

# Comparative Assessment of Compliance of Oil Producing/Base Logistics Companies' Environmental Management Systems (Ems) in Rivers State, Nigeria

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**Abstract**— The study was on Comparative Assessment of Compliance of Oil Producing/Base Logistics Companies' EMS with ISO 14001 Standards in Rivers State, Nigeria. The study made use of a cross-sectional research design. Companies were made to participate through convenience sampling of companies in the sampling frame. Being survey research, the instruments were administered on every willing respondent found in the HSE department of the companies surveyed. Out of 125 respondents, only 120 participated. Data collected were analyzed using percentage rating and simple descriptive statistics. A criterion mean value of 2.5 was used as a benchmark for checking compliance and other assessment indices. This was drawn from the Likert scale of 4, 3, 2, and 1. In checking compliance, for instance, out of the 5 items considered, Total E&P Nig. Ltd attained the 2.5 mark in 4 items whereas INTELS Nig. Ltd hit 3 of them. Moreover, the two companies are compliant in most of the components as they rated 2.5 in the compliance rating matrix with Total E&P Nig. Ltd taking the lead. The study came up with some recommendations: The government of Rivers State should ensure that all oil and gas companies especially the Oil-producing and Base Logistics companies in Rivers state run their businesses in tandem with the concept of sustainability by first encouraging them to adopt ISO 14001 standard.

**Keywords**— Base Logistics Companies, Comparative Assessment, Compliance, Environmental Management System, ISO 14001 Standards, Oil-producing.

## INTRODUCTION

The world can achieve balance when there is mutual interaction between components such as the environment itself, society, and the economy. This is important if the goal of their interaction is targeted at the concept of "Sustainable Development." The environment and Society deserve fair treatment. It is for this reason that whatever planning or development program embarked upon should be done in consonance with the tenets of sustainability. Anything short of this idea makes the law play its part. Legislation connected with our environment is getting more stringent because of the "growing pressures on the environment from pollution, inefficient use of resources, improper waste management, and climate change, degradation of ecosystems and loss of biodiversity."(ISO, 2015).

This has brought about moves by organizations to replace the "command and control" method to handle the abuse or menace internally. This move has led managers to adopt what is called "the systematic approach" to manage the environment by calling for voluntary adoption of ISO 14000, ISO 9000, ISO 20000, RESPONSIBLE CARE®, and EMAS, to contribute voluntarily to sustainable development.

Since the government spearheads matters about safety, health, and the environment, planning or refusal to plan can either bring about decisions that can help in societal

welfare or destroy society. For instance, when it comes to environmental matters, there are existing laws designed for mitigating or controlling social behavior towards the environment since whatever happens within our dear environment can affect society and the economy. Closely looking at the definition of sustainable development as "development that meets the need of the present generation without compromising the ability of future generations to meet their need," for instance, would be proper if the submission is that proper action is taken now to protect the environment from harm. Society, the economy, and the environment will suffer harm together, (Brundtland Commission, 1987)

Issues about the environment have started attracting growing concern in all parts of the earth inhabited by man. The book "Silent Spring" is a familiar contribution to efforts made over the centuries through activists of the environment. Also memorable is the event that that the world saw in 1972. The high point of the conference bothered about "sustainable development." The second, like it, was that staged in Rio De Janeiro, Brazil in 1992. These and more were the pioneering moves and contributions in support of sustainability. This second conference led to the release of a document known as Agenda 21- a blueprint for "Sustainable development into the 21st century." This was developed to assist individual countries to handle their environmental

hurdles as they occur. Again, in Geneva came a call for tools that individual companies can adopt and implement to indicate their commitment to the concept of "sustainable development." The tool promotes an open ground for companies across international boundaries. In 1946, the tool called ISO 14000 was launched. The *raison d'être* "of this International Standard" was to provide organizations with "a guide to setting up their own "Environmental Management System (EMS)" and carry out benchmarking at one point in time or another for continual "environmental improvement." The EMS framework, if well established, would assist operating companies to respond to changing conditions of the environment and balance with socio-economic demands. "It specifies requirements that enable an organization to achieve the intended outcomes it set for its environmental management system" (ISO, 2015).

Following this, there are agencies put in place by several governments to enforce environmental regulations the world over. In Nigeria, for instance, there is the "National Environmental Standards and Regulations Enforcement Agency" (NESREA) and the "National Oil Spill Detection and Response Agency" (NOSDRA) operating under the auspices of the Federal Ministry of Environment (FME). These agencies ensure that companies work towards "sustainable development." For corporate organizations, adopting standards like the ISO 14001, they find it very useful for it helps them run their affairs in a friendly manner; thus allowing the "National policy" on the environment directs their affairs. This is the hidden fact behind "Corporate Environmental Management". It is a management strategy open to companies for adoption to cater to their activities from a business perspective. It employs the "systems approach to integrate seemingly disparate" aspects of any business organization and achieve a single goal. Another way of saying the thing is that it uses the idea behind "Environmental Management Systems" (EMS) in mitigating whatever consequences their activities would bring about. Adopting this has helped companies manage ecosystem goods while maintaining their integrity.

