
Environmental Regeneration and Economic Sustainability: Examining Some Stylized Facts for Long-term Development of the Niger Delta

Donatus Otaigbe, ONOGBOSELE, Ph.D.

Department of Economics, University of Africa, Toru-Orua, Bayelsa State, Nigeria.

doi.org/10.51505/IJEBMR.2025.9606

URL: <https://doi.org/10.51505/IJEBMR.2025.9606>

Received: May 19, 2025

Accepted: May 26, 2025

Online Published: Jun 07, 2025

Abstract

The study examines the relationship between environmental regeneration and economic sustainability in the Niger Delta within four decades. It demonstrated that dearth of funds, corruption and mismanagement had wreaked havoc on the region's environment. This environmental degradation had impacted traditional livelihoods such as farming and fishing, jeopardising the region's long-run economic viability and survival. As a result, many residents had turned to crude oil theft and unlawful refining ("Kpo fire"). Pollution had also caused widespread health concerns, including respiratory disorders, cancer, and skin ailments, while acid rain and decreasing agricultural and fish yields have jeopardized the region's well-being. To achieve long-term growth, survival and sustainable development in the Niger Delta, it is recommended that the region diversifies its economy beyond oil and gas, focusing on sectors with greater potential for job creation and poverty reduction. Oil firms should increase their corporate social responsibility by working directly with communities and employing local labour for development initiatives, rather than going through intermediaries who may mismanage the resources. Efforts should also be made by stake holders to discourage residents from the entitlement mindset surrounding employment or revenues generated in the oil and gas operations, and prepare the region for a post-oil future, and the problems of climate change through inclusive and forward-thinking measures. Bioremediation was also recommended as one of measures to reclaim the environment for the sustainable development of the region.

Keywords: Environmental Regeneration; Economic Sustainability; Niger Delta

JEL Classification: Q56; Q01; Q34

1. Introduction

River Deltas regions may be considered as the wealthiest places on earth, drawing large populations with their rich environmental resources and strong economic potentials. They are hubs of innovation, biodiversity, industrial and agricultural productivity. Besides, the Delta regions are some of the most highly stressed areas in the world, with great competition for land, water use, other natural resources etc., that proliferate in them (Foufoula-Georgiou, 2013). They experience impacts from all activities occurring in the River Basins. Natural characteristics of

Deltas make them vulnerable to complex problems such as flooding, subsidence, and salt water intrusion, and in recent times conflicts as in the case of Nigeria for example.

Human activities and impacts increase their vulnerability by reducing natural resilience, introduce additional and devastate vital ecosystem. Although there are over 11 thousand Deltas in the world, about 48 large ones are most important (International Institute for Environment and Development, 2023), with the Ganges-Brahmaputra being the largest in the world, with a 105,000km², and Niger Delta Region (NDR) taking the 9th place in the world, occupying 70,000km², which accounts for about 7.5% of Nigeria's total land mass (Nwilo, & Badejo, 2001).

Historically, and cartographically, the NDR is constituted of Delta, Bayelsa and Rivers States. However, six other states cutting across two other regions have now been included viz; Cross-River, Akwa-Ibom, Edo, Abia, Imo and Ondo states, hence, it covers South South (6 states), South East (2 states), and South West regions (1 state) - three out of the six geo-political regions of Nigeria. It currently constitutes about 25% (about 55million people) of Nigerian population (Ike, & Emaziye, 2012; Nwilo, & Badejo, 2001), and it's considered as the world's largest wetland, and has been engulfed in crisis of instability caused by various groups, communities, individuals etc., agitating for development, environmental protection, resource control and self-determination (Sokari, 2022). The reasons for the aforementioned are not far-fetched, as they are basically instigated either by local or national, internal or external forces as the case may be. Hence the NDR is by and large poverty-stricken, disease-prevalent, and has been plagued by multifarious agitations overtime.

