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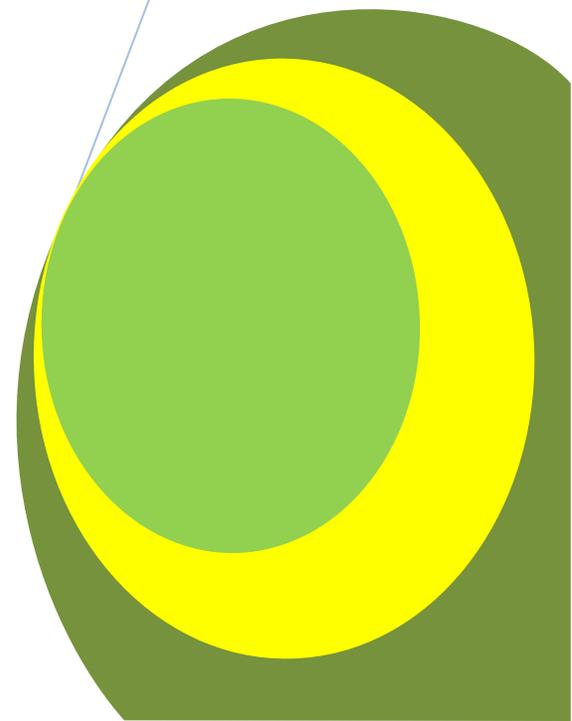
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The Spatial Impact of Industrial Establishments on the Environment in Esan West Local Government Area of Edo State, Nigeria

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ABSTRACT

The study examines the spatial impact of industrial establishments on the environment in Esan West Local Government Area of Edo State; examines the types of industry, their attributes and their spatial distribution in the study area; assesses the perception of the residents on the impact of the location of industries on the immediate environment; and evaluates the waste management practices of the selected industries of the study area.

Primary and secondary sources of data were used for this study. Primary data were collected through questionnaire administration, conduct of oral interview, focus group discussions and the determination of (x,y) ground coordinates of features of interest using the Global Positioning System (GPS). The results indicated that the industries located in Esan West Local Government Area of Edo State are attributed to the socio-economic development and negative impact to the study area. It also shows that the industries located in the area are concentrated majorly in local government headquarters and they are sited closer to the existing industries and the pattern of distribution was said to be clustered. The study concluded that there is high rate of environmental pollution and industrial waste due to the industrial establishments and therefore suggested that there is need to draw the attention of the industrialists and policy makers on the necessity to strictly observe and enforce rules and regulations on Environmental Impacts Assessments (EIA) in the study area.

Keywords: Spatial Impact, Industrial Establishments, Environmental pollution, Environmental Impacts Assessments (EIA).

1.0 INTRODUCTION

Industry is an organisation that produces goods and services to earn profits, (Jain and Khanna (2013). Industrial establishment is key to regional development which considers the factors such as transportation, market and source of raw materials for sustainable development (Alfred, 1909; Segynola, 2000).

Industries can be categorised based on the mode of their services and the nature of processing of the raw materials, these includes; Primary, Secondary, Tertiary and Quaternary (Onokerhoraye, 1986; Akinbode, 2002). Ajala (1998) grouped industries: small, medium or large scale industries. Different types of industries exist in an area. Industries can be classified either by using raw material, the numbers of workers employed, the amount of capital invested, and functions rendered by the industries. Using capital and labour approaches, there are large, medium and small scale industries. Using raw material approach, two types of industries emerge, these are agro – based and non- agro-based.

The concentration of industries in specific belts in the country result to environmental degradation in the same belts, all things being equal. This is because, industrialization, like any other human activity, makes great demand on the environment especially in terms of resource extraction and emission of waste. These concentrations make the problem of environment severe and difficult to handle in these belts (Segynola, 1988).

In view of the foregoing, this study was set against the background of examining the perception of respondents on the impact of industrial establishments on the environment in Esan West Local Government area of Edo State, Nigeria and to suggest measures that can be employed to protect the environment from being further deteriorated.