Among such companies in Nigeria are Total E&P Nig. Ltd and INTELS Nig. Ltd. They are finding these international standards useful as it provides a framework within which their organizations can "PLAN, DO, CHECK and ACT" as they explore, manufacture their products, deliver services and carry out their activities in the environment they find themselves. The standard assists businesses and the national economy together. It has a twin benefit – protecting the environment. Under

the "command and control" regulation, the government of Nigeria has designed and promulgated legal tools connected with environmental legislation since 1989. Among these tools are the "National Policy on Environment" of 1989 (as amended 1999), "Environmental Impact Assessment (EIA) Act No. 86 of 1992," the "National Environmental Protection (Pollution) Abatement in Industries and Facilities Generating Waste" Regulation of August (1991), etc. The incident at Koko in Delta State triggered this development this happened in 1987. This incident attracted other sundry laws and policies in the States. this included the Rivers State Environmental Protection Agency Law of 1996, Rivers State Compensation Tax Law of 1997, etc. indicating that a system of environmental protection has already been set up (ISO, 2015).

Setting environmental regulations is one thing, implementing and monitoring the setup is yet another. Another way of repeating what has been said is that since this infrastructure is installed already, individuals with business establishments can key into the system before a license can be issued to them or, better still, a lease approval to operate. Nevertheless, some have taken the deregulation approach of developing an EMS. To be successful, they design an environmental policy, goal, and objectives alongside vision and mission that connect with the company goal and the concept of "Sustainable development." Some committed companies have decided to exceed legislation on environmental protection. This commitment has given them an ethical stand and has led them to adopt voluntary tools like "ISO 14001 Environmental Management System (EMS)."

The challenge has been that the oil-producing/oil-servicing (Base Logistics/Life Camp Management) companies with their "environmental management system" in order and adopted the standard (ISO 14001) still refuse to go green and thus cause harm to the environment and society. This is a paradox to what the National Policy on the Environment and their environmental policy document state. This attitude brings about a deviation from what the ISO 14001 standard sets as guidelines. This has brought about wanton pollution to the environment their businesses have been set up. Even so, renowned companies with their standards and implementation strategies in order are not improving their environmental performance. This shows that the company staff along with top management lack commitment. However, the top management is supposed to be taking the lead in this. More so, this lack of commitment by the staff of

organizations shows a "lack of environmental culture" and they pollute and reduce the quality of the environment. According to Balogun and Francis (2015), it was discovered that: "Industries and their activities... have been established to be the reason behind the wanton environmental degradation particularly in the Niger Delta area of the country." The obvious is pollution from oil exploration activities. Service industries also contribute to a total load of pollutants introduced into the hydrosphere, lithosphere, and atmosphere (Balogun and Francis, 2015).

Human health consequences of these activities are enormous and include various morbidities and mortalities like cancer of the lungs, respiratory distress, various skin infections, asthma, and miscarriages amongst pregnant women, irritation of eye and skin, and even premature death. The danger to the physical environment includes loss of aesthetics as solid waste, not properly handled is seen in drainage channels clogging them up and causing urban flooding. More so, infrastructures such as roads are adversely affected by the flood as the drainages are blocked with waste materials and remain under flood water over a long period. When organizations' EMS lacks conformity to ISO standards, it makes them carry out their business in manners that are opposed to the dictates of sustainability. This leads to serious environmental consequences. This lends credence to the need for comparative assessment of compliance of the companies' EMS to ISO 14001 in the study area.

#### **STATEMENT OF THE PROBLEM**

Public skepticism that borders around corporate environmental practices is an old idea; even the popular media is an open indication of this. Members of the public assume that "many companies break the rules." The answer is the degree of noncompliance. To operate successfully, most companies have resorted to voluntary adoption of self-regulation amidst other governmental arrangements provided locally for corporations.

With the above in mind, Ruhl, Salzman, Song, and Yu (2002) in their research work, focused on environmental compliance of American Bar Association's segment of the Environment, Energy, and resources (section of the Environment) "in the United States." In the survey, they focused on knowing the extent to which corporations "comply with environmental" matters.

Another research work in Canada by Walcot in 2015 focused on Canadian electricity utilities that used "ISO 14001 EMS." This research work was focused on the extent to which the utilities' EMS under research

"conforms to the current" version "of ISO 14001(i.e. ISO14001:2015)."

Furthermore, Ailu and Hiew (2010), in research titled: "The Impact of the Voluntary Adoption of ISO 14001 among firms in the Asia-Pacific region," focused on several companies. For instance, the focus was on those in "the Hospitality and Tourism industry," Transport and Aviation industry, and Packaging industry; but not on Oil and gas producing/servicing companies.

Kika, (2017) in research titled "Corporate Environmental Management Systems of Select Companies in Rivers State," focused on companies that specialized in chemical and allied services, but not on petroleum refining or other oil services associated with the petroleum industry.

