

Environmental Impact of Oil Exploration in Nigeria: A Case Study of Nembe Local Government.

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ABSTRACT

Nigeria's economy has relied heavily on oil exploration for many years. The Niger Delta region's ecology and communities have, nevertheless, been significantly impacted by oil exploration and production. These effects include water and land contamination, a loss of biodiversity, and risks to public health. In-depth examination of the environmental impact of oil exploration in Nembe Local Government, Bayelsa State, is examined in this paper. It is based on a review of the literature in the field as well as interviews and surveys with people of the impacted communities. The research technique included statistical analysis of the data gathered, content analysis of the documents, and document analysis. According to the report, severe contamination of land and water caused by oil drilling in Nembe Local Government has decreased agricultural production and wiped-out aquatic life. The use of hazardous chemicals in oil extraction procedures has further exacerbated the environmental effects, putting the surrounding population at risk for conditions like cancer, respiratory illnesses, and skin irritations. In addition, wildlife habitats have been destroyed and biodiversity has been lost as a result of oil spills and pipeline vandalism. Actions to be taken to lessen the environmental impact of oil exploration in Nembe Local Government by the Nigerian government and oil exploration corporations include the application of best environmental practices in oil exploration, the use of non-toxic chemicals in oil extraction procedures, and the provision of adequate compensation to impacted populations for their loss of livelihoods and the degradation of their environment. In Addition the government should put in place strong regulatory frameworks to oversee oil exploration firms' operations and hold them accountable for any environmental harm they may cause. It suggests that using land treatment technology, there should be a strong environmental restoration of natural resources.

Keywords: Oil exploration, Environmental impact, Contamination, Biodiversity, Public health.

INTRODUCTION

Nigeria is a mono-economy, with oil from the Niger Delta contributing for more than 80% of federal government revenue, 95% of export revenue, and roughly 40% of GDP (Babatunde, 2012; Sagay, 2001; Human Rights Watch, 1999). The Niger Delta's local populations are exploited daily for around 2 million barrels of crude oil (HRW, 1999). The Niger Delta is one of the largest wetlands in the world, with a surface area of over 70,000 square kilometers. It is well-endowed and has nearly 20 billion of the estimated 66 billion barrels of oil and more than 3 trillion cubic meters of gas that are found in Africa (Ereibi, 2011)

Nembe underwent oil exploration beginning in the 1950s by the Tennessee Oil Company, a U.S. company. Shell D'Archy's discovery of the Oloibiri oil field in Ogbia, however, came considerably later and was the first to find oil. The vast and abundant Nembe oil deposits were found as a result of later explorations. In the Okpoama and Twon-Brass axis, which are close to the coast, were the first discoveries in Nembe. All these states and communities have historically encountered unfavorable effects of oil exploration, including oil spills and the myriad difficulties they present for daily life.

Nembe is a Local Government Area (LGA) of Bayelsa State in Nigeria and one of the largest settlements in the Niger Delta. Its secretariat is located at Nembe town, which is in the area's easternmost corner at a

latitude of 4°32'22"N 6°24'01'E. Nembe holds a dominant position in the Niger Delta due to its complicated terrain and advantageous location. Its geographical setting is lovely and conducive to life. The area, which is near Okpoama and Brass, is one of Nigeria's most southern. Nembe, the historic town of Twon Brass, and Okpoama are the three main locations where the Nembe people may be found. About 150,000 barrels of high-quality, low-sulfur petroleum are currently produced by the four Nembe oil fields and piped to both the Nembe-area Brass terminal and the Bonny oil export facility, both of which are on Bonny Island. Agip employs the Brass terminal, while Shell use the Bonny terminal. The only businesses in the region with concessions are Shell and Agip.



Due to the fertile soil and coastal waters, farming and fishing are the main economic activities of the people who live in the Niger Delta. More than 70% of the population is dependent on fishing and farming for a living. Local enterprises based on the mangrove and the nearby swamp waters are also present, including the production of mats and local salt.

Unfortunately, the sad and tragic stories of oil spills, which pose a serious threat to the people's way of life, have cast a dark shadow over the history of oil exploration in the Niger Delta. Nigeria has been attempting in vain to manage oil spills since the 1970s, when the country had its first one (HRW, 1999). The containment, remediation, and reclaiming of the environment, as well as the compensation of impacted parties, are all part of the management of an oil spill. Interestingly, in the case of Nigeria, this process has been hampered by a number of reasons, leaving the impacted people in a state of economic, environmental, and psychological destitution. For the communities who depend on oil, their way of life, the environment, and the Nigerian economy, the oil spill in Nigeria has been terrible, because of carelessness and poor management. The Niger Delta's economy, which is based primarily on farming and fishing, has been particularly hard hit. The fish and the numerous families who depend on them for survival are in peril as a result of the rising levels of water contamination caused by petroleum products that have been discharged. Drinking water access, including from subterranean boreholes, is impacted by oil pollution. Farmers are now helpless and stranded because crude oil has destroyed the land and greenery.

