



# Mitigating the Negative Externalities of Oil Drilling Activities in the Niger Delta, Nigeria

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## Abstract

This paper examined the unintended negative implications of oil drilling activities in the Nigerian Niger Delta region. The region has suffered neglect in every index of human and material development despite accounting for more than 90% of foreign exchange earnings. Its geo-strategic importance to the political economy of Nigeria as an oil producing and gas-surplus Niger Delta is the heart of Nigeria's hydrocarbon and the life blood of national economy. Oil drilling by government establishments, multinational oil companies (MNOCs), poor infrastructure and illegal activities of pipeline vandals and thieves, illegal refining, and seismic blasting and drilling of holes, have caused spills, gas flares, soot and venting of hazardous chemicals, that have negative effects on the ecosystem and economy. As of 2015, oil drilling which extends over half-a century, has caused about 9 - 15 million barrels of oil spills, in over 6817 incidences, raised the conflict profile and dynamics in the region has led to the internationalization of the crisis in the region. This paper adopted a historical descriptive method of inquiry by interrogating the role of the Nigerian state and MNOCS in the oil exploration activities in the Nigeria Delta. Using the resource curse thesis, the paper noted its applicability in the Nigerian Niger Delta question where oil exploration and exploitation has generated negative externalities resulting in youth restiveness, health hazards, and pollution of water bodies, environmental degradation and the lack of a sustainable means of livelihood for the people in the region. This paper found that oil externalities if not mitigated might result in 60% reduction in household food security, and about 30% of child malnutrition, and low life expectancy for the people in the region. Finally, the paper concluded that the stakeholders who generate these externalities have not done enough as any genuine and worthwhile effort aimed at mitigating these negative externalities by the Nigerian State, the MOCs, the international community, the people of the region and civil societies must adopt international best practices which

must be holistic and indigenously sustainable without further endangering the present and future environment and generation of the Niger Delta people.

### **Subject Areas**

Politics

### **Keywords**

Niger Delta, Oil Drilling, Externalities, Mitigation

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## **1. Introduction**

The importance of oil exploration and exploitation to human wellbeing the world over cannot be gainsaid. For Nigeria, the oil wealth of the Niger Delta is the most highly prized, readily available and ever-present mulch cash cow. For the Niger Delta, it is paradoxical that it is not only underfed, starving to death but a nightmare and source of misery to the people. This is the Niger Delta Question. The paper focused on the chronic and cumulative negative effects of oil drilling and extractive activities of oil companies, which have been unmitigated and endemic since the discovery of oil in commercial quantity in 1958. Crude oil spillage and the negative externalities of oil drilling is a global issue since the discovery of crude oil as part of the industrial revolution. However, it is expected that when these externalities do occur, there must be proactive mitigating measures to cushion their negative effects on humans; especially the environment which is man's greatest resource. In the Niger Delta, the contrary is the case, as unabated oil spillages by companies, illegal oil bunkering, and piracy, have vagaries of consequences such as, environmental degradation, unemployment, political, chieftaincy and land crises and other externalities. These have caused the militarization of the region creating a conflict trap between the government, MNOCs, the indigenous people and the international community. Oil exploration has been really a mixed bag of blessings and in some cases a curse heralded by the externalities and government neglect. Conspiracy and marginalization theorists, have argued that the near total neglect of this region is so engraved to the extent that the people are now asking the government what their original sin is by individually suing, MNOCs like Shell Petroleum Development Corporation (SPDC), AGIP and others outside the shores of Nigeria to get justice and compensation for ecological damage [1].

It is estimated that between 1976 and 2001, there were 6817 oil spills in the Niger Delta amounting to 3 million barrels of oil within the same period, with SPDC being the highest violator [2]. It has also been observed that between 9 and 13 million tons of crude oil had been discharged into the Niger Delta environment in the last 50 years with the Nigerian National Petroleum Corporation (NNPC) and the MNOCs doing little or nothing to mitigate the negative effects

of these spills on humans, flora and fauna [3]. The World Bank using remote sensing technical data said that the gas flared annually in Nigeria is approximately 8 billion cubic meters, making Nigeria the world's number seven [4] notwithstanding the venting of gas into the air without the burning of natural gas from crude oil extraction.

The adverse effects of carbon and Greenhouse emissions on the biodiversity in the region include: diseases on humans; destruction of farmland, water sources, fishing grounds and farm lands (which are the chief means of livelihood for the people leading to poverty, unemployment, and other negative effects that has made the region to be a waste land or desert of sort with the environment no longer sustainable). This has resulted in the unequal distribution of environmental and financial costs and benefits of oil drilling and exploration, leading to socio-economic and power imbalance and exploitation. This region apart from its geo-strategic location and value is very rich in natural endowments as it is the life wire of Nigeria's hydro-carbon accounting for over 80% of the national GDP, 90% of foreign exchange earnings [5] and 95% of national budget [6] yet suffers the "Resource Curse Syndrome" [7].

The Nigerian government, MNOCs, civil society group and the international community lack the committed political will to enforce legislations to curb the problems of insecurity, inadequate infrastructure, militancy, youth restiveness, and poverty. In 2016, Vice President Yemi Osibanjo launched "The Ogoni Cleanup" in a bid to remediate and reclaim the land from devastating oil spills after twenty years of agitation. Six years down the line a lot is still to be desired from the entire program. The MNOCs, the people of the region and the Nigerian government must understand that the Niger Delta is an environmental disaster in the offing and must take proactive steps, policy frameworks and implement best international practices, standards and most importantly, determined political will to reduce to the barest minimum the current negative externalities of oil exploration giving way for sustained development and growth. There and then will the guns be silent, criminality and crisis will be things of the past and the region will become the Eldorado of the people's dreams.

