

GREEN AND BLUE ECONOMY TRANSITIONS AND RESOURCE GOVERNANCE IN NIGERIA

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Abstract

This study critically examined the interplay transition dynamics linking green economy, blue economy, and resource governance in Nigeria from 2010 to 2024, a period marked by major reforms in energy, maritime trade, and governance. The paper conceptualizes the relationship among these variable not as isolated sectors but as an interconnected governance nexus shape by institutional quality, sustainability transitions and restructuring. The articles argue that renewable energy transitions and maritime economic reforms cannot independently produce sustainable development outcomes unless government institutions are capable of mediating economic interest, reducing corruption and coordinating regulatory framework. Anchored on an econometric research design and panel data analysis, the study utilized secondary data from credible sources including the World Bank, IEA, NPA, NRGI, UNCTAD, and CBN. The model integrated renewable energy adoption, green investment, maritime trade output, governance quality, and FDI inflows. Findings revealed that green energy transitions positively influence governance quality through accountability enhancing institutional reforms, while blue economy expansion strengthens governance when port administration, customs systems, and maritime regulation become transparent and digitally coordinated The study also reveals that governance quality simultaneously shapes and is shaped by green economy reforms, thereby demonstrating the existence of reverse causality and institutional feedback effects. Furthermore, improved governance significantly enhances investor confidence and foreign direct investment inflow. The study concludes that Nigeria's sustainable development prospects depend not merely on sectorial reforms but on the successful institutional coordination of green and blue economy transition within an accountable framework.

Keywords: *Green economy, Blue economy, Resource governance, Renewable Energy, Green Investment, Maritime Trade Output and Foreign Direct Investment (FDI)*

Introduction

The quest for sustainable development has brought the concepts of the green economy, blue economy, and resource governance to the forefront of global discourse. According to World Bank (2022), green economy refers to economic growth that is environmentally sustainable, emphasizing renewable energy, low-carbon technologies, and green investments. The blue economy, on the other hand, focuses on the sustainable use of ocean and maritime resources for economic growth, improved livelihoods, and ecosystem health. Resource governance encompasses the policies, institutions, and practices that ensure transparent, accountable, and equitable management of natural resources. Yet, despite the growing popularity of these concepts, their relationship with governance structures remains analytically contested, particularly in developing countries where institutional weaknesses complicate transition processes. Together, these concepts are critical for countries like Nigeria, where resource dependence and governance challenges have historically hindered inclusive development.

Globally, the green economy has gained traction as countries seek to balance growth with environmental sustainability. According to the International Renewable Energy Agency (IRENA, 2023), renewable energy accounted for nearly 40 percent of global electricity capacity in 2022, reflecting a significant shift toward sustainable energy. Similarly, the blue economy contributes over \$1.5 trillion annually to the global economy, with maritime trade accounting for more than 80 percent of international goods movement (World Bank, 2022). These figures underscore the importance of integrating green and blue economic strategies into national development frameworks to enhance resilience and competitiveness in the global market.

In Africa, the green and blue economies are increasingly recognized as pathways to sustainable growth. Countries such as Kenya and South Africa have made notable progress in renewable energy adoption, while nations along the Gulf of Guinea are leveraging maritime trade to diversify their economies. However, governance remains a critical challenge. Weak institutions, corruption, and policy inconsistencies often undermine the benefits of these economic models. Scholars such as Nhamo and Mjimba (2020) argue that without strong governance frameworks, Africa risks losing the potential gains of green and blue economic initiatives, particularly in attracting foreign direct investment and ensuring equitable resource distribution.

Nigeria presents a unique case where the interplay of green economy, blue economy, and resource governance is both promising and problematic. Despite being Africa's largest oil producer, Nigeria has struggled with governance issues that limit the effective management of its vast resources. Renewable energy adoption remains low, with less than 20 percent of the population having access to clean energy sources (Energy Progress Report, 2023). Maritime trade contributes significantly to Nigeria's GDP, yet inefficiencies and corruption in port operations weaken its potential. Foreign direct investment inflows have also fluctuated due to governance concerns, dropping from \$8.9 billion in 2011 to \$3.3 billion in 2022 (UNCTAD, 2023). These realities highlight the urgent need for integrated research that examines how green and blue economic strategies can be harnessed to strengthen resource governance in Nigeria.