2.0 MATERIALS AND METHODS

Study Area

Esan West Local Government Area has an area of about 502 km² and is located between latitude 6°36'00"N and 6°49'00"North of the Equator and longitude 6°02'00" and 6° 15'0"E of the Greenwich Meridian (Fig. 1). It occupies a landmass of 483. 29 km². It is bounded to the East by Esan Central Local Government Area, to the West by Uhumwode Local Government Area, to the South by Igueben Local Government Area, and to the North by Etsako West and Owan West Local Government Area (Eseigbe, 2010).

Various data were sampled for the work (table 1) and this led to the flow chart as developed :(fig 2)

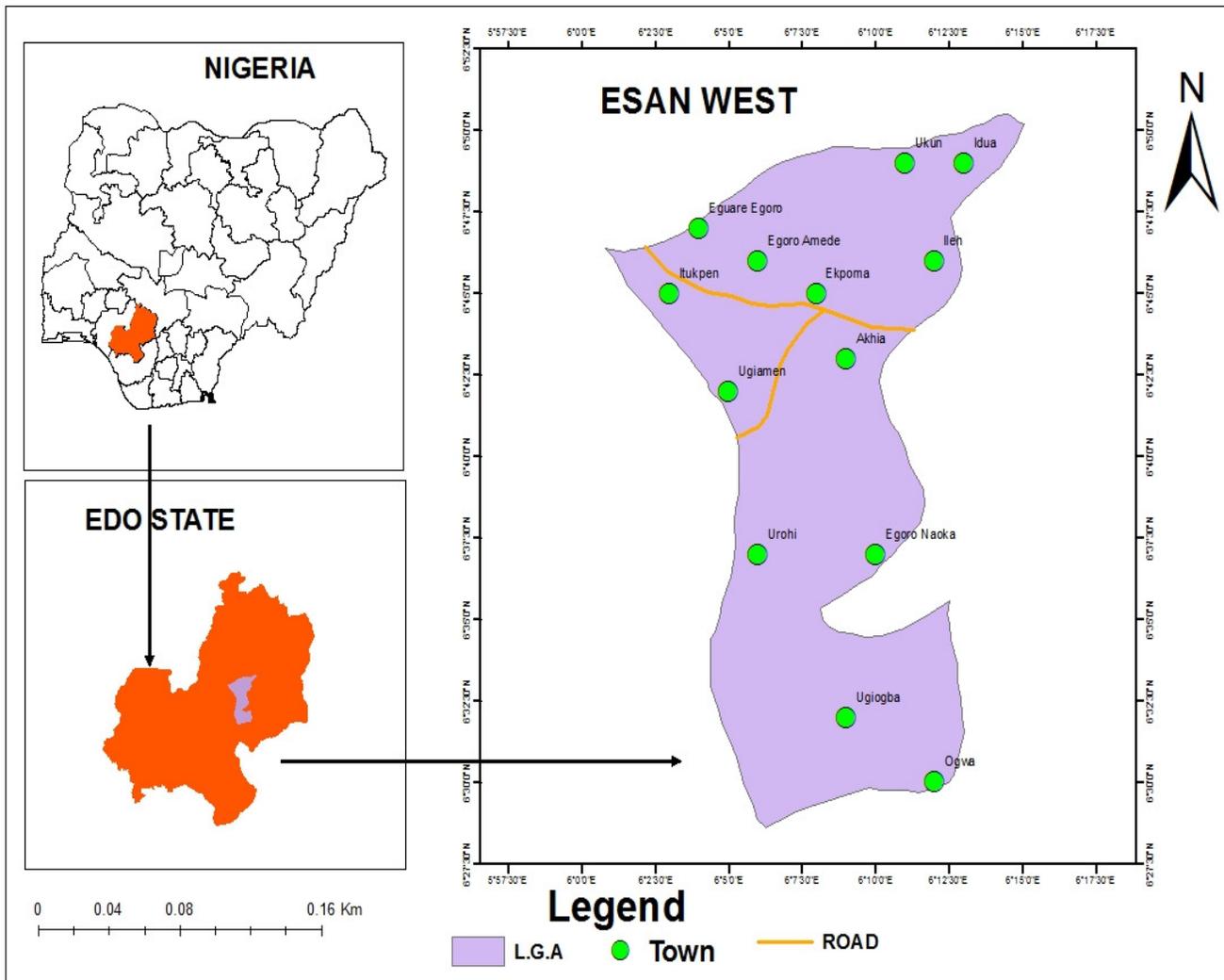


Figure 1: Map of Esan West L.G.A.

