

# Impacts of Industrial Wastes Disposal Strategies on Oil Producing Communities in Rivers State, Nigeria

DR. G. A. WOKOCHA

DEPARTMENT OF INTEGRATED SCIENCE *IGNATIUS AJURU UNIVERSITY OF EDUCATION, PORT HARCOURT, RIVERS STATE, NIGERIA*

## Abstract

This study was carried out to ascertain the impacts of industrial wastes disposal strategies embarked upon by Nigeria Agip Oil Company on oil producing communities in Ogba / Egbema/Ndoni local government area of Rivers State. To elicit information for this study a thirty two items structured questionnaire of agree and disagree was administered to one hundred respondents randomly sampled from four oil producing communities in the area. A simple percentage was used for data analysis Research findings show that different types of wastes are produced, some toxic and hazardous. The wastes disposal strategies employed by the oil company is substandard and these impacts negatively on the people of the area. Recommendations were also made.

## Introduction

The location of a drill site is dependent upon the characteristics of the underlying geological formations. Modern drilling techniques allow some flexibility in choice of location, allowing consideration of environmental protection and logistical needs. Connell and Miller (1991) asserts that a site is constructed to accommodate drilling operations and support services on land, a typical one-hole exploration site occupies between 5,000 and 20,000 square metres. Drilling rigs and support equipments are divided into modules to facilitate transportation. Typical modules includes derrick, drilling mud handling equipment, power generators and cementing equipment. The camp provides workforce, accommodation, canteen facilities, communications, vehicle maintenance and packing areas, fuel handling and storage, areas and provision for collection, treatment and disposal of wastes. Api (1994) posits that once drilling commences, drilling fluid or mud is continuously circulated down the drill pipe and back to the surface equipment to balance underground hydrostatic pressure, cool and lubricate the bit and flush out rock cuttings. Agarwal, Kumar and Mehrota (1996) asserts that the primary wastes from exploratory drilling operations include drilling mud's, and cuttings, cementing wastes, well completion work-over and stimulation fluids and production testing wastes. Other wastes include excess drilling chemicals and containers, construction materials, such as pallets and wood etc, process water, fuel storage containers, power unit and transport maintenance wastes. Scrap metals and domestic and sewage wastes.

ATSDR (1998) proposed the management of these wastes as sources of reduction, recycling and reuse, treatment to reduce the volume of toxicity and disposal in ways that will minimize adverse impacts to the environment and human health. There are other waste management technologies to cater for basic oil and gas such as;

1. Surface impoundments: Which are reserve pits use to temporarily store drilling fluids.
2. Land filling: Placing waste in the ground and covering them with layers of soil.
3. Land Application: Which consist of spreading mixing wastes into soils to promote the natural biodegradation of organic constituents and the dilution and attenuation of metals.
4. Bio-treatment methods: meaning that many organic compounds present in the exploration and production wastes may be biodegraded to carbondioxide and water using natural biological processes etc.

Brasier (1991) reported that there are many damage cases resulting from the management of exploration and production of crude oil and gas wastes, which are in violation of existing environmental agency's regulations. These cases include;

1. Damage to agricultural land, crops, streams, aquatic life and other resources from produce waters and drilling fluids, including potential contamination of aquatic and bird life in marine ecosystems by metals and polycyclic aromatic hydrocarbons from discharges of these wastes.
2. The risk of soil and ground water degradation from runoffs and leach ate from treatment and disposal facilities, reserve pits and unlined disposal pits.

3. Salt damage to ground water, agricultural land, domestic and irrigation waters caused by seepage of native brines from improperly plugged or unplugged abandoned wells.
4. Improper functioning of injection wells degrade ground water.
5. Damage to vegetation, including potential to fish ponds and lakes from road spreading of high-chloride drilling muds and seepage or discharge from reserve pits etc.

### **Statement of the problem**

Man produces enormous volume of solid wastes in industrialized societies. These wastes usually come in form of domestic, commercial, industrial, agricultural and mining wastes. Some are nontoxic while some are toxic and hazardous and quite injurious to both human health and environmental quality. This research is therefore undertaken to investigate the major industry in Ogba/Egbema/Ndoni Local Government Area, the Nigerian Agip Oil Company and examining:

1. The nature and types of waste produced.
2. The disposal strategies of those wastes.
3. The impacts of such wastes on people.

