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Non-Oil Resources Development in Nigeria: Environmental Implications and Policy Considerations

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Abstract. Nigeria's historical over-dependence on crude oil has prompted a strategic pivot toward economic diversification through non-oil resources, specifically targeting agriculture, solid minerals, manufacturing, and renewable energy. While this transition promises enhanced social welfare and macroeconomic stability, it introduces significant environmental risks that require urgent academic and regulatory scrutiny. This study evaluates the complex environmental implications of developing Nigeria's non-oil sectors, assesses the efficacy of existing regulatory frameworks such as the NESREA Act and the Petroleum Industry Act's non-oil provisions and performs a critical comparative analysis with Rwanda's acclaimed environmental governance model. Adopting a doctrinal research methodology, the paper utilizes secondary data from recent government reports, legal statutes, and contemporary literature to analyze environmental trends and policy effectiveness. Results indicate that while diversification potentially reduces carbon intensity in certain industrial segments, the rapid, often unregulated expansion of mining and large-scale farming triggers severe deforestation, soil degradation, and water pollution. Comparative findings reveal that Rwanda's success is rooted in the stringent enforcement of Environmental Impact Assessments (EIA) and community-led conservation. In contrast, Nigeria's progress remains hindered by institutional fragmentation and "lax" enforcement mechanisms. The study recommends transitioning from traditional waste disposal to circular waste minimization, strengthening regulatory oversight through a fully empowered NESREA, and adopting inclusive governance models that integrate local communities into resource management to ensure a sustainable economic future for the federation.

Keywords: Non-Oil Resources, Environmental Impact Assessment (EIA), Sustainable Development, Nigeria, Rwanda, Solid Minerals

1. Introduction

Non-oil resources comprise the diverse spectrum of economic assets and activities that exist independently of the petroleum and natural gas industry. These resources encompass solid mineral deposits such as gold, bitumen, and lead-zinc and broad economic sectors including agriculture, forestry, renewable energy, tourism, and manufacturing. Unlike the capital-intensive oil sector, non-oil resources are often labor-intensive and hold the transformative potential to drive inclusive growth, ensure food security, and reduce the national vulnerability to volatile global crude oil prices.

Historically, the Nigerian state was defined by its robust agrarian economy. Prior to the 1970s, Nigeria was a global leader in the exportation of cash crops, prominently cocoa, palm oil, rubber, and timber. However, the "oil boom" heralded a significant structural shift. The discovery and subsequent exploitation of petroleum led to a phenomenon often termed the "Dutch Disease," where the rapid development of the oil sector resulted in the systemic neglect of other viable mineral and agricultural resources. This mono-product dependency has not only made the economy fragile but has also stalled the institutional development of the non-oil sectors

1.1 The Diversification Imperative and Environmental Concerns

In recent years, the Nigerian government has recognized that economic diversification is a herculean but unavoidable task. However, the transition toward non-oil development is a double-edged sword. While it promises to increase the national GDP and improve citizen welfare, it introduces a wide range of environmental implications. The aggressive expansion of mining and large-scale farming often triggers deforestation, soil

erosion, habitat loss, and water pollution. As the nation looks toward these resources for economic survival, it is imperative to address these ecological footprints before they escalate into uncontrollable environmental crises.

To manage the interplay between development and preservation, several legal instruments have been enacted. These include the Nigerian Minerals and Mining Act, Forestry Law, National Park Service Act, and National Environmental Standards and Regulations Enforcement Agency (NESREA) Act, Furthermore, modern policies like the National Renewable Energy and Energy Efficiency Policy (NREEEP) and the Water Resources Act aim to provide a roadmap for sustainable resource management.
This paper provides a comprehensive examination of the environmental implications both positive and negative of developing Nigeria's non-oil resources. It scrutinizes the adequacy of existing laws and offers a comparative analysis between Nigeria and Rwanda, a country noted for its stringent environmental governance. Ultimately, the study proffers actionable recommendations to ensure that Nigeria's path to economic diversification remains environmentally sustainable.