Source: Ministry of Lands and Survey, Benin City, 2015.

Table 1: Data

S/N	Types of Data	Sources	Date
1	Map of Esan West LGA	Ministry of Land and Survey, Benin City	2015
2	Field survey and Questionnaire Administration	Ward One to Ward Ten in the Study Area	2015
3	Global Positioning System Co-ordinates	Some Selected Industries in the Study Area	2015
4	Personal Interview from Industrial Establishments in Esan West LGA	Employees and Employers in Planning Office, Benin City	2015
5	Focus Group Discussion	People from the Study Area	2015
6	Secondary Data from Review Literature	Textbooks, Newspapers	2015

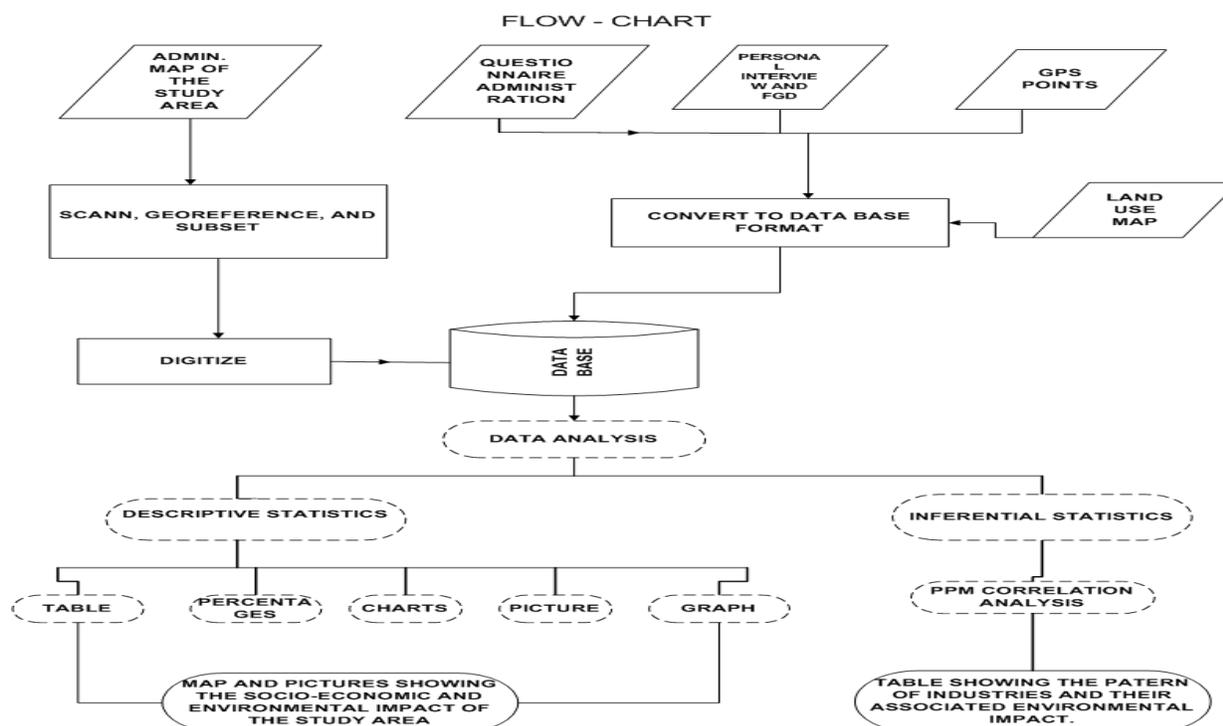


Figure 2: Methodological flow chart

3.0 RESULT AND DISCUSSION

In examining the spatial impact of industrial establishments on the environment in Esan West Local Government Area of Edo State, it is important to know that the industries are well distributed in the entire study area (table 2), (fig 3)

