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CHALLENGES OF PIPELINE VANDALISM AND OIL INDUCED ENVIRONMENTAL DEGRADATION IN THE NIGER DELTA REGION OF NIGERIA

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ABSTRACT

From available statistics, a total of 9,107 oil spill incidences occurred between 1976 and 2005 resulting in about 3,121,909.8 barrels of oil spilled into the environment. Sabotage is currently the leading cause of oil spillage in Nigeria. Oil pipeline vandalization occurs through acts of sabotage. Sabotage here relates to various acts that interrupt the production and distribution of petroleum products Nigeria hasdeveloped a National Oil Spill Contingency Plan (NOSCP), which was revised in 2003 and reviewed in 2006. This include joint surveillance of pipeline Rights-of-way involving the host communities, stricter penalties for pipeline vandalism, aggressive public enlightenment on the negative impacts of pipeline vandalism on the environment as well as making supply of refined petroleum products affordable and readily available thereby making oil pipeline theft unattractive. As a third world country, this is one of the strategies put in place by the Nigerian Government for sustaining development and human capacity building in the oil industry.

KEYWORDS: Oil Spill; Nigeria; Pipeline Vandalism.

INTRODUCTION

Nigeria is the largest oil producer in Africa and the eleventh largest in the world (Akpofure, 2008; Ifeadi and Nwankwo, 1978). The mainstay of Nigeria's economy is the petroleum sector, contributing about 90% of the nation's foreign exchange earnings and about 25% of the gross domestic products (Okoh and Eghon, 1999). A significant proportion of the nation's oil is produced onshore and is subsequently transported by pipelines, although recently oil

production has witnessed increased activities in the offshore. Estimated oil reserve is put at 35.2 billion barrels (Oshineye, 2000). The average oil production is between 2.5 billion barrels to 3.0 million barrels per day (bbL/d) (Okoh and Eghon, 1999; Oshineye, 2000). Over the years, the amount of oil produced and transported between points of production, processing and distribution or export terminals has greatly increased as the demand of and dependence on oil increased. Although this increase in oil production level contributes to the national economic growth, it also presents increased potential for environmental pollution and degradation especially in the Niger-Delta region. Oil exploration and exploitation has continued resulting into what is termed environmental destruction due to neglect and less concern of the multinational companies in environmental management in the area (Eregha, 2001).

The environmental degradation resulting from oil and gas production in the Niger-Delta has attracted the attention of environmentalist and other experts, who look at the region within the larger context of globalization (David-West, 2001). There are complex and extensive systems of pipelines across the Niger Delta region, which is the hub of oil exploration and production in Nigeria. It has been observed that thousands of barrels of oil have been spilled into the environment through oil pipelines and storage facilities failure in Nigeria. The causes of pipeline damage and leakages can differ greatly ranging from material defects and pipe corrosion to ground erosion, tectonic movements on the sea bottom and contact with ship anchors and bottom trawls particularly in the offshore operations while vandalism is observed as the substantial cause of pipeline damage onshore in Nigeria (Odu and Offodum, 1986) Most studies regarding on oil related environmental problems and the impact on the region have not really done extensive work on the link between the vandalization of oil pipelines and the resulting environmental degradation. Most of the studies in isolation only examined one of either vandalism of oil pipelines or environmental degradation. For instance, a recent study by Omafonmwa and Odia (2009) on oil exploration and the impact on the Niger-Delta employing a theoretical analysis revealed that the causes of the crises in the region is sequel to the inability of the multinational companies involved in the explorations of crude oil. Opukri and Ibaba (2008) adopted descriptive survey method of analysis of secondary data to reflect on social effects of oil induced environmental degradation in the region. Aluko (2004) used primary data sources from thirteen communities in the area to conducts descriptive analysis of impact of oil induced environmental degradation on the Niger-Delta region. He concludes that oil exploration activities in the region leading to environmental degradation

are responsible for the high degree of proverty in the area. Again this study was based on one of the economic effects of environmental degradation. Eregha (2001) examined the two dimensional effects of this devastating oil exploration in the region vis-a-vis economic and social dimensions. This study did not consider the environmental degradation as it relates to challenges of pipeline vandalism. . So this research seeks to fill this gap by examining the challenges of pipelines vandalism and oil induced environmental degradation. The main thrust of this paper is to examine environmental degradation of the Niger-Delta area vis-à-vis challenges of oil pipeline vandalism in the light of sustaining development and human capacity building in Nigeria.