NDR is constituted of a heterogeneous ethnic nationalities; Ijaws (Izons), Urhobos, Ukwuanis, Efiks, Ibibios, Isokos, Ibos, Itsekeris, and other sub-minorities which cuts across the nine states of Nigerian 36 states, have been inflicted with environmental pollution of its air, water and land, due to the activities of oil firms and saboteurs, leading to environmental genocide. This has devastated the environment and wildlife, endangered the health of most of the residents, deprived many of their livelihoods, and has fueled the regions already endemic insecurity, thus, exploration and exploitation of oil and gas in NDR, has been achieved at a great cost-peoples welfare and wellness, instigating agitations and restiveness (Justice for Bayelsa- Bayelsa State oil and gas Commission; Orish, 2021)

Unfortunately, the people's quest to resist these afflictions, occasioned by deprivation and large-scale unmitigated poverty prevalent in the region, has sometimes been met with stiff suppression from the Nigerian state, resulting in large scale perpetuation of crimes and criminality, human right abuses unleashed by the state. This, and the concomitant resistance and agitations of some of the occupants of the region, has, significantly resulted in self-inflicted environmental pollution and degradation, from illicit activities such as crude oil theft, illegal local refining of crude oil, continuous unrestrained exploitation (destruction) of the forest and mangrove among others, has created unmitigated economic, political, and social problems for the region in particular, with all

the implied consequences across the country, most especially, the long-term or future survival of the region.

Stripped to its barest essential, the problem of the NDR can basically be looked as economic deprivation. How do we mitigate these problems caused by nature, exacerbated by man, and ensure that the region does not go extinct, and sustainable development among the comity of ethnic regions in the world is guaranteed. Thus, the struggle of the NDR should not be construed as just about resource control, but that of ensuring that oil and gas firms strictly adhere to international best practices that safeguards the future of the people and their environment.

2. Conceptual and Theoretical Definition and Explanation of the key Variables

2.1: Environment

Environment here is the natural world, as a whole or a particular geographical area, in particular, as it is affected by human undertakings. It includes the water, air, land, and all plants, animals and human beings, living therein, and the interrelationships which exist among these or any of them (Aleru, 2017; Ityavyar, & Thomas, 2007). We adopt this as our working definition, in the study.

2.2: Regeneration

Regeneration implies renewal, regrowth, recovery, or restoration etc. Hence, Environmental Regeneration implies the ability of the ecosystem-environment and its living humans to renew and recover from damage. It involves formulating and implementing lifestyle policies that sustain and improve the natural environment and avoid depletion of resources. Basically, it is restoring what has been damaged in the natural environment of NDR – air, plants, animals, oil, natural gas, water, forest etc. i.e. the ecosystem as a whole (Shackelford, & McDougall, 2023).

2.3: Economic Sustainability and Sustainable Development (SD)

Economic Sustainability refers to activities that support long-term economic growth without harming the social, environmental, and the culture of the society (Mollenkamp, 2023). In other words, long-term economic growth that meets the needs of the present generation, without compromising the ability of the future generation to meet their own needs. Perhaps, coined from sustainable development; a phrase that found its way into the economic lexicon in the year 1972, in the UN Conference on Human Environment, held in Stockholm, Sweden in June. Subsequently, 20 years after, there was the United Nations Conference on Environment and Development (UNCED) organized conference in Rio, Brazil, in June 1992, Earth Summit. Previously, we had the Gro Harlem Brundtland chaired Report of 1987, commissioned by World Commission on Environment and Development (WCED), titled “**Our Common Future**” introduced the concept of Sustainable Development (SD), and described how it could be achieved, hence, the concept began to gather momentum (Chasek, 2020).

The 1992 Rio Conference was organized by the UNCED in June, which aimed to establish common goals of environmental protection with differentiated responsibilities for its fulfillment (UNCED, 1992). Again, another Rio conference was held in June 2012, by United Nations Conference on Sustainable Development (UNCSD), whose objective was to produce a set of global goals that meet the urgent environmental, political and economic challenges facing the world (Pisano, Endl, & Berger, 2012).