This paper interrogates the negative externalities of oil exploration and exploitation activities in the Niger Delta region from 1957 to 2010. To this end the paper is divided into five sections, namely, the geographical and historical background of the Niger Delta; the theoretical framework; the historical evolution of oil drilling in the Niger Delta; oil drilling externalities in the Niger Delta; mitigating the negative externalities of oil drilling; and conclusion.

## **2. Geographical and Historical Background of the Niger Delta**

The Niger Delta is geographically located in the Southern-most part of Nigeria, where the River Niger empties its waters, palming into the Atlantic Ocean through the Gulf of Guinea. The region is bordered by the Benue River in the

West, Imo River to the East and South to the Palm point at Akassa, bifurcating at Onya near Aboh. The history of the Niger Delta is written clearly in its geography as it bears the weight of the nation geo-strategically and economically. This region has one of the richest bio-diversities on earth with about thirty-six fish families, two hundred and fifty fish species [8] and luxuriant vegetation. It is economically the power house of wealth of the country as it has the largest oil and gas reserves on the continent thus making Nigeria one of the world's largest producers of crude oil.

The Niger Delta scientifically is an arcuate (bow-shaped) delta, triangular in shape, build-up of sand, silt and gravel deposits of the River Niger, piled up for about 65 million years [9] from the Paleocene times, covering a greater part of Nigerian coastline and sitting directly at the apex of the Guinean Gulf on the Atlantic Ocean. It is one of the greatest deltas in the world [10] and the most famous Delta in Africa, South of the Sahara. The region is a vast system of intricate wetlands hosting the largest mangrove forest in the world of about 5400 - 6000 sq/km [11]. Furthermore, the region geographically radiates southwards in a triangular shape, with its apex located approximately at the old trading town of Aba, through innumerable meandering tidal creeks ... river which empties in the Bight of Biafra [12].

The history of the Niger Delta environment goes back many millennia [13]. Historically and naturally, it is divided into three broad sub-regions coterminous with the Western, Eastern and Central Delta. The core states of Bayelsa, Delta and Rivers in the South-South geo-political zone of Nigeria. The major city-states include Itsekiri kingdom, Warri, the kingdom of Nembe (Brass), Elem Kalabari, Grand Bonny, Old Calabar, Okrika, Andoni and Opobo, patterned like the ancient Greek city-states. These city-states have deep historic intergroup relations with Igbo states of Aro, Oguta, Ossomari, Onitsha and Aboh in eastern hinterlands of the Niger Delta region. According to the Willinks Commission of Inquiry (1958), the Niger Delta comprises the three Provinces of Degema, Ogoni and Brass for which the Niger Delta Development Board (NDDDB) was formed in 1958 [14].

Following the dynamics of oil politics and revenue allocation in Nigeria, the Obasanjo administration promulgated the Niger Delta Development Commission (NDDC) Act of 2000 which defined the region cartographically as made up of nine states in three geo-political zones: six states from the South-South, namely, Akwa Ibom, Bayelsa, Cross River, Delta, Edo, and Rivers; one from the South-West, namely, Ondo; and two states from the South-East, namely, Imo and Abia, all of which are oil producing and oil bearing states [15]. This development was criticized by Nigerians as "political Niger Delta" [16], "core" or "periphery" Niger Deltain academic and policy circles. However, Okere and Njoku argued that the "Niger Delta is not a political, rather a geological affair" [17]. Niger Delta is now defined officially as consisting of the above named nine states and by this promulgation the Niger Delta became erroneously synonymous with

oil [18].

The region has four ecological subzones based on vegetation of the mangrove forests, fresh and salt water swamps, coastal forest, low lying rain forest and derived savannah. The “off shore” zone is made up of coastal waters of the Atlantic Ocean. The Niger Delta languages falls in the Kwa sub-family of the broad family of African languages called the Niger-Congo [19].

The weather is humid and belongs to the semi-hot equatorial climate. Temperatures range from 20°C to over 30°C. Annual rainfall decreases from South to North. The South is 3050 mm; the North 2550 - 3030 mm with an average rainfall of about 150 - 400 inches spread over 8 - 10 months between March and November with a short dry season from December to February. This dry season period is often accompanied with intermittent rain fall.

The region has a population of about 41.5 million [20] constituting 23% of Nigeria’s population, with about 185 local government councils, over eighty different ethnic groups that speak over 250 different dialects which cut across 5,000 communities. The people subsist on farming, fishing and local indigenous manufacturing.

Oil exploration and exploitation has had disastrous impacts on the Niger Delta. These impacts include oil pollution, contamination of the river systems, depletion of forests and biodiversity. These affect the livelihood of the indigenous people who depend on the ecosystem for ultimate survival. As a result there is abject poverty, health challenges, and displacement of the people leading to unsustainable development. The oil industries located within the region have contributed immensely to the growth and development of the country with very little to show for it. Since 1960 Nigeria’s national economy and budgets has been supported by income and revenues generated from oil. Abuja the Federal Capital Territory was planned and built with oil wealth. Niger Delta region is one of the five most severely petroleum damaged ecosystems in the world comprising the Exxon Valdez oil spill of the Alaska shoreline, gulf of Mexico, Santa Barbara Channel Islands, Arabian Gulf Oil spill and Coast of Trinidad and Tobago. Studies have shown that the quantity of oil spilled over 50 years was between 9 and 13 million barrels which is equivalent to 50 Exxon Valdez spills [3]. The government, MNOCs, civil society groups and policy makers must rise up and take immediate responsibility for the spillages from both MNOCs and illegal bunkering to mitigate the negative consequences of oil exploration for the global good, or the Niger Delta will be a disaster just waiting to happen.

