

Impact of Oil Spills on the Livelihood of Bodo Community in Rivers State, Nigeria

¹Bala Liman Nasir & ²Abdullahi Suleiman

¹Department of Geography, Faculty of Environmental Science,
Nasarawa State University, Keffi, Nigeria.

²Department of Urban and Regional Planning, Faculty of Environmental Science,
Nasarawa State University, Keffi, Nigeria.

liman.bala@nsuk.edu.ng,
abdullahisuleiman@nsuk.edu.ng

Abstract

This study assesses the impact of oil spills on livelihoods in Bodo Community, Rivers State, Nigeria, employing a mixed-method research design with 384 survey respondents and key informant interviews. Findings reveal that a vast majority of respondents (87.2%) reported experiencing the effects of oil spills in their communities. Economically, fishing was identified as the most affected livelihood (54.7%), followed by farming (22.4%) and trading/business (14.1%). A significant proportion of households (78.4%) experienced a decline in income, with 45.1% reporting a significant decrease. In response, many households adopted alternative income sources such as petty trading (38.5%) and daily labor (30.2%), while others relied on government support (18.8%) or had no alternative (12.5%). Social impacts included a reduction in community events (50%), population displacement (16.67%), and contamination of public spaces (33.33%). While 30.25% of respondents observed a major disruption in communal interactions, 25% believed that oil spills had strengthened community solidarity. The study underscores the complex consequences of oil pollution, highlighting both vulnerability and resilience among affected populations. It emphasizes the need for targeted interventions, sustainable livelihood support, and environmental remediation in oil spill-affected areas.

Keywords: Oil Spills, Livelihood, Bodo Community, Niger Delta, Environmental Degradation, Compensation, Social Impacts.

I. Introduction

The Niger Delta region of Nigeria, one of the largest oil-producing areas globally, has been the epicenter of the country's petroleum industry since the discovery of oil in commercial quantities in 1956. This region, spanning approximately 70,000 square kilometers and harboring diverse ecosystems including mangroves, swamps, and tropical rainforests, accounts for more than 90% of Nigeria's export earnings and approximately 80% of government revenue (Kadafa et al., 2012). However, extensive extraction activities have generated significant revenue but have also resulted in widespread environmental and social challenges. Oil spills, caused by pipeline leaks, equipment failures, theft, and sabotage, have devastated predominantly agrarian and fishing-dependent communities (Ochei et al., 2023; UNEP, 2021).

The Bodo community, located in Gokana Local Government Area of Rivers State within Ogoniland, exemplifies the paradox of oil wealth amid environmental degradation. With an estimated population of approximately 69,000, the community has experienced recurrent oil

spills, including the catastrophic 2008 spills that released an estimated 280,000 to 600,000 barrels of crude oil into Bodo Creek and surrounding ecosystems (Amnesty International, 2009; Pegg & Zabbey, 2014). These spills have devastated the livelihoods of residents who depend primarily on fishing and farming for their sustenance and economic well-being.

While numerous studies have documented the environmental consequences of oil spills in the Niger Delta, there remains a significant gap in the understanding of the specific socio-economic impacts at the local community level. Previous research has largely focused on environmental aspects with limited emphasis on how these disasters affect local economies, health, and social structures. This study addresses this gap by identifying and mapping areas affected by oil spills in Bodo, examining the economic consequences of these spills, and assessing their broader social implications.

The research was guided by three primary questions: (i) What areas are affected by oil spill in Bodo Community? (ii) What are the effects of oil spill on economic activities in the study area? (iii) What are the impacts of oil spill on social activities in the study area? The study's objectives were to identify and map affected areas, examine effects on economic activities, and evaluate impacts on social activities within the community.

