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Nigeria's Emerging Carbon Market: Institutional Frameworks and Investment Prospects

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ABSTRACT

Nigeria is advancing toward a low-carbon future through policy instruments like the Climate Change Act (2021) and the Carbon Market Activation Plan (2025). This study explores the country's institutional frameworks and investment potential in carbon markets, using qualitative analysis and stakeholder insights. While sectors such as forestry, clean energy, and CCS show strong carbon credit potential, challenges persist particularly in MRV capacity, regulatory coherence, and local participation. Comparative lessons from Kenya and Ghana highlight the need for transparent systems and inclusive governance. To attract investment and ensure integrity, Nigeria must operationalize its registry, strengthen institutions, and implement equitable benefit-sharing mechanisms. With targeted reforms, the country can become a regional leader in carbon trading under the Paris Agreement.

Keywords: Carbon Market, Nigeria, Climate Policy, MRV, Emissions Trading, Investment, Article 6

1.0 Introduction

Climate change remains one of the defining challenges of the 21st century, necessitating urgent global efforts to reduce greenhouse gas (GHG) emissions and transition to low-carbon economies. Nigeria, the most populous country in Africa and one of the largest economies on the continent, contributes approximately 0.8% of global emissions, driven largely by deforestation, gas flaring, energy use, and land use change (World Bank, 2021; IEA, 2022). Despite this relatively modest contribution, the country faces severe climate impacts ranging from desertification in the north to coastal flooding in the south thereby reinforcing the need for both mitigation and adaptation strategies (NCCC, 2023).

In response, Nigeria has made significant strides in climate governance, particularly with the enactment of the Climate Change Act 2021. This legislation established the National Council on Climate Change (NCCC), tasked with coordinating national climate policy and implementing five-year carbon budgets and a long-term low-emissions development strategy (Federal Republic of Nigeria, 2021). The Act further empowered the development of carbon pricing mechanisms, paving the way for a structured carbon market in Nigeria (Templars, 2024).

Complementing this, Nigeria launched its Energy Transition Plan (ETP) in 2022, targeting net-zero emissions by 2060, with key strategies including gas as a transition fuel, massive electrification, and the scaling of clean energy solutions (Federal Government of Nigeria, 2022). The ETP envisions a significant role for market-based mechanisms especially carbon trading in mobilizing the estimated $1.9 trillion in financing required to meet Nigeria's climate goals (UNDP, 2023).

In March 2025, the Nigerian government unveiled its Carbon Market Activation Plan, which aims to generate over $2.5 billion in climate finance by 2030 through the development of high-integrity carbon credit systems (Fastmarkets, 2025). The plan includes the establishment of a national carbon registry aligned with Article 6 of the Paris Agreement, and the creation of the Carbon Market Oversight Body (CMOB) to ensure transparency, verification, and market integrity (NCCC, 2025).

However, despite these institutional advancements, Nigeria's carbon market is still in its formative stage and faces several constraints. These include: weak monitoring, reporting, and verification (MRV) capacity; inadequate policy coherence across federal and sub-national levels; lack of clarity around land tenure and carbon rights; and the dominance of foreign actors in voluntary carbon projects (EfD Initiative, 2024; ICAP, 2023). Furthermore, many investors remain cautious due to historical regulatory uncertainty and limited market liquidity.

Nonetheless, the country possesses considerable potential for carbon market development. Nigeria's vast natural resources including mangroves, forests, wetlands, and degraded lands offer opportunities for nature-based solutions, while geological assessments suggest a potential storage capacity of over

10.7 gigatons of CO_2 for carbon capture and storage (CCS) (Akanji et al., 2025; IFC, 2024). These opportunities position Nigeria not only as a potential leader in Africa's carbon credit market, but also as a key player in global efforts to operationalize Article 6 of the Paris Agreement.

This study, therefore, examines the evolving institutional frameworks shaping Nigeria's carbon market, the investment opportunities emerging within these frameworks, and the barriers that must be addressed to ensure environmental integrity, investor confidence, and equitable participation.