By 2016, the world began the implementation of the 2030 agenda for SD, based on the 17 Sustainable Development Goals (SDGs), formulated a year earlier which translates to; “promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective accountable and inclusive institutions at all levels” by the year 2030. There are 191 countries in the world, including Nigeria which signed up to it in 2015. In 2023 in New York, a SDGs meeting was held, which was a new phase for accelerated progress towards 2030. World’s Summit for SD identified certain fundamentals as constituting projects that qualify sustainably developing a people thus; projects which come from the people; do not distort the ecosystem; its managed and serviced by the people; which are owned by the people (Hoss-Golan, Gofen, & Wellstead, 2024).

3. Empirical Review

3.1 Stylized Facts among the Variables Nexus

Of the over 923,7770km² Nigeria occupies, the NDR which currently constitutes of 9 states in the country, occupies 70,000km² (7.5% of Nigeria’s total), the largest Delta in Africa, the 9th largest in the world, and host about 25% of Nigerian population (one-quarter), which is over 50 million with the current estimates (Edoho, 2021). The NDR, is regarded as a place of high ecological value, the world’s 3rd largest mangrove and fresh water swamp, a third of which is wetland.

The region has over 200 oil fields, 400 oil producing and storage facilities, which generates over 90% of Nigerian export earnings, 80% of government revenue, and contributes between 5.5% - 9% to GDP, and up to 92% of the value of all exports (Nigerian Embassy Algiers, 2025; Chukwuma-Ekwueme, 2023). Undoubtedly, this statistic makes it the most important region of Nigeria in terms of oil and gas exploration, exploitation, sabotage, rent-seeking, wide-scale crime and criminality among others, instigated by internal and external forces, has caused a lot of damage to the ecosystem in the region.

Gas flaring from the region since the 1960s and 70s has contributed to over 30 billion tones/year of greenhouse gases that is depleting the ozone layer, making the earth warmer than hitherto. Moreover, we also have uncontrolled continuous wood logging destroying most of the forest and mangroves in the region, this also fits in here. Unregulated sinking of water boreholes everywhere, without scientific evaluation also impacts the environment, especially in the LR (Ogwu, Oluwaferanmi, & Johnson, 2021; Obi, Akuirene, Bwitit, Adjene, & Nwose, 2021).

3.2 Implications of this Nexus

The exploration and exploitation of oil in the NDR which has basically destroyed most of the ecosystem of the region, induced by state corruption, greed and mismanagement, has a wide range consequences viz; destruction of the traditional livelihood of the people like, fishing, farming in crops such as plantain, potatoes, cassava etc., jeopardizes the economic sustainability of the region. NDR constitutes about 25% of Nigerian population, which translates to over 50 million people, of which over 70% are young people under 30 years of age. Over 70% of the residents live below the poverty line of (\$1.90), about ₦3,135 (National Bureau of Statistics, 2022; Foundation for Partnership Initiatives in the Niger Delta, 2011).

Many of residents, particularly the youth, live in extreme poverty, despite being surrounded by signs of wealth and affluence; this stark contrast fuels their frustration and drives a struggle for survival, though their efforts are at times misdirected. The wide-scale frustration among most of the people in the area has resulted in the formation of militants gangs, some of whom have not just resulted in sabotaging oil exploration, but has a recourse to theft of crude oil and locally refining same popularly referred to as **“Kpo Fire”** This is not only hazardous, but highly inimical to the ecosystem of the region; including but not limited to; it’s impact on the community in terms of environmental harmony, health hazards and financial losses

Evidences have shown that skin diseases (oil acne), cancer, decreased fertility, fevers, cough and other respiratory diseases, diarrhea, abdominal pain are rampant among the region residents. Again, research has proven that there are reduced crop yields, as well as fish and its related products. The acid rain which endangers all forms of life, and destroys properties are also common in the NDR. Another reported economic effect of environmental degradation in the region, is the impoverishment of agriculture land, resulting in part, to the activities of Multinational Corporations (MNCs), especially oil and gas-related, which aids and exacerbate floods and erosion (Chijioke, et al., 2025).

