

OIL SPILLAGE AND ITS EFFECTS ON ECO-SYSTEM IN NIGER DELTA: A NATIONAL CONCERN

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Abstract

This paper examines the detrimental effects of oil spillage on the ecosystem in the Niger Delta region of Nigeria. The Niger Delta has been significantly affected by frequent oil spills due to inadequate maintenance of pipelines, sabotage, and negligent operations by oil companies. The disastrous consequences of oil spillage on the ecosystems of the region are explored, including the contamination of water bodies, destruction of aquatic life, degradation of farmlands, and health risks for local communities. This article adopts a survey method in tackling the menace of oil spillage in Niger Delta region. This paper also highlights the socio-economic implications of oil spillage in the Niger Delta, emphasizing the urgent need to mitigate and prevent further damage to safeguard the environment and the well-being of affected communities. Conclusively, oil spillage in the Niger Delta remains a pressing national concern due to its devastating effects on the ecosystem and local communities. Immediate action is needed from the government, oil companies, and civil society to prevent further degradation of the environment, protect the livelihoods of the affected communities, and safeguard the region's biodiversity. By implementing stricter regulations, enhancing spill response capabilities, and promoting sustainable practices, we can ensure a healthier and more prosperous future for the Niger Delta.

Keywords: Effects, Oil Spillage, Ecosystem, Niger Delta, National Concern.

Introduction

As we navigate the 21st century marked by rapid industrialization and globalization, the world is confronted with an array of environmental challenges threatening the sustainability of life on earth. Among these, the impact of oil spillage on ecosystems is considered one of the most severe. This paper discusses an issue at the nexus of societal development and environmental preservation - the catastrophe of oil spillage and its far-reaching effects on the ecosystem in Nigeria's Niger Delta and why this is a national concern.

The Niger Delta, located in southern Nigeria, is a crucial ecological region known for its rich biodiversity, vibrant ecosystems, and rich oil reserves. Ecology here includes "individuals (men, women and children), variously related with one another as member of families, societies, groups etc" (Nana, 2016). However, this fragile environment has suffered extensive damage due to repeated oil spillage incidents. Renowned globally as one of the world's largest oil-rich deltas, the Niger Delta has been mired in an environmental crisis due to frequent and uncontrolled oil spills (Nwokeocha, 2012). This issue, which has transformed into a national concern, offers a bleak picture of ecological collapse, devastating impacts on local livelihoods, and constant societal conflicts.

Fueling Nigeria's economy, the oil industry also provides a paradox as the catalyst for a national environmental disaster, bringing into sharp focus the need for sustainable resource management practices. The unchecked oil spillage has afflicted the Niger Delta with severe environmental degradation, significantly impacting its biodiversity and threatening the livelihoods of local communities who rely heavily on these natural resources for their survival (Anejionu et. al, 2015). The extraction, transportation, and refining processes of oil often lead to oil spillage, causing significant environmental damage. This paper examines the effects of oil spillage on the ecosystem in the Niger Delta, highlighting the impacts on various components of the environment. The aim is to recognize this pressing issue as a major concern for the nation of Nigeria. In the Niger Delta region of Nigeria, environmental regulation which are common practice in developed nations are often not followed. According to the trade and environmental based 2010, oil companies in Niger Delta dumps waste in a manner would be illegal to the united state environmental regulation. It is pertinent to state categorically that the Nigerian government has done little to protect the human right of its people against the action of the multinational companies, Attah in Nana, 2021. However, this has not been for want of laws in the nations. Nigerian law prohibits pollution the pollution of the land and water. But the regulatory system could be said to be weak. As rightly observed by Amnesty international (2010), exploiting this weak regulatory system, the operation of the oil company in Niger Delta are characterized by failure to take appropriate preventive and remedial action in relation to pollution in environmental damage (Nana, 2021).

Background Briefs on the Niger Delta Region

The Niger Delta region is a vast and diverse area that holds significant ecological, economic, and political importance for the country. This region is an area of enormous ecological and economic importance due to its abundant natural resources, primarily oil and gas reserves. However, the region has faced significant challenges, including environmental degradation, socio-economic inequality, and political instability. This region is also characterized by its intricate network of waterways and mangrove swamps. Understanding the historical, geographical, and socio-economic context of the Niger Delta is crucial to comprehending the complexities surrounding its development and challenges.

