

# Evaluating the Environmental Management System in the Nigerian Oil and Gas Industry with Emphasis to Shell: A Critical Evaluation of ISO 14001

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## **Abstract**

*This research assesses the Environmental Management System (EMS) of International Oil Companies (IOCs) in Nigeria with emphasis to Shell using EMS yard sticks (such as oil spills and gas flares). It presents the level of EMS, problems and factors necessary for its success. An in-depth study on IOCs' environmental performance and operations was carried out by critically evaluating ISO 14001 standard and legislation to identify the environmental and organisational shortfalls. Besides highlighting the shortfalls of complying with the Nigerian legislation and EMS standard, the study revealed specific factors such as ineffective implementation of ISO 14001 and non-compliance with legislation. A statistical analysis on the volume/ number of oil spills and quantity of gas flared in Nigeria for the period of 12 years (2000 to 2012) using a computer software statistical tool "SPSS" indicates that a mean of 277.15 and 23,837.77 Mcm respectively occur annually with an increasing trend. A SWOT analysis carried out suggest the adoption of ISO 14001 as a strategic tool to optimise IOCs' environmental and operational performance. Implementing Environmental Management System (EMS) which conforms to ISO 14001 could help organisations reduce liability and environmental pollution.*

**Key Words:** Impact, Environment Management, Oil spills, Gas flares, ISO 14001.

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## **I. Introduction**

### **1.1 Background of study**

The ability of organisations to improve their environmental performance is emerging as a strategic issue for many companies worldwide (Ann et al., 2006). Such as better management of social, economic, and environmental issues, as the issue of environmental sustainability is increasingly becoming an inseparable aspect of business operations. Besides quality management, health and safety, International Oil Companies (IOCs) implement and certify their Environmental Management System (EMS). The EMS is part of an overall management system, and a process designed to develop, manage, coordinate and monitor environmental activities, in order to ensure compliance with regulation both at facility and organisational levels (Melnyk et Al., 2003 and US DOI 2007). The EMS follows a Plan-Do-Check-Act principle to ensure a continuous improvement (BSI 2014; IEMA n.d). A considerable amount of literature has been published on EMS. These studies demonstrated the need for an EMS, its benefits and obstacles that organizations face during its implementation. In response to the present need for organisations to abate impacts from their activities with national / international certificates, the International Standard Organization (ISO) introduced ISO 14000 series (Ann, Zailni and Wahid 2006). The standard which focusses on EMS of the ISO 14000 series is the ISO 14001, a voluntary environmental standard which according to ISO (2004), strives to improve (when effectively implemented) performance on all environmental aspects: including legal compliance. A survey by ISO in 2014 shows that Nigeria has 48 number of ISO 14001 EMS certification compared to other oil producing countries with higher number such as South-Africa and Egypt with 6148 and 3615 respectively (ISO 2013). It has been reported that as a result of ineffective environmental laws in developing countries (DCs) (due to inadequate enforcement of legislation), IOCs have been called on to voluntarily improve their performance by environmental activist and practising lawyers in countries with inadequate environmental laws (Wawryk n.d). Subsequently, industry groups and IOCs have also recognised that companies operating in DCs with ineffective legislation should adopt best practices (Wawryk n.d). Popoola (2013) identified that most of the IOCs in Nigeria such as Shell, Total, and Chevron have ISO 14001 in place. For example, Shell, on its website reported that their facilities and pipelines are operated to the highest international standards and certified annually to ISO14001

standard (Shell n.d). The present study focuses on Shell as the largest oil operating company in Nigeria (Yusuf and Samuel 2013). Studies conducted by OPEC (2014) have shown that Nigeria has about 37.14 billion barrels and 5118 billion cubic meters of oil and gas reserves respectively, which was first discovered in 1956 by SDPC (Shell) (Nwilo and Badejo 2006). These large oil reserves have made Nigeria one of the leading oil producing countries in the world. Over the years, there has been an increasing question to investigate the impacts of oil and gas exploration in the Niger Delta (ND) of Nigeria. Although research by Fagbohun (2007) revealed that crude oil has indeed brought economic benefits to Nigeria, Gutti et al., (2012); Kadafa (2012); Imarhiagbe and Obayagbana (2019) and Sakib (2021) argued it has left the environment with visible physical damage such as loss of farmland and vegetation, contaminated water bodies, conflict, health problems, loss of aquatic life and source of livelihood (Ikelegbe 2005). According to Amnesty International (2009), a number of oil spills occur annually with about 2,000 sites contaminated, causing environmental pollution. More also, associated gas (AG) flared during oil production due to lack of infrastructure (Esther and Lozano 2012), has caused health diseases, low life expectancy, poor soil fertility, and acid rain (Basse 2008). In response to these impacts and public response, aside the legislation governing the petroleum industry, the Nigerian Government introduced an environmental regulatory tool that is, the Environmental Impact Assessment (EIA). This was to promote better environmental practice, with environmental institutions to supervise and evaluate IOCs' compliance to the legislation.

### **1.2 Problem statement**

The absence or poor effectiveness of environmental management (EM) has caused most of the environmental degradation and conflicts going on in the Niger Delta (ND) region of Nigeria (Okotoni 2004). This ineffectiveness in EM during project operation has resulted in economic, environmental, political and social problems in the region. As a result of the impacts associated with petroleum activities, the Federal Government (FG) has set out legislation, the EIA (procedural regulatory framework) and institutions to ensure that the enacted laws are complied with. With the need to understanding the level of compliance, the need to finding ways for improvement cannot be overemphasised, as a system on how to adopt and implement the laws need to be put in place. It has been reported that the laws are not being complied with due to the lack of enforcement. However, few researches were able to draw on the reasons for such. Also, Popoola (2013) in his study suggested implementing the ISO 14001 environmental standard in Nigerian companies but failed to identify any model to enhance on its adoption. This makes decision to adopting it difficult. Similarly, the Department of Petroleum Resources (DPR) added the EMS in 2002 as a requirement to its existing environmental guidelines (Agah *et al.*, 2004). This was to curtail the impacts of oil and gas activities. What is not clear is if it has improved performance since its implementation.

The significance of this research therefore, is to evaluate the EMS in the Nigerian petroleum industry if it has improved performance using ISO 14001 where applicable. It set out to assess the environmental pollution from oil spill and gas flaring, how the IOCs operate and deal with such when they occur, and reasons behind ineffectiveness of legislation and ISO 14001. It assesses both potential benefits and threats of adopting ISO 14001. Also, the Nigerian Government and IOCs will understand the reasons for lack of legislation enforcement, cultivate how to address the issue, and further help present ISO 14001 standard as a tool which could either improve performance when effectively implemented. The study is deemed important at this time because of the debate that has always surrounded the need to implement EMS protocols, especially in DCs. It is therefore hoped that the outcome of this study will contribute positively towards the ongoing debate.



**Figure no1:** Exposed oil pipelines running through settlements (Uyigüe and Agho 2007)

## II. Materials and Methods

Materials and data used for this study includes: journals, articles, books, company's websites, working papers, and Government official publications. A systematic literature review was conducted on studies which reported EMS, oil spill, gas flare in Nigeria and EM regulation. Gerring (2007) and Yin (2003) identified several advantages of case study employed for the present study such as its ability to accommodate different research techniques both quantitative and qualitative. Accordingly, document review was used for data collection to collect number and quantity of oil spills data and gas flare reports. SWOT analysis, trend analysis and statistical analysis were used for data analysis. The number and volume of oil spill incidents and quantity of gas flared were analysed with a Computer software statistical tool "SPSS to get oil spill and gas flare mean data. The SWOT analysis was employed to explore the strengths, weaknesses, opportunities and threats of ISO 14001. This also gives the rationale for making a choice of mixed method for this study. However, while Stake (1995) critic the case study as one that deals with complexity and the specific case in question, Yin (2003) claim that evidence become clear with case study.