From the foregoing, it is notable that researchers have done works on "environmental management system" and "corporate environmental management" in different places of the world. Even then, scarcely anyone focused on the Oil and gas sector. In Nigeria, for instance, and in Rivers State especially, some researchers have made notable attempts in this same field of research. However, none has researched Oil-producing cum Base Logistics companies specifically- let alone a comparative assessment of both segments of the oil and gas sector. This identified singular gap is significant and is the reason for this research work. Once again, this is the essence of this research: Comparative Assessment of compliance of oil-producing/oil-servicing (Base Logistics) organizations' environmental management systems EMS with "ISO 14001 standards in Rivers State, Nigeria."

#### **AIM OF THE STUDY**

##### ***The study aims to:***

Identify the environmental challenges of the companies' operations ISO 14001 standards have been able to address.

##### ***Materials and Methods***

The Cross-sectional research design was utilized for this study. A cross-sectional survey collects data to draw inferences about the target population of the study. This survey gathers data "to draw inference about a population of interest. It allows researchers to closely observe and carry out the measurement on a given phenomenon along with other factors that would be necessary for the success of a research. Since this study is about environmental management systems, all discussions are patterned after ISO 14001 standards.

### **Significance of the Study**

This study will be useful to the sampled oil-producing and servicing organizations in the study area. Other oil-producing and servicing firms will find it helpful as a management tool in the implementation of issues about EMS. Research students, as well as governmental and non-governmental organizations, will see it as a veritable tool. Lecturers of research institutions will find it helpful to use when citing examples of companies adopting (ISO 14001) EMS standards in their Corporate Environmental Management Meetings.

### **Scope of the Study**

This covered compliance of oil-producing/Base Logistics (oil-servicing) Companies' EMS with ISO 14001 Standards under the following components: Leadership; Planning; Support; Operation; Performance Evaluation and Improvement. It will also cover their nature of business as well as their environmental challenges.

### **Study Area**

The study area is Rivers State. Rivers State has a large Metropolitan city, towns, and villages. As a Metropolitan city, Port Harcourt is situated on a relatively firm land about 66km from the Atlantic Ocean (Mmom and Fred-Nwagwu, 2013). It lies approximately between latitude 40 42"E and 40 55" N and longitude 60 53" E and 70 08" N. Rivers State is bound on various sides by other states. It is bound on the north by Imo State, on the West by Delta State, on the East by Abia State, and on the South by Bayelsa State. It has Port Harcourt as its capital city. Port Harcourt is sited on a relatively firm land about 66km from the Atlantic Ocean (Mmom and Fred-Nwagwu, 2013 in Warmate, 2016). It lays approximately between latitude 40 42" E and 40 55" N and Ikwerre, Etche and Omuma Local Government Areas, to the East by Oyigbo, Tai and Eleme to the West by Emohua and South of Okrika and Degema Local Government Areas bound longitude 60 53"E and 70 08" N. Port-Harcourt Metropolis is positioned to the North. It spans 620 km<sup>2</sup>. It stretches from Choba to Rukpokwu by the north, Iriebe to the east, and a part of Bonny River to the West. Total E&P Nigeria Ltd (Latitude 4.81236167 South and Longitude: 7.02832167 East) and INTELS Nigeria Ltd (Latitude 4.703897 South and Longitude 7.153725 East) are the companies under study. These companies are located in Port Harcourt and Okrika Local Government Areas respectively.

According to Wikipedia, Total Nigeria Plc (RC 1396) was incorporated as a private company on June 1, 1956, to market petroleum products in Nigeria. The same indicated that on September 11, 2001, the company had a successful merger, which paved way for "sustainable

growth" and continuous development. What this means is that these companies have remained active in Nigeria for over 60 years "in oil and gas exploration and production," liquefaction "of natural gas as well as the marketing of petroleum products and" sundry services.

Total "in its country" of origin (i.e. South Africa) carry out business in well over 130 countries the world over. "This makes it one of the world's" leading oil companies. "the company explores for and produces oil and gas in more than 30 countries or regions. It acquired Petrofina of Belgium in 1990 and the French oil firm Elf Aquitaine in 2000."

Furthermore, another source has it that "Total E&P Nigeria Limited ("TEPNG"), an affiliate of Total S.A., has operated in the upstream sector of the Nigeria hydrocarbon industry "for more than 50 years and has" added over 3 billion barrels of oil equivalent to Nigeria's production to date. Total E&P is incorporated in Nigeria in 1962 and has cultivated and carried on a steadfast and strong partnership with the Government of Nigeria. It is also having a strong partnership with the Nigeria National Petroleum Corporation (NNPC) "and several indigenous companies, in developing the country's hydrocarbon industry."

Total is engaged in different operations such as upstream, downstream, and service stations scattered around the country even in Rivers State. Concerning the upstream aspect, it is said to be "in charge of" "40% interest in the NNPC/TEPNG Joint venture, producing oil and natural gas from several onshore and shallow water concessions. This affiliate of Total (i.e. Total Upstream Nigeria Limited (TUPNI) operates the Akpo field in OML 130 deepwater lease and is currently developing the Egina field, expected to come on stream in 2018 with a capacity of 200, 000 barrels per day. It also "has a non-operated interest in the SPDC-operated joint venture (10%), the Bonga field (12.5%), and the Usan field (20%). Total also has a 15% interest in Nigeria LNG, which currently operates 6 LNG liquefaction trains on Bonny Island."