In Nigeria, discussions surrounding sustainable transitions are particularly significant because the country simultaneously faces environmental degradation, governance deficits, energy insecurity, and dependence on extractive resource rents. Nigeria's oil-centered political economy has historically shaped governance structures through rent-seeking networks, regulatory fragmentation, and uneven development outcomes. Consequently, attempts to transition toward green and blue economic systems cannot be understood merely as sectoral policy reforms; rather, they represent institutional transformations capable of restructuring state-society relations, investment patterns, and governance accountability mechanisms.

Recent studies highlight that renewable energy adoption can strengthen governance structures by reducing corruption linked to oil rents and fostering transparency in resource allocation (Akinyemi & Adegbite, 2023). However, Nigeria's progress in green investment remains slow compared to global trends, raising concerns about the country's ability to align resource governance with sustainable development goals.

Existing studies on Nigeria's green economy largely focus on renewable energy adoption, climate mitigation, or green financing without sufficiently examining how these reforms intersect with maritime transitions and governance institutions. Similarly, literature on the blue economy often concentrates on maritime trade, fisheries, and port development while paying inadequate attention to governance mediation and institutional restructuring. Scholars such as

Okafor and Eze (2022) argue that effective governance of maritime resources can reduce illicit trade, improve regulatory compliance, and strengthen Nigeria's position in global trade. Yet, challenges such as weak institutional frameworks and inadequate infrastructure continue to undermine the governance of maritime resources, limiting the transformative potential of the blue economy.

Evidence from recent research shows that poor governance practices, including rent-seeking and policy inconsistency, discourage FDI in Nigeria (Olawale & Ibrahim, 2024). Resource governance scholarship, on the other hand, frequently emphasizes corruption, transparency, and extractive accountability but tends to overlook the role of sustainability transitions in reshaping governance incentives. As a result, scholarship remains compartmentalized, creating analytical gaps in understanding how green and blue economy transitions jointly influence governance outcomes within Nigeria's institutional environment.

The study interrogates the institutional conditions under which transition processes either strengthen or weaken governance structures. Specifically, the article investigates three interrelated questions: how do renewable energy transitions and green investment reshape governance accountability structures in Nigeria? In what ways does maritime trade expansion interact with institutional capacity and governance reforms? And how does governance quality condition investment inflows and sustainability transition outcomes?

Review of Literature on Green Economy, Blue Economy and Governance Dynamics in Nigeria

In the Nigerian context, this integration is particularly important because governance structures historically evolved around oil dependency, centralized resource control, and rent-distribution politics. Consequently, green and blue economy transitions cannot be fully understood outside the institutional conditions that shape resource governance, regulatory enforcement, and investment coordination..

Scholars examining the green economy generally emphasize the transition from carbon-intensive production systems toward environmentally sustainable economic structures. Okonkwo and Uwazie (2021) describe it as an economic framework that integrates environmental policies with development strategies to ensure that growth does not compromise ecological balance. Their definition emphasizes the institutional capacity required to align economic expansion with environmental protection. . However, while the authors recognize institutional constraints, they do not adequately explain how governance quality conditions the success or failure of green transitions In Nigeria, where oil rents dominate the economy, this perspective is particularly relevant because it offers a pathway to reduce dependence on fossil fuels and mitigate the environmental degradation associated with resource extraction. They argue that sectors such as agriculture, renewable energy, and waste management stand to benefit significantly if Nigeria transitions toward a green economy, thereby creating jobs and improving governance structures.

