

OIL EXPLORATION AND ENVIRONMENTAL SECURITY CHALLENGES IN NIGERIA: NIGER-DELTA EXPERIENCE

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Abstract

This study interrogated the nexus between crude oil production and environmental security challenges in the Niger-Delta region, Nigeria, between 2015 and 2021. Documentary method of data collection and content analysis were applied. Rentier State theory served as the theoretical fulcrum around which the study revolved. It was found that the atavistic pursuit of wealth by oil companies and the rentier nature of Nigerian economy brought about neglect or insensitivity on the part of both the government and the oil companies, to the Niger-Delta environment where the oil rent is generated. As a result the region experienced environmental security challenges. It was suggested among others that the Nigerian government should take practical steps to contain all those activities of the multinational oil companies that bring about environmental hazard, activities such as oil spillage and gas flaring.

Keywords: Environmental Security, Gas Flaring, Oil Spillage and Sustainable Development
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Introduction

The environment is the life support system given by the Creator to mankind. Sometime in the past, the three major components of the environment - air, soil and water - were uncontaminated and basically hospitable to humans. But today, the reverse is the case due to progress in human activities which evidently led to environmental degradation and serious ecological imbalance which in the long run may prove disastrous for mankind (Sharma, 2002). Those activities that negate the environmental balance and most importantly sustainability involve unhealthy agricultural practices like over application of chemicals on lands, illegal fishing activities that involve usage of destructive chemicals which lead to extinction of some aquatic lives in the river as well as contamination of the water and the worst of it all is oil exploration which is not only affect the land but also the general environment through gas flaring, oil spillage, air pollution and degradation of the environment through reduction of the soil nutrients.

Crude oil exploration in the Niger-Delta has been on the increase since 1956 when it was discovered in commercial quantity in Olobiri in today's Bayelsa State. These replaced earnings from agriculture which was the main stay of the Nigerian economy. The Niger-Delta of Nigeria which is richly endowed with natural resources, oil and gas deposit and abundant human and

material resources including good agricultural lands, extensive forests, excellent fisheries, as well as a well-developed industrial base are subjected to severe environmental degradation due to largely ecologically unfriendly exploration of oil. The region which consists of diverse ecosystems of mangrove swamps, fresh water swamps, and rain forest is now characterized by complete contamination of streams, rivers and forests-destruction of biodiversity to oil pollution in the area (Alagoa, 2004).

As observed by Adati (2012) this has affected the livelihood of the indigenous people who depend on the ecosystem services for survival. Throughout more than 50 years of crude oil exploration in Niger-Delta, oil drilling and refining has caused unquantifiable devastation to the people of the region as the people are sparingly engaged in their fishing, farming, and hunting activities which was the mainstay of their economy. This ecologically productive region has suffered extensive soil degradations, forest clearing, toxic discharges, habitat degradations, dredging fillings and significant alteration by extensive road and pipeline construction from the petroleum industry of particular concern in the Niger-Delta, frequent and extensive oil spill that have occurred.

More so, Aaron (2006) noted that poverty incidence and unemployment have been on a visible upward trajectory in the Niger-Delta. Statistically, about 72 percent of households in the region are in endemic poverty thereby reducing the inhabitants to below the World Bank benchmark definition of poverty (the World Bank benchmark for poverty is 2 dollars per day). These however, have become sources of agony, pain and disillusionment for the people of the region. The people of the region where the nation derives greater percentage of her natural resources has persistently complained that adequate attention has not been given to them as regards to development, employment, social amenities etc. despite the environmental devastation resulting from oil, which has resulted in loss of lives, personnel and abject poverty.

However, since the discovery of the oil in commercial quantity in Niger Delta, it has been generating enormous resources to the country which should enhance development in the region through all round security net. Therefore, the study is focused on ascertaining the nexus between the oil exploration and the environmental security challenges in the Niger-Delta within the period under investigation.