1.2 Conceptualizing Non-Oil Resources and Their Economic Scope

Non-oil resources represent the vast and multifaceted array of natural assets and economic activities that exist independently of the petroleum and natural gas industry. These resources encompass all material substances from nature that possess inherent economic value or provide the biological support systems necessary for the sustenance of life. In a broader economic sense, the non-oil sector refers to the totality of a nation's productive capacity excluding the extraction, refining, and sale of crude oil and its immediate derivatives. This sector is essentially the bedrock of a diversified economy, providing a more stable and labor-intensive alternative to the capital-intensive and volatile nature of the hydrocarbon industry.

The classification of these resources is typically divided into biotic and abiotic categories. Biotic resources are those derived from living or organic matter, including expansive forest reserves, wildlife, avian species, and aquatic life. Even certain energy sources like coal are categorized as biotic due to their origin from decayed organic substances over geological eras. Conversely, abiotic resources originate from non-organic materials and include the fundamental elements of the physical environment such as land, atmospheric air, and fresh water. Within the abiotic category lies Nigeria's significant endowment of metallic ores and industrial minerals, including gold, silver, tin, lead, copper, bitumen, and limestone.

Beyond primary extraction and agriculture, non-oil resources in a modern context include advanced service-oriented and industrial sectors. This modern expansion encompasses renewable energy technologies, the tourism and hospitality industry, manufacturing, telecommunications, Information and Communication Technology (ICT), and the financial services sector. The development of these sectors is particularly critical for a nation like Nigeria, as they offer the potential to generate massive employment opportunities for a teeming population. By shifting the focus away from a mono-product oil economy, these diverse non-oil resources foster inclusive growth, enhance food security, and create a resilient economic structure capable of withstanding global energy price fluctuations.

1.3 Historical Perspective: From Agrarian Roots to Oil Dependency

Prior to the discovery of crude oil in commercial quantities in 1956 at Oloibiri, Nigeria was primarily an agrarian society where agriculture served as the cornerstone of the economy. During this era, the nation was self-sufficient in food production, providing approximately 95% of the food needed to feed its population. Agriculture contributed 66.4% to the Gross Domestic Product (GDP) and served as the mainstay of the economy, providing the primary source of livelihood for the vast majority of the population Regional economies thrived on the exportation of diverse cash crops: rubber from the South-South, groundnuts and hides from the North, cocoa and coffee from the West, and palm oil from the East. Revenue from these non-oil resources was instrumental in building landmark social and economic infrastructure across the country.

However, the oil boom of the 1970s triggered a significant structural shift known as the "Dutch Disease." As global oil prices soared due to geopolitical crises, Nigeria's newly found wealth led to a currency appreciation that made agricultural exports less competitive globally. Public expenditure shifted almost entirely toward the petroleum sector, causing the agricultural contribution to GDP to plummet as the government prioritized "easy money" from oil exploration. By 1980, the oil sector accounted for nearly 30% of GDP and 90% of total exports,

rendering the nation's economy vulnerable to international oil price volatility. This historical neglect created a structural imbalance that remains a challenge today.

2. Development of Non-Oil Resources in Nigeria

In recent years, the Nigerian government has renewed its focus on the non-oil sector as a strategic imperative to stabilize the economy and reduce its vulnerability to oil price shocks. Most recently, the non-oil sector has emerged as the primary engine of economic expansion, consistently accounting for over 95% of Nigeria's real GDP. In most recent quarter, the non-oil sector contributed 96.56% to the total real GDP, driven by resilient growth in services, agriculture, financial institutions, and telecommunications.

A landmark achievement in this diversification drive was recorded in first half of 2024, when Nigeria's non-oil exports reached a record high of $2.7 billion, representing a 6.26% increase from the previous year and currently rose at approximately $6.1 billion representing a year-on-year growth of about 11.5 percent over and above the $5.4 billion recorded in 2024. This growth was supported by the export of 211 different non-oil products to 120 countries, including cocoa, urea, cashew nuts, sesame seeds, and solid minerals like copper and aluminum ingots. Total non-oil export volumes climbed to 8.02 million metric tonnes, reflecting a 10% increase in production capacity.

The Federal Government has prioritized the expansion of these revenues for the ensuing fiscal year, aiming to deepen integration into global value chains through sector-specific "deal rooms" and the National Industrial Policy 2025 unveiled recently. While services including information and communication currently dominate the GDP share, the ongoing push for value-added agricultural exports and solid mineral development is seen as the most credible path toward long-term economic resilience.