The second aspect of their operation (the downstream activities) "are managed by Total Nigeria Plc., the leader in the downstream sector of the Nigerian oil and gas industry, which has an extensive distribution network of over 550 service stations nationwide and a wide range of top-quality energy products and services."

Since customer needs evolve every day, "Total has "developed a "one-stop-center strategy whereby a variety of customers" can be attended to –TOTAL service stations.

INTELS Nigeria Limited as a company does not go into oil-producing, but is poised "to provide" needed logistics for the Nigerian "oil and gas sector.

INTELS Nigeria limited, according to Wikipedia, is Nigeria's largest logistics company. It was founded in 1982 as Nicotes Services Ltd and is based in Onne, Nigeria. It is partly owned by Nigeria's former vice president Atiku Abubakar."

INTELS does the following services: cargo services, port management, agency "services and support services" inshore bases. The company "also makes provision for" equipment. These include forklifts, trucks, generators, trailers, cranes, pipe handlers, and other specialized services like personnel services to other organizations.

INTELS was installed in 1982 at the Onne port complex in Rivers State. The company has since been "a major player in the development of the Nigerian Oil and Gas" Free Zone. "The company has created an integrated logistics solution that offers a complete array of facilities amid services for oil and gas industry operations in the sub-Saharan West African region."

INTELS is an innovative logistics company providing the highest quality service through dedicated professional personnel, utilizing modern and efficient equipment.

It implements its integrated logistics vision in cooperation with the respective government authorities, national oil companies, major oil-producing companies, and related services companies."

Aside from these, it also receives support from the African Petroleum Producers Association (APPA) and the African Institute of Petroleum (AIP). Because of this strong support, they have over the years evolved a common philosophy for managing oil and gas activities on a regional scale.

To show how far-reaching they are, INTELS has "created over 8,000 direct and 15, 000 indirect employment opportunities." It has also brought about the transfer of technology tailored vehemently after the Policy dictates of the Environmental Guidelines and Standards for Petroleum Industries of Nigeria (EGASPIN) policy.

According to Project Light-up Nigeria, the Corporate Head Office is at Federal Ocean Terminal (FOT) Road Oil & Gas Free Zone Onne, Rivers State, Nigeria Km 16, Port Harcourt/Aba Expressway Port Harcourt, Rivers State, Nigeria.

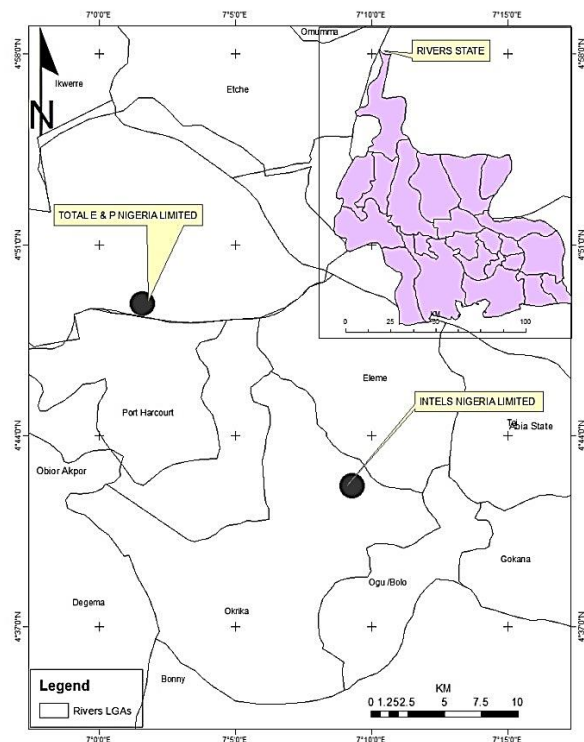


Figure 1: Point in the map.

#### Population and Sampling Frame

The surveyed population includes all HSE staff and contractors of the participating oil-producing and Base Logistics (oil-servicing) companies operating in the study area. The population also included contractors of the HSE department. What this means is that the HSE department of INTELS Nig. Ltd has 55 staff plus 5 contractors of the same department. This brought the number to 60 staff that was surveyed. On the other hand, the survey also covered 60 staff of the HSE department of Total E&P Nig. Ltd plus all five (5) contractors. This brought the total number of those surveyed to 125 respondents. The companies are placed in two categories- one is oil-producing (Upstream category) and Base Logistics and Life Camp Management (oil-servicing). The former features the following as shown in table 2 below.

All these companies were subjected to convenience sampling, but only Shell Petroleum and Total E&P showed their willingness to participate. In the long run, only Total E&P Nig. Ltd participated in the survey for the Oil-producing companies.