Environmental Security

Environment can best be described as all the external factors influencing the life and activities of mankind. It has some vital components which include first, atmospheric air which helps humans to inhale and exhale healthy air that is inevitable in human life and sustainability; second, soil,

which is the fundamental source of plants and animals and by extension, diverse forms of food items for man. Considering the decisive primacy of food in human life, a healthy soil becomes paramount in human terrestrial existence; thirdly, water, which provides for aquatic life and equally serves as food and drink for human beings. Environmental security therefore, implies a condition of proper preservation of the above components of the environment by not allowing them to degenerate into a state of contamination. This unwelcome circumstance is obtained when the atmospheric air become toxic to the body when inhaled, the soil degraded which affects its nutrients, while the water became contaminated which adversely affects the fishes and aquatic lives (Odeyemi & Ogunseitan, 1985).

In contrast and for proper clarification of the above view by Odeyemi and Ogunseitan, Aluko (2004) maintained that environmental insecurity is thus, a major cause of productivity losses and poor human health in the Niger-Delta. Going further, he insisted that it is widely accepted that if the environment is insignificantly being degraded and the degradation is not accounted for, then development will be wrongly measured. Hence, environmental security involves the protection of the major components of the environment such as the air, soil and water from pollutions and contamination, which are the sure way of human survivability.

Oil Exploration

Oil exploration entails the gamut of activities therein in the process of searching for crude oil for mining. According to Uduhene (2016) Oil exploration is a method used by petroleum geologists and geophysicists for searching for hydrocarbon deposits (oil) under the earth's surface. It consists of locating oil and gas reserves using primary technologies particularly seismic surveys and drilling wells. Explaining further, he maintained that oil exploration is a costly and risky operation because the expenditure associated are usually valued at millions of dollars and every two out of three wells, on average, contain no traces of hydrocarbons. It therefore requires companies to drill many wells in one area before they are able to find an oil or gas discovery, and this may take decades or more years. Some explorers sometimes find nothing at all after the exploration exercise.

However, oil exploration is an activity undertaken by oil companies for the purpose of accessing oil for use. In the process of the exploration, some harmful emissions are unleashed, then we set out to unravel the nexus between oil exploration and environmental security in Niger-Delta within the period under investigation.

Theoretical Nexus

This study adopted Rentier State Theory as a theoretical fulcrum around which it revolved. The proponents of the theory include Beblawi (1987); Mahdavy (1971) and some other contributors to the theory. Essentially, the concept of Rentier State was first postulated by Hossein Mahdavy. In his view, he maintained that rentier states are those countries that receive on a regular basis substantial amount of economic rent. Also, it is an economy in which rent plays a major role, and that rent is external to the economy (Mahdavy, 1971).

In another development, Beblawi (1987) delineated four characteristics which will be present in order for an economy to be classified as 'rentier' thus:

1. An economy in which rent situations predominate. He argued that there is no such thing as a pure rentier economy and concurred with Mahdavy's view that the determination of when an economy becomes rentier is a matter of judgment.
2. The origin of this rent must be external to the economy. Domestic rents, even if they were substantial enough to predominate, is not sufficient to characterize the 'rent economy' because economic rent is a factor income that only results from production (labour), investment (interest), and management of risk (profit)-i.e., internal forces of production.
3. In a rentier state only, the few are engaged in the generation of rent, while the majority is involved in its distribution and consumption. Therefore, an open economy with high levels of foreign trade is not rentier, even if it depends predominantly on rent (e.g., tourism), because the majority of the society is actively involved in the creation of wealth.
4. Finally, the government must be the principal recipient of the external rent in the economy. This last characteristic is closely related to the concentration of rent in the hands of the few (Yates, 1996, p.14).

In addition, the key feature of rentier state according to Luciani is that external rent liberates the state from the need to extract income from domestic economy. Convincingly, rentier state is a state whose major source of revenue does not arise from taxation on productive activities—agriculture, industry, services—undertaken by its economically active population. Instead, the rentier state lives by collecting a convenient income from sources into which it invests little or nothing. Rent comes in without opportunity costs, and if it comes in as centralized as in the case of oil, it is even more convenient, from the treasury's point of view (Harneit-Sievers, 2004).