It has been estimated that the government needs to plant 7.5million hectares of trees, that will absorb over 638 million carbon from gas flaring, and other sources of carbon, with a budget estimate of \$94million annually, in order to alleviate the toll on the environment and ecosystem of the NDR which accounts for more than 90% of earnings mainly from oil and gas in the region, and contributes over 60% of federally distributed revenue in Nigeria, with over 10,000km of pipelines, over 100 flow stations, over 10 gas plants, over 1,500 oil producing wells, 3 refineries is devastating (Amadi & Alapiki, 2014)–though most now moribund, makes sustainable development of the region a herculean, but not am impossible task.

3.3. Lessons from Some Selected Similar Climes

i. Just like the NDR, “Oil-Curse” has also afflicted some countries, who have suffered conflicts, crisis, mayhems, wars and deaths. Some of these crises resulted from perceived marginalization, neglects, oppression, injustice, and environmental degradation etc. Some of these countries who have witnessed such mayhem and crisis, are; Algeria, Angola, Sierra Leone, Democratic

Republic of Congo, Venezuela, South Sudan (before Independence), Columbia in Latin America etc. (Ahmadov & Guliyev, 2016; Mailey, 2015), which were very devastating for these countries that are still counting their losses, and recovery still a far cry; and mistrust deeply entrenched among the antagonists.

ii. However, Nigeria can study from the success story of some countries that have positively utilized their mineral resources for their country's development viz; Gabon, Equatorial Guinea, Botswana, Qatar, Norway, UAE. Saudi Arabia etc. Nigerian leadership can learn from what these countries did differently, to have achieved this level of harmony and development prompted by their natural resources' utilization. The Nigerian state can mimic, and replicate those countries policies that fits into her narratives.

iii. The overall capital of a nation does not only include manufactured capital (machines, factory, and roads or other infrastructures) but also human capital (knowledge, experience, skills) and environmental capital (forests, soil quality, and rangeland), this is how imperative environmental accountability has become in determining sustainable development. Thus, the country improves the human capital of the region through investment in skills and education of the people, especially the young residents.

3.4 A Brief Review of Previous Modest Efforts by Government at Tackling the Problem in Niger Delta Region

Since Nigerian independence, the concerns raised by the people, activists and stakeholders of NDR have always been placed before every succeeding government, albeit the exacerbation of the development and sundry crisis and challenges bedeviling the region. Prior to independence in 1960, the colonial Administration in 1958, consequent upon the early agitation and the report of the Henry Willink's Commission, recommended a special development agency, having declared the region special area that requires special intervention.

Following Nigerian independence, the federal government established a number of interventionist agencies charged with the responsibilities of developing the region. Some of these agencies includes; Niger Delta Development Board (NDDDB) established in 1960, the Presidential Taskforce on Oil Mineral Producing Areas in 1991, Oil Mineral Producing Area Development Commission (OMPADEC) in 1992, Niger Delta Development Commission (NDDC) in the year 2000, Niger Delta Ministry in 2008, ND Amnesty Program in 2009 among others (Ekpu, 2021; Afolabi, 2017). Suffice to say that the aim of setting up these institutions or agencies was to facilitate the rapid, even and sustainable development of the region, that is economically prosperous, socially stable, ecologically regenerative, and politically stable.

Though most research works regarding the underdevelopment and crisis affecting the NDR had be blamed on the Nigerian state, and most of the Multinational oil and gas companies operating in the region, suffice to say that the stakeholders in the region viz; the community leaders, political leaders, youth organizations, traditional rulers and the likes, have to also be called out for the environmental degradation and underdevelopment of the region, prompted either through

collaboration with these companies and government, outright sabotage or through their rent-seeking activities, mostly of criminal nature, that undermines their environment, and impoverish their people. This has largely been neglected in the literature, and thus one of the gaps this study seeks to fill.

Though this paper is basically a qualitative research work, we however, still adopted a descriptive methodology that involves statistical facts and figures obtained largely from government agencies and other organizations, over a span of four decades.