2.0 Literature Review

2.1 Global Overview of Carbon Markets

Carbon markets have emerged as essential tools for reducing greenhouse gas (GHG) emissions and facilitating cost-effective climate action. Broadly, these markets are categorized into compliance markets (mandated under emissions trading systems like the EU ETS) and voluntary carbon markets (VCMs) that allow corporations and individuals to offset emissions by purchasing carbon credits generated through certified emission reduction projects (World Bank, 2023; ICAP, 2022). The Kyoto Protocol's Clean Development Mechanism (CDM) was an early example of market-based climate mitigation, followed by evolving mechanisms under the Paris Agreement's Article 6, which aims to enhance international cooperation through cooperative approaches (Article 6.2) and the mechanism for sustainable development (Article 6.4) (UNFCCC, 2021).

According to the Taskforce on Scaling Voluntary Carbon Markets (TSVCM, 2021), the voluntary market could reach a value of up to $50 billion by 2030, especially with growing net-zero commitments and corporate sustainability disclosures. However, concerns about environmental integrity, double counting, and the lack of standardized MRV protocols have prompted calls for improved governance (Allen et al., 2022; McKinsey & Company, 2021).

2.2 Evolution of Carbon Markets in Africa

Africa's participation in global carbon markets has historically been marginal. Between 2005 and 2020, the continent accounted for less than 3% of all CDM projects, largely due to capacity gaps, limited institutional support, and high transaction costs (UNEP, 2022). Nevertheless, recent developments signal renewed momentum. Countries such as Kenya, Ghana, and South Africa have initiated national carbon registries, developed climate finance strategies, and established regulatory bodies to manage carbon credits (SEI, 2022; Gold Standard, 2023).

In particular, Kenya's Climate Change (Amendment) Act of 2023 and Ghana's bilateral cooperation under Article 6.2 with Switzerland are viewed as models for aligning national interests with international market rules (GOV.Kenya, 2023; Carbon Market Watch, 2024).

2.3 Nigeria's Institutional and Legal Framework for Carbon Markets

Nigeria's regulatory journey began with the enactment of the Climate Change Act 2021, which mandated the establishment of the National Council on Climate Change (NCCC) to coordinate carbon budgeting and emissions reduction (Federal Republic of Nigeria, 2021). The Act also envisaged the use of carbon pricing and emissions trading as tools for national mitigation. In 2025, Nigeria launched the Carbon Market Activation Plan, which proposes a multi-tier market structure comprising a national carbon registry, Carbon Market Oversight Body (CMOB), and Article 6-compliant mechanisms (NCCC, 2025; Templars, 2024).

Templars (2024) note that while Nigeria's regulatory aspirations are commendable, gaps persist in enforcement capacity, subnational alignment, and land tenure laws, which complicate the ownership and verification of carbon sinks especially for forest-based projects.

2.4 Voluntary Carbon Markets and Private Sector Engagement in Nigeria

The voluntary carbon market (VCM) in Nigeria has seen a rise in afforestation, reforestation, improved cookstoves, and mangrove restoration projects. Studies show that Nigeria is among the top five African countries generating voluntary credits, particularly in the REDD+ and energy access sectors (EfD Initiative, 2024; Verra Registry, 2023). However, most of these projects are implemented with significant foreign consultancy input, raising concerns about local capacity, benefit-sharing, and equitable participation (Okereke et al., 2021).

Despite growing corporate interest in carbon neutrality, Nigeria lacks sector-specific guidance on baseline setting, crediting periods, and third-party verification. As observed by ICAP (2023), this contributes to market fragmentation and price volatility, thereby deterring potential investors from participating in the national carbon credit space.

2.5 Investment Potential and Climate Finance Mobilization

Carbon markets are increasingly recognized as vehicles for attracting climate finance, technology transfer, and sustainable development co-benefits. Nigeria's vast potential for nature-based solutions such as mangroves in the Niger Delta, savannah restoration in the North, and degraded land rehabilitation positions the country as a key destination for Article 6 transactions and voluntary carbon offset buyers (IFC, 2024; Fastmarkets, 2025). Furthermore, the government estimates that carbon markets could contribute over $2.5 billion in financing by 2030 (NCCC, 2025).

However, investment risks persist. Key barriers include poor MRV infrastructure, lack of carbon accounting tools, uncertainty around credit quality, and absence of robust domestic carbon pricing (World Bank, 2023; UNDP, 2023). Studies such as Akanji et al. (2025) also point to low awareness among domestic investors and financial institutions regarding the potential returns and co-benefits of carbon credit portfolios.