METHODOLOGY

The research method employed in this work was document analysis. To obtain information on the effects of oil exploration in Nembe LGA, relevant sources such as scholarly articles, government reports, and other relevant publications were studied. The documents were selected based on their relevance to the issue and the quality of the information offered.

Government papers gave essential information on the legislation and regulations that regulate oil exploration in the region, as well as the monitoring and mitigation procedures in place to limit environmental harm. Academic publications provided insights into scientific study on the environmental impact of oil exploration

and provided a clearer knowledge of the intricate relationships between the ecosystem and oil exploration activities. Other relevant materials, such as community reports and media coverage, were also explored to provide crucial viewpoints on the impact of oil exploration on local communities.

RESULTS

The findings of this study report indicate the urgent need for the Nigerian government and oil firms to adopt measures to reduce the environmental impact of oil exploration in Nembe LGA. This can be accomplished by implementing sustainable methods in oil exploration and production, such as the use of advanced technologies to prevent oil spills and leaks. In order for the impacted communities to deal with the socioeconomic repercussions of oil exploration, adequate compensation should be offered. Furthermore, the government and oil firms must support sustainable growth in the region by investing in social infrastructure such as healthcare, education, and roads.

The Impact of Oil Exploration in Nembe Local Government

The Nembe local government in Bayelsa State is suffering an alarming amount from the effects of oil drilling. The activities of the petroleum industry, which are concentrated primarily in the Bayelsa State area of the Niger Delta and include exploration, production, refining, transportation, and marketing of oil and gas products, have been the main cause of the region’s environmental degradation. In addition to changing people’s lives, the exploration and exploitation activities in Nembe are still upsetting the earth’s crust’s natural balance. [George 2000]. Exploitative drilling and seismic surveys both involve the use of dangerous substances like dynamite. Using this technique, the depth of the earth’s composition can be measured.

This implies that when more oil is discovered there using this technique, the region’s natural ecosystem would experience greater shocks and rifts in its crust.

One of the main environmental issues connected to oil exploration and extraction in Bayelsa State (South-South region) is gas flaring and venting, which is a substantial contributor to global warming. According to the World Bank Global Gas Flaring Production (GGFP) collaboration, 150 billion cubic meters of related natural gas are flared annually on a global scale. According to Amanze-Nwachukwu (2007), this results in an annual CO₂ emission into the atmosphere of roughly 400 million tons. Moreover 70% of the gas generated in the Niger Delta region is flared, according to a DPR assessment from 2007 (Ugwuaren, 2008). This means that 177 out of 139 oil fields in the region still flare their gas.

Table 1: National Gas Flaring in Major Producing Countries as a Percentage of Gross Production in 1991

Country	Percentage
United States of America (USA)	0.6
Britain	4.3
Holland	0.0
Former Union of Soviet Socialist Republic (USSR)	1.5
Mexico	5.0
OPEC Countries	
Nigeria	76.0
Algeria	19.0
Libya	21.0
Saudi Arabia	20.0

OPEC Total	18.0
World Total	4.8

Source: World Bank Report, 1995, Vol.1:59

Most of the host towns for the oil and gas producing facilities in Nembe now live with gas stacks that flare gas 24 hours a day as a result of the aforementioned, which is alarming. This situation exposes residents to several environmental and health dangers or hazards. As a result, there are significant and destructive environmental repercussions linked to oil and gas exploration and exploitation, such as oil spills. This happens in numerous ways as a result; there are many varieties that can be identified. These range from minor to significant to calamity. Onshore and offshore oil spills both occur. Any unplanned well blowout, pipeline break, or storage tank failure results in it. This incident poses a serious risk to public health. These occurrences pose an immediate risk to the health or welfare of the public (Ibaba, 2005; Okonta et al, 2001; Ntukepo, 1996). Engineering drilling, an inability to efficiently control oil wells, equipment failure, and carelessness when loading and unloading oil tankers all contribute to one percent of oil spills (Nwilo and Badejo, 2001; Naanen, 1995).