2.1 Regulatory Framework Governing Non-Oil Resource Development

The legal regime governing the development of non-oil resources in Nigeria is multifaceted, comprising several sector-specific statutes:

Solid Minerals: The Nigerian Minerals and Mining Act 2007 serves as the primary legislation regulating the exploration and exploitation of solid minerals. It provides the legal basis for ownership, the issuance of mining licenses, and the payment of royalties.

Forestry: Forestry management is governed by various State Forestry Laws and the Forestry Act, which regulate the conservation of forest products and the grant of timber licenses.

Agriculture: This sector is regulated by policies and statutes such as the Agriculture (Control of Importation) Act, which manages land use, crop protection, and the importation of agricultural materials.

Wildlife and Biodiversity: The National Parks Service Act provides for the conservation of biodiversity and the protection of wildlife within designated national parks.

Environmental Protection: The National Environmental Standards and Regulations Enforcement Agency (NESREA) (Establishment) Act 2007 is the umbrella legislation for environmental protection. Under this Act, specific regulations have been promulgated, including:

- National Environmental (Desertification Control and Drought Mitigation) Regulations 2011;
- National Environmental (Protection of Endangered Species in International Trade) Regulations 2011; and
- National Environmental (Coastal and Marine Area Protection) Regulations 2011.

Tourism: The Nigerian Tourism Development Corporation Act regulates the promotion of cultural heritage and the licensing of tourism-related enterprises.

Land and Real Estate: The Land Use Act (originally the Land Use Decree of 1978, now Cap L5 LFN 2004) remains the fundamental legislation governing land tenure and administration, ensuring the effective management of land resources for development."

3. Environmental Impacts and Implications of Non-Oil Resource Exploitation

The expansion of Nigeria's non-oil sector, while economically imperative, presents a complex dichotomy of positive developmental outcomes and negative ecological externalities. Nigeria's diverse ecosystems ranging from freshwater swamps and mangroves to tropical rainforests are currently subjected to varying degrees of anthropogenic pressure.

Agricultural and Livestock Extents: As a primary driver of the non-oil economy, agriculture involves the intensive cultivation of food crops (cassava, maize, rice, yam) and cash crops (cocoa, oil palm, timber). However, the sector faces significant sustainability challenges. Unregulated livestock overgrazing and the indiscriminate application of chemical pesticides have led to soil degradation and accelerated desertification, particularly in the northern regions.

Forestry and Biodiversity Loss: Nigeria's cultural resources provide essential timber and non-timber forest products (NTFPs). Notwithstanding their contribution to rural livelihoods and carbon sequestration, these resources are threatened by uncontrolled deforestation, bush burning, and unstructured urbanization. These activities result in critical habitat loss, the extinction of microbial soil life, and a reduction in Nigeria's carbon sink capacity.

Urbanization and Infrastructure Development: Rapid demographic shifts have catalyzed a boom in the construction and real estate sectors. While providing essential infrastructure, this growth has led to unstructured land use and habitat fragmentation. Anthropogenic pollutants arising from improper waste disposal, the blockage of natural waterways, and poorly planned drainage systems continue to exacerbate erosion and ecosystem instability.

Energy Transition and Renewable Potential: The shift toward solar, wind, and hydropower offers a credible path to reducing the ecological footprint of the petroleum industry (notably oil spills and gas flaring). While renewable energy transitions generally reduce pressure on ecosystems, the lifecycle of these projects including land clearing for installations and the logistics of resource transportation can still contribute to residual greenhouse gas emissions.

Solid Minerals and Manufacturing: The extraction of minerals such as limestone, coal, tin, and bitumen is central to industrial diversification. However, aggressive mining operations often result in severe environmental concerns, including hazardous dust emissions, heavy metal water pollution, and permanent topographical disruption.

Tourism and Conservation: The promotion of cultural heritage and national parks offers a unique mechanism for conservation-led growth. While tourism can incentivize the preservation of biodiversity, improper management of tourist zones often leads to waste accumulation and the degradation of the very natural landscapes the sector seeks to promote.