**Table no 1:** Gas production and utilization in Nigeria (in Million cubic meters Mcm) (Esira et al., 2014).

Year	Quantity of Outputs produced	Quantity Utilized	Quality flared	% flared
2000	27,756	15,987	11769	52
2001	31,587	7,536	24,588	78
2002	32,465	7,058	25,406	78
2003	33,445	7,536	25,908	77
2004	32,793	6,577	26,216	80
2005	32,980	6,910	26,070	79
2006	36,790	10,150	26,820	73
2007	36,755	10,207	26,548	72
2008	35,937	10,877	25,050	70
2009	37,613	17,904	19,709	52
2010	44,233	20,303	23,930	54
2011	52,323	24,457	27866	52
2012	57,534	37523	20,011	35

**Table no 2:** Oil spills in the petroleum industry (Esira et al., 2014).

Year	No. of spills	Value of Quantity Spilled (in billion Naira)	Value of Quantity recovered(in billion Naira)	Value of Net quality cost to environment(in billion Naira)
2000	115	29,436	21,876	22876
2001	129	31866	6109	25757
2002	208	9172	1955	7217
2003	228	5956	2153	3803
2004	166	1410	2093	12058
2005	258	108367	2786	105581
2006	378	51188	1477	49711
2007	453	8105	2937	5158
2008	495	35124	2336	32787
2009	417	36677	3110	33567
2010	158	39904	1184	3872
2011	353	52875	1344	3797
2012	245	10543	2635	98677

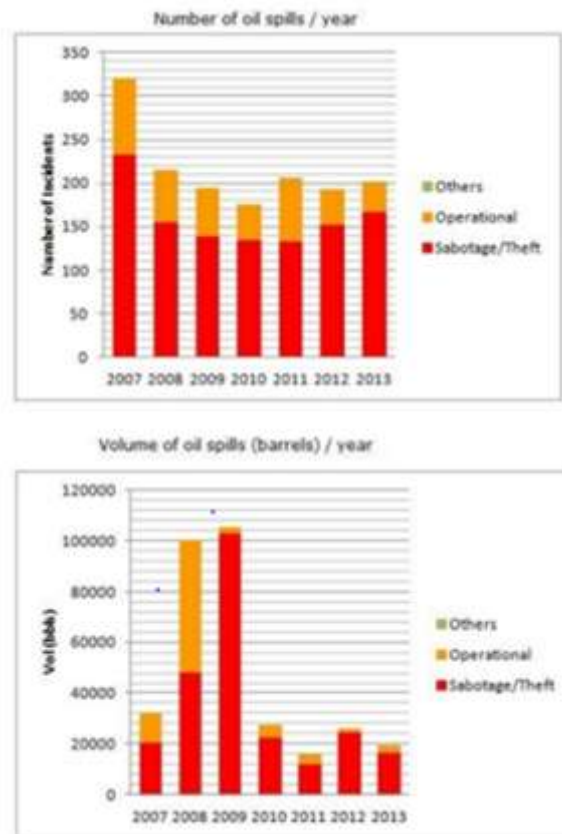


Figure no 2: Number and volume of oil spill for Shell (Shell 2013b)

### III. Result and Discussion

1. To evaluate if EMS has improved performance using EMS yard sticks such as oil Spills and gas flaring  
 A statistical analysis was run on SPSS, for quantity of gas flared, number and volume of oil spill incidents. This analysis was to help determine the extent to which EMS (in terms of oil spills and gas flaring) has improved performance. Figure no 3,4,5 and 6 shows the output of the analysis.

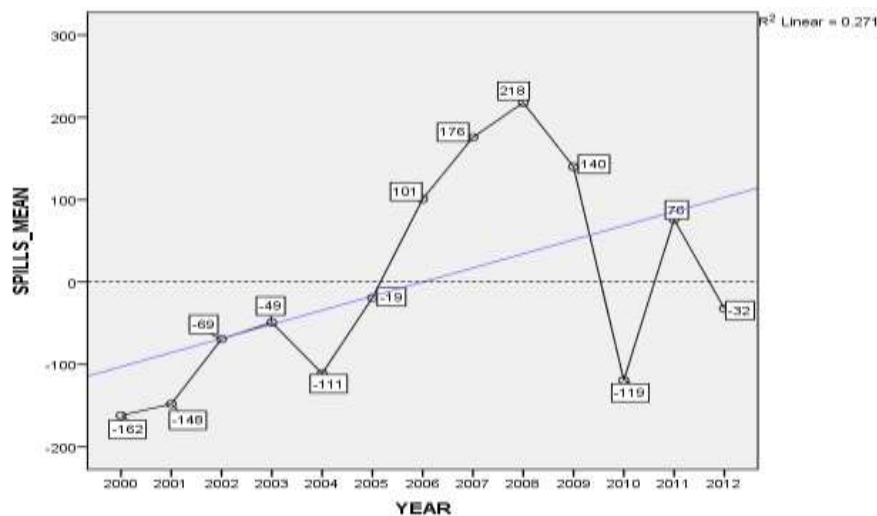
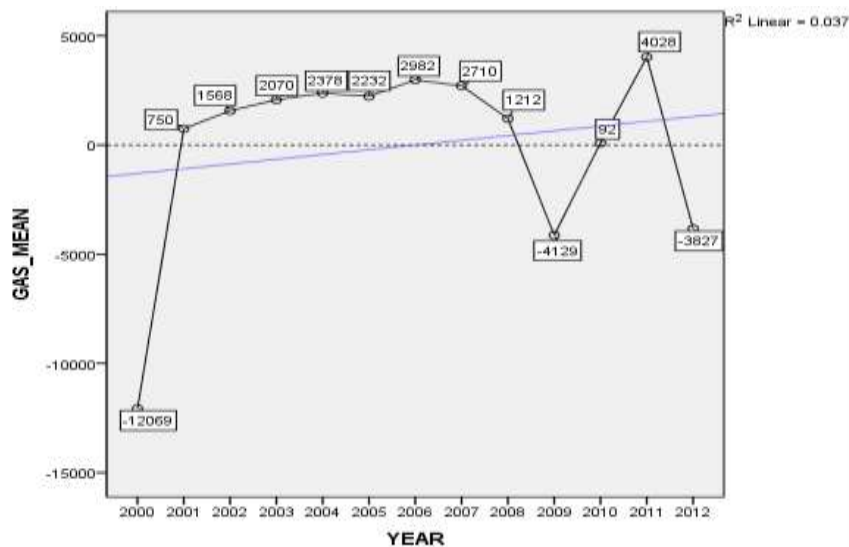


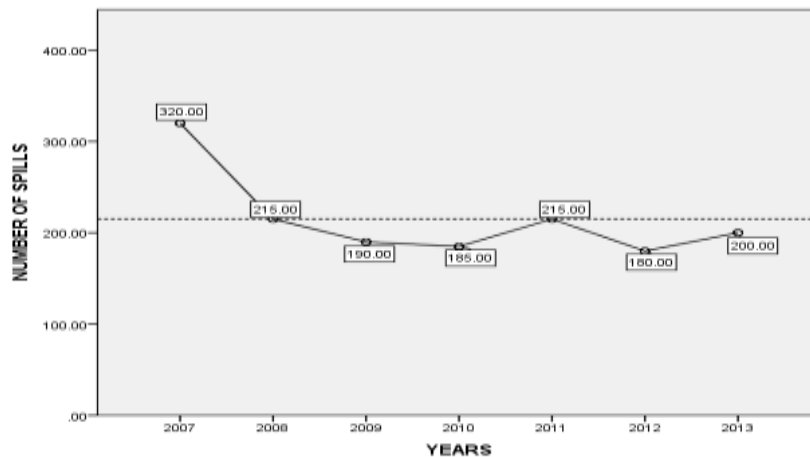
Figure no3: Annual trend of mean number of oil spill incidents in Nigeria based on oil spill data from Niger Delta Environment (Note: 0 corresponds to mean value of 277.15)

The average mean number of oil spill for the period was found to be 277.15. Therefore, in the graph shown in Figure 3, the first data point in 2000 corresponds to a value of 111.15 which is 162 below the average mean. Furthermore, the fitted line shows an increase in spill incidents, with a significant increase in 2005 through 2009. The slight increase in 2002 and 2003 was reported due to a pipeline burst (equipment failure) belonging to Shell, Kadafa (2012) and vandalism (Nwilo and Badejo 2006). About 4,000 barrels of oil was spilled as a result of equipment failure by Shell in 2008/2009 at Bodo community in Nigeria, Amnesty International (2011) and Esther and Lozano (2012), adding to the number of spill incidents for that year. In 2009, an agreement was reached between the Nigerian FG, IOCs, and the Niger Delta community (militants), as a result of amnesty implementation, leading to a cease fire. This led to a decrease in attacks, with subsequent decrease in oil spill incidents between 2009 and 2010 (Figure 3). However, the lack of progress in job creation and economic development has contributed to increased bunkering and attacks in recent years (EIA 2013). Figure 4 shows the effect of this by an increase in 2011 with 76 number of oil spill high above average.