The loss of mangrove plants has been one of the most noticeable effects of the frequent oil spills. Historically, the mangrove served as a habitat for the region's biodiversity as well as a source of firewood for the locals. Due to its habitat's toxicity from oil, the area is currently unable to thrive. When consumers eat seafood that has been contaminated by an oil spill, substantial health concerns result for them (Onuogha, 2007). More specifically, the Niger Delta's original forest has been negatively impacted by oil and gas exploration and extraction operations. Indeed, the Niger Delta mangrove forest loss is mostly a result of the oil and gas sector. Nigeria lost between 70 and 80 percent of its original forest in 1999 (Ibaba, 2005, Azaiki, 2003, Okonta et al, 2001).

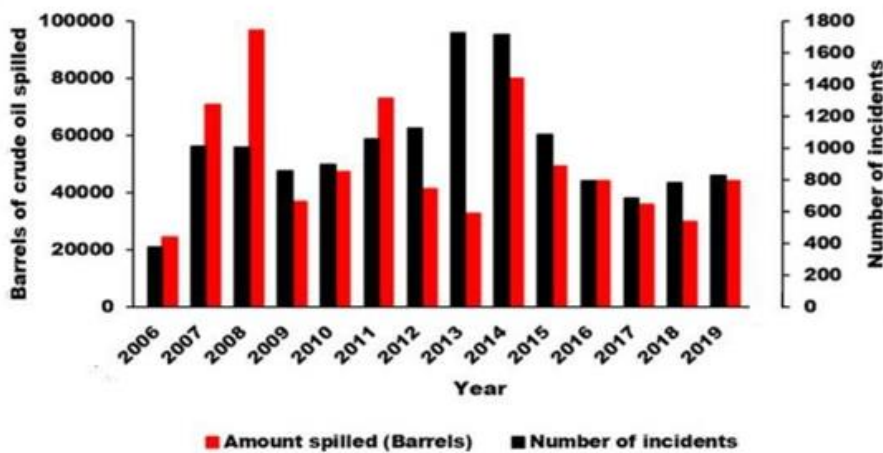
The rate of deforestation has been accelerated by the extraction of oil and gas as well as increased investment in the gas industry, and pipeline construction for the transportation of oil and gas products within and outside the Niger Delta region have resulted in the clearing of forests for the construction of pipelines and other oil and gas facilities. This further destroys the area's already fragile environment. The region's vulnerability to natural disasters and climate change was exacerbated by the degradation of the region's forests and coral reefs. The rate at which CO₂ is removed from the atmosphere decreases further as these forest ecosystems are destroyed. Every human civilization is mostly dependent on its nearby surroundings to survive. The Niger Delta region's oil and gas exploration and exploitation activities have, in fact, contributed significantly to the release of numerous greenhouse gases, which are the main drivers of climate change. On the one hand, these activities have caused the region's immediate natural environment to deteriorate. As a result, extensive land degradation, erosion, deforestation, and air, water, and soil pollution are signs of unsustainable consumption and development patterns.

Oil Spill Record in Niger Delta Between 2015-2021

Almost half a century of oil production and exploitation activities in Nembe have had far-reaching and devastating impacts on the people. Between 1985 and 2000 more than 50 cases of oil spills have been recorded and more than 500,000 barrels of crude oil have spilled into the swamps, creeks, rivers, and ocean. These spills have had a ruinous and debilitating impact on the flora and fauna. Consequently, the Nembe people, who depend mostly on fishing for their livelihoods, have experienced serious drawbacks on their ability to fend for a living. There have been several oil spills in the Nembe local government area of the Niger Delta region in recent years. In 2015, a major oil spill occurred in Nembe, which was caused by a ruptured pipeline belonging to the Nigerian Agip Oil Company (NAOC). The spill resulted in widespread contamination of waterways and farmlands, leading to significant economic and environmental damage. In

2019, a major oil spill occurred in Nembe Creek Trunk Line, which is operated by Aiteo Eastern Exploration and Production Company. The oil spill caused significant damage to the environment and affected the livelihoods of local communities. In March 2020, another oil spill was reported in Nembe, which was caused by a pipeline explosion near the Nembe Creek oilfields. The spill reportedly affected several communities in the area and caused significant damage to the local environment. In August 2020, yet another oil spill occurred in Nembe, which was caused by a leak in a pipeline belonging to the Shell Petroleum Development Company (SPDC). The spill reportedly affected several communities in the area and caused significant damage to the local environment.

Oil spills by cause for the Niger Delta (2006–2019).



Oil spills by cause for the Niger Delta (2006–2019).

