has assisted in building self- reliant population and also in uplifting the economy of Lagos State. However, the huge waste generated has caused serious problems relating to environmental pollution. The problems relating to the disposal of industrial waste are associated with lack of infrastructural facilities, negligence of industries and lack of commitment to take proper safeguard measures. The Lagos State Environmental Protection Agency has not been able to enforce the legal provision and make industries legally responsible for safety of all concerned. The component category of the waste is similar to other reports from several authors in different cities. The hazardous and non-hazardous wastes are mixed and are expected to produce health problems among the workers and handlers of waste and the residents. The industry (Unilever Plc) adopted more than one means for disposal of waste with the Private sector participation (PSP) respondent's score (42%) as the preferred waste disposal option.

CONCLUSION

Like other developing countries and major cities, sustainable industrial waste management in Lagos remains a herculean task, especially with its ever increasing population. While it may be said that LAWMA have been making frantic efforts to improve waste management in the state, there are still a lot of untapped opportunities for sustainable waste management. The results from the study have indicated that industrial waste management from the industry studied as well as other industries in the cities in Nigeria need to be studied. Companies need to be made responsible for their industrial waste generated. The government should enforce the Polluter pay principles (PPP) (Tchobanoglous et al., 1997).

REFERENCES

Abubaker BA and Naser HI (2000). Waste Management in Contemporary Nigeria. The Abuja Example. *International Journal of Politics and Good Governance* 2 (2.2) Quarter 11 2011.

Adewumi I (2011). Waste Management in Nigeria, Issues and Prospects Conference Paper, PAEHON 2001.

Akankali JA, Abowei JFN (2010). The institutional perspective of pollutants impact severity on Artisanal fisheries. Resources in Niger Delta, Nigeria. *Current Research Journal of Economic Theory*; 2:76-81.

Antonites R and De Villers (2003). Waste generation, waste disposal and policy effectiveness: Evidence on decoupling from the European Union. *Resources, Conservation and Recycling*, 52(10), pp.1221-1234.

Atsegbua CA (2010). Appraisal of the effect of Industrial Location on the Resident, of adjoining Neighbhood. And unpublished Msc environmental Management, dissertation submitted to the Department of Environmental Science and Technology Federal University of Agriculture Abeokuta, Ogun State Nigeria.

Belal NC (2001). Problem-Framing: A Perspective on Environmental Problem-Solving. *Environmental Management; 15*(*5):* 603-6 12.

Bewley PO and Li OF (2000) Recovery and recycling practices in municipal solid waste management in Lagos, Nigeria. *Waste Management*, 27(9): 39- 1143.

FEPA(1988) Federal Rebublic of Nigeria, Federal Environmental Protection Agency, Act no. 58.1988.

Guobadia GED (2000). City Structure and Planning forAfrica. Benin City: The Geography and Planning Series of Study Note, University of Benin, Nigeria.

Lagos State Ministry of Commerce and Industries, 2015 (Official Report)

Omofonmwa RJ and Osa-Edoh CR (2008) Study on Solid Waste Management Options for Poverty Africa. Project report African Development Bank Sustainable Development & Reduction Unit.

Onibokun IA (2011). A new Approach to Municipal Waste Management in Nigeria, International Conference on Energy, Environment and Disasters- INCEED, Charlotte N.C, USA.- July 24-30.

Sharma OF (2005). Recovery and recycling practices in municipal solid waste management in Lagos, Nigeria. *Waste Management*, 27(9):1139-1143.

Shearer T (2002). Environmental Management Plans Demystified: A Guide to Implementing ISO 14001. Taylor & Francis.

Shrivastava P (2015). Technological and Organizational Roots of Industrial Crises: *Lessons* from *Exxon Valdez* and Bhopal. *Technological Forecasting and Social Change.* 45**:** 237-253.

Tchobanoglous G, Thomas MJ and Lizzi PS (1997). Integrated Solid Waste: Engineering principles and management issues. McGraw-Hill Publishing company, USA.

Tchobanoglous G (1991). Wastewater Engineering: Treatment, Disposal, and Reuse, Metcalf & Eddy, Inc., 3rd Ed, McGraw-Hill, NY.

Vesilind AN (1979). Environmental Pollution and Control. Ann Arbor Science Publishers inc.U.S.A. 233pp.

Williams BK (1999). Municipal solid waste management in Africa: Strategies and livelihoods in Yaoundé, Cameroon. *Waste Management*, 29(2): 986-995.

Yamane T (Statistics) (1967). An introductory analysis (2nd ed.) New York U.S.A. Harper and Row Inc.