Nigeria has 69 Licenced Oil-servicing companies. These companies fell under six categories. Namely: "Base Logistics/Life Camp Management;" "Geophysical, Seismic, Data Processing, Geology, Geosciences;" "Survey; Drilling Contractors;" "Drilling Fluids and Chemicals (Barytes, Bentonites)" as well as "Drilling

and Well Services (Directional Drilling, MWD, Mud Logging, Reservoir Services)" -see appendix 2 containing a list of oil-servicing companies. Of these categories, "Base Logistics and Life Camp Management" is the oil-servicing company of focus. This category has only six of them in Nigeria. Four of these companies carry "out their operations" in Rivers State amongst which are Brawal Shipping Nigeria, INTELS Nigeria Ltd (A Terminal), Neptune Maritime

Nigeria, Prodeco Int'l Ltd (Property Development Company). see table 3.4.2 and appendix 3.

The research adopted convenience sampling. At the end of the convenience survey, only Brawal Shipping and INTELS were left to pick from. Finally, only INTELS Nig. Ltd was picked for the survey. This selection, however, was done based on acceptance by the management and staff of the HSE department and other (like contractors) of the companies to participate.

**Table 1:** sampling frame of all the companies involved in Oil production in Rivers State  
**SOURCE:** Statistical Data Adapted from the Department of Petroleum Resources 2019 Annual Report Upstream Oil Sector (Exploration and Production Companies with Oml and Opl)

S/NO.	Company
1.	Allied Energy Ltd
2.	Amni Oil and Gas
3.	Atlas Petroleum
4.	Consolidated Oil and Gas
5.	Continental Petroleum Company
6.	Dubri Oil and Gas
7.	Nigeria Petroleum Development Company Ltd
8.	Moni Pulo Nig. Ltd
9.	Yinka Folawiyo Oil and Gas Company
10.	Star Deep Oil and Gas Ltd
11.	Total Upstream Company
12.	Addax Petroleum
13.	Esso Usan Oil and Gas Ltd
14.	Nae Oil and Gas Ltd
15.	SNEPCO Oil And Gas Ltd
16.	SEPCO Oil And Gas Ltd
17.	Niger Delta Petroleum Resources
18.	Waltersmith Refining and Petrochemical Company Limited
19.	Universal Petroleum Company
20.	Prime Petroleum
21.	Chevron Nigeria Plc
22.	Total E&P Nig. Ltd
23.	Mobil Nigeria Plc.
24.	Nigeria Agip Oil Company Ltd
25.	Shell Petroleum Development Company
26.	Belema Oil

**Table 2:** Sampling Frame of Base Logistics, Life Camp Management (Oil-Servicing) Companies in Rivers State.  
 Adapted from [www.jarushub.com](http://www.jarushub.com)

Base logistics, life camp management companies		
1	Brawal shipping (Nigeria)	Investment house, 3 Grace's ave., Elelenwo, Port Harcourt, Rivers State.
2	INTELS Nigeria ltd (a terminal)(intel services)	Enterprise house, the road south, for Onne oil & gas free trade zone, Onne Rivers State
3	Ladol – Lagos deep offshore logistics base	

4	Neptune maritime Nigeria	Neptune Maritime Base, Aker road, Rumuolumeni, P.M.B 17, Trans-Amadi, Port Harcourt, Rivers State, Nigeria
5	Prodeco international ltd (property development company)	Oil and gas free zone Onne Port Complex; Onne, Rivers State
6	Snake island integrated free zone	

**Sample and Sampling Techniques**

The researcher carried out convenience sampling on all of the two categories of firms under study. This includes all the organizations engaged in oil production and oil-servicing (Base Logistics/Life Camp Management) and has an HSE department. For the latter, there are six of them in Nigeria with four located in Rivers State and two in Lagos State. Two of them were selected during convenience sampling (Brawal Shipping Nig. Ltd and INTELS Nig. Ltd) but only INTELS was finally picked. Conversely, Total E&P Nigeria Limited (TEPNG), Shell Petroleum Development Company (SPDC), Nigerian Agip Oil Company (NAOC), Chevron Nigeria, Mobil Producing Nigeria Limited, and Nigeria National Petroleum Corporation (NNPC) were conveniently picked from all the 26 oil-producing companies in Rivers State. Shell and Total were left to be picked from due to their willingness to participate. However, during the administering of the instrument, only Total E&P Nig. Ltd maintained interest. The checklist was designed to capture the type of business done by these companies, the components of ISO 14001 standards they adopted, and the environmental challenges these companies faced. 125 checklists were prepared and administered. Out of the 125 checklists sent, 120 were completed and were retrieved. The survey was voluntary and responses were anonymous. Furthermore, the instrument was weighted to check the level of EMS compliance of the companies involved with ISO 14001 standards, comparatively assess them, and rate their performance. The Likert scale is as follows:

- Strongly Agree: 4 point
- Agree (A): 3 point
- Disagree (D): 2 points
- Strongly Disagree: 1 point

**Nature/Sources of Data**

This study made use of primary and secondary data. The former was achieved through checklist administration. This instrument was administered to the population of the study. The instrument was sectioned to conform to the objectives of the research. The different sections: Leadership, Planning, Support, Operation, Improvement, and Performance Evaluation of the companies. The secondary source was achieved through

the use of ISO 14001 EMS documents, journals, books, and past research work from other researchers.