By a way of application, Nigerian economy which depends on natural resources especially oil export always experiences diversification deficit. Efforts of the leaders are in practice channeled to the sharing of oil dividend without serious consideration for economic sustainability. The reliance on oil rents incapacitated the country and blurred her vision of discerning the environmental hazards unleashed on the host community (Niger-Delta). The rents paid by the multinational oil companies on the other hand gave the oil companies the impetus to flout their rules of engagement by perpetrating gas flaring and oil spillage which brought about environmental security challenges in the Niger-Delta. However, should Nigeria mobilize well established international rules of engagements with the multinational oil companies, the more the oil companies would reduce the rate of gas flaring and oil spillage, and the less the environmental security challenges in the Niger-Delta.

Nature and Problems of Oil Exploration in Niger-Delta

With the discovery of oil and the corresponding exploration, the carelessness of the oil industry has also precipitated a situation where the Niger-Delta is forecast to experience a loss of 40% of its inhabitable terrain in the next thirty years as a result of extensive dam construction and some other oil exploration activities in the region (NNPC, 1983). Stressing further, it reported thus:

...we witnessed the slow poisoning of the waters of this country and the destruction of vegetation and agricultural land by oil spills which occur during petroleum operations. But since the inception of the oil industry in Nigeria more than twenty-five years ago, there has been no concerned and effective effort on the part of the government, let alone the oil operators, to control environmental problems associated with the industry (NNPC, 1983).

Essentially, Bronwen (1999) observed that the Department of Petroleum Resources estimated that 1.89 million barrels of petroleum were spilled into the Niger-Delta between 1976 and 1996 out of a total of 2.4 million barrels spilled in 4,835 incidents, approximately 220 thousand cubic metres. Furthermore, he averred that a UNDP report stated that there has been a total of 6,817 oil spills between 1976 and 2001, which accounted for a loss of three million barrels of oil, of which more than 70% was not recovered. 69% of these spills occurred off-shore, a quarter was in swamps and 6% spilled on land. More so, he disclosed that the Nigerian National Petroleum Corporation placed the quantity of petroleum jettisoned into the environment yearly at 2,300 cubic meters with an average of 300 individual spills annually.

However, World Bank (2008) argued that the true quantity of petroleum spilled into the environment could be as much as ten times the officially claimed amount, because this amount did not take into account "minor" spills. The largest individual spills include the blowout of a Texaco offshore station which in 1980 dumped an estimated 400,000 barrels (64,000 m³) of crude oil into the Gulf of Guinea and Royal Dutch Shell's Forcados Terminal tank failure which produced a spillage estimated at 580,000 barrels (92,000 m³). In 2010 Baird reported that between 9 million and 13 million barrels have been spilled in the Niger Delta since 1958. One source even calculates that the total amount of petroleum in barrels spilled between 1960 and 1997 is upwards of 100 million barrels (16,000,000 m³).

Similarly, Lawal and Ese (2012) in their opinion asserted that spills are under-reported, but independent estimate is that at least 115,000 barrels (15,000) tons of oil are spilled into the delta each year, making the Niger Delta one of the most oil impacted ecosystems in the world. Bassey (2002) in his study observed that in Nigeria, 32% of oil spillage is due to corrosion of pipelines and tanker accidents, 28% is due to sabotage and 21% are due to oil production operations while 19% of the oil spills is due to engineering drills, inability to effectively control wells, failure of machines and inadequate care in loading and offloading oil vessels. Still on the cause of spillage, Nwilo and Badejo (2001) opine that half of all spills occur due to pipeline and tanker accidents (50%), other causes include sabotage (28%) and oil production operations (21%), with 1% of the spills being accounted for by inadequate or non-functional production equipment.

On the aspect of gas flaring, World Bank (2008) disclosed that Nigeria flares more natural gas associated with oil extraction than any other country, with estimates suggesting that of the 3.5 billion cubic feet (100,000,000 m³) of Associated Gas (AG) produced annually, 2.5 billion cubic feet (70,000,000 m³), or about 70%, is wasted by flaring. This equals about 25% of the UK's total natural gas consumption and is the equivalent to 40% of Africa's gas consumption in 2001. Statistical data associated with gas flaring are notoriously unreliable, but Nigeria may waste US\$2 billion per year by flaring Associated Gas. Flaring is done as it is costly to separate commercially viable Associated Gas from the oil. Companies operating in Nigeria also harvest natural gas for commercial purposes but prefer to extract it from deposits where it is found in isolation as non-Associated Gas. Thus, Associated Gas is burned off to decrease costs.