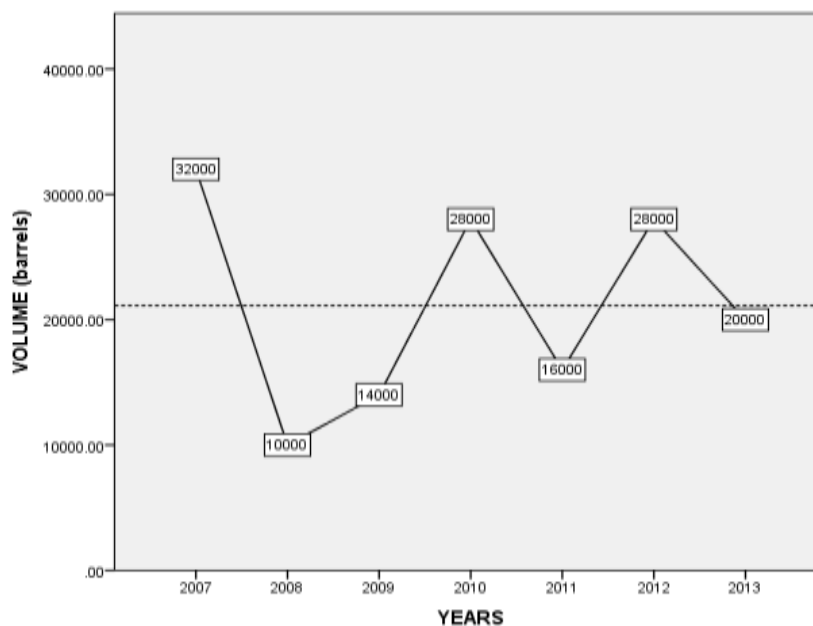
**Figure no 4:** Annual trend of mean quantity of gas flared based on gas flare data from CBN Statistical Bulletin (Note: 0 corresponds to mean value of 23,837.77 Mcm)

The average quantity of gas flared for the period was found to be 23,837.77 Mcm. Therefore, in the graph shown in Figure 4, the first data point in 2000 corresponds to a value of 11,768.77 Mcm which is 12,069 below the average mean. Further analysis of the fitted line shows an increasing trend of gas flared, with a significant drop of 4,129 Mcm below the mean in 2009. This could be due to no production in some oil fields (Frynas 2000), and Amnesty programmes (EIA 2013). Subsequently, quantity of flared gases increased in 2011, (Figure 6). This observed increase could be attributed to the FG, reinstating some oil field facilities which were initially shut down, following a court case of poor field practice (Friends of the earth 2007), and coupled with attacks on pipelines as a result of economic hardship (EIA 2013).



**Figure no 5:** Annual trend of mean number of oil spill incidents for Shell Nigeria (based on Shell’s oil spill data from SPDC website).

From Figure 4 spill incidents were shown to be below the average (215) from 2008 with a slight increase in 2011. The graph reveals a steady downward trend of spill occurrence (below the mean). However, Figure 6 shows a relatively increase in volume of oil spills. Comparing Figure 5 with 6 it can be seen that, though there is decrease in number of spill (Figure 6), the volume spilled into the environment is high. It was reported that Shell had two large oil spills in 2008 (Amnesty International 2011), but from Figure 6, it recorded the lowest volume of spills. This question the data presented by Shell and the need for more research. It also validates reports by International experts that the oil spill reports do not reflect the actual scale of the oil spills (Amnesty International 2009).



**Figure no 6:** Annual trend of mean volume of oil spill incidents (based on Shell’s oil spill data from SPDC website).

The mean average of oil spill volume was found to be 21,142.86 barrels. Comparing the number of spills for Shell (Figure 5) with the total number of oil spills in Nigerian petroleum industry (Figure 3) for the year 2012, it reveals that Shell accounts for about 78% of the Nigerian oil spill. This high percentage could be explained for the reason Shell being the largest oil operating coming in Nigeria (Shell 2013; Yusuf and Samuel 2013). The study examined the EMS implementation in the Nigerian oil industry. The results obtained seem to corroborate with other studies conducted on impacts of ISO 14001 EMS. Specifically, the study indicates that there is no significant improvement on environmental performance following EMS implementation. There is a continuous oil spillage and gas flaring over the years and EMS was not found to be the reason for the drop in

some years. Further, the study found lack of transparency. Thus, the argument claimed by advocates of ISO 14001 that it improves performance does not correspond with this section of the study. The subsequent section therefore examines the Nigerian legislation, ISO 14001 and level of compliance to identify the reasons for low improvement.

## **2. Implications of noncompliance with EMS regulations - evaluating its effectiveness**

From reviewed literature data, environmental issues and non-conformities attributed to non-compliance with regulatory and ISO 14001 standards were identified and discussed.

### **2.1 Oil spills**

Literatures reviewed revealed that oil spill has caused a major part of environmental damages from the activities of IOCs in Nigeria such as; vegetation loss, contaminated water bodies, ethical and social unrest. The present findings further buttressed other research which reported water samples in two locations having 18 ppm and 34 ppm of hydrocarbon. This is 360 and 680 times the number allowed in drinking water in the European Union (E.U.) (HRW 1999). This follows a recommendation by the UNEP for IOCs to provide portable drinking water to the community. Ugwuanyi (2013) reported that Nigerian has lost about ₦156 billion between 2009 and 2012. The Petroleum Act, Cap P10, LFN 2004 provide guidelines on oil spill prevention and mitigation. However, with this legislation, oil spill is still on the increase (Figure 3 and 5). Shell and other IOCs argue that the primary cause of spillage is sabotage and theft (Shell 2014). In contrast, Amnesty International (2011) argues that the case of sabotage has been over stated by the IOCs in order to avoid liability for compensation. Supporting this is a court document revealing that Shell has repeatedly made false claims about the size and impact of two oil spills at Bodo in Nigeria in order to minimise compensation (allAfrica 2014; Amnesty International 2014 and Bawden 2013). Moreover, securing the infrastructure from sabotage is to an extent the responsibility of the IOCs (operator) as discussed in section 2.3.1.4.