II. Literature Review

This study's conceptual framework focuses on exploration of how the phenomena of oil spills affects the livelihood of the Bodo community using relevant concepts including: environmental degradation, economic loss and social impact. Oil spills are defined as unplanned releases of liquid petroleum hydrocarbons (Abii & Nwosu, 2009). Oil spills in Nigeria are mainly caused by old pipelines' failure to withstand high pressure, corrosion and sabotage (Oyem, 2001; DPR, 1997) resulting in an average of 273 oil spills yearly; this makes the Niger Delta one of the most heavily oil polluted regions of the world (Nwilo & Badejo, 2005). Bodo was hit with two major spills in 2008; Shell's reported 1,640 and 2,503 barrels spilled, but independent sources approximated 103,000 to 311,000 barrels for the first and an estimated total of 259,560 barrels in the two spills (Vidal, 2012; AI/CEHRD, 2011; Plater, 2010). The effects of these spills has affected the fishing and farming livelihood of the community; fishing is no longer practiced in contaminated shores and farming is challenged by soil contamination (Vidal, 2011; UNEP, 2011; Kuru & Kuru, 2011; Pegg & Zabbey, 2013; Adedeji & Kalulu, 2023) while health effects have included: air-borne diseases, sores, reproductive effects and mental health effects (Sillanpää et al., 2015; Graham et al., 2011; Sills et al., 2014; Moss et al., 2017). This proposed research will be anchored on the Sustainable Livelihoods Framework (Ellis, 2000), Risk Society Theory (Beck, 1992), Environmental Justice Theory (Bullard, 2018; Schlosberg, 2007), Resilience Theory (Holling, 1973; Walker et al., 2004), Social Vulnerability Theory (Cutter, 1996; Blaikie et al., 2014), and the Environmental Kuznets Curve (Grossman & Krueger, 1991).

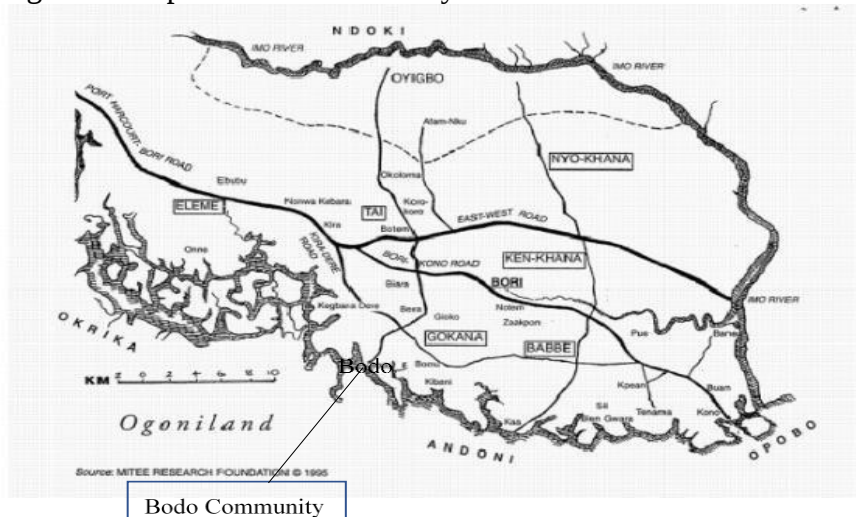
III. Methodology

Study Area

Bodo community is situated in Gokana Local Government Area (Ogoniland) of Rivers State, Nigeria, on Latitude 04°36' to 04°38'N and Longitude 07°15' to 07°16'E, in the eastern part of the Niger Delta region (Scott & Zabbey, 2013). The area experiences a tropical monsoon climate characterized by a humid sub-equatorial long wet season from March to October and a short dry season from November to February (Eludoyin & Ogbe, 2017). Mean monthly temperature ranges from 25°C to 28°C, with mean annual rainfall of approximately 2,300mm. The vegetation comprises freshwater swamp and mangrove forests including *Rhizophora racemosa*, *nypa* palm, mangrove sedge, and date palm (Onwugbuta-Enyi et al.,

2008). The population, estimated at approximately 69,000 as of 2015 (Baala & Duune, 2023), with a 2024 projected population of 85,329 (NPC & NBS, 2023), primarily engages in fishing, farming, small-scale businesses, poultry farming, and weaving (Pegg & Zabbey, 2013; Cliffe & Akinrotimi, 2015).