Major Oil Spill Incidents in Nigeria

In Nigeria, oil spill did not receive attention until late 1970's, when formal documentation commenced. From available statistics, a total of 9,107 oil spill incidences occurred between 1976 and 2005 resulting in about 3,121,909.8 barrels of oil spilled into the environment (Odu and Offodum, 1986). Some of the major spills recorded in Nigeria include:

i) The Escravos spill of about 300,000 barrels in 1978;
ii) The oil blowout of 1980. In the spillage which involved Texaco Oil Company, over 400,000 barrels of oil spread through the Delta region polluting about 1,200km^2. In the disaster, about 180 people died while 300 people contacted various illnesses through drinking polluted water and eating contaminated food.
iii) Another reported incident of oil spill also occurred in 1986. It was estimated that eight major creeks and villages were affected by the spillage. In the incident several thousand barrels of oil were lost and economic activity was paralyzed in the affected areas. The damage done to fishponds, nets and traps was put at over 2 million Naira (Odu and Offodum, 1986).
iv) Mobile oil spillage of 1998 polluted waters from Akwa Ibom State in the South to Lagos State in the West. It was observed that the spill led to loss of over 40,000 barrels of oil to the environment.
v) The Jesse spill incident of 1998, which resulted in a fire incident that claimed over a thousand lives and ravaged the fragile ecosystem.

Oil Spills through Pipeline Vandalism

Oil pipeline vandalization occurs through acts of sabotage. Sabotage here relates to various acts that interrupt the production and distribution of petroleum products. Sabotage is

currently the leading cause of oil spillage in Nigeria. Oil spill through pipeline vandalism by idle youth in Nigeria has peaked up in the last few decades. Poor implementation of memorandum of understanding (M.O.U) between oil companies and host communities, lack of employment and environmental degradation has been blamed for this trend (Balogun et al., 2006). Aluko (2005) reported that an average of 35,000 barrels of crude oil is stolen per day in circumstances that threaten lives and the environment. Oil spill incidence through pipeline vandalism appears to be peculiar to Nigeria and has become rampant in recent times and if no urgent measures are taken by the relevant Nigerian agencies, the frequent pipeline cuts that continue to spill for weeks and months has the capacity of undermining Government's efforts at meeting its obligations in spill management.

Table 1: Time Series Analysis of Oil Spill in the Niger-Delta.

Year	Number of spills	Volume in barrels (bbl)
1976	128	26157
1977	104	32879.25
1978	154	489294.75
1979	157	94117.13
1980	241	600.51102
1981	238	42722.5
1982	257	42841
1983	173	48351.3
1984	151	40209
1985	187	11876
1986	155	12905
1987	129	31866
1988	208	9172
1989	228	5956
1990	166	14150.35
1991	258	108367.01
1992	378	51187.9
1993	453	8105.32
1994	495	35123.71
1995	235	31,000
1996	326	39,000
1997	240	80,000
1998	248	50,000
1999	320	20,000
2000	330	30,100
2001	302	76,960
2002	262	19,980
2003	221	9,916
2004	236	8,317
2005	224	11,921

Total	7204	1,483,075.73102

Source SNAR, 2005.

Pipeline vandalism and disruption of oil production activities regrettably are now integral part of oil and gas operations in Nigeria. The enormous oil installations deployed in the Niger Delta region explains their vulnerability to vandalism. Presently, the Niger Delta region plays host to 600 oil fields of which 360 fields are onshore while 240 are offshore with over 3000 kilometers of pipelines crisscrossing the region and linking some 275 flow stations to various export terminals (Aaron, 2006 and Awobajo, 1981). It is pertinent to note that oil spills resulting from pipeline vandalism has continued to be a challenge, with most incidents along major pipelines and manifolds. This has introduced a serious challenge to oil spill management in Nigeria and at the moment has defiled all contingency arrangements of oil industry operators. The reasons attributed to this 'Monster' vary, ranging from economic to political. These reasons advanced notwithstanding, oil spill through pipeline vandalism is a threat to oil production, sustainable livelihood as well as the environment.