2.6 Gaps in Knowledge and Future Research Needs

While the literature acknowledges Nigeria's policy milestones and emission reduction potential, empirical analyses of institutional performance, stakeholder alignment, market readiness, and regulatory implementation remain limited. There is a need for more evidence-based studies assessing:

- The readiness of Nigeria's carbon registry under international carbon market rules;
- Sub-national participation and decentralized project approval mechanisms;
- Community benefit-sharing models and safeguards;
- Risk perception and willingness to invest by local financial institutions.

This article seeks to fill some of these gaps by offering a critical assessment of Nigeria's evolving institutional architecture and investment landscape in relation to carbon market development.

3.0 Methodology

3.1 Research Design

This study adopts a qualitative exploratory research design to critically assess the institutional frameworks and investment prospects of Nigeria's emerging carbon market. The approach is grounded in policy analysis, institutional theory, and climate finance evaluation frameworks, enabling a comprehensive investigation of formal and informal systems that influence carbon market development in Nigeria.

The research draws upon both primary and secondary data sources, employing triangulation to enhance the validity and reliability of findings (Patton, 2002; Creswell, 2014). Emphasis was placed on institutional readiness, legal structures, private sector engagement, and the alignment of Nigeria's carbon market with international mechanisms under the Paris Agreement.

3.2 Data Sources and Collection Methods

Secondary data were sourced from:

- Legal and policy documents: Climate Change Act 2021, National Carbon Market Activation Plan, Energy Transition Plan (ETP), and relevant NCCC publications.
- International databases and reports: World Bank (2023), UNDP (2023), ICAP (2022, 2023), UNEP, and the Verra Registry.
- Academic literature and think tank analyses: Peer-reviewed journal articles, technical papers from institutions such as the Centre for Climate Change and Development (CCCD), Stockholm Environment Institute (SEI), and Nigeria Economic Summit Group (NESG).
- Media and industry reports: Fastmarkets, Carbon Market Watch, Templars Law, and McKinsey insights.

These documents were subjected to content analysis to extract relevant themes, legal provisions, institutional mandates, implementation progress, and investment data.

Primary data were obtained through:

- Key Informant Interviews (KIIs) with 12 stakeholders purposively selected from:
    - The National Council on Climate Change (NCCC)
    - Nigerian Midstream and Downstream Petroleum Regulatory Authority (NMDPRA)
    - Carbon market consultants and developers
    - Representatives from private clean energy firms and climate finance institutions
    - NGOs involved in REDD+, afforestation, and cookstove projects

These interviews were semi-structured and conducted via Zoom and in-person between April and July 2025. Thematic coding was used to analyze the qualitative responses, focusing on stakeholder perceptions of market maturity, regulatory clarity, institutional constraints, and investment drivers.

3.3 Analytical Framework

The data analysis followed a thematic content analysis model based on the following categories:

1. **Institutional Readiness**
    - Policy and legal coherence
    - Interagency coordination
    - Institutional capacity and MRV systems
2. **Market Mechanism Alignment**
    - Compatibility with Article 6 of the Paris Agreement
    - Registry infrastructure and trading platforms
    - Role of voluntary vs compliance markets
3. **Investment Prospects**
    - Nature-based solution (NBS) potential
    - Carbon credit pricing trends and revenue projections
    - Risk factors (policy, technical, land tenure, benefit sharing)
4. **Barriers and Recommendations**
    - Legal gaps, land tenure challenges, MRV constraints
    - Opportunities for scale-up and reform

Data were coded manually and supported by qualitative analysis software (NVivo 14) to organize textual data from interviews and reports. Inter-coder reliability was ensured through independent reviews by two researchers.

4.0 Results and Discussion

4.1 Institutional Frameworks: Legal Architecture and Governance Gaps

The passage of the Climate Change Act 2021 and the operationalization of the National Council on Climate Change (NCCC) and Carbon Market Activation Plan (2025) represent major steps toward establishing a national carbon market in Nigeria. However, analysis of stakeholder feedback and policy documents reveals gaps in enforcement capacity, fragmented mandates between climate-related agencies, and underdeveloped carbon pricing instruments (Okereke et al., 2022; Templars, 2024). Without the activation of a compliance-based emissions cap or tradable permit system, the current framework leans heavily on voluntary carbon trading mechanisms, which remain underregulated.