Gas flaring is generally discouraged as it releases toxic components into the atmosphere and contributes to climate change. In Western Europe 99% of Associated Gas is used or re-injected into the ground. Gas flaring in Nigeria began simultaneously with oil extraction in the 1960s by Shell-BP. Alternatives to flaring are gas re-injection or to store it for use as an energy source. If

properly stored, the gas could be used for community projects. Gas flaring releases large amounts of methane, which has a high global warming potential. The methane is accompanied by the other major greenhouse gas, carbon dioxide, of which Nigeria was estimated to have emitted more than 34.38 million metric tons of in 2002, accounting for about 50% of all industrial emissions in the country and 30% of the total CO₂ emissions. While flaring in the west has been minimized, in Nigeria it has grown proportionally with oil production (World Bank, 2008).

Table 1: Causes, Places and Volumes of Oil Spillage in Niger Delta from 2015-2021

S/N	Years	Places	Causes	Volumes
1	2015	Swamp	Operational	23,296
2	2016	Land	Sabotage	15,373
3	2017	Land	Sabotage	18,241.4
4	2018	Swamp	Sabotage	30,367.9
5	2019	Land	Sabotage	10,757.8
6	2020	Land	Operational	14,793.6
7	2021	Swamp	Operational	31,217.4

Source: SPDC (2021)

Decipherable from the table one above is that we have many incidences of oil spillage in the Niger Delta within the period under investigation. The spillages as demonstrated on the table majorly happened on land and the causes are mainly sabotage and a bit of operational issues. The highest volume of oil spillage which is 31,217.4 was recorded in 2021 followed by 30,367.9 volumes in 2018. The least volume of oil spillage was however recorded in 2019 as 10,757.8. 2020 has 14,793.6, 2016 has 15,373 while 18,241.4 were recorded in 2017. These oil spillages constitute environmental havoc in the Niger-Delta areas within the period of the study.

Table2: Standard Cubic Feet of Gas Flaring in Oil States in Nigeria, 2015-2021

S/N	States	Standard Cubic Feet(SCF)	Incidents
1	Abia	3.0 million	34 months
2	Akwa Ibom	25.8 million	60 months
3	Bayelsa	170.7 million	62 months
4	Delta	349.0 million	62 months
5	Edo	82.7 million	62 months
6	Imo	37.1 million	62 months
7	Kaduna	5.0 million	23 months
8	Rivers	299.0 million	62 months

Source: Footprint to African Investors Service (2021)

Observable from the table two above is that there are monumental flares of gas in the littoral zones during the period under investigation. The table measures the flares in SCF, based on that the highest gas flare was recorded by Delta (349.0 million scf) followed by Rivers (299.0 million

scf), Bayelsa (170.7 million scf), Edo (82.7 million scf), Imo (37.1 million scf), Akwalbom (25.8 million scf), Kaduna (5.0 million scf) which is the least on the table. The incessant gas flaring unleashed environmental hazard in Nigeria within the period of the study.

Oil Exploration and Environmental Security Challenges in the Niger-Delta

This segment of the study is designed to unravel the oil exploration and environmental security challenges in Niger-Delta. To begin with, we shall first of all demarcate the area that made up the Niger-Delta. In 2000, however, Obasanjo's regime delineated them to include the following states: Akwa-Ibom, Bayelsa, Cross River, Delta, Edo, and Rivers. The Niger-Delta extends to about 70,000 km² (27,000 sq mi) and makes up 7.5% of Nigeria's land mass, with a population of 31 million people of more than 40 ethnic groups including the Bini, Efik, Esan, Ibibio, Igbo, Annang, Oron, Ijaw, Itsekiri, Isoko, Urhobo, Ukwuani, Kalabari, Okrika and Ogoni, are among the inhabitants of the political Niger-Delta, speaking about 250 different dialects (CRS, 2008).