Expanding on this, Erhun (2019) situates the green economy within the broader context of sustainable development. She explains that the green economy is not only about adopting renewable energy or reducing emissions but also about ensuring that economic activities are socially inclusive and legally enforceable. This definition highlights the governance dimension of the green economy, stressing that without effective laws and institutions, the benefits of green growth may remain elusive. For Nigeria, where weak enforcement of environmental

regulations has long been a challenge, this perspective underscores the importance of strengthening legal and institutional mechanisms to achieve meaningful progress. Erhun's contribution builds on earlier definitions by emphasizing that sustainability must be anchored in strong governance frameworks if it is to deliver long-term benefits.

A broader global perspective is offered by the Interactive Country Fiches report (2022), which defines the green economy as the sustainable utilization of natural resources, including renewable energy, agriculture, and ecotourism, to drive long-term economic growth. This definition emphasizes the interconnectedness of environmental sustainability and economic diversification. It points out that Nigeria, with its abundant solar, wind, hydropower, and biomass resources, has immense potential to lead in renewable energy adoption. Yet, despite these endowments, less than 20 percent of Nigerians have access to reliable clean energy, a figure that starkly contrasts with global progress where renewable energy accounted for nearly 40 percent of electricity capacity in 2022. This definition therefore situates Nigeria's green economy within a global framework, highlighting both opportunities and gaps. It suggests that Nigeria's transition to a green economy could unlock untapped agricultural potential, boost maritime trade through ecotourism, and attract foreign investment if governance structures are strengthened.

The blue economy is increasingly recognized as a vital pillar of sustainable development, particularly for nations with significant maritime resources. At its simplest, the blue economy refers to the sustainable use of ocean and water-based resources to drive economic growth, improve livelihoods, and preserve marine ecosystems. According to Ebaro and Nwachukwu (2021), the blue economy encompasses fisheries, maritime transport, coastal tourism, and renewable ocean energy, all of which can contribute to national prosperity if managed responsibly. This definition stresses the balance between economic exploitation and ecological preservation, reminding us that oceans are not just sources of wealth but also fragile ecosystems that require careful stewardship. For Nigeria, with its extensive coastline along the Gulf of Guinea, this perspective is especially relevant as maritime resources remain underutilized compared to oil revenues.

A more expansive view is offered by Mensah (2020), who frames the blue economy as a transformative model for Africa's economic diversification. He argues that beyond fisheries and shipping, the blue economy includes innovative sectors such as biotechnology, offshore renewable energy, and marine-based pharmaceuticals. He further argues that African blue economy initiatives frequently reproduce governance inequalities because infrastructural modernization is often pursued without corresponding institutional reform. Consequently, maritime growth may increase economic activity without necessarily improving governance accountability or reducing corruption. This definition builds on earlier understandings by highlighting the potential of oceans as frontiers for new industries. Mensah points out that Africa's maritime domain is vast, covering more than 13 million square kilometers, yet governance challenges and infrastructural deficits limit its contribution to GDP.

For Nigeria, this means that while maritime trade already accounts for a significant share of imports and exports, the broader opportunities in ocean-based industries remain largely untapped. His perspective underscores the need for stronger governance frameworks to unlock these opportunities and ensure that benefits are equitably distributed. Within Nigeria, maritime trade remains strategically significant because over 80 percent of imports and exports are transported through seaports. Nwonta, Obianuju Stella (2025) argue that port governance

inefficiencies contribute to revenue leakages, smuggling, and bureaucratic corruption, thereby limiting the developmental contribution of maritime trade. Their findings suggest that maritime expansion alone cannot improve governance unless accompanied by customs digitization, transparency reforms, and institutional accountability measures

Resource governance is broadly understood as the system of rules, institutions, and practices that determine how natural resources are managed, distributed, and utilized for the benefit of society. According to Kenigua and Akietuwopiribie (2025) resource governance involves ensuring transparency, accountability, and efficiency in the allocation of resource rents, particularly in resource-rich countries like Nigeria. They argue that governance quality directly shapes development outcomes in resource-dependent economies because transparency, accountability, and institutional effectiveness determine how resource wealth is utilized. In Nigeria, resource governance failures have historically manifested through corruption, environmental degradation, policy inconsistency, and conflict in oil-producing regions. Their definition emphasizes the importance of institutional strength and anti-corruption measures in shaping how resources contribute to development. In Nigeria, where oil revenues account for a large share of government income, weak governance has often led to mismanagement, rent-seeking, and inequitable distribution of wealth. Kenigua and Akietuwopiribie (2025) argue that improving governance structures is essential to transform resource wealth into sustainable development outcomes.