4.2 Market Readiness and MRV Infrastructure

Robust Monitoring, Reporting, and Verification (MRV) is foundational to market credibility. Yet, Nigeria's MRV systems are constrained by the lack of standardized baselines, sector-specific protocols, and digital registries. Stakeholder interviews revealed that MRV processes are often outsourced to international consultants, inflating transaction costs and delaying project certification. The proposed national carbon registry, though promising, remains in beta phase with limited functionality for tracking, issuance, or retirement of carbon credits.

Further, land tenure issues particularly in forestry-based projects complicate carbon rights verification and credit ownership. These issues undermine Nigeria’s alignment with Article 6 safeguards and have implications for environmental integrity, as observed in comparative contexts (Gichuki & Nhamo, 2023).

4.3 Carbon Credit Generation and Investment Potential

Nigeria exhibits substantial sectoral potential for carbon credit generation across nature-based and engineered solutions. Table 1 below presents an estimate of annual carbon credit potential by sector, compiled from IFC (2024), NCCC (2025), and industry interviews.

Table 1: Sectoral Carbon Credit Potential in Nigeria (Estimated Annual Potential in $MtCO_2e$)

Sector	Estimated Annual Potential ($MtCO_2e$)
Forestry and Land Use (REDD+/Afforestation)	18.5
Improved Cookstoves and Clean Energy	7.2
Methane Capture and Waste Management	4.3
Carbon Capture and Storage (CCS)	11.0
Soil Carbon and Climate-Smart Agriculture	3.8

Source: Authur's Review Survey, 2025

These results highlight that forestry and land use remain the dominant sector, with REDD+ and afforestation projects accounting for the highest mitigation potential. However, CCS is rapidly gaining traction due to Nigeria's extensive sedimentary basins, particularly in the Niger Delta.

Despite these opportunities, the voluntary carbon credit price in Nigeria is relatively low, which poses a barrier to scalability and investor returns. Table 2 provides a comparative overview of voluntary carbon credit price ranges across selected African countries.

Table 2: Carbon Credit Price Ranges in Selected African Countries (Voluntary Market, 2024)

Country	Price Range (USD/tCO_2e)
Nigeria	$2–$12
Ghana	$5–$14
Kenya	$6–$15
South Africa	$8–$16
Mozambique	$3–$10

Source: Authur's Review Survey, 2025

These figures reflect that Nigeria's average price lags behind more structured markets like South Africa and Kenya, where policy clarity and MRV strength have enabled higher credit quality and pricing confidence (ICAP, 2023; UNEP, 2023).

4.4 Stakeholder Engagement and Community Participation

Stakeholder interviews emphasized the limited involvement of local communities in project design, credit monitoring, and benefit sharing. Many carbon offset projects in Nigeria operate through externally managed platforms with minimal local capacity building or informed consent. This not only raises ethical concerns but also violates principles under Free, Prior and Informed Consent (FPIC) and undermines project sustainability (EfD Nigeria, 2024).

Integrating community-driven mechanisms and participatory governance in carbon project development is essential to ensure social co-benefits and long-term success.

4.5 Comparative Analysis with Regional Counterparts

Compared to countries like Kenya and Ghana, Nigeria's carbon market infrastructure is still at a formative stage. Ghana's bilateral Article 6.2 agreement with Switzerland, and Kenya's robust MRV and community benefit frameworks, demonstrate higher institutional maturity. However, Nigeria's larger mitigation potential and diversified sectoral base provide a strong foundation if governance challenges are addressed (Carbon Market Watch, 2024; SEI, 2022).

4.6 Risk Landscape and Investment Barriers

Major risks identified include:

- Policy and regulatory uncertainty due to shifting mandates and legal overlaps.
- Technical limitations, particularly in MRV and carbon accounting systems.
- Financial constraints, including lack of concessional finance and high entry costs.
- Sociopolitical risks, such as land conflict, insecurity in carbon-rich regions, and public distrust.

These risks mirror findings in other frontier carbon markets and necessitate risk mitigation instruments like insurance, guarantees, and results-based payments to mobilize private finance (World Bank, 2023; UNDP, 2023).