The Niger Delta extends across nine states in Nigeria: Abia, Akwa Ibom, Bayelsa, Cross River, Delta, Edo, Imo, Ondo, and Rivers. The region is primarily characterized by its vast network of rivers, creeks, mangrove forests, and swamps. These waterways include the Niger River, Benue River, Escravos River, and Forcados River, among others, which provide a rich ecological niche for diverse vegetation and fauna Hogan, (2013), The Niger Delta is the delta of the Niger River sitting directly on the Gulf of Guinea on the Atlantic Ocean in Nigeria. The Niger Delta region is also known for its abundant reserves of oil and gas. Uche (2020) is of the view that since the discovery of oil in commercial quantities in 1956, the Niger Delta has been the mainstay of Nigeria's economy. This discovery was possibly responsible for the increased foreign investment and the subsequent transformation of the region's economy. The Oil and Gas Journal (a leading petroleum industry weekly publication with a worldwide coverage) estimated in 2020 that the Niger Delta holds about 36.9 billion barrels of proven oil reserves, accounting for approximately 37% of Nigeria's total reserves.

A careful look reveals that the history of the Niger Delta region is marked by colonization, exploitation, and marginalization. The advent of European colonial powers, particularly the

British, in the late 1950s shaped the landscape for oil exploitations which have continued into the post colonial times. As we continue to look critically into the background of the Niger Delta, and taking into consideration its abundance of oil and gas resources, it becomes necessary to say that this region thus far has been confronted with a wide range of challenges – chief amongst which is dreadful conditions of the environmental, and conflicts over resource thereby leading significantly to socio-political tensions in this region.

Causes of Oil Spillage in the Niger Delta Region

There are major causes of oil spillage in the Niger Delta region which include inadequate maintenance of pipelines and infrastructure, sabotage and oil theft, negligent operations by oil companies, etc. We will discuss these factors as they distinctively affect the Niger Delta region below:

- **Inadequate Maintenance of Pipelines and Infrastructure:** The inadequate maintenance of pipelines and infrastructure is a major cause of oil spillage in the Niger Delta region. Obi, (2018) asserts that aging infrastructure, corrosion, and lack of routine inspection and repairs contribute to pipeline failures and subsequent spills. It is without doubt that over the years, some oil companies have neglected proper infrastructure maintenance. Bamousa et al., (2020) attribute such negligence to financial constraints, inadequate regulatory oversight, and questionable maintenance practices. As a result this, leaks occur, thereby leading to oil contamination of surrounding land, water bodies, and vegetation.
- **Sabotage and Oil Theft:** Sabotage and oil theft also significantly contribute to oil spillage in the Niger Delta region. Orubele, and Agwu, (2019) identify that criminal activities such as pipeline vandalism and illegal tapping of oil pipelines have become pervasive in the area. These activities are driven by socio-economic factors, including poverty, unemployment, and a lack of alternative livelihood opportunities for local communities. The aftermath of these vandalizations of pipelines is the creating of holes and ruptures in the system, thus leading to massive oil spillage that contaminate the environment.
- **Negligent Operations by Oil Companies:** Negligent operations by oil companies further exacerbate oil spillage in the Niger Delta region. For instance, Amakiri and Tamuno (2019) strongly believe that some companies prioritize profit-making over the implementation of environmental and safety regulations, leading to inadequate safety measures during drilling, extraction, and transportation processes. Furthermore, Osayande, (2017) states that these companies often fail to use modern technology and equipment, thereby resulting in equipment failure that can lead to spills. Additionally, Osayande further identified that poor waste management practices, such as improper disposal of drilling mud and produced water, contribute to environmental pollution and oil spillage.
- **Natural Disaster:** Another factor causing oil spillage in the Niger Delta region is undoubtedly the natural disaster. Amadi et al., (2018) outline such natural disasters to include floods and earthquakes, which can damage pipelines and infrastructure. Ntukekpo, (2007) also noted that heavy rainfall and flooding heighten the pervasiveness of oil spillage both by weakening existing infrastructures and escalating unintended discharges. To backup this, it is important to note the view of Juhasz et al., (2010) who put forward that flooding in the Niger Delta often results in a series of mass displacements of

oil as the high water volume sweeps across the terrestrial ecosystems intermingling with buried oil pipelines, leading to pipeline breaks and subsequent spillage.