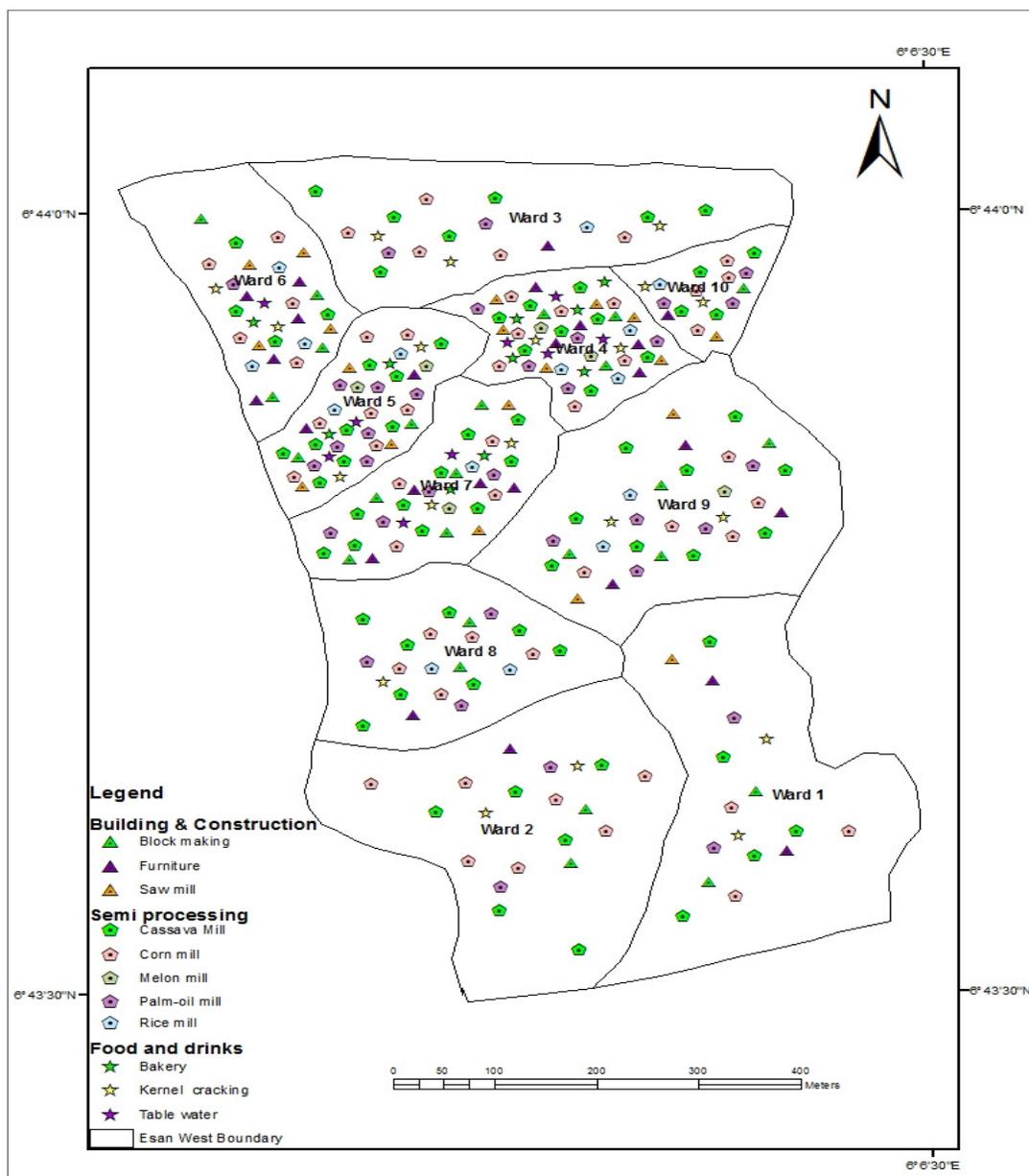


Figure 3. Spatial Distribution of the Industries in Esan West local Government Area, Edo State

The spatial impact of the industrial establishments on the quality of the environment was also examined. It was discovered that the industrial establishments have both positive and negative impacts on the quality of the environment in the study area.