### 3. Theoretical Frame Work

This work adopted a descriptive historical approach which examined the origin of oil exploration in the Niger Delta and how it has not benefited the people commensurately resulting to disguised blessings which does not contribute much to its owners hence resource curse syndrome. This work interrogated the numerous socio-economic, political, environmental, health challenges associated

with oil exploration *inter alia* youth restiveness, health hazards, poor infrastructure, and pollution of water bodies, environmental degradation and the lack of a sustainable means of livelihood for the people in the region and how these problems have been internationalized in an attempt to mitigate these negative consequences. The work further interrogated the resource curse thesis and its applicability to the Niger Delta question. Primary and secondary data sources were analyzed to obtain logical deductions, sequential presentation of facts to show vividly the impact of this activity and therapeutic measures to alleviate its onerous effects in the Niger Delta.

Resource curse is a curious phenomenon in social sciences used to describe the failure of resource-rich societies especially in oil and gas often performing worse in terms of economic development and good governance than countries with fewer resources [21]. Perversely many countries rich in natural resources are poorer and more miserable than countries that are less well-endowed [22]. The dialectics of natural resource curse syndrome holds that there is a trade-off in the gain and loss of groups in deriving the benefits from natural resources. It is evident in the oil-rich Niger Delta which is a blessing or windfall of “nature’s gifts” has become a curse rather than an advantage. Accordingly, “the tendency of countries that are heavily dependent on natural resource exports to perform poorly on a variety of economic, political, and social measures is frequently attributed to the ‘resource curse’” [23]. Resource-rich Niger Delta and Nigeria are blessed or cursed by natural resources because they suffer negative externalities and inadequate development. Nigeria depends on oil (mono-dependence) to the chagrin of other sectors that can generate revenue for the nation. The result is the economic fluctuations in revenues and sore investment in non-petroleum sectors for lack of long term development and diversification of the economy.

There is no gain saying the fact that oil has been of immense benefits to the Nigerian state as it is the most important revenue earner while the people of the region suffer oil pollution caused by spillages from the oil industries, pipeline vandalism, bunkering; piracy; kidnapping; militancy; religious and chieftaincy disputes; land crisis between communities; unemployment; poor international image of the region; extensive destruction of farmlands, sources of drinking water, mangrove forest, fish and aquatic population and other inhabitants of the ecosystem. Furthermore, large areas of mangrove forest have been destroyed by pollution and reclamation by MNOCs for oil activities necessitating complete relocation of some communities leading to the loss of ancestral homes, loss of income and diseases. With these negative effects one can only say that the oil which is nature’s gift to the Niger Delta people remains a curse and not a blessing. This trend must be reversed through government policies and legislations most especially the political will for the political economic and environmental sustainability of the region.

In Nigeria many problems ranging from resource-related conflicts to poor socio-economic development abound. Between 1965 and 2000, the per capita gross

domestic product (GDP) of Nigeria, stood at \$325, although it spent over \$350 billion in oil rents [24]. Oil exploration-related conflicts are common, leading to frequent attacks on oil installations. Between 2005 and 2008 alone, it was estimated that 500,000 barrels of oil were lost due to such attacks and their disruptive effects [25] with 20% of Nigeria's oil lost to vandals and "bunkerers". Some scholars like Lubeck, are of the view that 70% of the country's oil wealth is held by 1% of the population [26]. This concept can be misleading in that, what is a curse for one state may be a blessing to another. It all depends on the adequate utilization and management of the resources for the wellbeing of society. Countries like Botswana, Mauritius, and South Africa without oil possess enviable records of how they have mitigated problems of resource curse by reducing corruption in the sector and implementing international best practices in the industry. So is Norway, Canada Sweden and Denmark with laudable results. Kuwait and Iran have also developed and witnessed growth but have their own fair share of the resource paradox [27].

Furthermore, there is a distinct inverse relationship between corruption in the oil sector and underdevelopment in a country or region. Jegede opined that state corruption accounts for the current predicament of the Niger Delta people. The factors which account for the continued degradation of the Niger Delta region include: the prevalence of fraud and acute mismanagement of oil revenue, a development, which accounts for the non-translation of massive revenues from oil resources into meaningful physical development both locally and nationally; the contribution of domestic political accumulation and diversion of money meant for Niger Delta development to private political and traditional elites; and the "procedural remittance of funds" based on the subsisting agreement between the corrupt officials at all levels [28]. Corruption fuels the embers of crisis in the Niger Delta creating new challenges in resolving the conflicts arising from drilling externalities. Paradoxically, instead of turning Nigeria into one of the most prosperous states on the African continent and the world, oil wealth has enriched a tiny minority while the majority has been increasingly pauperized with a per capita income of about US\$260 a year, making Nigeria one of the poorest countries in the world [29].

The politics of revenue sharing formula, struggle to control the nation's resources by the politicians and oil companies has intensified and made oil politics a vexatious one, tearing states, communities, ethnic groups apart causing fierce conflicts, socio-economic, political, environmental crisis and cleavages. This reinforces the resource curse thesis for what is meant to be of great benefit to all. The government must invest in key economic variables that will shore up investment and drive the development process for a more sustainable economic growth for Nigeria.