4.7 Policy Coherence and Institutional Coordination

Findings show that Nigeria's carbon governance suffers from poor vertical and horizontal integration. Most sub-national governments lack enabling laws or institutional frameworks to participate effectively in the national carbon market. This is problematic for sectors like forestry and agriculture, which fall under concurrent legislative jurisdiction.

To strengthen institutional coordination, Nigeria must align NCCC activities with state environmental agencies, enhance capacity building at all levels, and adopt a unified implementation framework across ministries and departments (Templars, 2024; NCCC, 2025).

5.0 Policy Recommendations

5.1 Strengthen Legal and Regulatory Foundations

- Operationalize the Climate Change Act 2021 through actionable regulations, subsidiary legislation, and enforcement mechanisms that clarify roles, penalties, and compliance thresholds.
- Enact enabling state-level legislation to empower sub-national governments to participate in carbon market activities, especially for land-use, forestry, and agricultural-based mitigation projects.
- Develop a national carbon pricing policy that integrates both carbon taxes and emissions trading options for high-emitting sectors, ensuring alignment with Nigeria’s long-term low-emission development strategy.

5.2 Activate and Digitize the National Carbon Registry

- Ensure full operationalization and transparency of Nigeria’s National Carbon Registry with features including credit issuance, tracking, transfer, and retirement functionalities.
- Integrate registry systems with international platforms, particularly under the Article 6.2 and 6.4 mechanisms of the Paris Agreement to enable international trading.
- Adopt blockchain or distributed ledger technologies (DLT) to enhance data integrity, reduce double-counting risks, and foster trust among market participants.

5.3 Build MRV Systems and Technical Capacity

- Develop sector-specific MRV methodologies consistent with IPCC guidelines and international standards (e.g., Verra, Gold Standard).
- Establish a national MRV coordination unit within the NCCC, with responsibilities for oversight, training, and accreditation of local third-party verifiers.
- Invest in climate data infrastructure, including satellite-based monitoring, emission inventories, and digital reporting systems to support transparent accounting and verification.

5.4 De-risk Investment and Improve Market Liquidity

- Design results-based finance (RBF) mechanisms such as performance-linked carbon payments to incentivize private sector participation.
- Facilitate blended finance instruments combining concessional funds, carbon revenue, and equity from domestic and international partners (e.g., GCF, AfDB, IFC).
- Create a sovereign-backed guarantee facility to insure against delivery and permanence risks, especially in forestry and land use projects.
- Develop a public-private carbon fund or facility, managed by a credible financial intermediary, to aggregate small-scale projects and improve credit bankability.

5.5 Ensure Community Participation and Equity

- Institutionalize Free, Prior, and Informed Consent (FPIC) protocols for all nature-based projects involving indigenous communities and communal lands.
- Mandate benefit-sharing frameworks to guarantee that at least 30–50% of carbon revenues reach local communities or project hosts.

- Support community-based organizations (CBOs) through grants and technical assistance to engage in carbon farming, reforestation, and clean cooking initiatives.

5.6 Foster Inter-Agency Coordination and Policy Coherence

- Establish a cross-ministerial carbon market taskforce under the Office of the Vice President to coordinate NCCC, NESREA, FMEnv, NNPC, and state-level agencies.
- Harmonize overlapping mandates through policy realignment, institutional mapping, and coordinated implementation strategies.
- Align Nigeria's carbon market policies with broader development strategies, such as the Energy Transition Plan (ETP), National Development Plan (2021–2025), and the African Carbon Market Initiative (ACMI).

6.0 Conclusion

Nigeria has made notable progress in establishing the foundational structures of a carbon market through key policy reforms, including the Climate Change Act (2021) and the Carbon Market Activation Plan (2025). These initiatives position the country to align with global carbon trading mechanisms under Article 6 of the Paris Agreement.

However, the study reveals critical gaps particularly in MRV systems, registry infrastructure, regulatory coherence, and community participation that must be addressed to ensure market credibility and attract long-term investment. Despite these challenges, Nigeria's diverse carbon credit potential across forestry, energy, and CCS sectors offers significant opportunities for climate finance mobilization. To operationalize a high-integrity carbon market, Nigeria must strengthen institutional coordination, build technical capacity, and implement clear benefit-sharing mechanisms. With sustained reforms, the country is well-positioned to lead Africa's transition to market-based climate solutions.

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