The aftermath of heavy rainfall is usually erosion. Erosion increases the propensity of pipeline infrastructure to damage, thus leading to oil spillage. As rightly pointed out by Ogbonna et al. (2013), the soil erosion destabilizes the covers over oil pipelines in the region, heightening the risk of rupture and ensuing oil spills. According to Anejionu et al., (2015) adding to the disaster are the consequential effects of climate change, which exacerbate the frequency and severity of natural disasters, such as flooding, posing a more formidable challenge to oil spill prevention in the region. As natural disasters become more severe, the already fragile infrastructures cannot withstand these extreme weather events, leading to increased incidences of oil spills.

Consequences and Impacts of Oil Spillage on the Ecosystem in the Niger Delta Region

There are several consequences of oil spillage on the Ecosystem particularly as it concerns the Niger Delta region. Some scholars have discussed on these consequences and they have highlighted how unique these consequences are to the Niger Delta region. These consequences include but not limited to the following:

- **Water Pollution**

Oil spillage in the Niger Delta has a severe impact on water bodies, including rivers, creeks, and the Gulf of Guinea. The oil contaminants interfere with the natural water quality, composition, and aquatic life. According to Adati et al. (2019), studies have shown that oil spills alter the biochemical properties of water, reduce oxygen levels, and lead to the accumulation of toxic substances in aquatic organisms.

- **Mangrove and Wetland Ecosystem Damage**

Mangroves and wetlands are essential ecosystems in the Niger Delta, providing breeding grounds for fish and serving as a natural barrier against coastal erosion. However, frequent oil spills result in the destruction of these habitats. A study by Abowei (2017) indicated that oil spillage causes the suffocation of mangroves, resulting in reduced biodiversity and loss of important ecological services.

- **Loss of Biodiversity**

Oil spillage disrupts the delicate balance of the ecosystem, leading to a decline in biodiversity. Nwilo and Badejo (2018) argue that the oil residues contaminate soil, water, and air, negatively impacting various species of plants, animals, and microorganisms. The loss of biodiversity in the Niger Delta has significant ecological and economic implications, as many species are essential for the region's fisheries and agriculture industries.

- **Impact on Human Health**

Oil spillage not only affects the environment but also poses potential threats to human health. Research by Mukoro et al. (2016) revealed that individuals living in communities affected by oil spillage often experience health issues, including respiratory problems, skin disorders, and various forms of cancer. Furthermore, consumption of contaminated food or water can lead to long-term health complications.

Socio-Economic Implications of Oil Spillage in the Niger Delta Region

Oil spillage in the Niger Delta Region of Nigeria has been an ongoing environmental and socio-economic issue with far-reaching consequences. Over the years, there have been numerous oil spillages due to pipeline vandalism, inadequate infrastructure maintenance, and improper waste disposal. These oil spillages have had devastating socio-economic implications, thereby affecting communities, government revenues, and overall stability of the region. The socio-economic implications of the oil spillage in the Niger Delta region include such factors as the displacement of communities and loss of livelihood, reduced revenues for the government leading to economic instability, and the resultant social unrest and conflicts.

- **Displacement of Communities and Loss of Livelihood**

The Niger Delta Region is inhabited by numerous communities that heavily rely on fishing, farming, and small-scale businesses for their livelihoods. Oil spillage contaminates water bodies, farmland, and vegetation, rendering them unproductive. According to Ajala, (2017), the resultant effect of this is that there is massive displacement of communities from their ancestral lands and the loss of their traditional means of sustenance. As a result of such displacement, communities within the Niger Delta region have been exposed to the experience of food scarcity, malnutrition, and increased vulnerability to health issues.

- **Reduced Revenues for the Government and Economic Instability**

Nigeria heavily relies on oil exports for its economic growth and sustenance and these oils are mainly produced within the Niger Delta region of the country. Obioha, (2018) argues on this and pointed out that oil spillage in the Niger Delta Region leads to decreased oil production, which directly translates into reduced revenues for the government. From the point of Obioha, it is worthy to draw the conclusion that when there is decrease in oil production, it directly leads to loss of revenue which in turn affects the country's budgetary allocation for infrastructure development, education, healthcare, and social welfare programs. In addition to this, Ajakaiye (2019) opines that this also leads to reduced foreign exchange earnings thereby contributing to inflationary pressures and economic instability, leading to a decline in the standard of living in the country at large.