3.5 Some Stylized Facts of Previous Government Efforts

A little background check reveals that oil revenues contributed just 1% to total revenue in the 60s, by 1990s, it accounted for 98% of the total revenue. However, oil producing minority states got 50% of total revenue derived from them, but drastically reduced to 15% (initially for OMPADEC), to a paltry 3% by mid 1990s, and only increased to 13% in 1999 due largely to the struggles and agitations.

OMPADEC was given a seed money of over ₦1.6billion at inception, which was filtered away through corruption and other unwholesome management practices. Furthermore, in the period 1992-1996, out of the expected allocation ₦85.47billion, only the sum of ₦13.71billion (16.04%) was released to the agency, leaving a shortfall of ₦71.72billion (83.91%). This was indeed massive, and the trend continued (Akpan, 2023).

In 2024 budget, a mere ₦1.9trillion was earmarked for NDDC projects in the 9 states. Similarly, from 2001-2019, the agency received ₦6trillion to execute their projects. However, it was acknowledged by the government that over 13,000 projects were either poorly executed or unverified, prompted by corruption and mismanagement (Chukwu, 2024). Thus, paucity of funds contributed to the less-than-optimal performance of these interventionist agencies. As early as 2001 for example, only ₦15.77billion was budgeted for NDDC projects, the following year 2002, out of the ₦40billion proposed by the Commission, only a paltry sum of ₦17billion was approved by the national assembly. Again, between 2009-2015, the ministry of ND received ₦427billion (60%) out of the budgeted ₦700billion. This trend continued over the years, to the extent that they recently, even resorted to borrowing funds to meet their obligations (Akeju, 2017).

These agencies, apart from their challenges of underfunding, have been largely accused of corruption, mismanagement, highhandedness, recklessness, lack of transparency and accountability in the usage of allocated funds by stakeholders, government, activists among others. There were also the politicizations of the leadership of the commission, which negatively impacted their activities. Even the sub-national governments are not immune from these criticisms. For example, within two and half years of the return of democracy (May1999-Dec 2011), the ND states received a total amount of ₦2.68 trillion as 13% derivation funds, with nothing substantial to show in terms of development in the region.

Another troubling concern is that Nigeria flares about 70mm³ of gas per day; this accounts for 41% of African natural gas consumption, and makes the country one of the single biggest contributors to greenhouse gas emission in the world. It is on record that Nigeria lost a revenue of ₦9 trillion to gas flaring between, 2012-2022, which could have been deployed for the development of the region (Elehinafe, Nwizu, Odunlami, & Ibukun, 2022; Ibrahim, 2025).

These abysmal performances culminated in tension, resistance, communal crisis, particularly among young people in the region, who resulted to self-help to draw the attention of the government to their plight; excruciating poverty, unemployment, environmental and health problems etc. These unfulfilled developmental dreams and aspirations, further fueled resentment and militancy in the region. Unfortunately, this resentment created a lot of chaos and anarchy in the region fueled by various militant groups, environmental activists, some of whose activities became criminal, and contributed to the pollution and degradation of the environment and ecosystem, further impoverishing the people, and creating health hazards in the region. In addition, these unemployed and agitated youths, became a fertile ground of recruitment for unscrupulous politicians and community leaders, who employed their services for their nefarious activities. This created a large thrust deficit, and enlarge the fault lines among the ethnic nationalities of the region, further bringing destruction to the local economy in its wake.

4. Conclusion

According to Ahmed Zaki Yamani, the Saudi Arabia erstwhile oil minister (1962-1986) ***“The stone age did not end because we ran out of stones; and oil age will not end because we run out of oil.”*** Put differently, the role of the oil resource in the advancement and development of nations in the future, may take a less pivotal part. Similarly, the oil era will come to an end not because oil runs out, but because its importance as a fundamental driver of national prosperity and revenue is waning, particularly as other energy sources expand around the world, and alternatives induced by researches and scientific innovations evolve.