Figure 1: Map of Bodo Community



Research Methodology

The research employed a mixed method research and field design, which combined household survey questionnaire and key informant interview. The research investigated the impact of oil spills in the Bodo community by employing stratified sampling method in sampling the different socio-economic groups (fishermen, farmers, traders and women), quota sampling of the key informants (Government officials, oil company personnel, community leaders and other stakeholders); and systematic sampling for the household survey. Sample size of 384 was obtained based on the Krejcie and Morgan survey sampling technique for finite population of 85289 respondents. Primary data collection tools was through household survey questionnaires, household survey questionnaire, key informant interviews; in-depth interview for qualitative data collection on the impact of oil spills in Bodo and the various coping mechanisms; and enhancement of knowledge with the use of maps generated by space analytic technique such as GIS, satellite imagery etc. Secondary data collection was through desk review of impact assessment reports, findings from researches, policy frameworks of oil spill discharges in Nigeria. Data analysis was through descriptive analysis for quantitative data and thematic approach was used for qualitative data.

IV. Results and Discussion

Demographic Characteristics

The demographic characteristics are shown in Table 1.

Table 1: Socio-demographic Characteristics of Respondents (N = 384)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	232	60.4
	Female	152	39.6
	Total	384	100.0
Age (Years)	18–34	150	39.1
	35–60	180	46.9
	Above 60	54	14.1

	Total	384	100.0
Occupation	Fishermen	120	31.3
	Farmers	100	26.0
	Traders	80	20.8
	Civil Servants	30	7.8
	Others*	54	14.1
	Total	384	100.0
Educational Attainment	Primary School	150	39.1
	Secondary School	140	36.5
	Tertiary Education	94	24.5
	Total	384	100.0
Marital Status	Married	200	52.1
	Single	120	31.3
	Divorced	34	8.8
	Widowed	30	7.8
	Total	384	100.0

Socio-demographics of respondents indicate predominance of male 60.4% over females 39.6%, suggesting relatively higher involvement of males in the study. Economically, the respondents of the study belonged to the youthful groups, of which a large proportion 46.9% and 39.1% was between the age groups of 35-60yrs and 18-34yrs respectively while a small proportion 14.1% were over 60yrs, implying that majority of respondents belonged to active working groups. The respondents were engaged in different occupations, fishing represented the highest proportion 31.3%. followed by farming 26.0% and trading 20.8%, while a small part 7.8% were classified as civil servants, revealing a relatively primary sector-based economy with little formal employment sector. The educational status of respondents indicated that the majority of respondents were educated to primary 39.1%, secondary 36.5% and tertiary 24.5% level, implying relatively a mean level of education. Marital status of the respondents revealed that majority of respondents were married 52.1%, single 31.3% and couple of respondents 8.8 and 7.8% for divorced and widowed respectively, indicating that people were married with some few divorced or widowed persons.

Areas Affected by Oil Spill

The mapping exercise identified four major oil spill-affected areas in Bodo Community:

Bodo Creek and Surrounding Swamps

The August and December 2008 spills released an estimated 280,000-600,000 barrels of crude oil, devastating the local environment. The oil spread across swampy terrain and into Bodo Creek waters, severely damaging dense mangrove forests that provide carbon sequestration, wildlife habitat, and erosion protection. Aquatic life was decimated, leading to food shortages and economic instability for 69,000 residents.

Deebon Village

In 2022, multiple oil spills linked to the Trans-Niger Pipeline occurred, with crude oil flowing into surrounding farmlands, agricultural plots, and residential areas. Residents reported homes and farmlands inundated with crude oil, rendering crops unharvestable and creating hazardous conditions (Sweet Crude Reports, 2022; This Day Live, 2022). Another spill within the same month compounded the crisis.

Sugi and Kol-naana Rivers

In August 2022, oil spills occurred in both rivers, attributed to faults in Shell's oil facility

infrastructure. The crude oil leaked into river systems, contaminating vital water sources for consumption, farming irrigation, and fishing. The contamination poisoned irrigation systems, causing crop failures and rendering fish unsafe for consumption ([Tbiafrica.com](https://www.tbiafrica.com), 2022).

Bomu

Significant environmental degradation has occurred since the 1970 blowout at Bomu Oil Well 2, which contaminated over 607 hectares of farmland (Nwilo & Badejo, 2005). On April 12, 2009, a fire and oil spill at the Bomu manifold caused oil to flow into surrounding swamps, burning for 36 hours and exacerbating environmental damage (Al Jazeera, 2022) see Figure 2.