- **Social Unrest and Conflicts**

Not only does the socio-economic effect of the oil spillage in the Niger Delta region affect the communities of the region directly, and the economic stability of the nation at large, the continuous cycle of oil spillage and its associated negative impacts has also fostered social unrest and conflicts within the Niger Delta region. Ovuokerie (2017), the affected communities may sometimes resort to civil protests, sabotage of oil pipelines, and acts of violence as a means to address their grievances. Militant groups, commonly known as "the Niger Delta Avengers," have emerged in a bid to demanding justice, environmental remediation, and a fair share of oil revenues from the government. Anumele (2019) is of the opinion that the resulting conflicts between these groups, security forces, and oil companies further aggravate the overall social and economic stability of the region.

Mitigation and Prevention Measures to the Effects of Oil Spillage in the Niger Delta Region

To combat the adverse effects of oil spillages in the Niger Delta region, it is crucial to implement a comprehensive approach that addresses various areas, including strengthening regulatory frameworks and law enforcement, enhancing pipeline maintenance and security, promoting community engagement and participation, and encouraging sustainable and alternative energy sources. We will explore these mitigation and prevention measures and their potential to alleviate the impacts of oil spillage in the Niger Delta.

- **Strengthening Regulatory Frameworks and Law Enforcement**

To effectively mitigate and prevent oil spillage, it is crucial to establish robust regulatory frameworks and ensure effective law enforcement. Adeniran (2020) has highlighted a few ways and measures to be followed in order to be able to achieve this. Such measures include:

- **Establishing Comprehensive and Stringent Regulations**

Adeniran, (2020) suggests that the Nigerian government should prioritize the development and enforcement of robust legislation that mandates oil companies to comply with international best practices in spill response, prevention, and compensation. When this is effectively monitored, it will go a long way in ensuring that oil companies do not only exploit their host communities in the Niger Delta, but they will also find a way of compensating their host communities.

- **Establishing Monitoring and Reporting Systems**

Adeniran (2020) maintains that implementing a centralized system that requires oil companies to promptly and accurately report all spills is essential for effective monitoring and quick response. When this is done, it will go a long way in putting the oil companies operating in the Niger Delta region under checks and balances.

- **Strengthening Regulatory Agencies**

According to Adeniran (2020), adequate funding, resources, and staffing should be directed towards regulatory agencies such as the National Oil Spill Detection and Response Agency (NOSDRA) and the Department of Petroleum Resources (DPR) to ensure effective oversight and enforcement of these regulations.

- **Enhancing Pipeline Maintenance and Security**

Maintaining the integrity of pipelines and ensuring their security is another vital approach in mitigating and preventing the effects of oil spillage in the Niger Delta region. The following measures have been identified by Ogri and Ameka (2019) to aid in ensuring and enhancing pipeline maintenance and security:

- **Routine Maintenance and Inspections**

Ogri and Ameka (2019) asserted that oil companies should be mandated to conduct regular maintenance, inspections, and repairs of pipelines to minimize leakages and potential spillages.

- **Deploying Advanced Leak Detection Technologies**

Ogri, and Ameka also suggest that utilizing modern technologies such as fiber-optic sensing and satellite monitoring systems can aid in early leak detection, enabling prompt response and containment.

- Another measure to ensure the maintenance and security of pipelines suggested by Ogri, and Ameka is what they call “strengthen security measures”. According to them, the collaborative efforts among oil companies, local communities, and security agencies are required to mitigate the risk of vandalism, oil theft, and sabotage of pipelines.

- **Promoting Community Engagement and Participation:**

Involving local communities in spill response planning and decision-making processes is also crucial in mitigating and preventing the effects of oil spillage in the Niger Delta region. To achieve this, Smith and Longhurst (2010) have highlighted a number of approaches and steps to take:

- **Encouraging Community Involvement in Spill Response Planning:** According to Smith, and Longhurst (2010), local communities should be actively engaged in the development of spill response plans, ensuring they possess the knowledge and resources to respond effectively in case of oil spill.
- **Establishing Community-led Monitoring Programs:** Smith, and Longhurst (2010) maintain that empowering local communities to monitor and report pipeline integrity issues can serve as an early warning system, facilitating timely interventions to prevent spills.
- **Promoting Environmental Education and Awareness**
 Smith, and Longhurst (2010) argue that the implementation of educational programs that raise awareness about the impacts of oil spills and the significance of environmental preservation can foster a sense of responsibility and encourage sustainable practices. This in the long run will go a long way in exposing members of local communities to the dangers and effects of oil theft and vandalism thereby possibly reducing the rate of their engagements in such unsafe acts.