We therefore posit: what happens to oil-dependent regions, such as the Niger Delta, when oil exploration no longer generates significant revenue? The Niger Delta must revitalize and broaden its economic horizons beyond oil and gas, as demonstrated by the NDR-Beyond Oil and Gas program led by Dr. Emmanuel Uduaghan, the former governor of Delta State. It is critical to prepare the region for the post-oil age by increasing public support for affirmative action and educating local communities about climate change and its global consequences. This understanding should be spread throughout schools, churches, mosques, marketplaces, community meetings, youth, and women's organizations, to keep the region from being caught off guard by future climate-related turmoil.

Corruption, incompetence, greed, and crisis-driven initiatives will never result in lasting development in the Niger Delta Region. While these may have benefited a few in the past, they must be abandoned if the region is to survive in the future. There's a saying: "No matter how far you've gone down the wrong road, it's better to turn back." This sentiment reflects the immediate need for a change in the NDR. Saving the region requires collaborative efforts, not only for

ethical reasons, but also for the survival of the region, the nation, and humanity as a whole. The sacrifices made by the region's heroes and heroines, from Adaka Boro to Ken Saro-Wiwa, politicians to community leaders, must not go unnoticed. Their struggles laid the groundwork for a more sustainable future for the Niger Delta, and it is the responsibility the region's residents to honour their legacies, by guaranteeing the region's long-term viability.

5. Some Suggested Way Out of This Quagmire for Niger Delta

To effectively carry out their duties, interventionist institutions such as the NDDC must be appropriately funded and administered without regard for political or ethnic considerations. Accountability and resource management should be key to their operations, with no superfluous spending to preserve the region's competitiveness and long-term economic viability.

Projects should be initiated through the use of a bottom-up approach, incorporating the communities that will benefit, to avoid confrontations and impositions. Furthermore, criminal actions disguised as agitation or militancy should not be encouraged through government or community engagement because they undermine both the environment and the economy. The region must also abandon an entitlement mindset towards employment in the oil and gas industry, as the industry's ability to provide direct large-scale jobs and reduce poverty is restricted, due to its high-tech nature, as diversifying and modernizing the local economy is critical to survival, long-term growth and development of the region.

The Niger Delta's local economy, particularly fishing and crop cultivation (such as plantain, cassava, and potatoes), should be supported by funds from the region's States Oil Development Commissions. Wealthy individuals in the region, along with their networks, should invest in these sectors to boost confidence and foster peaceful coexistence. To increase agricultural output, numerous interventions are required, including environmental regeneration through large-scale mangrove planting, comparable to successful projects in Thailand, Kenya, Senegal, and the Sundarbans. This will benefit both the ecology and long-term agricultural output. Still, bioremediation can be utilised to remove toxins from soil and water, thereby improving the region's health and agricultural potential.

The region should transition from fossil fuels to renewable energy usage, which will lessen environmental damage and avoid more deforestation. To ensure long-term development, strict logging control legislation should be enacted and enforced.

Once more, investing in the human capital and skills of the region's youth, especially in sectors where they have a competitive edge, is critical for increasing earnings, reducing poverty, and alleviating unemployment. This approach is consistent with the accomplishments of successful countries such as Luxembourg, Singapore, and South Korea, which have used human capital to promote economic growth and development.

Oil and gas firms could increase their corporate social responsibility by interacting directly with local communities, avoiding intermediaries such as community leaders who may mismanage

resources. Companies should also develop community initiatives with local labour. Moreover, communities should avoid activities that hurt the environment and worsen the region's problems, such as pipeline sabotage, illicit refining ("Kpo Fire"), and criminal acts such as kidnapping, that is hurts investments drive in the region.

Politicians, community leaders, and traditional rulers should stop exploiting the region's predicament by instigating conflict or indulging in illicit operations for personal benefit. To combat unethical actions by global oil companies, the region's oil may be labelled like **"Blood Oils" or "Genocide Oils"** to draw world's attention to the plight of the region, and discourage illicit exploration of oil in the region.