Contamination of Land and Sea

The main cause of the contamination of the land and water in the Nembe local government is oil spills brought on by oil company operations. Crude oil is released into the environment because of these spills, which frequently happen as a result of equipment failure, sabotage, or other types of human error. Large-scale oil spills have the potential to harm fishing operations and marine life by contaminating land, rivers, creeks, and finally the sea. Contamination of the land with crude oil has a huge effect. Oil spills have the potential to destroy fields, harm crops, and leave soil unsuitable for agricultural use. Farmers and their families, who depend on agriculture for subsistence, frequently lose their livelihoods as a result of this. The ecological equilibrium of the region may have also been impacted by soil erosion and a loss of biodiversity brought on by oil contamination of the land.

The local authority in Nembe is likewise quite concerned about the waters becoming contaminated with crude oil. The marine life in the area is important to the local economy since it supports many different sectors and provides food and employment opportunities. However, oil spills can cause the mortality of fish and other marine animals, lowering the amount of seafood that is available for commerce and human consumption. Local communities that depend on fishing for a living may suffer substantial economic effects as a result. Access to clean drinking water may be hampered by the contamination of water sources as a result of oil spills. A considerable health danger to the local people have resulted from the accumulation of hazardous compounds and heavy metals caused by the leakage of crude oil into water supplies. Skin irritation, respiratory issues, and gastrointestinal illnesses are just a few of the health issues that can be brought on by contaminated water.



Source: UNEP Report (2011).

Contamination of Farmland by Crude Oil

Farmland have been contaminated with crude oil when there is an oil leak and the oil penetrates the soil, rendering it unusable for farming. The oil alters the pH of the soil, decrease soil fertility, and render the soil poisonous to plants. Crop yields are drastically decreased as a result of crude oil contamination on fields, which can cause food insecurity and financial hardship for farmers and their families. The local inhabitants' agriculture and means of subsistence have suffered significantly as a result of the crude oil contamination of farms in the Nembe local government. The area's farmers rely heavily on agriculture for both their income and way of life. Due to the inability of farmers to sell their products or make a profit, the pollution of fields by crude oil has resulted in considerable financial losses. Businesses that depend on agriculture have also been badly impacted, which has had a cascading effect on the regional economy.

In addition to its negative economic effects, the pollution of farmland by crude oil has had a serious negative impact on the local population's health. Health issues for farmers and their families can result from exposure to crude oil and the toxins it is associated with. These health complications can include rashes on the skin, respiratory troubles, and other conditions. Because they are more prone to play outside where contaminated soil is present, children are especially susceptible to the negative effects of crude oil contamination on their health. An important environmental and socioeconomic problem that needs immediate response in the Nembe local government is the pollution of agriculture by crude oil. Oil businesses operating in the region should take precautions to avoid environmental contamination and oil spills, such as investing in cutting-edge technology and best practices that reduce the danger of spills. Oil spills should be cleaned up as soon as possible to avoid further contaminating agriculture and other regions. The oil industry should also hold thorough community meetings and reimburse impacted farmers for their losses.

A concerted and cooperative effort by the government, oil firms, and the local community is required to solve the problem of farmland pollution by crude oil in the Nembe local government. Regulations that safeguard the environment and the rights of local communities should be passed by the government and put into effect. Additionally, oil firms must be accountable for their social and environmental effects and hold substantive community discussions.



Crude Oil Contamination of Ground and Seawater

An important environmental issue that has had a negative influence on the health and way of life of the residents is the presence of crude oil in the ground and ocean in Nembe local government. The area is a large oil-producing area in Nigeria, and oil exploration activities have had a considerable negative impact on the local ecology and population. When there are oil spills, the oil seeps into the land and water, rendering it unfit for human food or usage. The oil can contaminate saltwater, killing marine life and destroying the ecology. It can also poison groundwater sources, making them dangerous to drink.

The health and way of life of the residents have been severely harmed by the contamination of groundwater and seawater in Nembe local government by crude oil. For drinking water, many communities rely on groundwater supplies, and the contaminating effects of crude oil have resulted in water scarcity and health issues. The fishing business, a vital source of income for numerous villages in the area, has been severely impacted by the contamination of the seawater. For people living in the surrounding towns, exposure to tainted water can have serious health effects. Chemicals included in crude oil are hazardous and can cause skin rashes, breathing troubles, and other health concerns. Exposure to tainted water can also result in long-term health issues like cancer and other chronic illnesses.