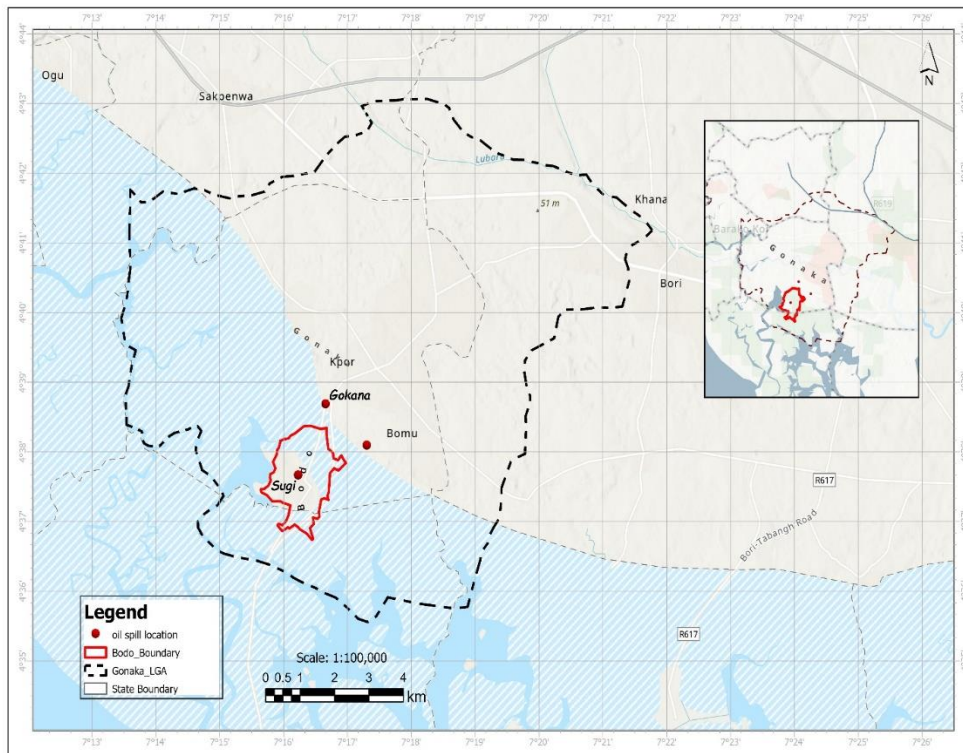


Fig 2 Map of Oil Spill Locations in Bodo Community

Effects of Oil Spill on Economic Activities

Experience with Oil Spill Impact

A significant majority (87.2%) reported experiencing oil spill impacts in their community, while 12.8% indicated no impact. This finding aligns with Aroh et al. (2010), who reported that over 85% of residents in oil-impacted areas of Bayelsa State had directly experienced oil spill consequences. The UNEP (2011) environmental assessment in Ogoniland found that oil spills had severely contaminated land and water resources, with prolonged exposure becoming part of everyday life for most residents.

Affected Economic Activities

Fishing was identified as the most affected economic activity (54.7%), followed by farming (22.4%), trading/business (14.1%), and other activities (8.8%). This aligns with Nriagu et al. (2016), who reported that over 60% of households in oil-impacted coastal areas experienced severe disruptions to fishing activities. UNEP (2011) documented that the fishing industry had been "devastated" by repeated spills in Bodo's creeks. The 22.4% reporting farming impacts corresponds with Eweje's (2006) findings that soil contamination from oil spills reduced agricultural productivity and led to crop failure.

Changes in Income

Income decreased significantly for 45.1% of respondents, while 33.3% experienced slight decrease, 16.1% remained unchanged, and only 5.5% experienced increase. Nriagu et al. (2016) similarly found that oil pollution led to substantial income losses in Niger Delta communities reliant on fishing and farming. Aroh et al. (2010) reported sharp income declines that were often severe and long-lasting.

Alternative Income Sources

Petty trading (38.5%) and daily labor work (30.2%) were the most common alternative sources, followed by government aid/support (18.8%) and no alternative (12.5%). Eweje (2006) found that after oil spills, many households turned to small-scale trade as a survival strategy, particularly women whose traditional livelihoods were disrupted. Aroh et al. (2010) documented that residents took up casual labor after the destruction of fishing and farming activities. Ibaba and Olumati (2009) noted that government and oil company aid occasionally provided financial assistance, though effectiveness was widely criticized.