#### **4. Historical Evolution of Oil Drilling in the Niger Delta**

The historiography of oil drilling started in the United States of America when

in August 1859, Colonel Drake drilled a 70 feet well in Titusville, Pennsylvania and discovered oil. By the end of the century a number of wells were drilled in Pennsylvania, Kentucky and California. The birth of the modern oil industry is credited to the discovery oil at Spindletop in 1901 atop a salt dome near Beaumont Texas [30]. Oil and natural gas are dominant fuel sources in the U.S economy, providing 62% of the nation's energy and about 100% of its transportation fuels [31]. Liquid fuel was expected to rise by 79% and energy for transportation dropping slightly to 90% by 2020 according to the US Energy Information Administration (EIA) <http://www.eia.gov/usenergy> facts explained.

The historical trajectory of the exploration and drilling of crude oil in Nigeria started while the nation was still under British colonial rule. In 1903 the Colonial Government mineralogical survey, did a survey of Nigeria to ascertain its level of mineral viability. In 1905, an international oil company from Germany the Nigeria Bitumen Corporation (NBC) was granted license to search and prospect oil with the intention of making Nigeria a potential oil producing country. In 1908, NBC started its search at Okitipupa. These initial efforts yielded no success due to the intervening First World War from 1914-1918, not until 1937 when Shell D'Archy, now known as Shell Petroleum Development Company (SPDC) also called a subsidiary of Shell-BP from the Netherlands pioneered the official search for oil in the country have been giving the right to prospect [32]. Shell had its base in Owerri in present day Imo State and since Shell knew little of the geology of the environment discovered nothing. Shell not relenting extended its search some 103,600 km<sup>2</sup> deep into the basins of the Niger Delta.

By 1939 the searches were suspended because Second World War (WWII) and resumption began after the war in 1946 with first drill of oil in Ihuo community near Owerri in 1951 but no oil found. In 1953, Shell moved to Akaata-2, at Ikot/Akpa where it discovered some oil but not in viable commercial quantity. In 1955, Mobil Oil Corporation moved into Nigeria. Shell in frustration and persistence continued the searches frantically and in August 3, 1956, struck oil in viable quantity in Itokopiri which comprised Otabagi and Otuogidi communities in the Oloibiri district in Ogbia in today's Bayelsa state [33]. Shell later same year drilled another viable well in Afam in Eleme in River State. In February 1958, Nigeria's first Oil cargo was shipped from Port Harcourt through Bonny terminal for export with a daily production of between 4000 - 5100 bpd (SPDC, 1982) thus Nigeria become an oil producing country at the eve of its independence.

For reasons of proximity, the construction of roads, harbors to handle freights, pipelines, logistics for tankers transportation of crude and the building of the Bonny terminal, Shell had to move closer to the source of exploration hence relocated its base from Owerri to Port Harcourt. Shell completed its first terminal of four tanks in 1961 linking Bumu in Ogoni and Afam with a combined capacity of 300,000 barrel of crude oil [34]. Since 1958, oil exploration and exploitation have been going on Nigeria with more viable wells discovered with not only oil



but with massive quantities of gas thus making Nigeria to be referred to as a gas surplus nation. Today oil and gas have become the chief revenue earner for the country with new international and indigenous companies such as, Texaco, Sefrap, Nigeria Agip Oil Company (NAOC), the Nigerian National Petroleum Company (NNPC) and Sunray, Ashland, Pan Ocean, Mobil and others coming in to the country for exploration.

In 1963, Sefrap, (Elf) and NAOC started their operations in Nigeria. In the same year Elf struck oil in Obagi while in 1965 NAOC did in Ebocha. In 1966 Phillips Oil Company got oil in Edo and Delta states and in 1967 in Gilli-Gilli, Edo State. In 1968 Mobil Producing Nigeria Limited came into existence and in the same year Gulf Terminal at Escravos was commissioned. It should be emphasized that the Nigerian Civil War from 1967-1970 actually disrupted and slowed down oil production as only Shell, Gulf Oil and Elf operated minimally in the country. However, soon after the civil war the number of companies increased to five, and 10 by 1981. In 1970 Nigeria oil revenues increased geometrically from 176 million Naira to 1.4 billion in 1973 and 12.68 billion in 1980 [35]. This was the period of the “oil boom” when oil consisted 96% of total export earnings and 80% of government revenue. It is on record that during this period the then Head of State General Yakubu Gowon had false impression that Nigeria was actually set to develop and boasted that the problem with Nigeria was not the scarcity of funds but what to do with the available abundant funds. History has proven him utterly wrong.

In 1969, the Federal Government of Nigeria (FGN) passed the Petroleum Act and the Land Use Act which vested all minerals and lands within Nigeria under the ownership of the state. This policy took away the rights of oil bearing communities to own the resources from their communities. In 1971 Nigeria became a member of the Organization of Petroleum Exporting Countries (OPEC), a cartel made up of some major oil producing countries that seeks to influence the global price of oil through control of production. In 1973 the First Participation Agreement was signed in which the Nigerian Government had 31% shares in all the oil companies. In 1974, the Second Participation Agreement was signed in which the FGN acquired 55% Equity shares in all the oil companies. In 1975 the Directorate for Petroleum Resources was upgraded to the Ministry of Petroleum Resources and in the same year the lifting of crude oil from the ownership of newly built Brass terminal began. In 1977 Decree 33 established the NNPC embracing both the Nigerian National Oil Company (NNOC) and the Ministry of Petroleum Resources. With the NNPC, operational in 1979 the Nigerian Government signed the Third Participation Agreement and Fourth Participation Agreement in which the equity was raised to 60% to 80% respectively with 20% to Shell.