3.4. Critical Analysis: The Implementation Gap in Non-Oil Regulation

The juxtaposition of these environmental externalities against the existing legal framework reveals a critical implementation gap. While the National Environmental Standards and Regulations Enforcement Agency (NESREA) has promulgated specific regulations such as those addressing desertification control and coastal area protection the persistence of unregulated bush burning, illegal mining, and unstructured urbanization suggests that the current enforcement mechanisms are insufficient.

Furthermore, Nigeria's commitment to international environmental instruments, including the Paris Agreement and the Convention on Biological Diversity, necessitates a more rigorous alignment of non-oil industrial expansion with the principles of sustainable development and 'green' economic growth

4. Comparative Analysis: Environmental Implications of Non-Oil Resource development

4.1 Overview of the Rwandan Context

Rwanda, the "Land of a Thousand Hills," is a landlocked nation whose economic potential is tied strictly to its non-oil natural resources: land, water, biodiversity, and minerals. Unlike oil-rich nations like Nigeria, Rwanda's geography creates biophysical vulnerabilities. The country faces land scarcity and acute soil erosion, with 45% of the land at high risk of erosion.

4.2 Contrasting the Extractive Sectors: Mining vs. Oil

While Nigeria's environmental crisis is dominated by the industrial and toxic pollution of the oil sector (spills and gas flaring), Rwanda's extractive challenges are rooted in its rapidly growing mining sector.

Scale and Impact:

The environmental footprints of these two sectors differ significantly in nature and primary impact:

Nigeria (Oil Sector): in Nigeria, Oil extraction causes irreversible chemical contamination of water

and air due to oil spills, gas flaring, and illegal refining. Recent studies in the Niger Delta have recorded high levels of biological oxygen demand and total dissolved solids in aquatic ecosystems linked to crude oil bunkering. These pollutants cause irreversible physical, chemical, and biological damage, contributing to poverty and hardship in host communities.

Rwanda (Mining Sector): Rwanda's challenges are rooted in its rapidly growing mining industry, which is the country's largest export earner currently. Roughly, majority of the sector still consists of artisanal and small-scale mining (ASM). The primary impacts are physical, including changes in landscape structure and sediment-loaded runoff that can contaminate downstream catchments. Rwanda is a top global producer of tantalum and also extracts tin, tungsten, gold, and lithium representing nearly 60% of mineral export.

Regulatory Approach:

Both nations have introduced major legislative reforms, but their current focus and progress vary:

Rwanda's Modernization: Rwanda has aggressively updated its legal framework to professionalize the sector. A new 2024 Mining Law replaced previous 2018 legislation to better regulate ASM and attract international investment for mechanized operations.

Strict Environmental Oversight: License holders must submit an Environmental and Social Impact Assessment (ESIA) and a rehabilitation plan before starting operations.

Traceability: Rwanda adheres to OECD due diligence guidelines, ensuring minerals are 100% conflict-free and traceable from mine to market.

Value Addition: The government has established state-of-the-art facilities, including a gold refinery, tantalum refinery, and tin smelter, with plans for a lithium refinery. This contrasts with Nigeria's oil sector, where despite laws like the Petroleum Industry Act (PIA), implementation remains fraught with transparency and accountability issues.

4.3 The "Green" Diversification Model

Rwanda's non-oil strategy utilizes sectors that, if managed well, restore rather than deplete the environment:

Sustainable Tourism: Nature-based tourism accounting for a vast majority of leisure visitors funds the protection of biodiversity, such as gorilla habitats. This creates an economic incentive for conservation that is absent in purely extractive oil economies.

Integrated Agriculture: Programs like **"Girinka"** (One Cow per Family) provide organic manure for soil fertilization, directly addressing Rwanda's soil degradation. In contrast, oil-dependent nations often see neglect of the agricultural sector, leading to food insecurity and land toxicity.

4.4 Governance and Summary: The "Green" vs. "Brown" Institutional Divide

Rwanda's proactive approach to environmental governance is not merely a modern trend but a deep-seated national priority dating back to the community-led conservation campaigns of the 1980s (e.g., the Year of Soil Conservation and the Year of the Tree). This historical foundation has evolved into a robust institutional setup led by the Rwanda Environment Management Authority (REMA), which integrates climate resilience into every level of national planning through the Green Growth and Climate Resilience Strategy (GGCRS).