The world today recognizes the significance of environmental sustainability to the development of any nation. That is more reason one of the cardinal objectives of the Sustainable Development Goals (SDGS) is to ensure environmental sustainability. It then implies that there should be reduction in environmental degradation as well as pollution. Multinational and other industrial establishments are expected to play a significant role in the development of the society and host communities (Eregha & Irughe, 2009). Inversely, throughout over 50 years of oil exploration in Niger-Delta, this ecologically productive region has suffered extensive habitat degradations, forest clearing, toxic discharges, dredging filling and significant alteration by extensive road and pipeline construction from the petroleum industry and frequent extensive oil spill that have occurred (Akpabio et al.,2010).

As we have noted earlier, the components of environment involve oil, air and water. Therefore, where the pollution is more serious soil becomes infertile because nutrients essential to plant growth become scarce, while those that are toxic to plant become more available. Based on that, oil spillage in the Niger-Delta areas often spread-out over a wide area, destroying crops through contamination of the underground water and soils. The major impact of oil exploration in the Niger-Delta is the drastic decrease in the fertility of the soil and land mass for cultivation, with consequent decrease in agricultural food materials. Oil exploitation has had adverse environmental effect on soils, forests and water bodies in host communities in the Niger Delta. Farmers have lost their lands and are consequently forced to emigrate to other communities in search of livelihood exerting additional pressures on natural resources in such area (Aaron, 2006; Gbadegesin, 2000; Ijaiya, 2013 &Watts, 2008).

Oil exploration has caused a lot of environmental problems in Niger-Delta by degrading most agricultural lands in the area and turned hitherto productive area into wastelands with increasing soil micro-organisms and dwindling agricultural productivity. It also, worsened environment disaster and has affected fishing and other agricultural activities in the region. More so, agricultural output has greatly been hampered by near constant incidences of oil exploration; the farmers have lost their lands and are consequently forced to emigrate to other communities in search of livelihood. It equally pollutes the air by generating toxins that spread air borne diseases in the Niger-Delta regions (Bisina, 2004; Collier, 2000; Gbadegesin, 2000; Opukri & Ibaba 2008).

Specifically, one effect of oil pollution in Akwa Ibom State is the destruction of the traditional local economic support system of fishing. The combination of the effects of oil spill and acid rain resulting from gas flaring has been water pollution which affects aquatic life. Fish are driven away from in-shore or shallow waters into deep-sea as a result of flaring. The ultimate result of this is the poor fish catch, as most fish has been driven into deep waters. Oil contamination affects the fish population and affects the farmer that relies on fishing to support their family. In Eastern Obolo Local Government Area, Shell Production Company and Exxon Mobil's operations have reportedly led to the loss of fish populations along the coast, fishing is a viable only to those who can afford large boat engine and trawlers to venture into the high sea. The rest of the population must buy "ice fish" (frozen fish) from commercial fishermen, a practice totally unknown a few years back – since prices are constantly on the rise, many villagers have to go without fish. Only a small section of the local population in Eastern Obolo Local Government gets employment in Shell and Mobil's facilities and thereby earns money to buy food (Worgu, 2000; Essien, 2005 & Onuoha et al, 2018)

Table three demonstrates environmental security challenges engendered by oil exploitation in the Niger-Delta region.

Table 3: Some Severely Oil Polluted Sites in the Niger Delta from 2015-2021

S/N	Locations	Environment	Impacted Area (ha)	Nature of Incidence
	Bayelsa State			
1	Biseni	Freshwater Swamp Forest	20	Oil Spillage
2	Etiama/Nembe	Freshwater Swamp Forest	20	Oil Spillage & Fire Outbreak
3	Etelebu	Freshwater Swamp Forest	30	Oil Spill Incidence
4	Peremabiri	Freshwater Swamp Forest	30	Oil Spill Incidence
5	Adebawa	Freshwater Swamp Forest	10	Oil Spill Incidence
6	Diebu	Freshwater Swamp Forest	20	Oil Spill Incidence
7	Tebidaba	Freshwater Swamp Forest Mangrove	30	Oil Spill Incidence