In 1984, the NNPC/Shell Joint Venture was signed and in 1989 the Fifth Participation Agreement as signed with the Nigerian government represented by the NNPC has 60%, SPDC 30%, Elf 5%, and NAOC 5%. In 1993 the Sixth Participa-

tion Agreement was signed in which the NNPC had, 55% equity, SPDC 30%, Elf 10%, and NAOC 5% [36]. In 1999, the Nigeria Liquefied Natural Gas (NLNG) exported its first gas shipment via Bonny terminal. In 2001, the Okono off-shore field started producing and 2002 was the first time in the history of Nigerian oil industry, that the Obasanjo administration liberalized the down-stream oil sector with Nigeria producing 2 million bpd and 2.5 million bpd by 2004 respectively. Thus in spite of the significant investment in the oil sector by foreign companies, the place of the region in Nigeria's political economy, is one of neglect.

## 5. Oil Drilling Externalities in the Niger Delta

To adequately understand the numerous drilling and exploration activities that cause externalities that pollute the Niger Delta, it will be pertinent to understand the constituents in crude oil that makes it really a danger to the environment and humans. Accordingly, crude oil is a viscous, awful-smelling liquid in alternate forms from colorless to green, yellow and black. Depending on its density, volatility and toxicity, oil has four primary types, namely, the light/light distillates, middle distillates, the medium oils, and heavy fuel oils [37]. It contain a complex mixture of volatile organic compounds, gaseous, liquid, and solid hydro-carbons made of Sulphur, Nitrogen and Oxygen, with heavy metals such as nickel, vanadium,) which are the major pollutants in the Niger Delta [38]. Nigeria generates more than 40 million tons of CO<sub>2</sub> daily in gas flares in about 123 sites [39].

Oil companies on-shore or off-shore, discharge these hazardous gases and metals on the environment through their exploration, drilling and production engagements which might be up-stream and down-stream from the petro-chemical plants, oil refineries to natural gas distribution companies to the consuming public respectively. Furthermore, hazardous discharge can be done through illegal activities of oil bunkering and pipe line vandalism.

Prior to the discovery of oil, the people lived in harmony with their natural and virgin environment engaging in subsistence farming, fishing and local manufacturing with life expectancy very high. But this pristine state of the region started to change dramatically with intensive oil exploration activities in 1958. Since then the region has never remained the same and kept declining in all indices of peace, health and comfort and development.

The MNOCs often clear and dig trenches (3 to 7 ft) with another (20 to 40 ft) right of way over vast land areas. This process involves the cutting and destruction of the vegetation (mangroves and rain forests) in order to access sites, prepare seismic activities, and lay oil pipelines, geological and geophysical surveys and drilling. These activities include the dynamiting of rocks which disintegrates sedimentary rocks, produces narcotic effects, kill fishes and animals or drive them to inhabitable areas, reducing the process of photosynthesis in plants. These distort the ecosystem, the rich bio-diversity, reduce land space and pose

great threats to agricultural production, comfort and habitation for the communities so effected [40]. The Oil companies dredge and reclaim vast swamps for harbors and road construction, dumping the sand recovered in adjacent lands. These destroy flora and fauna, change the physio-chemical content of water like the PH to be acidic, thus depriving living things of portable water and oxygen in the region. These companies further emit dangerous gases (Carbon dioxide, Nitrogen, Sulphur) and other inorganic contaminants directly or indirectly which are flared in the environment through burning of fossil fuel for power and heat, leaks, and chemical reactions. These gases cause greenhouse effects, soot, and acid rain which are hazards to plants, animals and humans and climate change. During the process of drilling, these companies inject pollutants and spill crude oil and chemicals like, lead, chromium, vanadium which are heavy chemicals and metals. These chemicals filter into the already weak and fractured sedimentary aquiver rocks into water sources causing contamination of ground water and sources. The Niger Delta people due to scarcity of clean water, drink this polluted water causing health problems such as birth defects, respiratory infections and death. Even the fishes and other inhabitants of the polluted streams are also infested with lead and other poisonous metals and when consumed by humans can cause chronic illnesses. In all, lands are infertile for agriculture and the people means of livelihood is truncated with no alternative avenue to salvage their poverty and hunger.

The activities of individuals like militants, pirates, pipelines vandals, oil bunkerers, fallen trucks, sunk vessels and accidents in companies that cause oil spills and discharges are also source of negative externalities. Illegal theft, sabotage by vandals and oil bunkerers, the refining of stolen crude by artisanal refiners, popularly known as “Gbo fire” are major source of spill because the vandalized pipes are never locked at the vandalized points by the thieves. Also, accidental bursting of oil pipe, decay or poorly maintained infrastructure and human mistake lead to spillages which often take weeks or months to mend. These might have devastating effects on the environment and loss of revenue by the state, oil companies and the oil bearing communities.

The activities of government establishments such as NNPC, law enforcement agencies who destroy illegal refineries and petroleum product in open air, discharge Sulphur dioxide (SO<sub>2</sub>), Carbon Monoxide (CO), Nitrogen Dioxide (NO<sub>2</sub>), Ozone gases into the environment have negative effects on the ecosystem. Their activities cause water pollution (water scarcity, contamination, and water borne diseases), land pollution (solid and hazardous wastes deposits, soil degradation, and deforestation), acidic rain (corrosion of metals), mangrove deforestation (loss of biodiversity), and environmental degradation (climate and atmospheric changes), Soot generated from illegal refining activities can cause cancer and respiratory diseases.