Crude oil contamination of groundwater and seawater in the Nembe local government is a serious environmental and social problem that needs immediate response. Oil businesses operating in the region should take precautions to avoid spills of oil and other environmental damage, including making investments in technology and industry best practices that reduce the risk of spills. To stop further contaminating groundwater and ocean, quick and efficient cleanup procedures should be implemented after an oil spill. The local authority of Nembe needs to make a concerted effort to address the current contamination of groundwater and seawater by crude oil in addition to preventing oil spills. The government should pass and implement laws that safeguard the environment and human rights of the local communities. Oil firms must also accept responsibility for their environmental and social implications, as well as engage in meaningful engagements with local people.

Radioactive Impact of Oil Spillage and Contamination

Oil spills and contamination in Nembe local government have had serious environmental and social consequences, including the release of radioactive elements into the environment. Radioactive elements produced during oil spills can have long-term environmental and health consequences for nearby residents and the ecosystem. Radioactive elements such as radium, uranium, and thorium can be found in crude oil and its byproducts such as drilling mud, generated water, and sludge. These radioactive compounds can be released into the environment during oil spills and contaminate the land, water, and air. Once released into the environment, these pollutants can travel vast distances, causing extensive contamination.

The radioactive impact of oil spillage and contamination in the Nembe local government area can have

serious health consequences for the residents. Radiation sickness, cancer, and other health concerns can result from contact with radioactive materials. Children are especially vulnerable to the health impacts of radiation exposure because they are more prone to radiation's negative effects. The radioactive impact of oil leakage and contamination in the Nembe local government can have serious environmental consequences. The release of radioactive elements into the environment can kill plants and animals and harm the ecosystem in the long run.

Radioactive material management in the oil sector is a big concern, and the risks linked with oil spills and contamination demand immediate consideration. Oil businesses operating in the Nembe local government must take precautions to avoid oil spills and reduce environmental harm. To prevent the additional release of radioactive materials into the environment in the event of an oil spill, timely and effective cleanup operations should be conducted.



Source: UNEP Report (2011)

Public Health Impact on Neonates and Infants

In the Nembe local government, oil extraction has been linked to a number of harmful effects on the environment, the economy, and the health of local residents. The health effects of oil exploration on neonates and newborns are among the most serious. Oil exploration and production activities can have major health repercussions for neonates and newborns, including breathing issues, skin irritations, and developmental delays.

The first few years of a child's life are critical for the development of their immune system and organs, and any exposure to toxins during this period can have long-term consequences for their health. Because their organs and immune systems have not fully formed, infants and neonates are more sensitive to environmental contaminants. The exposure of neonates and newborns to oil exploration and production activities might result in developmental issues, growth delays, and an increased susceptibility to infections. In the Nembe local government, oil exploration and production activities leak toxic chemicals into the air, water, and land. These substances can be inhaled, swallowed, or absorbed via the skin, causing health problems. The discharge of methane gas and volatile organic compounds (VOCs), for example, can lead to respiratory issues such as asthma, bronchitis, and emphysema. The discharge of benzene, a known carcinogen, can result in leukemia and other cancers. The poisoning of local water sources demonstrates the public health impact of oil drilling on neonates and infants in Nembe local government. The area's water sources are frequently contaminated by crude oil, which can induce gastrointestinal issues like diarrhea, vomiting, and dehydration. Exposure to polluted water sources can also lead to skin rashes, irritations, and infections.

Oil drilling may also have an indirect impact on the health of newborns and infants in the Nembe local

government. The economic and social consequences of oil exploration can lead to increasing poverty, hunger, and a lack of access to healthcare, all of which can exacerbate neonatal and infant health problems.



A gas flare is seen in the background as a pregnant woman dries tapioca near Akauma-ama flow station in Nembe

Public Health Impact of Contaminated Drinking Water

The public health impact of oil exploration on contaminated drinking water sources in Nembe local government is a major problem that impacts the health and well-being of the local communities. The region's oil exploration activities have contaminated water supplies, including rivers, streams, and groundwater, with harmful compounds and heavy metals such as lead, mercury, and arsenic. Contaminated drinking water can cause a variety of health issues, including gastrointestinal ailments, skin irritations, respiratory problems, and even cancer. Toxic substances in contaminated water can be absorbed into the body by ingestion, inhalation, and skin contact, resulting in both acute and chronic health impacts.

Gastrointestinal problems are one of the most serious health consequences of contaminated drinking water in Nembe local government. Water contamination can cause diarrhea, nausea, vomiting, and dehydration. These illnesses can be severe, particularly in susceptible populations such as children and the elderly and can result in hospitalization or even death. Skin irritations and rashes can occur as a result of consuming polluted water. Toxic substances in the water can cause skin irritation, itching, and redness. In severe circumstances, skin diseases caused by polluted water may necessitate medical attention.