#### **2.1.1 Environmental Aspects**

ISO 14001 clauses 4.3.1 require a company to identify its environmental aspects and put control measures in place (ISO 14001 2004). The pipeline one aspect to consider because when damaged (either by weather, corrosion or theft), could cause oil spillage which could pollute the environment as discussed in the preceding section. In 2009, Amnesty International document that Shell has been informed by its employee that the pipelines not being properly maintained or integrally assessed for over 15 years before it damaged the ND environment by rusting and spilling of barrels of oil (Amnesty International 2014). This suggest that Shell had failed to act on its own internal advice to replace an old oil pipeline. This could be attributed to lack of adequate enforcement of law (section 3.3). Similarly, the Human Right Watch (HRW) claim there is little evidence that Shell have been involved in EIA, that they acknowledge the potential impact of their pipeline operations (HRW 1999). They reported that the pipelines are laid with narrow diameter which creates opportunity for leaks. Inadequate fencing has proved hazardous. According to HRW (1999), five children had drowned in an unfenced flooded pit where Shell used to have a 'Christmas tree' well head. These findings suggest that the IOCs neither protect or consider their pipelines as threat to the environment. Shell with the other IOCs should have considered the pipeline as an aspect that could cause impact in its objectives of environmental policy as required by ISO 14001 clause 4.2 to set an EMS that will continually improve and prevent pollution, and also to comply with legal requirements (identify aspects). And use an anti-tempered material to avoid being damaged. The inadequate and regular maintenance of the pipelines suggest IOCs' failure to comply with legislation and Governments' inability to enforce relevant sections of Pipeline Act. The vulnerable infrastructures have been left exposed to vandalise. This supports the argument by Chukwu and Sunday (2013), that the saboteur finds it easy to break the oil pipelines.

#### **2.1.2 Legislation**

The Nigerian Oil Pipelines Act requires that pipelines should be protected and buried at: 0.9 m, 1 m and 1.2 m depth for dry land, river crossing and swamp area respectively (PLAC 2012). This legislation seems rather not complied with; oil pipelines run across settlements on the ground surface which makes it vulnerable to vandalise (Figure 1). Supporting this is HRW (1999) that most pipelines and flow lines in onshore areas are above the ground at narrow diameter which the law prohibits. Similarly, another violation of the law is discharge of Produced water (PW). An SPDC former employee accused Shell of inadequate facilities for treating oil waste. This implies that the IOCs do not comply with International standards and the Nigerian law even when they claim to. For example, Shell in its business principles states that it will comply with the best environmental standard even if it is low in the country that it operates (Shell 2010 and Shell 2014). These evidences suggest that, Shell did not only violate the Nigerian legislation, but also, has not complied to its ISO

14001 requirements ISO 14001 clause 4.2 requires that a company should be committed and comply with legal requirements which relate to its environmental aspects (pipelines) (ISO 14001 2004). It requires that the law be taken into account if the EMS must be implemented and maintained to improve legal compliance.

### **2.1.3 Objectives and targets**

Shell in its sustainability report claim that, its oil spill has reduced due to improvement of its infrastructure as a result of environmental programmes (HRW 1999 and Shell 2013b). This can be seen from Figure 5 which is below the mean; however, this has not prevented its impact as the volume that is being spilled is significant (Figure 6). Shell's sustainability report states they are working to reduce number of spill, where about 770 km of pipelines have been replaced in the last three years and operational spills accounted for around 15% of the total volume spilled from Shell's facilities in 2013 (Shell 2013b). Moreover, though they have objective to reduce spill incidences Calvert (2012), they should have a specific target and measurable (in the form of percentage) to demonstrate performance against such objective and target for reductions which is required by ISO 14001 clause 4.3.3.

### **2.1.4 Emergency preparedness and response**

The Oil Pipeline regulation stipulates that a company must put in place emergency plans and respond to any oil spill in time. Similarly, DPR's 2002 EGASPIN require that 'clean-up' shall commence within 24 hours in the occurrence of a spill. In spite of these requirements on environmental emergency plans including oil spills, response to oil spills when it occur, is rather ineffective as oil spills last and spread across the land and water bodies for long time before being attended to. There a delay between the time the spillage was observed and dealt with (Amnesty International 2011). For example, the UNEP report of 2012, revealed that, the oil spill incident at Bodo community were being disputed; the community claim the spill to begun on the 28<sup>th</sup> of August 2008, which was also confirmed by NOSDRA. However, Shell claim the start date to be 5<sup>th</sup> of October 2008 (Amnesty International 2012). There was no explanation to the different dates however, what is not in dispute is that Shell did not respond to the spill until 7<sup>th</sup> of October 2008 (Amnesty International 2012). This implies that it took Shell about a week to respond (stop) to the spill. In light with the above claim, it is possible therefore, that there could be no transparency and Shell has not put in place a system to respond to oil spills or if there were, it seems rather ineffective as required by ISO 14001 clause 4.4.7 to implement a procedure(s) to emergency and potential accidents and how it will respond to them in order to mitigate or prevent adverse environmental impact associated with it. It further requires that a company establish, implement and maintain a procedure(s) to identify potential emergency situation and potential accidents that could have an impact on the environment and how it will respond to it (ISO 14001:2004). The IOCs should have secured the pipelines with anti-tempered material and put surveillance in place. Furthermore, remediation by enhanced natural attenuation (RENA), which is the primary method for remediation of oil impacted sites used by Shell, has not proved effective and is failing to reach either legislative or clean-up standards (Amnesty International 2012). Shell with other IOCs should have improved on it giving that it is not effective, by reviewing and revising the RENA procedure after the occurrence of spill required by ISO 14001 clauses 4.4.7. According to Amnesty (2009), in some sites, spill has occurred more than ones, even though the IOCs claim to respond, in reality is the other way around.

## **2.2 Gas flaring**

Various means have been adopted by the Nigerian government to abate the act of gas flare, it made some international commitments to abate gas flaring including: The United Nations Framework Convention on Climate Change (UNFCCC), Global Gas Flaring Reduction (GGFR), and Kyoto Protocol, with such strategies to end the act, gases are still being flared (Figure 4).

### **2.2.1 Legislation**

The Nigerian Management Act on the environment act (draft) 2000, banned gas flaring and states that anyone who violates the provision has committed an offence and is liable to about ₦5000 million fine. This law was put in place by the Nigerian Government in order to protect the environment; however, it has been reported that, after Oil Company lobbying, exemption to this rule were granted by an amendment which permitted flaring in certain instances (HRW 1999 and Ishisone 2004). This act, therefore, question if the fines are being paid by the IOCs. The African Business reports that the Nigerian Government owes the IOCs dept. And thus, it cannot actually collect gas fine since it failed to redeem its obligation. This factor may explain why the fine is low. It has also been reported by Ishisone (2004) that the fines are low and cannot be increase; one reason may be because the Government is being owed. Although, the Nigerian system seem rather frail, the IOCs should regardless of this, adhere to the law as required by its ISO 14001 clause 4.3.3 to take into consideration applicable legal requirements, which should have improved their level of compliance to the law because of



thoroughness of the consensus nature of the standards (Mroz 1996). However, IOCs still flare gas and is practised near settlements which section 17 and 10(b) of the Petroleum Act, Cap P10, LFN 2004 prohibits within fifty yards of any building. This act has been reported by Uyigwe and Agho (2007) to cause health problem such as; lungs, pneumonia, destroys vegetation, and acid rain. They further explained that, acid rain corrodes roofing sheets of houses and that the people in the ND change their roofing sheets often than usual.

### **2.2.2 Aspects/impacts**

Accordingly, the Gas Injection Act 1979 prohibits gas flaring in Nigeria and requires the IOCs to provide and develop facilities for the utilisation of associated gas after five years of commencement but is half a decade since exploration began and there seem to be none in place. Supporting this were Esther and Lozano (2012) that, gases are still being flared and facilities to capture such gases are lacking. The IOCs should have considered and taken into account these excess gas as an aspect that when flared, could pollute the environment as required by its ISO 14001 clause 4.3.1 and also clause 4.3.3 and put in place technology (facility that will capture and utilise this gases), and the time-frame to achieve it. The IOCs are liable to legal and compensation fees which they should have been protected against by their certified EMS. From the findings in this section (2), it suggests that the IOCs have violated the legislation to practice an EMS as required by DPR to put into account requirements of ISO 14001. ISO 14001 seem not to have significantly improved performance, and has not met legal requirements, which suggest the standard not effectively implemented. These findings corroborate the ideas of Gbedemah (2004) who suggested that, certification alone does not guarantee the management system to have met all requirement. It should be noted that, an organisation need to put into account and practice requirement by the standard in order for the EMS to be implemented, maintained and improve EM, which from the findings, the IOCs have failed to. With the legislation and IOCs being ISO 14001 certified, one could wonder why the continuous environmental issues and the laws not adhered to. Section 3.3 was included to address the issues.