The national Bureau of Statistics in Oviasuyi and Uwadiae, opined that there is no correlation between wealth generated from oil in the region and human

development index as the trend has continued to sour from 1980-2004 [41]. The socio-economic, health, political and cultural wealth of the people continues to deteriorate increasing poverty and want [42]. According to the UNDP, 2006, about 60% of the region's inhabitants who have little money and depend on fishing and agriculture are severely affected as SPDC prospects 40% of the land with pipelines, around homes, farms and communities. These impact negatively on the psychological health, wildlife, and economy of affected communities.

In the Niger Delta, kidnapping, violence, oil theft and sabotage of pipelines increased sharply during the mid-1990s and peaking in 2006-07. Militant groups and communities vented their anger about unemployment, inequitable sharing of oil revenues, environmental degradation and threats to their livelihood and way of life. In fact, Chevron Texaco is estimated to have lost around \$750 million as a result of community strife [43] owing to failure to contribute in poverty reduction in the host communities. In 2004, oil companies at times fed conflicts by the way it awarded contracts, gained access to land, and dealt with community representatives through cash payments to community leaders to avoid disruption or through the use of local (usually armed) individuals for security to reduce conflict and crime, hostage-taking of oil workers.

Transparency is crucial for accountability mechanisms to work and for oversight bodies such as the media, parliaments and civil society to hold governments to account. Transparency, integrity, functioning systems of justice and law, anti-corruption mechanisms must be effective in partnership with the Extractive Industries Transparency Initiative (EITI) in setting global standard for increasing the transparency of revenues from oil. According to the EITI, over 50 of the world's largest oil, gas and mining companies support and participate in the process including many of the (predominantly Western) International Oil Companies (IOCs) operating in Africa [44].

## 6. Mitigating the Negative Externalities of Oil Drilling Activities

This section assessed the proactive political, economic, social, environmental measures by the Nigerian Government, MNOCs, Civil society groups, the Niger Delta People, and the international community to mitigate the negative externalities of oil drilling activities in the Niger Delta. Oil drilling activities is in conflict with humans and the environment. The impact of oil drilling activities that came with discovery of oil in the Niger Delta cannot be gainsaid as the harsh impacts (antithesis) must generate strategic mitigation (synthesis) to enhance sustainable balance and mutual co-existence between the humans and the environment.

Owing to adverse effects of oil drilling activities in the Niger Delta like gas flaring; [45] pollution; [46] illegal refinery (locally referred to as "*Gbo fire*"); rock dynamiting; oil spillages, accidental discharges; leaks from poor infrastructure; sabotage by staff and vandals; [47] oil theft and pirates' activities led to the

hazardous contamination of the ecosystem, corruption and squandering of oil money [48], kidnapping and militancy, and the devastating environmental degradation of the region. The culminating effect is misery, hardship and death on the near 30 million inhabitants of the region. Furthermore, the area suffers from loss of fishing sites and farmlands to about 3100 km<sup>2</sup> of network of pipelines, and coastal lands, varying disease, temperature rise to about (1300°C - 1400°C) with noise and light pollution, birth defects [49], respiratory infections couple to lack of good health centers, poverty with 66% of the population earning less than ₦10,000.00 monthly [50]. Lack of portable water and increased death rates, low life expectancy in the region, reproductive and respiratory issues, cancers and psychological challenges, rural-urban migration, loss of cultural heritages and relics and intractable communal conflicts are rife in the region [51]. This ugly trend must be reversed for the region to know peace and made safe for investment and sustainable development.

The Rivers State Command of the Nigerian Security and Civil Defense Corps, Commandant Mr. Haruna Mohammed said the Corps in December 31, 2018, had not relented in combating and stamping out oil thieves and vandals in the State as 15 vehicles, 36 trucks, 20 boats, 6 vessels, 170 drums loaded with petroleum and adulterated products were seized and 132 suspects detained, with the Command securing 65 convictions despite inadequate equipment like gun boat, speed boats, and others (Punch, 29, December, 2018 others (Punch, 29, December, 2018 Taiwo Ojoye: Oil Theft: NSCDC apprehends 132 suspects, seizes 36 trucks in 2018)

(<https://www.google.com/amp/s/punchng.com/oil-theft-nscdc-apprehends-132-suspects-seizes-36-trucks-in-2018/%3famp>) [52]. These are ways the security agencies are curbing oil theft, spills and sabotage that characterize oil drilling activities in the Niger Delta.

There are basically three actors in the domestic oil environment that influence the political, economic, social and environmental dynamics of oil politics in Nigeria. These are government, MNOCs and the local people (militants, civil society, title holders, and elites) [25]. This means that any credible and sustainable solutions aimed at mitigating the negative externalities of oil drilling activities must come from these actors not dwarfing the important roles of the international community. The government must take the lead in the mitigation without which the problems will continue to persist. Successive governments in Nigeria have been negligently culpable in demonstrating sincere political will to revise, update and implement to the latter all legislations and policies to bring about transparency, end corruption, improve the economic wellbeing of the people by properly managing the oil resource of the region in the interest of equity, restructuring the oil industry and social justice to end the pains and destruction of the Niger Delta. The government oil agencies and MNOCs should be able to adopt international best drilling and exploration processes that are eco-friendly and environmentally responsible. According to Siegel:

The adoption of Octopus techniques could reduce the impact of oil on the land surface by about 75%. This would result in drillers accessing more oil with less “on-the-ground” damage to the land. It also allows drillers to disturb less underground water sources, certainly a major benefit these days [53].