Respiratory issues are another major health impact of contaminated drinking water in the Nembe local government. VOCs and other airborne pollutants generated during oil exploration activities can cause respiratory disorders such as asthma, bronchitis, and emphysema. Methane gas emissions can also induce respiratory issues, headaches, and dizziness. Cancer and other chronic health problems can be exacerbated by drinking contaminated water. Toxic compounds found in contaminated water, such as benzene and polycyclic aromatic hydrocarbons (PAHs), are proven carcinogens associated to a variety of cancers, including leukemia, lymphoma, and liver cancer.



Economic Benefits of Oil Exploration in Nigeria

First and foremost, oil exploration has supplied the Nigerian government with a large source of money. The sale of crude oil has been the country's principal source of foreign exchange revenues, accounting for more than 90% of total export earnings. This money has supported economic growth and development by funding many sectors of the economy such as education, health, infrastructure, and social welfare programs. Oil exploration has produced jobs and employment prospects for Nigerians in addition to providing income for the government. Thousands of people are employed in the oil sector in fields such as engineering, geology, logistics, and support services, giving solid incomes and chances for progress. This has helped to reduce unemployment and poverty, notably in the Niger Delta region, where most oil drilling takes place.

Oil exploration has aided the growth of many industries and areas of the economy, including manufacturing, transportation, and construction. Oil's cheap and abundant energy has fueled the rise of various industries, offered new business opportunities, and increased economic activity. Furthermore, numerous multinational oil corporations have made investments in Nigeria's oil business, bringing superior technology, knowledge, and finance with them. This has contributed to the modernization and efficiency of the oil industry, offering chances for local enterprises, and promoting economic growth.

DISCUSSION

The study discovered that oil extraction in Nembe Local Government has had a substantial impact on the environment, including contamination of land and water, loss of biodiversity, and public health threats. The use of harmful chemicals in oil extraction operations has exacerbated the environmental impact, resulting in health risks such as cancer, respiratory ailments, and skin irritations among the local people.

Furthermore, oil spills and pipeline vandalism have resulted in biodiversity loss and habitat degradation for species. Contamination of land and water has resulted in decreased agricultural productivity, loss of aquatic life, and decreased availability to safe drinking water.

Prioritizing the health and safety of nearby communities is crucial for oil corporations and governments engaged in oil exploration. Accident avoidance, risk management, and personal safety from exposure to dangerous substances should all be addressed with appropriate measures which entails using appropriate safety procedures, providing personnel with the necessary training, and routinely checking on the effects on

proactively to put in place procedures and methods that lessen pollution, environmental deterioration, and the disruption of livelihoods which are some of the negative effects oil exploration activities on the safety and health of the local communities as well as to give impacted communities compensation and other means of support. Communities should also have access to accurate and timely information about the potential risks and impacts of oil exploration activities. Their concerns, perspectives, and traditional knowledge should be considered during decision-making processes. Governments, oil corporations, and relevant parties should also collaborate to make sure that human rights are protected at all stages of the process, from planning to implementation to monitoring and mitigation.

Furthermore, thorough analyses of the potential environmental effects should be done before beginning any oil exploration activity. Environmental protection should be given top priority during oil exploration. Procedures, methods, and technology that reduce the release of contaminants into the environment should be put in place. Hazardous substances, waste, and byproducts produced during exploratory operations should be appropriately controlled and handled. Oil exploration must be carried out in a way that safeguards and conserves biodiversity. Sensitive ecosystems, animal habitats, and protected areas should be carefully considered, and proper steps should be taken to prevent or reduce any disturbance or deterioration. Careful water resource management should be practiced during oil exploration activities. Efforts should be made to lessen the amount of greenhouse gas emissions brought on by oil exploration activities. After exploration activities, the impacted areas should be restored to their pre-exploration condition as much as feasible by taking the proper reclamation and remediation measures. This includes restoring ecosystems, rehabilitating contaminated land, and cleaning up contaminated water and soil.

Stakeholder engaging with local communities, indigenous peoples, and other stakeholders is essential for fostering environmental responsibility. Trust may be fostered and ensured that the worries and opinions of impacted communities are taken into consideration through meaningful discussions, information availability, and transparency in decision-making processes. It is possible to reduce the ecological imprint and work towards sustainable development by incorporating environmental caution into oil exploration techniques. To ensure ethical exploration activities, governments, regulatory agencies, and oil firms all play critical responsibilities in putting environmental legislation and best practices into practice and enforcing them.