Table 1 shows that for the period 1976-2005 for instance, shell Petroleum Development Company one of the major oil operators in Nigeria recorded a total of 2944 oil spill incidents. The data reveals a noticeable increase from 235 oil spill incidents in 1976 to 330 in 2000. The least number of 104 oil spill incidents was observed in 1997. The level of equipment failure and corrosion due to ageing facilities were attributable to the rise in spill occurrences. Also mechanical failure coupled with human error was also identifiable human factor believed to be responsible. However, with improvements in these facilities a gradual decline in oil spill incidents from 2001 to 2005 although, a slightly high number was recorded in 2004. Correspondingly, the maximum volume of 489,294.75 barrels of crude oil was spilled in 1978, while the least volume of 600.51102 was recorded in 1980.The rising tide of violence, hostage taking in the Niger Delta region has significant consequences on oil spill management particularly in the area of quick access to spill sites. The situation is further compounded by often unnecessary pecuniary demands by the host communities which often results to restrictive ability to respond and clean up spills in good time. In 2006, Shell Nigeria recorded 241 oil spill incidents. Of this number sabotage accounted to 165 (69%,) while 50 (20%) were controllable incidents (resulting from equipment failure, corrosion or human error). The remaining 26 incidents are yet to be classified or quantified due to access restrictions either by communities or the current insecurity in the Niger Delta. Evidently, prompt response to oil spill is generally hampered thereby making oil spill management more

difficult than anticipated and the environment being worse off. In view of this, the Nigerian Government and industry operators should explore ways and means other than what is available currently in order to abate this 'Monster'. There is need for more engagement of the communities in all the processes of oil spill management to stem this ugly trend in the Petroleum sector.

Oil Spill and Environmental Degradation

The exploration and exploitation of crude oil in the Niger-Delta has resulted to a number of environmental problems for the region. The Niger-Delta region is located in the coastal part of Nigeria and this is a waterlogged area as more than eight percent of the oil producing communities is on water. Before the discovery of oil in the region, it was characterized as natural clean and healthy water lettuce that adds beauty and flavour to the environment. The community's shorelines have been washed away or eroded due to the high volume of deep-sea exploration and exploitation activities. Apart from the loss of lives and property through pipeline fire, the run-off from impacted sites usually degrade the quality of the fresh water sources which serves the domestic rural water supply need of the most communities. A lot of land degradation and forest deforestation were caused by oil induced fire and pollution on the environment. A number of oil induced fire outbreak has occurred in the Niger-Delta leading to deforestation and destruction of farmland such as the Jesse fire incident that occurred in October 17, 1998 (Odu and Offodum, 1986; Aaron, 2006; Akpofure, 2008). The unfortunate thing was that this fire incident did not only destroy farmlands or natural ecology but also killed more than 1,000 people of the community (David-West, 2001). Another fire incident occurred in September, 2004 in Okirika community, Rivers State that lasted for 3 days and destroyed the plants and animals inhabiting the affected area (Zabbey, 2004). Another fire scourge occurred in Ugbomro community and a study was carried out to ascertain the effect on the soil and it was discovered that contrary to the popular opinion that fire improvised bush fallowing for cropping, the site witnessed severe impoverishment not only from the fire incidence but also from the oil spill on the site (Osuji and Ukale, 2000). Other sources of land degradation and loss of biodiversity as well as forest and crops destruction in the region are acid rain from gas flaring.

Emerging Trends for Mitigation of Oil Spill

The government as the environmental conscience of the citizenry has put in place a number of laws to govern the petroleum industry in Nigeria and by extension provide the necessary framework for oil spill management.

These include:

a. Oil pipelines Act , 1965;
b. Mineral oil (Safety) Regulations, 1997
c. Petroleum Regulations, 1967;
d. Petroleum Drilling and Production Regulations, 1969;
e. Oil in Navigable Water Act, 1968;
f. Oil terminal Dues Act, 1969;
g. Petroleum Refining Regulations, 1974;
h. Federal Environmental Regulations, 1974;
i. Federal Environmental Protection Agency Act, 1990;
j. National Oil spill Detection and Response Agency Act, 2006.
k. Ministry of Niger Delta, 2011

In a related effort to effectively manage oil spill in Nigeria, a co-operative of oil industry operators known as clean Nigeria Associate (CAN) was formed in 1981, which amongst others, maintains the required capacity and capability for oil spill preparedness, prevention and response within the 1st and 2nd Tier spill response systems of the its members. Nigeria, as a signatory to the international convention on oil pollution, preparedness and response co-operation (OPRC) that focuses on the responsibility of member states to establish a national system or plan for responding promptly and effectively to oil pollution incidents, developed a National Oil Spill Contingency Plan (NOSCP), which was revised in 2003 and reviewed in 2006. The Government established the National oil spill Detection and Response Agency (NOSDRA) in 2006 as part of its effort in implementing the NOSCP. This can be seen as an emerging trend for sustaining development and human capacity building in the Nigerian oil industry.