This octopus technique investigate acute exposure to crude oil with the aim of eliminating externalities that degrade the environment and drilling done in an eco-sustainable way with very insignificant negative impact on the eco-system hence restoring the abundant bio-diversity of the Niger Delta because if the environment is lost, all is lost. The environmental impact assessment (EIA) for petroleum projects should be thoroughly monitored to ensure efficient compliance and implementation. The technologies used for oil drilling and seismic activities must be eco-friendly [25] with the government and oil companies jointly carrying out remediation, reclamation and restoration programs. Marsh lands can be reclaimed for agriculture to boost food production to reduce poverty and food insecurity.

The government should enact conservation laws and educate the people on the need to conserve natural resources. The pollution control standards should be kept to protect the land, water and air resources. Conservation agencies like the Federal Environmental Protection Agency (FEPA), Rivers Basin Development Authority (RBDA), Departments of Wild Life conservation, Federal Ministry of Water Resources and Federal Ministry of Agriculture should be active and alive to their responsibilities making sure that conservation and water treatment policies and procedures are adhered to.

Land use and land cover change, have become a central component in the current strategies in managing natural resources and monitoring environmental changes caused mostly by petroleum activities aimed at achieving sustainable land use development. The government must ensure proactive monitoring of all sources of externalities with the aim of mitigating them immediately when they occur, especially in the Niger Delta region. Monitoring the locations of the oil companies; the terrain, the accessibility, revenue, man power availability for the monitoring agency, qualified personnel are not available. This restricts the ability and efficiency of monitoring by the government. Updating and revising the legislations, reviewing the license of the oil companies and reviewing penalties from fines, withdrawal of oil licenses to jail terms for violators of pollution regulations will go a long way in ensuring compliance.

The government, MNOCs and the people of Niger Delta must adopt a judiciously planned, controlled and dedicated program to ensure adequate preservation of the pristine nature of the environment. Conservation of water resources, planting of trees, no grazing, no hunting of animals in the region, control of forest fires and illegal refining of crude oil, cleaning of polluted water sources and the provision of good sources of portable water in the region should be encouraged. Over the years there has been complicity between the MNOCs and gov-

ernment political and military class with some locals especially traditional title holders to subvert the implementation of policies and legislations to mitigate the negative externalities. As Allen, opined that, MNCs are the link and cannot be exonerated from dangerous politics in host communities as they have extensive influence on local actors, through formal and informal relationships forged with national and local military, and economic elites. Most times money change hands to do the biddings of the MNOCs [54]. This unholy triple alliance makes mitigating efforts really cumbersome and onerous. This conspiracy must stop in the interest of the health and environment of the people in the Niger Delta. The government must punish culpable individuals and companies who do not comply with its mitigating policies to act as a deterrence. In 2009, the government of President Umaru Yar'Adua initiated the Amnesty program in which the militants were paid in exchange for given up their arms ("cash for arms deal"). By 2016 much was still to be desired of the Amnesty program as militancy, kidnapping, oil vandalism and illegal refining continued unabated, thus owing to the failure of effective implementation of the program in a sustainable manner as it has become another drain pipe of corruption by its handlers. Thus, the program to a large extent has not fared well irrespective of its noble intentions.

The government can restructure the oil industry by first repealing the Land Use Act and the Petroleum Act 1969, which vests all lands and oil wealth in the country to the Federal Government. The oil bearing communities can be made to manage their oil resources or retain a sizeable part of the proceeds from oil. The Petroleum Industry Bill before the National Assembly should be passed into law and implemented to ensure local participation in the oil industry in the interest of social justice and fairness.

For the first time since the start of oil exploration in the country, the Buhari led Federal Government is carrying out a comprehensive remediation program in Ogoni land. This effort started in June 3, 2016 when Vice President Yemi Osibanjo launched the Ogoni Clean-up in line with the UNEP Report under the supervision of the Hydrocarbon Pollution Remediation Project (HYPREP). This was aimed at cleaning up all oil impacted sites in the area to make the land fertile for agriculture again. In 2021, six years after the commencement of clean-up, the project is faced with serious managerial and operational problems [55].

The MNOCs should be alive to their corporate social responsibilities in the areas of providing employment of qualified people, provision of schools with good facilities to help educate the people; good sources of portable water for the people; good hospitals to care for the health of the people; and agricultural support in terms of seedlings, farm implements, fish species and others to mitigate the long neglect of the area. These can be boosted by the efforts of a responsible government because the oil companies often complain that they are in business (shareholders and not stake holders) as they pay taxes to states and federal government, that most of these are not their responsibility. In a way, they are right. Although these MNOCs provide support, they are not really enough when com-

pared with the profit they make from the region where they operate. These companies must have crisis monitoring and management desks with sincere community members to timely mitigate crises early enough at both pollution and human activities levels before they degenerate. They must make sure that their drillings, pipelines and other infrastructures and assets are healthy and eco-friendly and must act promptly to end spills when they occur. The contention has always been that most of the mitigating measures do not tackle the oil drilling externalities from the roots causes and are therefore superficial and temporary resulting violent agitations for resource control, resource mobilization, infrastructural deficits, environmental degradation and self-determination. The impact of oil on the prosperity, well-being and development of the people is not felt and the vicious circle of Poverty continues. This trend must stop to pave way for sustainable solutions to the Niger Delta question.