### **3.3 Factors militating compliance with EM regulation and iso 14001 in Nigeria**

Based on findings, literature consulted, and reports, this section discuss the inability legislation and EMS to abate environmental pollution from gas flaring and oil spills (improve performance). A number of issues were identified such as the absence for community participation of oil activity planning, insufficient resources and corruption. Some factual evidences are presented in this section:

#### **3.3.1 Political will**

The Federal Government (FG) is the supreme authority in Nigeria piloting the affairs of the nation and supersedes State and Local Government. This power was bestowed to it by the enforcement supremacy of power decree of 1960. It has the power to stop any demonstration that is not comfortable with its agenda. In 2005, Shell and other IOCs were ordered to shut down their facilities, when gas flaring was decided as an abuse to human right and illegal by the Chief Judge of the Federal High Court in Benin, Nigeria (Friends of the earth 2007). The Judge was transferred to Katsina State in Nigeria as a result of making a decision against the Government, when the Government is trying to increase its production output. According to (NNPC 2010), the FG has a larger share (about 55% - 60%) of the total output, and in order to contribute its own part to the joint venture, it wielded its power by transferring the Judge and reinstated operation that were ordered to be shut down where gas flaring is being practiced (Friends of the earth 2007). This evidence suggests that an increase in production amounts to increase in gas flaring. Another instance where the FG exhibits its power was the retirement of the former CBN Governor Sanusi Lamido Sanusi for being controversial due to his action of exposing lapses in government administration (This Day 2014).

#### **3.3.2 Overlapping and conflicting jurisdiction**

There has been striving for supremacy among the enforcement agencies. According to Salau (1997), these agencies strive for power to handle environmental issues which consequently has led to them building different regulation approach and standard to enforce a policy governing an environmental problem. This could be attributed to the overlap in duties of these institutions (Table 3).

**Table no 3:** Environmental legal institutions in Nigeria

Legal Institutions	Duties
Federal Ministry of Environment (FME)	The FME is the supreme power concerning environmental issues such as oil spills and gas flaring in Nigeria (Adelegan 2004). The FME assume the duty of the DPR whose responsibility is to implement and monitor relevant legislation governing oil activities.
Department of Petroleum Resources (DPR)	The DPR deals with environmental problems emanating from oil and gas exploration. They monitor the environmental performance of IOCs and compliance and prosecute defaulters of regulation where necessary.
Nigerian National Petroleum Corporation (NNPC)	It assumed the responsibility of the MPR: including the regulating department (DPR). It has 2 divisions of responsibility: the inspectorate and commercial functions. The inspectorate function is the means by which this institution supervises the environmental performance of IOCs in Nigeria (FME 2013).
National Oil Spill Detection and Response Agency (NOSDRA)	It is mandate with ensuring timely, effective and appropriate response to oil spills, as well as ensuring clean up and remediation of affected sites to all best practical extent (Oyebo et al. 2011).

Recent research has reported two Government agencies (DPR and NOSDRA), responsible for enforcing regulation, monitoring oil spills and remediation, as a result, strive over jurisdiction (Policy brief 2011). It further states that both agencies attend oil spill investigation with contradictory recommendations. This view was supported by Ajugwo that environmental regulation has not been effectively enforced as a result of the overlapping duties of agencies in charge (Ajugwo 2013). In the event of a spill, both may strive to whom control the incident and should take charge of the organisation. It is possible therefore, that this act may contribute to an entrenching culture of poor accountability of oil spills and an obstacle to effectively enforce law and abate oil spill pollution. The present study recommends that the National Assembly rewrite or amend the statutory rights of the NOSDRA and DPR in their respective Acts.

### 3.3.3 Enforcement mechanism

The command and do is a common instrument used in Nigeria which according to Adelegan (2004), is ineffective as it lacks human resources and poor funding to enforce the policy. Some economic instruments adopted against the defaulters of gas flaring are in the form of fines, and restrictions. The fine, attached by the Nigerian Government to be paid by defaulters of the law, according to Bassey (2008) is seen by the IOCs as a token which could be afforded rather than installing facilities or new technology that will capture and utilise the gas, which, to them is expensive. This was further supported by Ishisone that IOCs find it more economically expedient to flare the natural gas and pay the fine than to inject the gas back into the oil wells (Ishisone 2004). Due to the low fine attached, the IOCs find it easier to pay and continue flaring. This also accords with earlier observation (section 2.2.1), which reveals the fines as very low. Aside the low fine, DPR and FEPA seldom monitor emissions to ensure compliance with their regulation (Ishisone 2004).

### 3.3.4 Incoherent

From the literature explored, it is factual that there have been different proclamations after the first gas flaring regulation (Re-injection Act 1979) for phasing out gas flaring in Nigeria by the legislature and executives. There have been incoherent datelines to terminate the act by legislature; this made it difficult for the authorities and Judiciary to litigate defaulters (Malumfashi 2007). The Nigerian Government executives fixed 2008, which then shifted to December 2011 to end gas flaring (Ako and Oluduro 2013; The Economics 2008). In 2003, President Obasanjo moved up the deadline for phasing out gas flaring from 2008 to the end of 2004 (Ishisone 2004 and 2007). In a conflicting manner, the Nigerian executives fixed 2012 as the current date to phase out gas flaring (Esther and Lozano 2012). This could make it difficult for enforcement agencies and regulation to effectively implement the law as a result of incoherent proclamation, and one reason why gas is still being flared to date (Figure 5 and 7).

### 3.3.5 Influence of IOCs

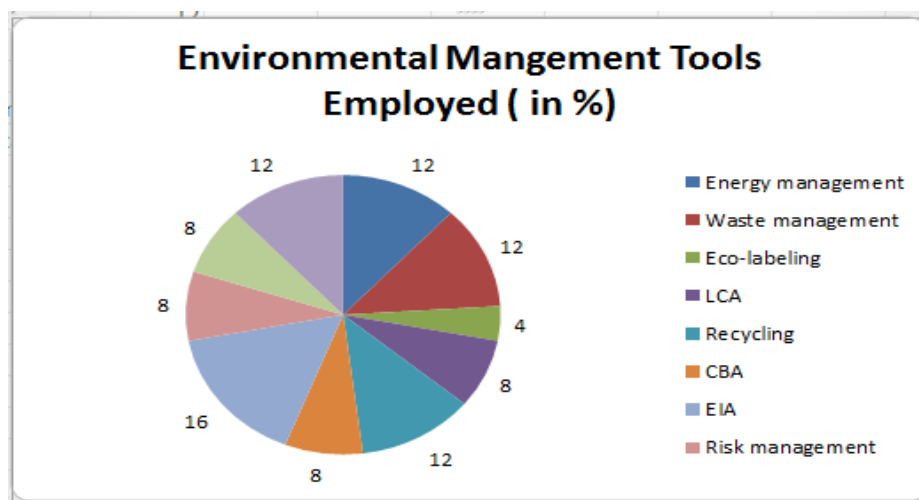
In Nigeria, the IOCs have the resources, wielding them power to be subjected to adhering to regulation. They could influence the Government agencies and if any refuses to succumb to their rhythm, such a person is likely to lose his/her job. An example is the case of the Chief Judge who by passing judgement against Shell, was transferred, while the case file got missing. Another case is the SPDC-NDDC partnership of CSR doctrine. One of the features is to facilitate capacity building for NDDC staff. According to Idemudia (2007), SPDC-NDDC has trained NDDC staffs on relevant third party, training both within and outside Nigeria. This partnership seems to tie the hand of the State. For example, out of the 7 outlines to address the oil and gas sector, only one relates to substantial regulation and was created under the oversight of Shell (Rexler 2010). This could weaken the institution rather than enhancing it, as a former Shell employee Samuel Iyang explains, that IOCs are the backers of the NDDC especially financially. It can be suggested that such partnership does not

only weaken the state but increases its dependency on the IOCs. This validates the view of Edoho and Dibia (2000) that the IOCs have the will, power and resources to influence Nigerian Government on oil production or environmental issues.