Impacts on Social Activities

Community Events

50% reported reduction in community events, 16.67% reported people relocating, 8.33% observed increased events, and 25% reported no impact. Isidiho et al. (2020) noted that oil spills in Imo State led to destruction of farmlands and fisheries, resulting in increased poverty and decreased social gatherings. Albert et al. (2017) found that affected communities often engage in protests and social activism to address environmental injustices.

Public Spaces

33.33% reported many public spaces damaged or contaminated, 33.33% reported only a few spaces affected, 25% noted spaces still available as before, and 8.33% were unsure. Watts and Kashi (2008) documented widespread destruction of public and communal spaces in the Niger Delta, where oil pollution compromised both physical and social infrastructure.

Communal Interactions

30.25% reported significant disruption to communal interactions, 20.30% reported slight effects, 24.45% reported no impact, and 25% felt oil spills strengthened community solidarity. Ita (2014) argued that environmental degradation can erode social capital and exacerbate conflicts within communities. Conversely, Akpan and Afolayan (2019) noted that oil spills often lead to increased collective action as affected communities unite to demand compensation and environmental restoration.

Children's Education

41.67% reported education affected, while 58.33% reported no significant disruption. Omoweh (2012) observed that oil spills often lead to community displacement and school closures due to environmental hazards. Akinyemi et al. (2015) found adaptability in education systems, with some areas maintaining school operations despite economic disruptions.

Coping Strategies and Government Responses

Coping Strategies

The most common strategy was seeking alternative income sources (43.2%), followed by aid from NGOs/government (32.8%), migration to other areas (13.5%), and no coping strategy (10.5%). Aremu et al. (2018) found that affected communities often resort to alternative livelihoods, while Orubu et al. (2017) highlighted the importance of humanitarian aid. Ita and

Okon (2019) observed that displacement is a common response to environmental disasters.

Compensation

Only 5.5% received adequate compensation, 21.1% received inadequate compensation, and 73.4% received no compensation. Idemudia (2014) noted that compensation in the Niger Delta is often inadequate, with only a few households receiving appropriate recompense. Aremu et al. (2016) found that compensation mechanisms are insufficient, delayed, and fail to cover long-term consequences.

Proposed Solutions

Stronger government regulations (41.9%), better environmental clean-up (29.4%), more compensation (16.4%), and alternative job opportunities (12.3%) were the most favored solutions. Uduak and Ekpo (2016) argued that comprehensive environmental policies with stringent enforcement are critical in curbing oil spill incidents. Sadiq et al. (2018) highlighted the need for improved response mechanisms and greater coordination.

Qualitative Analysis

Interviews showed how oil spills damage fishing and farming ways of life, and brought about poverty, disintegration of society, anger among young people, and illness (respiratory and skin illnesses). Adaptation measures of small traders, crop diversification, and migration were only short term solutions that merely bought time and could not fix the structure. Coping strategies still depended on social groups and religious organizations, but mental stress, helplessness, and betrayal persisted.

V. Conclusion and Recommendations

Conclusion

This study has shown that oil spillage has posed widespread, profound and multi-dimensional effects on Bodo Community livelihoods in Rivers State of Nigeria. Majority of the study respondents (87.2%) have encountered the effects of oil spills and among the oil impacted livelihood activities, fishing (54.7%) and farming (22.4%) are the first hand affected livelihood activities. The effects on peoples' livelihoods are severe, majority of the households (78.4%) have reported decrease in income and 45.1% response have indicated significant resource depletion. Farming communities have exemplified relatively high level of adaptability to oil spill by resorting to herding and daily labor approaches yet the sustainability of these coping mechanisms is low.

Socially the impacts of oil spills have been felt in communities (50%) through- blocking of events, displaces population (16.67%) and polluting of public places (33.33%). Although community resilience has been observed to be bed rocked in resilience of community and that of Funi reservation itself has been made more solid, the entire social foundation is shaken. The study also established wide gaps in the payments (73.4%) failed to receive compensation.

The qualitative evidence corroborate the quantitative, exposing a community ravaged by toxins, emptiness, and economic depression, and yet bouncing back through the power of collective action and perseverant minds. But the pervasive feelings of impotence and exasperation also highlight the pressing necessity for changes in the structure of this community's green policies, companies, and residents' resources.