Furthermore, accountability and transparency are essential components of prudent oil exploration. Oil companies ought to place a high priority on open communication, information sharing, and meaningful engagement with neighborhood stakeholders and communities. Oil companies should provide pertinent data about their operations, including any advantages and disadvantages of oil exploration efforts. Giving specifics on environmental impact analyses, safety precautions, and procedures for risk management are all part of this. Transparent communication aids decision-making by stakeholders and clarifies any potential effects on communities. It is crucial to undertake fruitful discussions with local stakeholders, such as communities, indigenous peoples, and other impacted parties. These discussions ought to be open to everyone, allowing for the expression and resolution of suggestions, criticisms, and issues. Meaningful participation promotes collaboration, trust-building, and ensures that local communities' viewpoints and interests are considered when making decisions. Environmental and social effect assessments: It's crucial to carry out comprehensive environmental and social impact assessments. These analyses should consider potential environmental, social, and cultural effects of oil exploration activities in a transparent, unbiased, thorough manner. Sharing the results of these analyses with neighborhood stakeholders fosters transparency and enables well-informed deliberation. Regulation Compliance: Oil companies are required to follow national and international laws, standards, and industry best practices. The rights and welfare of nearby populations are protected when operations are transparently demonstrated to be in accordance with legal standards and to be held accountable.

Grievance processes: For resolving issues and grievances brought up by regional stakeholders, efficient

grievance processes must be established. Affected parties should have a way to express their complaints and seek redress through these procedures, which should be open, transparent, and impartial. Independent Monitoring and Reporting: Independent oil exploration monitoring and reporting promote accountability and openness. In order to ensure compliance with legislation and keep businesses accountable, third-party groups, local communities, and governmental agencies can play a part in tracking and reporting on the environmental and social effects of oil operations. In the oil exploration industry, transparency and accountability develop relationships that last, help to build trust, and encourage ethical behavior. Oil firms can endeavor to ensure that their activities are in line with social and environmental values by having an open dialogue and being attentive to the worries and interests of local stakeholders.

Given the severe environmental impact of oil exploration in the Nembe local government, it is critical to alleviate the negative impacts while also ensuring sustainable and responsible exploration operations. Here are some suggestions:

A crucial component of responsible governance is the routine monitoring and evaluation of oil exploration activities by a neutral agency. By doing this, firms are more likely to follow environmental regulations and best practices. In the following reasons, regular monitoring and assessment are essential:

Compliance with Environmental Regulations: Oil exploration activities can be observed by an unbiased organization to make sure that companies abide by the rules and guidelines established by the government. Monitoring the handling and disposal of hazardous materials, adhering to pollution prevention measures, and meeting environmental impact assessment criteria are all included in this. Oil exploration activities may have possible environmental hazards and implications that can be recognized by frequent monitoring and assessment. This makes it possible for prompt intervention and mitigating actions to reduce adverse effects on ecosystems, water resources, air quality, and biodiversity. An unbiased organization can determine whether companies are using best practices in their oil exploration operations. This includes assessing the use of innovations and methods that lessen pollution, advance energy efficiency, and reduce environmental impact. The agency may help the industry by keeping track of and disseminating best practices. Ongoing evaluation and monitoring help the oil exploration industry to be transparent and accountable. The agency can offer independent and objective reports on the performance and compliance of companies, making this data public. Due to its transparency, stakeholders can hold companies responsible for their environmental obligations. Monitoring and assessment allow for the early identification of any environmental or non-compliance issues associated with oil exploration activities. Rapid identification enables prompt remedial action, stopping future harm or adverse effects. Adaptive management strategies can be informed by the results of routine monitoring and assessment. This entails modifying procedures and rules considering new scientific information, technological developments, and shifting environmental conditions. The government may play a significant role in ensuring that oil exploration activities are carried out in a responsible and sustainable manner by establishing an impartial body for routine monitoring and assessment. By protecting the environment and holding companies responsible for their environmental commitments, this agency can serve as a watchdog.