The development of sports, music, and entertainment, in general the entertainment industry; particularly in areas where the region has a competitive advantage, such as wrestling, swimming, and water-related activities, music and dance, movies etc. has the potential to employ thousands of young people in the region, by harnessing their energy, and therefore, drastically reducing the agitations in the region. Finally, the government and communities must work together to create trust by resolving genuine concerns and agitations of the people, foster genuine reconciliation, and address regional conflicts.

References

- Afolabi, O. (2017). Achieving sustainable development in the Niger Delta area of Nigeria: The imperative of peace education. *Scholars Journal of Arts, Humanities and Social Sciences*, 5(6B), 615 – 621.
- Akeju, R. (2017). Niger Delta Ministry spent N423bn from 2009-2015. Available at: <https://freedomonline.com.ng/niger-delta-ministry-spent-n423bn-2009-2015/>
- Akpan, I. E. (2023). Crude oil exploitation in the Niger Delta and Appointments in Nigeria's oil industry. *AKSU Journal of Administration and Corporate Governance*, 3(2), 132 – 141.
- Aleru, C. J. (2017). Ten sentencing in environmental offences in Nigeria: An overview. *African Journal*, 6, 106 – 121.
- Amadi, L., & Alapiki, H. (2014). Perspectives and Dynamics of the Natural Resource Curse in Post 1990 Niger Delta, Nigeria. *Journal of Advances in Political Science*, 1(2), 45 – 62.
- Ahmadov, A., & Guliyev, F. (2016). Tackling the resource curse: The role of democracy in achieving sustainable development in resource-rich countries. International Institute for Democracy and Electoral Assistance. Available at: <https://www.idea.int/sites/default/files/publications/tackling-the-resource-curse.pdf>
- Chasek, P. (2020). Stockholm and the birth of environmental diplomacy. Still only one earth: Lessons from 50 years of un sustainable development policy. International Institute for Sustainable Development. Available at: <https://www.iisd.org/articles/deep-dive/stockholm-and-birth-environmental-diplomacy>
- Chijioke, M. C., et al., (2025). Causes and effects of environmental degradation in the Niger Delta and the mitigation measures that can be implemented. *Saudi Journal of Humanities and Social Sciences*, 10(2), 45 – 55.

- Chukwu, I. (2024). Contractors to execute 1,006 projects as NDDC gets N1.9trn budget approval. *Business Day*. Available at: <https://businessday.ng/news/article/contractors-to-execute-1006-projects-as-nddc-gets-n1-9trn-budget-approval/>
- Chukwuma-ekwueme, I. G. (2023). Impact of crude oil trade on Nigeria's economy: a time series approach. M.Sc. dissertation submitted to the World Maritime University. Available at: https://commons.wmu.se/cgi/viewcontent.cgi?article=3304&context=all_dissertations
- Edoho, F. M. (2021). Expropriation of petroleum ownership: institutionalization of poverty by dispossession of the Niger Delta Region. *International Journal of Business and Social Science*, 12(5), 11 – 19.
- Ekpu, C. E. (2021). The Contributions of Niger Delta Development Commission (NDDC) To the Socio, Economic and Political Development of Niger Delta Region of Nigeria: An Overview. *Icheke Journal of the Faculty of Humanities*, 265 – 280.
- Elehinafe, F. B., Nwizu, C. I., Odunlami, O. B., & Ibukun, F. D. (2022). Natural gas flaring in Nigeria, its effects and potential alternatives – A Review. *Journal of Ecological Engineering*, 23(8), 141–151.
- Foundation for Partnership Initiatives in the Niger Delta (2011). A report on Niger Delta region youth assessment. International Youth Foundation. Available at: <https://ndpifoundation.org/wp-content/uploads/2018/09/Niger-Delta-Region-Youth-Assessment-Research.pdf>
- Foufoula-Georgiou, E. (2013). A vision for a coordinated international effort on delta sustainability. Deltas: Landforms, Ecosystems and Human Activities. Proceedings of HP1, IAHS-IAPSO-IASPEI Assembly, Gothenburg, Sweden, July.
- Hoss-Golan, E., Gofen, A., & Wellstead, A. M. (2024). Meeting expectations? Response of policy innovation labs to sustainable development goals. *Policy and Society*, 43(3), 334 – 350.
- Ibrahim, A. (2025). Energy-starved Nigeria flares most gas in four years. *Business Day*. Available at: <https://businessday.ng/energy/article/energy-starved-nigeria-flares-most-gas-in-four-years/>
- Ike, P. C., & Emaziye, P. O. (2012). An assessment of the trend and projected future values of climatic variables in Niger Delta region, Nigeria. *Asian Journal of Agricultural Sciences*, 4(2), 165 – 170.
- International Institute for Environment and Development (2023). Huge population growth in major river deltas puts tens of millions at increased risk from climate change floods. Available at: <https://www.iied.org/huge-population-growth-major-river-deltas-puts-tens-millions-increased-risk-climate-change-floods>
- Ityavyar, E. M., & Thomas, T. T. (2007). Environmental pollution in Nigeria: The need for awareness creation for sustainable development. *Journal of Research in Forestry, Wildlife and Environment*, 4(2), 1 – 9.
- Mailey, J. R. (2015). The anatomy of the resource curse: predatory investment in Africa's extractive industries. Africa Center for Strategic Studies (ACSS) Special Report No. 3. Available at: <https://africacenter.org/wp-content/uploads/2015/12/Africa-Center-Special-Report-No.-3-EN.pdf>