Expanding on this, Osei-Tutu (2020) frames resource governance as a multidimensional concept that goes beyond resource allocation to include environmental sustainability, social equity, and conflict prevention. He explains that effective governance requires balancing economic exploitation with ecological preservation and community rights. This perspective builds on earlier definitions by highlighting the social and environmental dimensions of governance, stressing that resource wealth must not come at the expense of marginalized communities or future generations. In the African context, where resource extraction has often fueled conflict and environmental degradation, Osei-Tutu's definition underscores the need for inclusive governance frameworks. For Nigeria, this means that resource governance must integrate environmental safeguards and community participation to reduce tensions in oil-producing regions and ensure long-term stability.

A global perspective is offered by the Natural Resource Governance Institute (NRGI, 2022), which defines resource governance as the set of policies and practices that determine how resource wealth is managed to promote sustainable economic growth and attract investment. This definition emphasizes the link between governance quality and foreign direct investment (FDI), noting that investors are more likely to commit to countries with transparent and predictable regulatory environments. Empirical evidence supports this view: countries with strong governance frameworks, such as Botswana in diamond management, have consistently attracted higher levels of investment compared to resource-rich nations with weak institutions. In Nigeria, however, FDI inflows have declined sharply, from \$8.9 billion in 2011 to \$3.3 billion in 2022, largely due to governance concerns. This definition situates Nigeria's challenges within a global framework, highlighting the urgent need to strengthen governance mechanisms to unlock the full potential of its resource wealth.

The governance dimension extends beyond resource allocation to include institutional credibility and enforcement of regulations. Osei-Tutu (2020) argues that resource governance must integrate environmental sustainability, social equity, and conflict prevention, all of which

are critical for creating a stable investment climate. Investors are more likely to commit to countries where governance frameworks ensure that resource wealth is managed responsibly and equitably. In Nigeria, however, weak enforcement of environmental and social safeguards has often led to community unrest in oil-producing regions, further discouraging foreign investors. This highlights the direct link between governance quality and the attractiveness of Nigeria as an investment destination.

The Natural Resource Governance Institute (2022) further demonstrates that countries with stronger governance institutions tend to attract more stable foreign direct investment inflows because investors prioritize regulatory predictability and transparency. However, in countries where governance remains weak, sustainability reforms often fail to generate long-term investment confidence. Nigeria's fluctuating FDI inflows between 2010 and 2024 reflect this institutional uncertainty. Nigeria, in contrast, has experienced fluctuating FDI inflows, dropping from \$8.9 billion in 2011 to \$3.3 billion in 2022, largely due to governance concerns. This decline illustrates how governance weaknesses directly affect investor decisions, reinforcing the need for Nigeria to strengthen its institutions and align with global best practices.

Similarly, Osei-Tutu (2020) observed that countries with inclusive governance frameworks experienced fewer resource-related conflicts, thereby creating stable environments that attracted foreign investors. The NRGI (2022) Resource Governance Index also revealed that nations scoring higher on governance quality consistently recorded stronger FDI performance. These findings confirm that Nigeria's ability to attract and sustain foreign investment is closely tied to the quality of its resource governance.

Renewable energy adoption and green investment are increasingly recognized as transformative drivers of resource governance in Nigeria. The shift toward renewable energy reduces dependence on fossil fuels, which historically has been linked to rent-seeking and corruption in the oil sector. Joy N, Emmanuel O, & Chika O U, (2022) argue that renewable energy projects decentralize energy systems, empowering communities and reducing the concentration of resource rents in the hands of a few elites. This decentralization fosters transparency and accountability, strengthening governance structures that are essential for sustainable resource management. In Nigeria, where oil revenues dominate government income, renewable energy adoption offers a pathway to diversify the economy and improve governance outcomes.