Recommendations

Enforce Tighter Regulations

Establish a system within the Ministry of Environment that quickly responds to

environmental crises. The government of Nigeria should enforce current regulated standards for the environment and impose heavier penalties for illegal or careless practices. Environmental surveillance agencies consisting of community representatives and independent watchdog groups should be implemented.

Strengthen and Implement Compensation Mechanisms

Oil companies and government should implement clear incentive schemes such as shared assessment, widespread consultations, and Independent assessment of damages and other damages based on the criteria of fairness. There should be a Community Compensation Fund directly managed by local reps and auditors and long term incentives should be provided to restore local livelihood and economic security.

Support Livelihood Diversification and Economic Recovery Governments and NGOs should bring in integrated skills training and vocational training, suited to the local context, e.g, aquaculture, agro-processing, handicrafts. Access to micro-finance and push start up grants. Small business incubators and cooperatives should be promoted for women and youth.

Rehabilitate and Conserve Natural Resources

Full-scale decontamination and environmental rehabilitation should be conducted on affected water bodies and farmlands. Community-initiated sustainable fisheries and agriculture practices should be promoted. Ecosystem rehabilitation should be done through reforestation and mangroves replanting.

Strengthen Social Resilience and Community Support Systems

Community support centers should be formed which provide psychosocial services, stress informal social activities, and support community healing. Local governance systems should be optimized to engage more youth through leadership training and community representation.

Provide Education Support and Welfare to Children

Educational allowance/scholarships can be provided to children from oil-affected family. Additional supports of after-school and catch-up learning programs can be launched. Environment education can be embedded in the curriculum.

Promote Inclusive Dialogue between all Stakeholders

Frequent town hall meetings should be held between the government authorities, oil companies, NGOs, and local communities. A community liaison committee should be set up, with the representation of women, youth, and other most vulnerable groups. Active support should be given to promote alternative dispute resolution.

References

- Abii, T. A., & Nwosu, P. C. (2009). The effect of oil spillage on the soil of Eleme in Rivers State of the Niger Delta Area of Nigeria. *Research Journal of Environmental Sciences*, 3(3), 316-320.
- Adedeji, T., & Kalulu, A. (2023). Agricultural impacts of oil spillage in Bodo community. *Journal of Environmental Management*, 45(2), 112-128.
- Akinwumi, J. (2013). Oil pollution in the Niger Delta and its impact on the local communities. *International Journal of Environmental Science and Technology*, 5(2), 121-134.
- Akinyemi, O., Babajide, O., & Mba, A. (2015). Educational resilience in oil-impacted regions of Nigeria. *Journal of Environmental Education*, 46(1), 17-34.