8	Nembe Creek	Mangrove Forest	10	Oil Spill Incidence
9	Azuzuama	Mangrove	50	Oil Spill Incidence
	9 Sites			
	Delta State			
10	Pueebe	Barrier Forest Island	50	Salt Water Intrusion
11	Jones Creek	Mangrove Forest	35	Spillage & Burning
12	Ugbeji	Mangrove	2	Refinery Waste
13	Ughelli	Freshwater Swamp Forest	10	Oil Spillage-Well head leak
14	Jesse	Freshwater Swamp Forest	8	Product leak/Burning
15	Ajato	Mangrove	4	Oil Spillage Incidence
16	Ajala	Freshwater Swamp Forest	2	Oil Spillage Incidence
17	Uzere	Freshwater Swamp Forest	4	Oil Spillage Incidence
18	Afiesere	Freshwater Swamp Forest	3	Oil Spillage Incidence
19	Kwale	Freshwater Swamp Forest	14	Oil Spillage Incidence
20	Olomoro	Freshwater Swamp Forest	21	QC
21	Ughelli	Freshwater Swamp Forest	2	Oil Spillage Incidence
22	Ekakpare	Freshwater Swamp Forest	3	Oil Spillage Incidence
23	Ughuvwughe	Freshwater Swamp Forest	8	Oil Spillage Incidence
24	Ekerejegbe	Freshwater Swamp Forest	11	Oil Spillage Incidence
25	Ozoro	Freshwater Swamp Forest	15	Oil Spillage Incidence
26	Odimodi	Mangrove Forest	5	Oil Spillage Incidence
27	Ogulagha	Mangrove Forest	10	Oil Spillage Incidence
28	Otorogu	Mangrove Forest	13	Oil Spillage Incidence
29	Macraba	Mangrove Forest	10	Oil Spillage Incidence
	20 Sites			
	Rivers State			
34	Rumuokwurusi	Freshwater Swamp	20	Oil Spillage
35	Rukpoku	Freshwater Swamp	10	Oil Spillage
	2 Sites			

Sources: Feature Manipulation Engine (FME), Nigerian Conservation Foundation (NCF), World Wide Fund United Kingdom (WWF UK), Community Enhancement and Expansion Project-International Union for conservation of Nature (CEEP-IUCN) 2016 Niger Delta Resource Damage Assessment and Restoration Project.

Table 3 records the three most affected states which are Bayelsa with nine sites, Delta with twenty sites and Rivers with two sites. The major incidents of environmental danger were oil spillage, salt water intrusions, burning and refinery waste. However, the incidence that covered the largest expanse of land was salt water intrusion in Pueebe Delta state which consumed fifty hectares of land. Discernible from the Table also is that the major environmental location affected by the oil spill incidence was freshwater swamp forest and some barrier forest island and mangrove forest.

Conclusion

Environmentally friendly atmosphere is much a sought-after phenomenon in our terrestrial existence. This has been naturally provided for humanity, the world over, during pre-modern society. Therefore, the environmental security challenges observed in the Niger-Delta region within the period 2015 to 2021 resulted from oil exploration and the activities of the oil companies, as well as the negligence of the country's governments. The following recommendations were made:

Recommendation

1. The Nigerian government should adopt a holistic approach to sustainable development. This is necessary because development is sustainable when there is no negative ripple effect. To avert the precarious situation, the government should implement the oil and gas laws that frowned at oil spillage, gas flaring and other environmental menaces engendered through oil exploration;
2. The NNPC as a Joint Venture (JV) with International Oil Companies (IOCs) should play its institutional role of containing unlawful activities of the IOCs. It is always embarrassing that NNPC with impunity sabotaged the Nigerian government's operational agreements with International Oil Companies (IOCs). Alternatively, NNPC should be answerable to the Ministry of Petroleum Resources on issues that relate to Nigerian upstream petroleum industry sub-sector;
3. The multinational oil companies should adhere strictly to the rules of their engagements, by shunning those activities that are tantamount to breach of contract which involve largely gas flaring and oil spillage;
4. Finally, the leaders in the Niger Delta should be transparent in their dealings with the Nigerian government and the oil companies. Apparently, the leaders are supposed to be middle men between the oil companies, the government and the community.

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