### **Purpose of the study**

The objectives of the study are:

1. To ascertain the nature and types of wastes produced by Nigerian Agip Oil Company.
2. To identify the wastes disposal strategies used by the Nigerian Agip Oil Company.
3. To identify the impacts of such wastes on people.

### **Research Questions**

This study attempts to answer the following research questions;

1. What is the nature and types of wastes produced by Nigerian Agip Oil Company?
2. What are the wastes disposal strategies in Nigerian Agip Oil Company?
3. What are the impacts of such wastes on people in the area?

### **Scope of the Study**

This study is centered on the main oil company in Ogba/Egbema/Ndoni Local Government Area which is Nigerian Agip Oil Company (NAOC).

### **Area of the Study**

The area of this study is Ogba/Egbema/Ndoni Local Government Area of Rivers State. This study area is the largest oil producing community in Rivers State, where the processing, transportation of oil and gas take place daily with its resultant wastes, disposals and different strategies being utilized.

### **Design of the Study**

The design used for this study is a simple survey design which involved the use of questionnaire to seek the opinion of a defined sample from a population.

### **Study Population**

The population of this study is made up of oil and gas producing communities in Ogba/Egbema/Ndoni Local Government Area of Rivers State.

### **Sample and Sampling Technique**

The study sample consists of one hundred people randomly selected from oil and gas producing areas such as; Obiafor, Obrikom, Ebocha, Idu and Akiri all in Ogba/Egbema/Ndoni Local Government Area of Rivers State. The sample consists of only male workers, twenty (20) from each area totaling 100 respondents.

### **Instrumentation**

A thirty-two item structured questionnaire of “agree” or “disagree” was used to illicit information for the study.

### Data Analysis Technique

A simple percentage was used for the data analysis.

Research question one: what is the nature and types of wastes produced by Nigerian Agip Oil Company?

Items 1-14 of the questionnaire were analyzed to provide answers to this research as shown in table one below.

**Table one: Responses of the nature and types of wastes produced by Nigerian Agip Oil Company.**

NO.	ITEMS					TOTAL
		Agree	% Agree	Dis agree	% Dis agree	
1.	Liquid waste are produced	86	86	14	14	100
2.	Gasses are produced	84	84	16	16	100
3.	Solid wastes are also produced	82	82	18	18	100
4.	Toxic wastes are produced	62	62	38	38	100
5.	Non-toxic wastes are produced	30	30	70	70	100
6.	Corrosive wastes are produced	56	56	44	44	100
7.	Non corrosive wastes	72	72	28	28	100
8.	Hazardous wastes are produced	74	74	26	26	100
9.	Nonhazardous wastes	36	36	64	64	100
10.	Noise pollution are produced	70	70	30	30	100
11.	Heat are produced	74	74	26	26	100
12.	Products are biological in nature	16	16	84	84	100
13.	Products are chemical in nature	62	62	38	38	100
14.	Physical in nature	66	66	34	34	100

Based on the table one above, the respondents affirmed that the nature and types of wastes indicated with 50% and above are produced by the Nigerian Agip Oil Company.

**Research Questions Two:** What are the wastes disposal strategies of Nigerian Agip Oil Company?

Item 15-23 of the questionnaire were analyzed to provide answer to the research question as shown in table two below.

**Table Two:** Responses showing the waste disposal strategies of Nigerian Agip Oil Company

No	ITEMS					TOTAL
		Agree	% Agree	Dis agree	% Dis agree	
15.	Solid wastes are evacuated promptly to designated dump site	0	0	100	100	100
16.	Solid wastes are incinerated	98	98	2	2	100
17.	Liquid wastes are discharged into nearby pits	28	28	72	72	100
18.	Liquid wastes are treated before disposal	4	4	96	96	100
19.	Hazardous wastes are chemically converted into less toxic forms	28	28	72	72	100
20.	Some gas wastes are recycled and reused	64	64	36	36	100
21.	Some wastes are recovered and converted into useful products	24	24	76	76	100
22.	Some hazardous liquid wastes are kept in containers and buried	60	60	40	40	100
23.	There are integrated waste management system in place	4	4	96	96	100

In table 2 above, the respondents affirmed that the above waste disposal strategies are carried out.