**Method of Data Collection/Instrumentation**

Since it is survey research, the checklist was administered on every willing respondent found in the HSE department of the participating companies in the study area; including their and HSE contractors. These formed the surveyed population for each company.

**Validity/Reliability of Instrument**

Reliability is the degree of consistency arising from the scores obtained and from the instrument. The reliability of the instrument was tested using the Pearson Correlation test. Out of a total of 120 respondents in the survey, 20 were made to participate twice in the test-retest for reliability and validity of the instrument.

**Comparative Techniques**

The Qualitative Comparative Analysis (QCA) was used in this research since it is a case study research. Data were gathered with the aid of a checklist designed from the ISO 14001 document and interpreted using qualitative techniques. Thereafter, a comparison was made with the aid of SPSS software. The comparative test was done using the cross-tabulation method through descriptive statistics from the SPSS package. This was presented in tables as shown in tables displayed in the appendix.

**Methods of Data Analysis**

Data collected from the respondents were analyzed using comparative statistics. For this study, comparative descriptive statistics were performed using the cross-tabulation method through descriptive statistics with the SPSS package.

For the test-retest aspect, Pearson correlation was carried out for the two mean values of all the variables with a correlation value of 0.986(as shown in appendix 4.0). But to check compliance, responses were measured on a Likert scale of 1-4 as shown below. This scale helped in calculating the mean value for the test-retest co-efficient of the survey as the criterion mean as shown in the appendix.

Likert Scale = 1, 2, 3, 4

**RESULTS AND DISCUSSION**

This chapter deals with research, analysis, and discussion of findings. Each set of information is described and presented in tables. Presentation and analysis of data were made to go in line with the

sequence of research questions as presented in chapter one. The outcome of the analysis was placed in the appendix section and represented in tables in this chapter.

*Table 3: Percentage of Respondents*

S/N	Name of company	Respondents	No	Percentage
1.	Total E&P Nig. Ltd	HSE Staff	58	48.33
		Contractors	4	3.33
2.	INTELS Nig. Ltd	HSE Staff	53	44.17
		Contractors	5	4.17
<b>Total</b>			120	100

Table 3 shows a distribution of those who participated in the survey. As shown in Table 3, out of a total of 120 respondents at the Oil exploration and Production (Total E&P Nig. Ltd) company, 62 of them, representing 51.67% of the total population agreed that their company is in the business of Oil exploration and Production. The respondent whose response is that their company explores and produces oil constitutes more than 50% of the whole population of respondents. Whereas those who say that their company is not in the business of oil exploration and production constitute 0% of the population.

Table 3 at item no. 2 illustrates the nature of business carried out by INTELS Nigeria Ltd. As shown by the table, out of a total of 120 respondents at the Base Logistics (INTELS Nig. Ltd) company, 58 of the respondents, representing 48.33% of the total population agreed that their company carry out Logistics services. This result shows that the company under study is in the business of Base Logistics /Life Camp Management. Seemingly, those whose response is that their company is in this business constitute the whole of the population of INTELS Nig. Ltd surveyed.

*Table 4: Environmental Challenges of the two Oil Companies*

S/N	Checklist Items	TOTAL E&P NIG. LTD				TOTAL RESP.	TOTAL %	INTELS NIG. LTD				TOTAL RESP.	TOTAL %	GRAND TOTAL RESPONDENT	GRAND TOTAL %
		%	A	%	D			%	A	%	D				
1	Air pollution challenges	55	6	3.3	4	70	58.33	38.3	4	3.3	4	50	41.67	120	100
2	water pollution	55	6	5.8	7	73	60.83	32.5	3	6.6	8	47	39.17	120	100
3	Land pollution	58.3	7	5.8	7	77	64.17	33.3	4	2.5	3	43	35.83	120	100
4	noise pollution	53.3	6	2.5	3	67	55.83	40	4	4.1	5	53	44.17	120	100
5	radiation challenges.	54.1	6	8.3	1	75	62.5	37.5	4	0	0	45	37.5	120	100

Table 4, item No.1 depicts that out of a total of 120 respondents, 66 of them, representing 55% of the total population are from Total E&P Nig. Ltd. This number affirms that ISO 14001 document has assisted their organization in its EMS in taking care of "Air Pollution" challenges related to their company's operation. Also, 4 respondents, representing 3.33% disagreed; whereas at INTELS Nig. Ltd, 46 respondents, representing 38.33% of the same population agreed, while 4 respondents

representing 3.33% disagreed. This result means that far above the average of the respondents agreed that ISO 14001 addresses the air pollution challenges of their company. By comparison, Total E&P Nig. Ltd has the higher number of respondents with a difference of 16.67%. On the other hand, those who think that their company has not been assisted in any by the use of ISO 14001 document are well on the minority. This result further shows, by comparison, that Total E&P Nig. Ltd has a greater number of respondents affirming that the document has been of assistance to their company. Table



4, item No.2 depicts that out of a total of 120 respondents, 66 of them, representing 55% of the total population are from Total E&P Nig. Ltd. This number affirms that ISO 14001 document has assisted their organization in its EMS in taking care of "Water Pollution" challenges related to their company's operation.