- Mollenkamp, D. T. (2023). What is sustainability? How sustainabilities work, benefits, and example. Investopedia. Available at: <https://www.investopedia.com/terms/s/sustainability.asp>
- National Bureau of Statistics (2022). Nigeria launches its most extensive national measure of multidimensional poverty. Available at: <https://www.nigerianstat.gov.ng/news/78>
- Nigerian Embassy Algiers, (2025). Nigerian economy dominated by oil. Available at: <https://embassyofnigeriaalgiers.org/nigerianEconomy>
- Nwilo, P. C., & Badejo, O. T. (2001). Impacts of oil spills along the Nigerian coast. Available at: <https://web.archive.org/web/20080430164524/http://www.aehsmag.com/issues/2001/october/impacts.htm>
- Obi, N., Akuirene, A., Bwitit, P., Adjene, J., & Nwose, E. (2021). Impact of gas flaring on communities in Delta region of Nigeria, narrative review part 1: environmental health perspective. *International Journal of Scientific Reports*, 7(3), 186 – 193.
- Ogwu, C. E., Oluwaferanmi, F. M., & Johnson, A. I. (2021). Impact of gas flaring on climate change (a case study of Niger Delta region of Nigeria). *GSJ*, 9(5), 231 – 248.
- Orish, E. (2021). Crude oil and public health issues in ND, Nigeria: much ado about the inevitable. *Elsevier Environmental Research*, Vol.194, March, 110725.
- Pisano, U., Endl, A., & Berger, G. (2012). The Rio+20 Conference 2012: Objectives, processes and outcomes. Rio+20 and its implications for Sustainable Development Policy. Available at: https://www.esdn.eu/fileadmin/ESDN_Reports/2012-June-The_Rio_20_Conference_2012.pdf
- Shackelford, N., & McDougall, C. (2023). Ecosystem restoration, regeneration and rewilding. *BMC Ecol Evo*, 23(52). <https://doi.org/10.1186/s12862-023-02165-3>
- Sokari, V. (2022). What has changed with development in Nigeria's Niger Delta region? the challenging trajectories of a current day interventionist institution. *Wilberforce Journal of the Social Sciences*, 7(1), 67 – 94.
- United Nations Conference on Environment and Development (1992). A new blueprint for international action on the environment. Rio de Janeiro, Brazil, 3-14 June. Available at: <https://www.un.org/en/conferences/environment/rio1992>