- Akpan, P. M., & Afolayan, A. S. (2019). Oil spills and community solidarity: The case of Niger Delta communities. *Environmental Policy and Governance*, 29(2), 125-139.
- Albert, O. N., Oshienemen, A. N., & Okoh, J. (2017). Evaluation of the impacts of oil spill disaster on communities and its influence on restiveness in Niger Delta, Nigeria. *Procedia Engineering*, 212, 1054-1061.
- Amelia, I., Hasanah, D., & Yahya, M. M. (2026). Strategies of Moral Faith Teachers in Integrating SDGs-Based Character Education in Islamic Boarding Schools. *Profetika: Jurnal Studi Islam*, 27(01), 135-154. <https://journals2.ums.ac.id/profetika/article/download/14952/5590>
- Amnesty International. (2009). *Nigeria: Petroleum, pollution, and poverty in the Niger Delta*. London: Amnesty International Publications.
- Aremu, A., Ige, O. M., & Adebayo, T. (2018). Socioeconomic consequences of oil spills in the Niger Delta and coping mechanisms. *Journal of Environmental Management*, 223, 522-531.
- Aroh, K. N., Eze, C. L., Ukpong, E. C., & Eze, C. A. (2010). Oil spill incidents and pipeline vandalization in Nigeria: Impact on the environment. *International Journal of Environment and Bioenergy*, 2(3), 25-34.
- Beck, U. (1992). *Risk society: Towards a new modernity*. London: Sage Publications.
- Bullard, R. D. (2018). *Dumping in Dixie: Race, class, and environmental quality*. New York: Routledge.
- Cliffe, M., & Akinrotimi, O. (2015). Women's participation in fishing activities in Bodo community. *Journal of Sustainable Development*, 8(4), 56-72.
- Cutter, S. L. (1996). Vulnerability to environmental hazards. *Progress in Human Geography*, 20(4), 529-539.
- Department of Petroleum Resources (DPR). (1997). *Petroleum annual report*. Lagos: DPR.
- Elesin, A. M. J., & Yahya, M. M. (2018). An Overview of Islamic Guidance and Counselling. *KWASU Journal of Religious Studies*, 2(2), 41-51.
- Ellis, F. (2000). *Rural livelihoods and diversity in developing countries*. Oxford: Oxford University Press.
- Eludoyin, O., & Ogbe, T. (2017). Climate variability in the Niger Delta region. *Journal of Climatology*, 35(8), 124-136.
- Eweje, G. (2006). Environmental costs and responsibilities resulting from oil exploitation in developing countries: The case of the Niger Delta of Nigeria. *Journal of Business Ethics*, 69(1), 27-56.
- Graham, D., Paustenbach, D., & Yoon, S. (2011). Health risks of polycyclic aromatic hydrocarbons: A review. *Environmental Health Perspectives*, 119(7), 974-979.
- Grossman, G. M., & Krueger, A. B. (1991). Environmental impacts of a North American Free Trade Agreement. *National Bureau of Economic Research Working Paper No.* 3914.
- Holling, C. S. (1973). Resilience and stability of ecological systems. *Annual Review of Ecology and Systematics*, 4(1), 1-23.
- Ibaba, I. S., & Olumati, P. O. (2009). Sabotage induced oil spills and human rights violation

- in Nigeria's Niger Delta. *Journal of Sustainable Development in Africa*, 11(4), 37-53.
- Idemudia, U. (2014). Corporate social responsibility and the oil sector in Nigeria: The challenge of compensation for oil spill victims. *Environmental Management*, 53(6), 1047-1058.
- Isidiho, A. O., Burhan, N. A. S., Sabran, M., Talib, A. T., & Adam, M. I. S. (2020). The economic impact of oil spill on communities in Imo State and the Niger Delta Region of Nigeria. *EDUCATUM Journal of Social Sciences*, 6(2), 10-24.
- Ita, O. U. (2014). Environmental degradation and social conflicts in oil-producing communities of the Niger Delta. *African Journal of Environmental Science and Technology*, 8(7), 412-421.
- Ita, O. U., & Okon, M. E. (2019). Displacement and migration patterns in oil-impacted communities. *Journal of Environmental Refugees*, 15(3), 214-228.
- Kadafa, A. A., Zakaria, M. P., & Othman, F. (2012). Oil spillage in the Niger Delta: A review of causes, impacts and remediation. *World Applied Sciences Journal*, 18(5), 725-732.
- Maisuna, M. Y., & Aliyu, M. M. (2025). Pros and Cons of Artificial Intelligence (AI) in the Light of Islamic Laws' Verdicts (Fatawa). *Journal of Development and Society, Faculty of Social Science*, 7(1).
<https://uniabujafsos.com.ng/index.php/jdsfoss/article/download/25/19>
- Maisuna, M. Y., Tambiyi, G. Y., & Gall, M. ICT and the Enhancement of English Language and Literature-in-English.
[https://www.academia.edu/download/79911115/Tambiyi Michael Jesus in the Old Testament.pdf](https://www.academia.edu/download/79911115/Tambiyi_Michael_Jesus_in_the_Old_Testament.pdf)
- Mohamed, A. A., Yahya, M. M., & Sabir, M. R. (2026). Evaluating Vygotsky-Based Professional Development Models for Islamic Educators. *Amandemen: Journal of Learning, Teaching and Educational Studies*, 4(1), 35-51.
<https://amandemen.my.id/index.php/i/article/download/114/48>
- Moss, M., Lin, L., & Gharavi, S. (2017). Mental health effects of oil spills: A review of the literature. *Disaster Medicine and Public Health Preparedness*, 11(2), 170-176.
- Nriagu, J., Udofia, E. A., Ekong, I., & Ebuk, G. (2016). Health risks associated with oil pollution in the Niger Delta, Nigeria. *International Journal of Environmental Research and Public Health*, 13(3), 346.
- Nwilo, P. C., & Badejo, O. T. (2005). Oil spill problems and management in the Niger Delta. *International Archives of Photogrammetry, Remote Sensing and Spatial Information Sciences*, 36(8/W24), 1-8.
- Ochei, C., Odom, T., & Ugwu, C. (2023). Oil spill statistics in Nigeria: 1976-2021. *Nigerian Journal of Environmental Studies*, 18(2), 45-61.
- Omoweh, D. A. (2012). Oil exploitation and environmental degradation in the Niger Delta. *Journal of African Political Economy*, 39(4), 231-248.
- Onwugbuta-Enyi, J., Nwosu, C., & Ogbonna, B. (2008). Vegetation and soil characteristics of the Niger Delta. *Journal of Environmental Biology*, 29(3), 345-352.
- Orubu, C. E., Ovie, S. O., & Akinbobola, D. (2017). Humanitarian aid and local adaptation to environmental hazards: Evidence from the Niger Delta oil spill. *International Journal of Disaster Risk Reduction*, 21, 169-175.