Table 2: Industrial types of establishments in the study area

S/N	Wards	1	2	3	4	5	6	7	8	9	10	Total
	Industrial Type											
1.	Cassava mill	12	15	14	17	42	28	68	63	84	41	384
2.	Rice mill	0	0	4	15	10	16	8	14	20	12	99
3.	Melon mill	0	0	0	10	15	0	9	0	10	0	44
4.	Corn mill	6	12	16	32	34	30	26	48	46	41	291
5.	Saw mill	21	0	0	134	53	42	13	0	16	8	287
6.	Palm oil mill	7	9	7	23	4	16	12	10	27	13	128
7.	Bakery	0	0	0	22	8	5	14	0	0	0	49
8.	Block making	6	8	0	14	11	26	37	14	40	12	168
9.	Furniture	4	8	5	18	10	35	29	10	30	14	163
10.	Kernel cracking	6	5	12	9	13	10	16	9	20	23	123
11.	Table/Pure Water factory	0	0	0	15	8	10	18	0	0	0	51
	Total	62	57	58	309	208	218	250	168	293	164	1787

Table 3: Socio-economic Facilities Provided/Rehabilitated by Industrial Plants in Esan West LGA

Ward No.	Ward Name	Socio-economic Variables
1.	Ogwa	Electricity, health centre, education
2.	Ujiogba	Tarred roads, health centre, education
3.	Egoro, Ukhun, Idoa	Electricity, health centre, education
4.	Eguare, Emaudo	Tarred roads, electricity, health centre, pipe borne water, education
5.	Ihumudumu, Idumebo, Ujemen	Tarred roads, electricity, health centre, pipe borne water, education
6.	Iruekpen	Tarred roads, electricity, health centre, pipe borne water, education
7.	Ukpenu, Ujoelen, Emuhi	Tarred roads, electricity, health centre, pipe borne water, education
8.	Urohi	Health centre, education
9.	Uhiele, Ikhirolo	Tarred roads, electricity, health centre, pipe borne water, education
10.	Ileh, Imule	Tarred roads, electricity, health centre, pipe borne water, education

Table 4. Negative impact of industrial establishments on the quality of environments in the study area

S/NO	TYPES OF ENVIRONMENTAL POLLUTION	FREQUENCY	RANK	PERCENTAGE (%)
1.	Waste generation	240	1	36
2.	Noise pollution	173	2	25
3.	Erosion	127	3	23
4.	Air and land pollution	95	4	16
5.	Traffic congestion	19	5	-
	TOTAL	654		100

Source: Field survey, 2015.

By implication, industrial establishments have great adverse effects on the environment in which the industries are located. This is in line with Owate et al. (2005), who concluded that environmental noise is increasing with alarming rates in industrialization.

It shows that different types of waste were generated by the industries in the study area. About 53.5% of the industries generate solid waste such as saw dust from the numerous wood industries, empty sachet from the water factories, cannell shells from the oil milling industries and husk of rice from the rice mills, among other industries that generate solid waste. 25.7% of the respondents agreed that liquid was generated in the area. These includes different forms of chemicals that are being washed into the environment by so many hair dressing and barbing saloons, photographic studios, filling stations, and cassava mills.

It was also found that 20.9% gaseous wastes are generated by industries in the area such as fumes from the various transportation industries and numerous plants. The types and rates of pollution were also examined by the researcher in the study area. On the types of pollution examined, 55 respondents out of 187, i.e. 29.4 % agreed that the type of pollution in the study area was chemical discharge into the environment, these chemicals discharge includes waste water from hair dressing and barbing saloons, petrol stations, fumes from moving vehicles, photographic studios, fume from the numerous generating plants, waste from cassava, cannell and corn mills. 73 numbers of respondents, i.e. 39.0% agreed that dust particles pose another form of pollution in the study area. These are generated by the numerous wood industries, block molding industries, rice mills, cannell cracking industries and vehicles plying the earth roads especially during the dry season. Poultry/piggery is another type of pollution in the study area. The remaining 59 number of respondents i.e. 31.6% agreed to be poultry/piggery odors which was generated by the various milling factories, wood industries, and welding industries. Also the rate of pollution was assessed.