In order to address the detrimental effects of oil exploration activities, it is unquestionably important to offer impacted communities proper compensation and repair. In relation to compensation and remediation, the following crucial points should be noted:

Compensation for Losses: Affected communities should be given fair and sufficient compensation for any losses or damages they may have sustained as a result of oil exploration activities. Compensation for lost wages, property damage, and other negative effects may be included in this. If local water supplies have been contaminated as a result of oil exploration activities, those communities should have access to clean, safe drinking water. In order to do this, it may be necessary to put in place water treatment facilities or provide alternative clean water sources. Oil companies should be in charge of cleaning up after exploratory

activities to repair and rebuild the ecosystem. This may entail decontaminating affected areas, regenerating ecosystems, and putting policies in place to lessen the long-term effects on the environment. Communities that have been impacted may rely on natural resources for their livelihoods, including farming, fishing, or other pursuits. Oil companies should help affected people or communities rebuild or transition their livelihoods by offering support and assistance. This can include financial aid to assist people in recovering from the effects of oil exploration, alternative income-generating options, or training programs. As part of their efforts to mitigate the detrimental effects of exploratory activities, oil corporations can make contributions to community development programs. To enhance the general wellbeing of impacted communities, this can involve funding local infrastructure, healthcare, education, and other social initiatives.

It's important to hold meaningful consultations with the afflicted communities to learn about their requirements, issues, and top objectives for compensation and remedy. When creating and implementing compensation and remedial strategies, their perspectives should be taken into account. Long-Term Monitoring: To guarantee the efficacy of the steps taken, long-term monitoring should be carried out following the implementation of compensation and remedial initiatives. This makes it possible to spot any lingering problems and, if further action is required, to make adjustments. Oil companies can assist in reducing the detrimental effects of exploratory activities on impacted communities by offering proper compensation and repair. It reveals a dedication to corporate social responsibility and promotes the well-being and sustainable development of impacted areas.

1. **Improved waste management:** The government should implement effective waste management rules to ensure that oil exploration activities do not pollute the environment. Oil firms should be held accountable for their waste management procedures and be forced to dispose of waste responsibly.
2. **Promotion of renewable energy sources:** To reduce reliance on fossil fuels, the government should support the use of renewable energy sources such as solar and wind energy. This will help to lessen the environmental impact of oil exploration and protect the ecosystem.
3. **Public awareness initiatives:** The government should conduct public awareness campaigns to educate local communities about the impact of oil exploration on the environment and their health. This will help to guarantee that the local people are aware of the risks involved with oil exploration and may take precautions to protect themselves.
4. **Strict environmental rules:** The government should impose strict environmental standards and ensure that businesses follow them. This will help to ensure that oil exploration activities are carried out in a sustainable and responsible manner.
5. **Involve local communities and environmental non-governmental organizations (NGOs):** It is imperative that local communities and environmental non-governmental organizations (NGOs) be engaged in the decision-making process regarding oil exploration in order to ensure that their interests are taken into account and protected. The local communities experience the firsthand impact of the potential environmental effects, health and safety issues, and changes to their way of life as a result of oil exploration activities. The Environmental NGOs are committed to preserving biodiversity and natural habitats by carrying out frequent environmental impact assessments (EIAs). Environmental NGOs can provide important information and insights on the potential ecological effects of oil exploration through thorough and objective assessment. Also, effective community interaction can help identify potential negative effects at the early stage of the planning process, for instance, The Canadian hamlet of Fort McKay collaborated with oil firms to create technology that minimized the environmental effects of oil sands mining by using less water. Also, in Norway, the local populations collaborated extensively with Statoil (now Equinor) in addressing issues and putting sustainable practices into place.
6. **Establish a contingency plan:** The government and oil firms should develop a plan for dealing with oil spills and other environmental calamities. This plan should include efforts to contain spills, reduce environmental damage, and assist the affected population.

CONCLUSION

Nembe local government is located in one of the world's most oil-rich locations, with a number of global oil firms operating there. However, the environmental impact of oil drilling has caused considerable environmental damage and the oil exploration and exploitation has adversely affected the population. Contamination of soil, water, and air, soil quality, surface, groundwater and drinking water, habitat destruction, and biodiversity loss have all had serious consequences on the local population's health and livelihood. The government, in partnership with oil firms, must take necessary steps to guarantee that exploratory activities are carried out in a sustainable and responsible manner. Effective policies and regulations are required to prevent oil spills and limit greenhouse gas emissions from oil exploration activities. Furthermore, suitable compensation and rehabilitation procedures should be implemented to assist impacted populations and restore the damaged ecosystem. Only through combined efforts can we ensure sustainable and responsible oil exploration techniques that protect the environment as well as local communities' health and livelihoods.

As the environmental contamination as a result of oil exploration continues to rise with associated socio-economic and environmental impacts in the Nembe local government, there is need for an urgent call to action by all stake holders. The listed ethical violations must be promptly addressed so that the exploration of crude oil in Nigeria can benefit the Government, the oil companies, the residents of the oil-producing region (Nembe local government area), and all Nigerian citizens.

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