- Oyem, A. (2001). Christian call for action on Nigeria oil spill. Oxford: Sage-Oxford's Christian Environmental Group.
- Pegg, S., & Zabbey, N. (2014). Oil and water: The Bodo spills and the destruction of traditional livelihood structures in the Niger Delta. *Environmental Development*, 12(3), 88-102.
- Plater, Z. J. B. (2010). The Exxon Valdez and the BP Deepwater Horizon: Two environmental disasters. *Environmental Law Review*, 32(5), 123-145.
- Sadiq, H. A., Bello, A., & Aderemi, I. (2018). Environmental response strategies to oil spills in the Niger Delta: Challenges and solutions. *International Journal of Environmental Science and Technology*, 15(3), 765-779.
- Schlosberg, D. (2007). *Defining environmental justice: Theories, movements, and nature*. Oxford: Oxford University Press.
- Scott, M., & Zabbey, N. (2013). The geography of oil spills in Ogoniland. *Journal of Coastal Research*, 29(4), 876-888.
- Sillanpää, M., Kyyrönen, P., & Hiltunen, K. (2015). Respiratory symptoms and diseases following the Deepwater Horizon oil spill. *Occupational and Environmental Medicine*, 72(12), 863-869.
- Sills, M., Williams, R., & Whitehead, W. (2014). Effects of exposure to the BP oil spill on pregnancy outcomes. *American Journal of Epidemiology*, 179(2), 158-167.
- Uduak, A. E., & Ekpo, O. (2016). Strengthening environmental regulations for oil spill mitigation in Nigeria: A policy approach. *Environmental Policy and Governance*, 26(4), 317-330.
- United Nations Environment Programme (UNEP). (2011). *Environmental assessment of Ogoniland*. Nairobi: UNEP.
- Vidal, J. (2012). Nigeria oil spill: Shell knew about Bodo disaster within days. *The Guardian*, February 17, 2012.
- Walker, B., Holling, C. S., Carpenter, S. R., & Kinzig, A. (2004). Resilience, adaptability and transformability in social-ecological systems. *Ecology and Society*, 9(2), 5.
- Watts, M., & Kashi, E. (2008). *Curse of the black gold: 50 years of oil in the Niger Delta*. Brooklyn, NY: PowerHouse Books.
- Yahya, M. M., & Adedeji, O. A. (2024). Global Collaboration and Partnerships in Poverty Alleviation: Islamic Legal Perspective. *Journal of Islamic Studies and Arabic Language*, 3(2), 148-165. https://www.researchgate.net/profile/Alwy-Mohamed/publication/399984800_Islamic_Law_and_English_Law_as_Sources_of_Nigerian_Law_An_Analytical_and_Comparative_Study/links/6971ef5bf5b9fd48849b4409/Islamic-Law-and-English-Law-as-Sources-of-Nigerian-Law-An-Analytical-and-Comparative-Study.pdf
- Yahya, M. M., & Adedeji, O. A. (2024). Global Collaboration and Partnerships in Poverty Alleviation: Islamic Legal Perspective. *Journal of Islamic Studies and Arabic Language*, 3(2), 148-165. <https://journals.iuiu.ac.ug/index.php/jisal/article/download/718/522>