**Research Question Three:** What are the impacts of such wastes on Nigerian Agip Oil producing communities?

Items 24 – 32 of the questionnaire were analyzed to provide answer to this research question as shown in table three below:

NO.	ITEMS	Agree	% Agree	Dis agree	% Dis agree	TOTAL
24	Oil and gas wastes cause air pollution which affect peoples respiratory system	100	100	0	0	100
25.	The wastes contaminates drinking water thereby causing stomach disorder	100	100	0	0	100
26.	Most people have hearing problem due to noise pollution of gas flaring	100	100	0	0	100
27.	Heat from gas flare causes discomfort and restlessness	90	90	10	10	100
28.	Volatile wastes of gas and liquid can cause vision problems	96	96	4	4	100
29.	Heat rashes are common in the people	90	90	10	10	100
30.	Fire outbreak from volatile wastes of gas and liquid has led to loss of lives	70	70	30	30	100
31.	Corrosive wastes causes scald	75	75	25	25	100
32.	Accidents from carelessly kept wastes leads to injuries	80	80	20	20	100

From the table above, it is understood that the wastes from the company adversely impact negatively on the people.

**Discussion of Results**

From the analysis of data in table one above over 56 percent affirmed the nature and types of waste produced by the Nigerian Agip Oil Company as wastes such as solid, liquid, gaseous, toxic, corrosive and non corrosive, hazardous, heat, noise and chemical as well as physical wastes. This finding is in line with that of Agarwal (1996) who asserts that the primary wastes from exploratory drilling operations include muds and cuttings, cementing wastes, drilling chemicals, construction materials such as pallets, wood etc, process water, fuel storage containers, transport maintenance waste, scrap metals and domestic and sewage wastes.

Analysis in table two indicates that standard waste disposal strategies are not followed by Nigerian Agip Oil Company. This is indicated by the high number of respondents. This finding is in line with that of ATSDR (1998) who found that companies produce enormous volume of wastes which are highly toxic and hazardous and are also injurious to human health and the environmental quality.

From the analysis in table three, the responses indicate that the people within the communities are adversely and negatively impacted by the wastes generated by the company.

This finding is in agreement with that of Bergel (1998) who reported from his research finding that crude oil wastes are not properly managed as some migrate through seepages to contaminate underground water causing stomach upset, and at regular consumption of the water resulting in respiratory problems, diarrhea, cholera and even cancer.

**Summary**

This research survey was carried out to ascertain the nature and types of wastes produced by Nigerian Agip Oil Company, the disposal strategies and the impact of such wastes on the people within the communities.

A structured 32 item questionnaire of agree and disagree was administered to 100 respondents. The findings indicate the types of wastes produced by the oil company as solid, liquid and gaseous, ranging from toxic, hazardous etc. that

the disposal strategies used are inadequate and below standard, and that the wastes impact negatively to the health of members of the communities.

### **Conclusion**

The following conclusions are drawn from the studies

1. A lot of hazardous, toxic, liquid, solid and gaseous wastes are produced by Nigerian Agip Oil Company.
2. Nigerian Agip Oil Company employ inadequate and below standard disposal strategies.
3. The people in the research communities are negatively impacted by the wastes produced through noise pollution, gas flaring and drinking of contaminating water.

### **Recommendations**

Based on the findings, the following recommendations are made;

1. The National Environmental Standards Regulator and Enforcement Agency (NESREA) should be up and doing to monitor oil companies waste disposal strategies.
2. Oil companies should manage their wastes directly instead of subletting it out thereby creating room for substandard jobs.
3. There should be maintenance culture for aging and corroding equipments.
4. Oil companies should modernize their equipments.
5. Environmental impact assessment should be conducted to ascertain impact of gas and other wastes in the area.
6. Well equipped hospitals should be sited in the areas.

### **References**

- Agarwal, R. Kumar, S., and Mehrotra, N. K. (1996), polyaromatic hydrocarbon profile of mineral oil by gas chromatography journal of chromatography science 24 (7), 289-292.
- Api (1994), Waste oil round up No. 3: Committee on disposal of waste products. American Petroleum Institute Division of marketing Washington, D. C.
- ATSDR (1998), Health assessment for York Oil Company, Moira, New York, Region Atlanta: Agency for Toxic Substance and Disease Registry. Report No. PB 90 140013.
- Bergel, F. (1998), Carcinogenic hazards in natural and man-made environment, 185, 165-181.
- Brasier, F. (1991), United States Environmental Protection Agency. A reviewed comment on produced water disposal, submit monograph 67-88.