Also, 7 respondents, representing 5.83% disagreed; whereas at INTELS Nig. Ltd, 39 respondents, representing 32.5% of the same population agreed, while 8 respondents representing 6.67% disagreed. This result means that far above the average of the respondents agreed that ISO 14001 addresses the water pollution challenges of their company.

But by comparison, Total E&P Nig. Ltd has the higher number of respondents with a difference of 22.5%. On the other hand, those who think that their company has not been assisted in any by the use of ISO 14001 document are far lesser.

This result further shows, by comparison, that Total E&P Nig. Ltd has a greater number of respondents affirming that the document has been of assistance to their company.

Table 4, item No.3 illustrates that out of a total of 120 respondents, 70 of them, representing 58.33% of the total population are from Total E&P Nig. Ltd.

This number affirms that ISO 14001 has assisted their organization in its EMS in taking care of "Land Pollution" challenges related to their company's operation.

Also, 7 respondents, representing 5.83% disagreed; whereas at INTELS Nig. Ltd, 40 respondents, representing 33.33% of the same population agreed, while 3 respondents representing 2.5% disagreed.

This result means that almost 100% of the respondents agreed that ISO 14001 addresses the land pollution challenges of their company. By comparison, Total E&P Nig. Ltd has the higher number of respondents with a difference of 25%.

On the other hand, those who think that their company has not been assisted in any by the use of ISO 14001 are in the minority.

This result further shows, by comparison, that Total E&P Nig. Ltd has a greater number of respondents

affirming that the document has been of assistance to their company.

Table 4, item No.4 illustrates that out of a total of 120 respondents, 64 of them, representing 53.33% of the total population are from Total E&P Nig. Ltd. This number agreed that ISO 14001 has assisted their company in its EMS in taking care of "Noise Pollution" challenges related to their company's operation. Also, 3 respondents, representing 2.5% disagreed; whereas at INTELS Nig. Ltd, 48 respondents, representing 40% of the same population agreed, while 5 respondents representing 4.17% disagreed. This result means that almost 100% of the respondents agreed that ISO 14001 addresses the noise pollution challenges of their company.

But by comparison, Total E&P Nig. Ltd ones again have the higher number of respondents with a difference of 13.33%. On the other hand, those who think that their company has not been assisted in any by the use of ISO 14001 are in the minority.

This result further shows, by comparison, that Total E&P Nig. Ltd has a greater number of respondents affirming that the document has been of assistance to their company.

Table 4, item No.5 illustrates that out of a total of 120 respondents, 65 of them, representing 54.17% of the total population are from Total E&P Nig. Ltd.

This number agreed that ISO 14001 has assisted their company in its EMS in taking care of "Radiation" challenges related to their company's operation. Also, 10 respondents, representing 8.33% disagreed; whereas at INTELS Nig. Ltd, 45 respondents, representing 37.5% of the same population agreed, while 0 respondents representing 0% disagreed.

This result means that far above 50% of the respondents agreed that ISO 14001 addresses the radiation challenges of their company.

But by comparison, Total E&P Nig. Ltd as usual has the higher number of respondents with a difference of 16.67%.

On the other hand, those who think that their company has not been assisted in any by the use of ISO 14001 are in the minority.

This result further shows, by comparison, that Total E&P Nig. Ltd has a greater number of respondents

agreeing that ISO 14001 standards have been of assistance to their company.

**Table 5: Comparing Result of staff Perception on EMS compliance with ISO 14001 Standards as regards environmental matters**

S/N	CHECKLIST ITEMS	TOTAL E&P Nig. Ltd					REMARK	INTELS Nig. Ltd					
		SA	A	D	SD	-X		SA	A	D	SD	-X	REMARK
1	ISO 14001 has been able to take care of Air pollution challenges related to my company's operations.	40	20	5	2	2.5	Compliant	33	15	2	3	2.5	Compliant
2.	ISO 14001 has been able to take care of water pollution challenges related to my company's operations.	40	20	8	5	2.5	Compliant	30	10	5	2	2.5	Compliant
3.	ISO 14001 has been able to take care of Land pollution challenges related to my company's operations.	42	30	0	9	2	Non-Compliant	26	12	1	0	2.5	Compliant
4.	ISO 14001 has been able to take care of noise pollution challenges related to my company's operations.	43	30	1	5	2.5	Compliant	34	6	0	1	2	Compliant
5.	ISO 14001 has been able to take care of radiation challenges related to my company's operations.	35	25	4	5	2.5	compliant	30	20	0	1	2	Non-compliant

Table 5, item No.1 depicts that Total E&P Nig. Ltd is compliant when it comes to handling air pollution challenges with a mean value of 2.5. INTELS Nig. Ltd, on the other hand, is recorded as compliant in the same aspect as well. This data affirms that ISO 14001 document has assisted their organization in its EMS in taking care of "Air Pollution" challenges related to their company's operation.