### 3.3.6 Technical knowhow, resources and incentives

To design and implement a suitable policy, technical-knowledge, experience and scientific awareness are needed. Insufficiency of the above could pose problem of implementation among others. For it to be sufficient, expertise is needed to monitor and enforce environmental standards with compliance. A number of DPR staff may not have the knowledge of environmental related programmes and lack basic knowledge to execute task as they (enforcement officers) hardly attend professional courses or training to get acquainted with current environmental discourse. Strategies to correct this might involve employing ISO 14001, which makes provisions to train employees. Furthermore, lack of funding to environmental institutes is limiting the reduction and mitigation of environmental problems associated with oil spills and gas flaring. According to the Budget Office (2014), out of the N4.91 trillion National's proposed budget, only about ₦14,264,963,475 was allocated to the Ministry of Environmental Affairs (MEA). Other Ministries such as the Ministry of Petroleum Resources and Niger Delta Ministries get about ₦55,706,174,457 and about ₦64,229,614,937 respectively. The MEA fund tackles Staff payment and environmental problems emanating from Ministry of Petroleum. Supporting the above assertion is Kadafa (2012) that, there are no sufficient funds and road to collect actual data. This low funding of the Environmental Ministry could limit human resource mobilization for regulation and standard enforcement. The UNEP report supports this that the regulators lack experience and training, and further recommend an improvement in technical skills, with the provision of human and material resources especially to agencies who presently depend on IOCs for support (UNEP 2011).

### 3.3.7 Evaluating environmental impact assessment (EIA)



**Figure no 7:** Current EM practices in Nigeria (Popoola 2013)

(CBA = Cost Benefit Analysis, LCA = Life Cycle Assessment, EIA = Environmental Impact Assessment)

EIA being the tool mostly practiced or employed (figure 7) by companies in Nigeria enacted in 1992. This system aimed at preventing and reducing impacts on the environment as contained in the EIA Act of 1992. The system (EIA) acknowledges that the Nigerian environment is vital for survival, and a healthy environment (land, water and air) inevitable for survival. It is committed to developing strategies to minimise the impacts of oil exploration from oil spills and gas flaring on the environment. However, the system seem rather poor as the Nigerian environment has been negatively impacted from reported studies. Some leading problems are discussed below:

#### 3.3.7.1 Pollicisation of EIA process

Public consultation in an EIA is an obligatory requirement for the scoping phase procedure (Kruopiene et al.,2009). However, most of the populace in Nigeria where petroleum activities are practiced are not given opportunity to be part of the EIA process, while some are not aware of their rights to objecting of any unfriendly prospective project that is being displayed. According to the Access initiative (2009) and Silas (2013), there is lack of community participation in the EIA. Factual evidence can be seen during the Mobile and Nigerian

Liquefied Natural Gas (NLNG) recovery project, the public and interested parties have been reported not to have been given the opportunity to comment and give information on the project (Frynas 2000), this question the role of FEPA. In a study conducted by Ogunba of the Nigerian EIA, the respondents claim low degree of advertisement of the procedural guidelines for EIA (Ogunba 2004). In light with the above claim, it is suggested that, the guidelines require stakeholders and the public to gain knowledge about the EIA procedure. This supports the assertion made by Kruopiene et al.,(2009) in their study of current practice and short comings of EIA in Lithuania, that one of the EIA's short comings was insufficiency of publication of the process. The present study suggests that thorough knowledge of legal requirement and EIA process could be achieved by integrating the EIA with EMS ISO 14001 compliant. The ISO 14001 clause 4.3 required and provides guidelines on communication and the need for such which could be both internal and external. The standard requires an organisation to communicate, consider views and information needs of interested parties (community and stakeholders), which could improve EIA procedure communication in Nigeria. The external communication could be through community meetings or bulletin boards where the general public can be informed.

### **3.3.7.2 Competence of authorities involved**

There is a lacuna in the EIA law, its secondary legislation, and EIA process as it fails to provide a competence limit of EIA authorities and consultants. The use of experienced EIA consultants was rated low by the officials of DPR and FEPA in the study conducted by Ogunba (2004). This response indicates that DPR and FEPA make use of inexperienced rather than experienced EIA consultants during the EIA process. This validates Ifeadi and Orubima (1996) view that the authorities involved perform poorly. The local authorities and consultants lack knowledge on EIA process and purpose, and conclusions may not be clearly formulated. Similarly, such a drawback could be overcome by increasing competence, awareness and knowledge of relevant authorities undertaking EIA process through trainings provided by ISO 14001 sub clauses 4.4.2, it requires that an organisation identifies the knowledge, understanding, and skills needed by any consultant or authority that will perform task on its behalf, ensuring provision for training. In light of the above requirements and guidance, adopting and integrating ISO 14001 and EIA could overcome the problem of incompetence, by training and understanding the capability of consultants carrying out EM functions such as EIA process/ procedure.

### **3.3.7.3 Enforcement power**

The enforcement agencies (DPR and FEPA) that ensure that the EIA law is complied with are rather seen inferior by Government agencies, making compliance low especially in the public sector. This is evident in the case presented by Douglas, an environmental right activist who sued the State oil corporation (NNPC), Shell, Mobile, NLNG project, and the Attorney General for non-compliance with the EIA Decree No.86 of 1992 (197) (Frynas 2000). The EIA was seemed not applied in the NLNG project and Mobile's NLG recovery. Following the case, the FEPA then publicised the project requesting for comments and information on the project which it failed to do before. More also, the case revealed that before the EIA was submitted to FEPA for approval, the Mobile's gas project construction work had already started (Frynas 2000). Accordingly, identifying and considering legal requirements such as EIA Act could improve compliance provided by ISO 14001 clause 3.2 (legal and requirements). It states that an organisation will identify the legal requirements (which in the context of this research is to undertake EIA as required by law) that is applicable to its aspect (BSI 2014). Having an EMS certified with ISO 14001 standards, could help the IOCs or Government agencies identify the need to take an EIA as required by law. If the EMS is effectively followed, and by evaluating compliance, a company will know if it has complied with the legal law and has the licence or permit (applicable) by agencies to execute a project. Integrating EMS with EIA in Nigeria could keep negative impacts within acceptable limits, enforce the approval conditions by regulatory bodies in the operational phase and make the enforcement (lacking in the Nigerian EIA) of environmental mandate possible which may lead to excellence (Figure 8). This view was supported by Terivel (2004) that EIA is seen to be a sustainable instrument that needs to be integrated into an EMS, which provides industries with ability to improve on a continuous basis, environmental performance and move towards sustainability (Figure 9).



Figure no 8: Tipification of EMS adoptions (Goncalo 2009)

Table no 4: Barriers to linking EIA with EMS (Palframan 2010).