4.4.1 The Enforcement Gap: Rwanda vs. Nigeria

while both nations have comprehensive laws on paper, the comparative analysis reveals a significant "Implementation Gap":

Rwanda's "Bottom-Up" Enforcement: Rwanda utilizes unique cultural pillars like **Umuganda** (mandatory community work) to enforce environmental standards, such as the nationwide ban on non-biodegradable plastic bags. This creates a culture of collective accountability.

Nigeria's "Top-Down" Challenges: In contrast, Nigeria's environmental governance is often reactive. Agencies like the National Environmental Standards and Regulations Enforcement Agency (NESREA) struggle with the "resource curse" of oil, where the economic urgency of petroleum production often overrides environmental protections, leading to the neglect of ecological restoration in the Niger Delta.

4.5 Economic Resilience and synthesis

The comparison demonstrates that Rwanda's lack of oil has been a blessing in disguise for its institutional strength. By necessity, Rwanda has developed a diversified and targeted policy approach that treats the environment as an economic asset (via Tourism and Agriculture) rather than an extraction site. While Nigeria remains vulnerable to global oil price volatility and industrial degradation, Rwanda's "Non-Oil" model demonstrates that even a land-locked nation with limited territory can achieve noteworthy progress in environmental and economic resilience through transparency, community mobilization, and strict policy enforcement.

5. Recommendations

To mitigate the environmental implications of resource dependency and promote sustainable non-oil development, Nigeria should prioritize policy implementation that balances conservation with economic growth. Drawing from the Rwandan model, the following recommendations are proposed:

Institutionalizing "Green Days": The Federal Government of Nigeria should establish mandatory National, State, and Local Government days dedicated to reforestation and afforestation. Emulating Rwanda's community-led success, each household should be incentivized to plant at least one tree per season to combat desertification.

Strengthening Enforcement of Protected Areas: Penal laws must be strictly enforced to punish encroachment on parks and recreation centers. Preservation of these areas is essential for the future of Nigeria's nascent tourism sector.

Urban Waterway and Flood Management: Citizens must be educated on the critical role of drainage systems and the environmental impact of waste disposal in waterways. Furthermore, industrial regulations must mandate that factories treat effluent before discharging it into water networks to protect aquatic biodiversity.

Transitioning to Biodegradable Materials: Nigeria should follow Rwanda's lead by phased banning of non-biodegradable plastic bags. Encouraging the production of packaging made from paper, cloth, and natural fibers will stimulate local cottage industries while reducing urban pollution.

Structured Urbanization and Technology Oversight: The National Office for Technology Acquisition and Promotion (NOTAP) should rigorously vet imported technologies to prevent Nigeria from becoming a dumping ground for obsolete, high-emission tools. Better management of confiscated goods is required to avoid open-air burning and subsequent atmospheric pollution.

Environmental Justice: The judiciary must ensure "timeous justice" for victims of environmental exploitation. Reasonable and deterrent sanctions should be meted out to corporate and individual offenders to end the culture of impunity.

Agricultural Extension Services: Government agencies should increase the education of rural farmers on best practices for sustainable land cultivation and soil management to prevent the long-term degradation seen in intensified farming regions.

Diversifying the Energy Mix: To reduce over-dependence on oil and wood fuel (which drives deforestation), the government must provide fiscal incentives for solar, wind, and hydropower development.

Prioritizing Security for Tourism: The government must stabilize the security situation in resource-rich rural areas. Without the safety of lives and property, Nigeria cannot harness the economic potential of nature-based tourism as Rwanda has successfully done

6. Conclusion

Diversifying the Nigerian economy beyond petroleum is no longer an option but a necessity for long-term stability. While the development of non-oil resources such as agriculture, minerals, and tourism presents a pathway to growth, it carries significant environmental risks if left unmanaged.

The Rwandan example demonstrates that a lack of oil can be a catalyst for high-standard environmental stewardship and institutional transparency. For Nigeria to replicate this success, it must move beyond having "comprehensive laws on paper" to a culture of strict enforcement and community mobilization. By prioritizing conservation, reducing corruption, and maintaining policy consistency, Nigeria can maximize the benefits of its non-oil resources while ensuring an ecological legacy for future generations

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