- **Encouraging Sustainable and Alternative Energy Sources**

Another step towards mitigating and preventing the effects of oil spillage in the Niger Delta is the encouraging of sustainable and alternative energy sources not just for the people of the Niger Delta region, but also to the entire country. According to Ogri, and Ameka, diversifying the energy mix and promoting clean energy technologies can help reduce dependence on oil and minimize the risks associated with extraction and transportation. They have highlighted the following measures as part of what can be adopted to reach such stage of gaining alternative energy source:

- **Diversification of Energy Sources:** Ogri, and Ameka are of the view that the Nigerian government should actively support the development and adoption of renewable

energy technologies such as solar, wind, and hydropower, as this will go a long way in decreasing reliance on oil.

- **Investing in Research and Development:** It is also the viewpoint of Ogri, and Ameka that allocating resources to research and development of sustainable energy technologies can accelerate the transition to cleaner energy sources.
- Ogri, and Ameka also suggest that in order to arrive at the point of encouraging sustainable and alternative energy sources, there is much need to prioritize the provision of incentives for clean energy initiative. They believe that offering tax breaks, subsidies, and financial incentives can stimulate the adoption of alternative energy sources by individuals, businesses, and communities. It is necessary at this point to stress that by implementing these mitigation and prevention measures, Nigeria as a whole can work towards minimizing the occurrence and impact of oil spillage, thereby protecting the environment, and improving the livelihoods of communities in the Niger Delta region.

Conclusion

The Niger Delta region has been a key area for oil exploration and production for several decades. However, this has come at a significant cost to the region's environment and the people who depend on it. Oil spillage in the Niger Delta has resulted in severe ecological damage, posing a serious threat to the fragile ecosystem and the communities that rely on it. Oil spillages have led to the destruction of terrestrial and aquatic habitats in the Niger Delta. The oil coats the surfaces of water bodies, affecting the growth and survival of aquatic organisms. This disruption further impacts the food chain and biodiversity of the region. Contaminated water bodies due to oil spills have detrimental effects on the health of both humans and animals. The consumption of polluted water can lead to various health issues, including skin diseases, respiratory problems, and reproductive disorders. Fish, which is a vital source of sustenance for the local population, becomes unfit for consumption. The oil-contaminated land has rendered large areas of agricultural land unproductive, affecting the livelihoods of local farmers. Crops and livestock exposed to oil pollutants often experience stunted growth or even death, leading to economic losses in the farming sector. The dependence of indigenous communities on the Niger Delta's natural resources, primarily fishing and farming is severely impacted by oil spillages. Loss of livelihoods, increased poverty, and social tensions often exacerbate existing challenges faced by these communities.

There have been calls for urgent need for effective measures to protect the ecosystem and communities. To achieve this, government agencies must enforce stringent regulations on oil companies operating in the Niger Delta to ensure responsible practices, prompt spill response, and enforce penalties for non-compliance. Continuous monitoring and surveillance of oil facilities, pipelines, and water bodies are also imperative to identify potential spill sites and ensure early response measures are enacted promptly. Immediate and thorough spill response, cleanup, and remediation processes must be implemented, utilizing advanced technologies and expertise to minimize the long-term environmental impacts. Developing and implementing programs to enhance local capacity in spill response, monitoring, and environmental management is also necessary. This will empower communities and enable them to actively participate in safeguarding their environment.

This paper concludes by calling for action from stakeholders: Government, Oil Companies, and Civil Society because the issue of oil spillage is a national concern. On the part of the government, this paper calls for the implementing and enforcing of stricter regulations, establish emergency response centers, conduct periodic audits of oil companies, and adequately fund research on the environmental and health impacts of oil spillage. On the part of the oil companies, this paper calls for the embracing of sustainable practices, investing in research and development of spill response technologies, engaging local communities in decision-making processes, and taking responsibility for the damages caused by oil spills. On the part of the civil society, this paper calls for advocacy for transparent and accountable governance, collaboration with government agencies, raising awareness about the consequences of oil spillage, and actively participating in community-led initiatives to protect the ecosystem.

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