Type of barrier	Example	Reference
Legal and policy framework	Different consenting regimes for planning and environmental protection (implied)	ERM Ltd, 2004
	Potential overlap in requirements leading to inefficiencies	Eccleston & Smythe, 2002
	Voluntary basis of EMS providing little incentive for uptake	Slinn et al., 2007
Process / technical issues	Complexities of site ownership and occupation	Slinn et al., 2007
	Time lag between EIA being carried out and detailed design of the project	Ridgeway, 2005
	EMS orientated towards day-to-day activities, environmental implications of new development not considered	Marshall, 2004
Practitioner issues	Limited number of practitioners specialising in both tools	Sánchez & Hacking, 2002; Marshall, 2004
	Different personnel undertaking EIA and EMS for any given project	Ridgeway 2005; Sánchez & Hacking, 2002
Proponent and stakeholder attitudes	Public debate around new developments centred on whether or not to grant consent, not on mitigation	Sánchez and Hacking, 2002
	Companies consider EMS to be outside the normal scope of operational activities	Marshall, 2004
	EIA viewed by proponents as a bureaucratic step rather than a useful process to aid the delivery of the project	Sánchez & Hacking, 2002
	Reluctance of proponent to put resources into operational management before the outcome of the application is known	Slinn et al., 2007

With the advantages of integrating EIA with EMS, barriers to integrating the two systems have been reported. Table 4 presents barriers to integrating EIA with EMS. However, some of them could be overcome by the Government providing incentives. For example, in the UK, any organisation which discharges in water body is liable to a fine, but companies with ISO 14001 could pay less (Quensh n.d). Having the system is not compulsory but could save cost and encourage companies integrating it. The EIA and EMS are sustainable tools, which when integrated by competent team both could deliver an enhanced and cost effecting solution for better environmental outcome. Shell, has experience practitioners abroad; they could bring them to Nigeria. Furthermore, in order for practitioners to undertake both, EIS should be prepared around the activities of the aspect-impact model.

**3.4 Adoption of ISO 14001 compliant EMS as a strategy to achieve sustainability, assessing its strengths, weaknesses, opportunities and threats**

SWOT analysis was used to evaluate the strengths, weaknesses, opportunities, and threats accompanied with the adoption and effectiveness of ISO 14001.

**Table no 5: ISO 14001 SWOT Analysis**

<p><b>STRENGTHS</b></p> <ul style="list-style-type: none"> <li>• Image Improvement</li> <li>• Improvement of environmental performance</li> <li>• Fulfilment of Legal requirements</li> <li>• Cost reduction</li> </ul>	<p><b>WEAKNESSES</b></p> <ul style="list-style-type: none"> <li>• Fulfilment of legal requirements</li> <li>• Cost of certification</li> <li>• More documentation</li> <li>• Lobby over Government officials</li> </ul>
<p><b>OPPORTUNITIES</b></p> <ul style="list-style-type: none"> <li>• Consultancy experience</li> <li>• Increase long-term relationship with stakeholders</li> <li>• Cost reduction from non-compliance to regulation.</li> <li>• Technical support (seminars and training) provided by the certification bodies.</li> <li>• Fading international trade barrier</li> </ul>	<p><b>THREATS</b></p> <ul style="list-style-type: none"> <li>• Increase in cost</li> <li>• More time required</li> <li>• Legal problems</li> <li>• Existence of auditors less oriented for the development of audits</li> <li>• Corruption</li> </ul>

Table 5 reveals the possible strengths, weaknesses, opportunities, and threats factors influencing ISO 14001 adoption.

**3.4.1 Strengths**

From the literature reviewed and findings, ISO 14001 could improve a company's environmental performance when effectively implemented. With ISO 14001 compliant, DynMcDermott's company response to the Hurricanes Katrina and Rita in 2005, demonstrated the company's emergency planning, emergency response and operational readiness (NIST n.d). For example, the response included re-routing the primary SPR computer networks to a storage site in Louisiana to support the Emergency Operation Centre in Texas, and after a month later, DynMcDermott evacuated and relocate to a planned alternate site (NIST n.d). Hurricane Katrina affected other companies' sites as well, displacing employees, but in less than five days after the incident, DynMcDermott was able to restore operations and deliver oil to refiners (NIST n.d). This has earned them 2005 Clean Texas–Cleaner World National Award which improved their image. ISO 14001 could improve emergency response in the Nigerian oil industry by providing an effective emergency plans and training employees to cleaning up oil spills either from equipment failure, vandalism, or weather. The system could improve the environmental issues with oil spills and gas flared in Nigeria by IOCs, with the provision of guidance and criteria on how they could identify aspects, change corroded pipelines, use anti-tempered materials and establish facilities to capture and utilise excess gas. In a nutshell, by doing so, it helps comply with regulatory laws which could improve their image. These findings further support the study carried out by Matuszak-Flejszman (2009) that ISO 14001 it has reduced pollution, improved the organisation's performance and compliance.

**3.4.2 Weakness**

One of the drawbacks in adopting the system is the cost related to certification and fulfilment of legal requirements (Figure 11) (Babakri et al 2003). Fulfilling legal requirements which tends to be difficult to adhere by organisations could affect the adoption and effectiveness of the standard, with a number of enacted laws and institutes governing the Nigerian environment, the IOCs could find it difficult to comply as indicated by the study however, such requirements when effectively followed such weakness can be avoided. The cost of implementation, documentation and employee training could stand as a barrier to some organisations. Papoolo (2013) carried out a study on the obstacles to adopting the standard in Nigeria (Figure 10). However, with similar approach it could be minimised when a company has a QMS since it shares similar requirements, and documents can be used which saves time and reduce cost. Lobby over governmental authorities, by paying them to report fake results of impact makes the system ineffective even when it is in place.

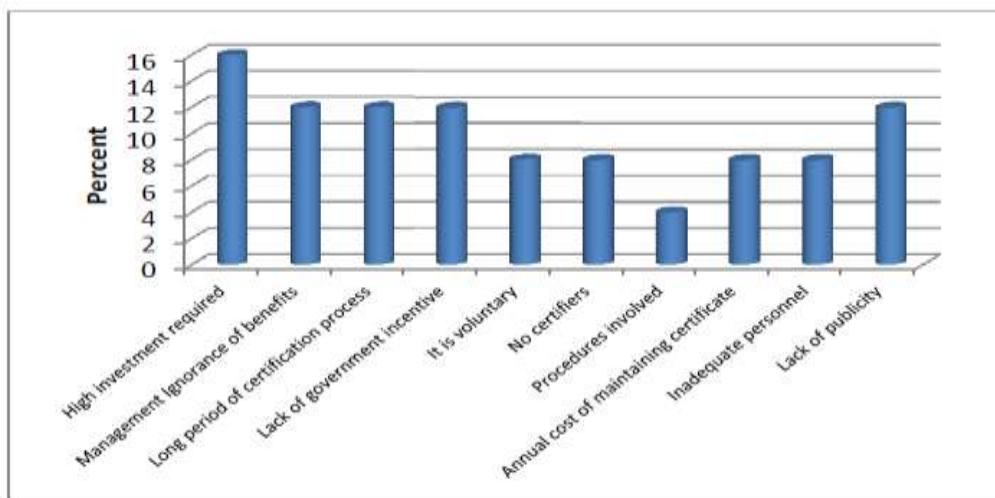


Figure no 9: Obstacles to acquiring ISO 14001 certificate (Papoolo 2013)

### 3.4.3 Opportunities

The opportunities of adopting ISO 14001 can be incurred to both the Nigerian environment and the IOCs. Pollution control and prevention, which is the idea underlying the EMS concept, provides requirements, aimed at minimising environmental problems arising from oil spills and flared gases which could bring about cost reduction from protection against claims for compensation and clean-up of spills, and utilisation of gas that is being flared. For example, the 2008/2009 oil spill claim to be paid by Shell and billions of dollars to clean up the Ogoni land spills could be minimised. In a study conducted by Morrow and Rondinelli (2002) for five German oil companies, a significant improvement towards regulatory compliance and legal certainty were reported by the five companies, and similar reports by Zutshi and Shohal (2004); Matuszak-Flejszman (2008). ISO 14001 makes provisions for guidance and training on EIA lab testing. The gases being flared and wastes discharge by IOCs could be tested for harmful and toxic substances before being released, which monitors and audits their activities to improve their performance which is lacking in EIA process. Unqualified and inexperienced consultants identified with the Nigerian EIA could be corrected by technical support (seminars) provided by the ISO certification bodies to the EIA consultants and environmental agency officials, where experienced and external auditors audit the company's proposed project and activities which will either permit a project or put it on hold, this will in turn reduce the environmental pollution which the project tends to pose on the environment. These findings suggest that, by keeping environmental pollution to a minimum could improve and gain the IOCs a long-term relationship with the communities and stakeholders to continue operating.