The findings revealed that there are high rates of environmental pollution in the study area, out of a total number of 187 respondents, 82 i.e. 43.9% ascertained that the rate of pollution in the area was high. 19 respondents i.e. 10.2% agreed that the rate of pollution is very high, 71 of the respondents i.e. 38.0% agreed the rate of pollution in the area was low and while the remaining 15 of the respondents i.e. 8.0%, agreed the rate of pollution was very low. Therefore, a lot of pollutants being released into the environment by the industries in the study area are capable of polluting the environment.

In examining the waste management practices of the selected industries in the study, the findings of the study reveals that a total number of 90 respondents i.e. 48.1%, agreed that the waste generated by the industries are being disposed off by burning the waste. 16 of the respondents i.e. 8.6% agreed that the industrial waste generated are disposed off by way of digging and burying in the ground. 45 of the respondents i.e. 24.1% agreed that the industrial waste generated are disposed off by dumping in the bush and while the remaining 36 of the respondents i.e. 19.3% agreed that the waste of the industries was disposed off by dumping in an open space.

The findings of the study on the waste management practices of the selected industries reveals that 52.9% of the respondents ascertained that the local government waste collection vehicles do collect their waste on weekly basis and while the remaining 47.1% of the respondents do not ascertain that the local government waste collection vehicle collects their waste.

Table 5: Perceptions on Industrial Waste Management Practices in Esan West Local Government

ITEMS	VARIABLES	FREQUENCY	PERCENTAGE (%)
The type of waste generated in the industrial area.	solid waste	100	53.5
	liquid waste	48	25.7
	gaseous waste	39	20.9
The rate of waste generation in Esan West LGA.	High	98	52.4
	very high	23	12.3
	low	56	29.9
	very low	10	5.3
Effects of land pollution observed in the area.	chemical discharge	55	29.4
	dust particles	73	39.0
	foul odour	59	31.6
The rate of land pollution in the selected area.	High	82	43.9
	very high	19	10.2
	low	71	38.0
	very low	15	8.0
The methods of waste generation from the industries disposed off.	Burning	90	48.1
	dig and bury	16	8.6
	dumping in the bush	45	24.1
	dumping in an open space	36	19.3
Does the local government waste collection vehicles collect your waste	No	88	47.1
	Yes	99	52.9
How often waste collection vehicles collect waste in the area	once daily	32	17.1
	once weekly	104	55.6
	once in a month	45	24.1
	others	6	3.2
The other waste management body that collects waste apart from the local government sanitation unit	No	101	54.0
	Yes	86	46.0
If yes, on what basis	Contract	83	44.4
	voluntary	55	29.4
	others	49	26.2
How would you assess the performance of the waste collection	Effective	57	30.5
	not effective	83	44.4
	fairly effective	36	19.3
	very effective	11	5.9
	Total	187	100

Source: Field Survey, 2015

4.0: CONCLUSION

The study concluded that there is need to harmonise contribution from policy makers, professionals in the field of social and environmental sciences and public opinions at the inception of industrial establishments. This would aid balanced economic growth with social, cultural and physical development of communities, cities, in developing

nations. When the residents become aware of the effects of their unwise use of the environment, and are well equipped with the techniques of environmental management, the goals of the national policy on the environment will be easy to achieve. All hands must be on deck to see that the efforts being made to revitalise the environment are not wasted. However, the Federal Government should enforce the establishment of environmental protection agency boards at both state and local government levels in Esan West Local Government Area.

The contributions of industrial establishments in Esan West and Nigeria at large to environmental pollution and degradation are quite substantial and potentially dangerous to human health through environmental contamination. The resultant effect of the high pollution load of the industries in Esan West and Nigeria at large is mostly due to weak or non-enforcement of environmental laws, lack of political will to back up existing laws or bring in new ones and the laissez-faire attitudes of industry. The need to subject the industries to EIA or environmental monitoring or audit need not be over-emphasised. There is need to draw the attention of the industrialists and policy implementers on the necessity to strictly observe and enforce rules and regulations of environmental impacts assessment in Nigeria. Given the investment scenarios in Nigeria prior to the EIA Act and the current patronizing attitude to its provisions, aggressive implementation of its provisions is necessary if the Act will not end up a "paper tiger".

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