Also in table 5, item no.2 shows that respondents from Total E&P Nig. Ltd are compliant when it comes to handling "water pollution" challenges in the course of carrying out their activities as they record a mean value of 2.5. INTELS Nig. Ltd, on the other hand, records the same (2.5). This data affirms that ISO 14001 document has assisted both organizations in their EMS in taking care of "Water Pollution" challenges related to their company's operation.

Also in table 5, item no.3, there is a slight shift as the response from Total E&P Nig. Ltd has placed them as non-compliant when it comes to handling land pollution

challenges in the course of carrying out their activities as they record a mean value of 2.0. INTELS Nig. Ltd, on the other hand, records a different value of (2.5). This points to the fact that INTELS Nig. Ltd is compliant with this aspect in their environmental management system. This data affirms the fact that ISO 14001 document has assisted their organization in its EMS in mitigating land pollution challenges related to their company's operation. Conversely, Total E & P is trying to meet up in this regard.

Also in table 5, item no.4, there is compliance with Total E&P Nig. Ltd for they recorded a mean of 2.5. This places them as compliant when it comes to handling radiation challenges in the course of carrying out their activities.

INTELS Nig. Ltd, on the other hand also records a value of (2.0). This points to the fact that INTELS Nig. Ltd is none-compliant in this aspect of their Environmental Management System. This data affirms the fact that ISO 14001 document was put to use in this regard as it has assisted Total E & P in its EMS in mitigating noise

pollution challenges related to their company's operation.

Also in table 5, item no.5, there is compliance with Total E&P Nig. Ltd for they recorded a mean of 2.5. This places them as compliant when it comes to handling noise pollution challenges in the course of carrying out their activities.

INTELS Nig. Ltd, on the other hand also records a value of (2.0). This points to the fact that INTELS Nig. Ltd is none-compliant with this aspect in their Environmental Management System. This data affirms the fact that ISO 14001 document has assisted Total E&P Nig. Ltd in their EMS in mitigating radiation challenges related to their company's operation. But the converse is the case with INTELS Nig. Ltd.

### **DISCUSSION OF FINDINGS**

Given the findings, there are notable differences discovered from the assessment so far. Out of the two companies engaged in the survey, Total E&P Nig. Ltd is discovered to be at the leading edge. Both companies, nonetheless, have all of the components adopted from ISO 14001 standards as the assessment has revealed. The companies were checked for the adoption of the standard, compliance with it, and their level of compliance as well as for their performance rating.

The above data also conveys a fine point- Total E&P Nig. Ltd is pro-active for the most when it comes to handling their Environmental Management System (EMS) matters. The study also brings to mind that this organization has environmental culture amongst its HSE staff and contractors. Despite its size, it coordinates its activities for environmental protection and continual improvement. This places TOTAL E&P Nig. Ltd at the "Excellence and Leading Edge" phase of Room's strategic option model. INTELS Nig. Ltd also fell within the expectation of that model. Excellence and Leading Edge companies, as one research work puts it: "view environmental management as good management, recognize the opportunities that have arisen as a result of the environmental revolution and strive toward state-of-the-art environmental management." More than, "it is through" these "strategies that" an organization can achieve "competitive advantage." (Roome, 1992)

The outcomes presented above agree with two well-known concepts in the study of the environment: environmental sustainability and environmental management. The former pursues "the course of action that tends to meet the resource and service needs of" generation now and generation to come "without

compromising the health of the ecosystems that" provide them. Morelli (2011)

### **CONCLUSIONS**

Compliance with ISO 14001 standard by Oil-producing and Base Logistics (Oil-servicing) companies in Rivers State and Nigeria at large will have a strong impact on the environmental performance of adopting business organizations let alone their financial performance. Looking at it through other lenses will trigger action that will boost the state revenue as well as that of the nation. This is because financial returns to Oil-producing and Oil-servicing organizations mean a swell in revenue accrued. Nevertheless, there is every possibility that the government of Rivers State will make the adoption of the standard mandatory for firms especially those in the Oil and gas firms.

Moreover, it also means an environment with good air and soil quality for those living in the state for compliance of companies' EMS to ISO 14001 standard as it will help them in keeping to the dictates of the sustainability concept. If all companies in Rivers State and Nigeria were following suit with what is obtainable in these companies, then the sustainable development goal would be achieved.

The study reveals a good degree of compliance with the components obtainable in the ISO 14001 standard. It also reveals the appreciable performance of the Oil-producing and Base Logistics (Oil-servicing) firms under study.

The study further reveals that there is a high level of compliance with the standard at TOTAL E&P Nig. Ltd being an Oil-producing organization in Rivers State and the same was observed with the Base Logistics (Oil-servicing) company. However, the former ranks higher in terms of comparison.

It is, however, safe to conclude that the compliance level of the Oil-producing and Base Logistics (Oil-servicing) organizations' "Environmental Management System (EMS)" in Rivers State with ISO 14001 standard is commendable.

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