Primary Role of the National Oil Spill Detection and Response Agency (NOSDRA)

The National Oil Spill Detection and Response Agency (NOSDRA) is charged with the responsibility of implementing the national oil spill contingency plan (NOSCP) for Nigeria in line with international convention on oil pollution preparedness, response and cooperation

(OPRC) which Nigeria is a signatory. This Agency is empowered to ensure timely, effective and appropriate response in terms of necessary equipment and resources to protect threatened environment and facilitate clean up of impacted sites to the best practical extent including remediation and restoration.

The primary roles of the agency amongst others include:

i) Maintains surveillance and ensures compliance with all existing environmental legislation as well as the detection of oil spills in the petroleum sector;
ii) Receives reports of all oil spillages and co-ordinates oil spill response activities throughout Nigeria;
iii) Coordinates the implementation of the plan for the removal of hazardous substances as may be issued by the Federal Government;
iv) Strengthens the national capacity and regional action to prevent, control, combat and mitigate marine pollution.

DISCUSSIONS

Most studies regarding on oil related environmental problems and the impact on the region have not really done extensive work on the link between the vandalization of oil pipelines and the resulting environmental degradation. Most of the studies in isolation only examined one of either vandalism of oil pipelines or environmental degradation. So this research has filled this gap by examining the challenges of pipelines vandalism and oil induced environmental degradation.

The level of equipment failure and corrosion due to ageing facilities are attributable to the rise in spill occurrences. Also mechanical failure coupled with human error is also identifiable human factor believed to be responsible. The rising tide of violence, hostage taking in the Niger Delta region has significant consequences on oil spill management particularly in the area of quick access to spill sites. The situation is further compounded by often unnecessary pecuniary demands by the host communities which often results to restrictive ability to respond and clean up spills in good time.

The Government as the environmental conscience of the citizenry has put in place a number of laws to govern the petroleum industry in Nigeria and by extension provide the necessary framework for oil spill management. This include joint surveillance of pipeline Rights-of-way involving the host communities, stricter penalties for pipeline vandalism, aggressive

public enlightenment on the negative impacts of pipeline vandalism on the environment as well as making supply of refined petroleum products affordable and readily available thereby making oil pipeline theft unattractive.

The National Oil Spill Detection and Response Agency (NOSDRA) is charged with the responsibility of implementing the national oil spill contingency plan (NOSCP) for Nigeria This Agency is empowered to ensure timely, effective and appropriate response in terms of necessary equipment and resources to protect threatened environment and facilitate clean up of impacted sites to the best practical extent including remediation and restoration.

CONCLUSION

The environmental degradation resulting from oil and gas production in the Niger-Delta has attracted the attention of environmentalist and other experts. Oil pipeline vandalization occurs through acts of sabotage. The productive and environmental impacts of the number of operators are at increase every day in the region. The percentage of the land of the region occupied by the oil industry is less than five percent but the adverse effects associated with its operations are innumerable and region-wide. Evidently, prompt response to oil spill is generally hampered thereby making oil spill management more difficult than anticipated and the environment being worse off. The Government as the environmental conscience of the citizenry has put in place a number of laws to govern the petroleum industry in Nigeria and by extension provide the necessary framework for oil spill management. Nigeria has developed a National Oil Spill Contingency Plan (NOSCP), which was revised in 2003 and reviewed in 2006. The National Oil Spill Detection and Response Agency (NOSDRA) is charged with the responsibility of implementing the national oil spill contingency plan (NOSCP) for Nigeria in line with international convention on oil pollution preparedness, response and cooperation (OPRC) which Nigeria is a signatory. These reasons advanced notwithstanding, oil spill through pipeline vandalism is a threat to oil production, sustainable livelihood as well as the environment.

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