The government and the MNOCs or the Transnational Corporations (TNCs) and their agencies should prior to exploration and drilling activities inform, sensitize, and enlighten the people on the positive and negative effects of their abiotic and biotic activities before, during and after and the level of preparedness of the government to mitigate any challenges arising from these activities. By so doing there will be responsibility on both sides. While the government and MNOCs provide the oil bearing communities employment, education, portable water, good health care, and respect memorandum of understanding (MOU) with the communities, both sides would be happy and the environment made safe for exploration. If these are done the insecurity and restiveness in the Niger Delta would be abated. The government should be able to act as check and balance in the relationship between the host communities and the MNOCs to ensure peaceful and smooth working relationship between them. The people see the MNOCs and the TNCs as agents of imperialism [56] in complicity with the Nigerian state stealing their patrimony. This notion can only be set straight by favorably mitigating oil externalities in the region.

Nigeria has forest of legislations to mitigate oil drilling externalities. These include but not limited to the Endangered Species Decree 1990, Federal Environmental Protection Act, 1990, Harmful waste (special criminal provision CAP 165 LFN, 1990), Petroleum (Drilling and Production Regulation, L.N.69 of 1969), Mineral Oil Safety Regulation, LN.45 of 1963, International convention on the establishment of an international fund for compensation for oil pollution damage, 1971, Convention on the Prevention of marine pollution damage 1972, African convention on the conservation of nature and natural resources, 1968, Environment Impact Assessment Decree No. 86, 1992, National Oil Spill Detection and Response Agency (NOSDRA), 2006, NIMASA, DPR, and others handling spills and other environmental issues [57]. However, these legislations have not minimized the issue of externalities. This is because the government lacks the political will to eradicate corruption in the oil industry and eliminate these problems. The Nigerian SAT-1 launched in 2003, which is supposed to



monitor and identify disaster areas through satellite images has not produced the expected results of detecting oil spills.

The international community is not left out of the fight against oil drilling externalities. The United States and United Nations had donated and the UNO had donated patrol boats to the Nigerian Navy to patrol the high seas and dark creeks to stop pirates, fight oil thieves, illegal oil bunkers and vandals. Although these are welcomed development for the Niger Delta to reduce the spate of insecurity and mitigate oil theft, spills and loss of revenue by government, they have not addressed the problems of resource curse in the region. The government, the Niger Delta Development Commission (NDDC) and civil society groups are also engaging oil bearing and producing communities on the effects of oil drilling and assisting them in the provision of roads, health care schools, clean-ups, remediation, reclamation and employment of host communities to mitigate the effect of oil drilling.

## 7. Conclusion and Recommendations

Oil drilling and exploration have come to stay and there is no doubt that the enormous oil wealth in the Niger Delta has been of great benefit to the Nigerian state. In 1970, Nigeria oil revenues increased geometrically from ₦176 million to ₦1.4 billion in 1973 and ₦12.68 billion in 1980 [35]. This was the period of the “oil boom” when oil consisted 96% of total export earnings and 80% of government. However, externalities of oil drillings and related activities have caused massive destruction to farmlands, sources of drinking water, mangrove forest, fishing grounds and declination, crabs, periwinkles, birds, general Environmental Security Threats (EST), unsustainable livelihood and internationalization of the Niger Delta crisis.

The paper further showed the vast natural mangrove forest has been decimated thus affecting terrestrial and marine resources with spills contributing to the complete relocation of some communities, loss of ancestral homes, cultural heritages, agricultural land, and the destruction of fish population in the region. Oil drilling has also caused fundamental and enduring alterations to the environment which significantly have negative global effects like climate change. Although there exist many mitigating policies and legislations to curb or reduce these problems to their barest minimum, they can achieve nothing if basic proactive steps and committed political will on the part of the government, the MNOCs, the Niger Delta people and the international community are absent.

Monitoring drilling activities and oil spills, implementation of legislations and policies on the environment, life sentence or death penalty for oil thieves, impose stiffer fines, updating, revising legislations and reviewing the license of the oil companies that violate operational standards will help mitigate the challenges. Furthermore, environmental restoration by government and oil companies, development of environmental management and research institutions, periodic Environmental Impact Statement (EIS) and Environmental Impact As-

assessment (EIA) by operators, public awareness and education on the dangers of oil drilling externalities will reduce to the barest minimum incidences and consequences of oil externalities on the people. Adopting environmentally healthy technology that minimizes the impacts of drilling activities on the environment for example, the gas produced through gas flaring, can be converted to alcohol for diverse uses and alternative energy source and the creation of local government and state spill response centers. These measures are essentially lacking in the Niger Delta region, but they are the best ways of mitigation. Without the threat of pain, loss or actual punishment to offenders, this ugly trend will continue; however, it will stop once there is practical deterrent. Any genuine mitigation efforts must be sustainable and be a win-win situation for all the stakeholders and the natural environment in the long-run for the greater good of humanity.

International and national initiatives can be undertaken by the Nigerian government to stop illegal trade in stolen crude from the Niger Delta through the issuance of certificates for import and export to prevent unauthorized participants, with effective regulatory mechanisms to address illegal trade in oil. These measures will reduce conflicts and social unrest in the area and stem the tide of oil drilling externalities on the Niger Delta.

### Conflicts of Interest

The authors declare no conflicts of interest.

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