### 3.4.4 Threats

External factors likely to affect the implementation and effectiveness of the system are: The increase in cost for periodic auditing and payment of recertification, in cases of non-conformance, is a limitation with implementing and maintaining the standard. However, with cost benefit analysis, companies could overcome this threat, if top management is made aware of the positive returns of implementing an EMS, it can help obtain the resources and top management's commitment to implement the EMS (Edmonton 2005; Zutshi and Shohal 2004). Companies find it difficult complying with legal requirements as one vision of ISO 14001 (Figure 11) which at times leads to corruption, as discussed earlier as a weakness to the system. This may lead to ineffectiveness of the standard. An example is Shell, in spite being ISO 14001 certified, seldom adhere to legal laws as required by its ISO 14001 standards on environmental policy (clause 2). It was reported that the company do not repair corroded pipelines, compensate affected communities or respond to clean up spill (Amnesty 2014). The corruption in the country has affected the performance of ISO 14001, making the system ineffective as Shell with other IOCs still spill oil, flare gases and compensate for damages.

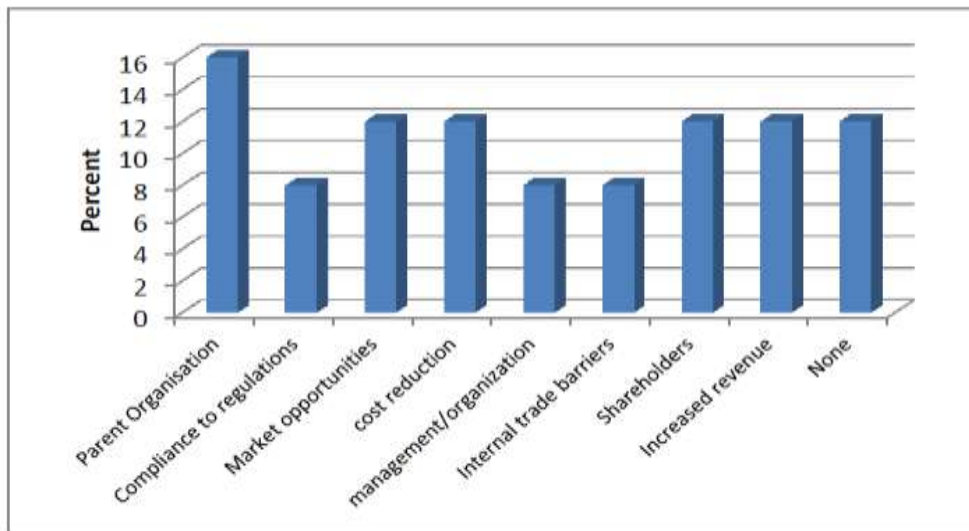


Figure no 10: Motivations for ISO 14001 adoption in Nigeria (Popoola 2013)

The motivation for adopting the system could also be a threat to the effectiveness of the standard. Figure 10 show that a number of the companies adopt the standard because of their parent organisation. It is suggested that these companies adopted to either retain business or show they are concerned about the environment, rather than to improve performance, legal requirements or curtail pollution. This could also make the system ineffective and to why though the Nigerian IOCs are ISO 14001 certified, there is little evidence of EM improvement. From the SWOT analysis it is suggested that, the opportunities presented by ISO 14001 outweigh its threats; however, depending on the company’s management team involved. It is worth noting, that the opportunities could sometimes be viewed as threats and vies-versa. A pessimist person is one who sees a misfortune in an opportunity, where as an optimist sees an opportunity in a misfortune (Balamuralikrishna and Dugger 1995). From the problems discussed on the EIA in Nigeria, the opportunities provided by ISO 14001 for authorities to comply with laws, for DPR and FEPA to employ competent consultants could be viewed as threats or opportunities by both Government and the IOCs.

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Figure no 11: ISO 14001 vision (Goncalo 2009).

Figure 11 presents ISO 14001 vision and mission to help organisations prevent and reduce pollution, and to improve on their environmental performance on a continuous basis. The Nigerian IOCs therefore, could achieve this vision and mission by evaluating its weakness, strength, exploit the opportunities and avoid the threats. It is worth noting that management and employees need to believe in the certification process, for success to be achieved. A target of zero emission and spillage builds a company’s corporate culture that could guarantee environmental improvement. However, it may not be achieved without the companies’ top management commitment to put into action the system’s requirement (Ann 2006). The Nigerian Government also have a duty to support and enhance the level of environmental proactivity by providing regulatory



incentives. For example, in the form of grants to gain the certificate. Provision of tax relief (incentive) to companies with ISO 14001 in place can as well enhance the adoption. According to Steger (2000), an adoption mechanism such as tax relief could encourage being green by companies. For example, incentive in the form of subsidies are being provided by Government to companies using unleaded petrol and natural gas in Malaysia (Zailani and Ann 2006). UNEP reports attributed company's inefficiency in CSR to lack of Government support and involvement (UNEP 2011). This does not apply to Nigeria alone but also Ghana. The World Business Council for Sustainable Development (WBCSD) reports that in Ghana, CSR is thought to be too expensive and there was little outside pressure on companies to encourage them to take the initiative. Lack of Government control and involvement (as revealed by the study in Nigeria) was as well reported to be one reason for the low priority to CSR in Ghana (WBCSD 2000). With an increase in fine for violators, enforcing the legislation, effectively implementing ISO 14001 EMS, it is hoped that EM and performance might be improved in Nigeria.

#### **IV. Conclusion**

This study set out to evaluate the activities of IOCs in the Nigerian oil and gas sector, using EM yard sticks oil spill and gas flaring, to determine if Environmental Management (EM) laws has improved performance since its implementation in 2002. Based on the statistical analysis adopted and problems evaluated in this study, results obtained indicates that EMS has not fully been implemented in the Nigerian oil industry with no significant improvement in performance. Although, there is evidence of EMS, it seems rather ineffective thus, the study suggests the implementation of an EMS ISO 14001 compliant. Based on the analysis and findings of this research, the following conclusions were arrived at; Oil spills and gas flaring is still occurring. Environmental aspects are not being identified and taken into account as required by the EIA Act of the Nigerian law. The factors affecting the effectiveness of the Nigerian law were found to be: political will, overlapping and conflicting jurisdiction and enforcement mechanism, lack of technical knowhow, low financial funding and influence of IOCs. The present study suggests that, unless the Nigerian Government adopt effective enforcement mechanism, get involved and encourage companies, CSR and sustainability may not be attained. In order for the adoption of ISO 14001 be supported, the strengths and opportunities of the system needed to be exploited to its outmost potential in order to suppress its threats and weaknesses being encountered. Moreover, results from this study suggest that the strengths and opportunities outweigh the weaknesses and threats. Some of the weaknesses and threats identified in this study could be overcome by providing incentives. For example, in UK discharge to water bodies is prohibited but violators with ISO 14001 could pay less. It is not compulsory but it will save cost and in turn help comply with legislation. Also, awareness on the benefits of ISO 14001 towards prevention of pollution and legal compliance could change the motivation from parent organization which affects the system. This study suggests that while trying to overcome these weaknesses, it is worthy to retain the strengths as well. With the benefits of ISO 14001 identified, this study indicates that there are no such in the Nigerian oil companies. The evidence from this study suggests that IOCs have couldn't have effectively implemented it. It could be wondered what would happen to quality, health and safety. An implication of this is that, it could be the same as in the case with the environment. There is, therefore, a need for a focus on all for improvement to run operation more effectively. Although, the present study is based mostly on Shell, the study suggests that, it could be similar with the other IOCs. It is proposed in this study that EIA be linked with EMS, they aim to achieve different goal which is why both is required. The EIA is applied during planning stage of new project which identifies impacts and how to mitigate, while EMS identifies aspects and ensures that capacity exist to implement the necessary EM (Sanchez and Hacking 2002).

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