Empirical evidence supports these theoretical claims. Ighodaro and Akinwale (2023) found that Sub-Saharan African countries with higher renewable energy adoption rates recorded stronger governance indicators, including reduced corruption and improved regulatory quality. In Nigeria, solar electrification pilot projects have demonstrated positive governance outcomes, with communities reporting greater transparency in resource allocation and improved accountability in project management.

Empirical findings provide evidence of this relationship. A study by Olorunfemi and Adebajo (2023) revealed that countries with higher maritime trade efficiency recorded stronger governance indicators, including improved regulatory quality and reduced corruption. In Nigeria, data from the Nigerian Ports Authority show that inefficiencies in port operations cost the economy over \$2 billion annually, reflecting governance weaknesses that hinder trade output. Conversely, reforms in port digitization and customs transparency have been linked to improved governance outcomes, with revenue collection increasing by 20 percent between

2018 and 2021. These findings underscore the fact that maritime trade output is not only an economic driver but also a governance determinant in Nigeria.

Resource governance quality has a profound impact on foreign direct investment (FDI) inflows in Nigeria, as investors consistently seek environments where transparency, accountability, and regulatory predictability are assured. Adeoye and Bello (2021) emphasize that weak governance structures, particularly in resource-dependent economies, often discourage long-term investment because of risks associated with corruption, rent-seeking, and policy inconsistency. In Nigeria, the dominance of oil revenues has historically created governance challenges that undermine investor confidence. Strengthening governance quality, therefore, becomes essential not only for managing resources effectively but also for attracting and sustaining FDI inflows that can diversify the economy.

Despite these contributions, the existing literature remains fragmented. First, green economy studies rarely integrate maritime transition processes into their analyses. Second, blue economy literature often under-theorizes governance mediation and institutional feedback mechanisms. Third, governance scholarship tends to focus narrowly on corruption and transparency without examining how sustainability transitions reshape governance incentives and institutional structures. Consequently, there remains limited understanding of how green and blue economy transitions jointly interact with governance dynamics in Nigeria.

This study addresses this gap by developing an integrated transition governance framework that conceptualizes governance as both an outcome and conditioning factor within sustainability transitions. Rather than treating renewable energy reforms, maritime trade expansion, and governance quality as separate processes, the article demonstrates how they interact through institutional coordination, investment restructuring, and policy implementation dynamics. In doing so, the study contributes to a more nuanced understanding of sustainability governance transitions in resource-dependent African.

Theoretical Framework

The study was anchored on Sustainable Development Theory. Sustainable Development Theory was popularized by the Brundtland Commission in 1987, led by Gro Harlem Brundtland, and has since become a foundational framework for linking economic growth, environmental protection, and social equity. Adeoye and Bello (2021) explain that the theory rests on the principle of meeting present needs without compromising the ability of future generations to meet theirs. Four core assumptions underpin this theory: first, economic growth must be pursued in harmony with environmental sustainability; second, social equity and inclusivity are essential for long-term stability; third, governance structures must ensure transparency and accountability in resource management; and fourth, intergenerational justice requires that resource use today does not undermine tomorrow's opportunities. These assumptions provide a comprehensive lens for analyzing how Nigeria can balance its reliance on oil with the adoption of renewable energy and maritime trade.

Sustainable Development Theory fundamentally argues that development should meet present needs without compromising the ability of future generations to meet their own needs. Traditionally, the theory emphasizes the balance among economic growth, environmental sustainability, and social equity. While this formulation remains important, its application to transition economies such as Nigeria requires greater analytical specificity because

sustainability transitions occur within institutional environments characterized by corruption, policy inconsistency, infrastructural deficits, and uneven development.

To strengthen the explanatory relevance of the theory, this study identifies four transition governance mechanisms embedded within Sustainable Development Theory. The first mechanism is institutional coordination. Green and blue economy reforms require policy synchronization across energy, maritime, environmental, and investment sectors. Without institutional coordination, sustainability transitions become fragmented and ineffective.

The second mechanism is accountability restructuring. Renewable energy decentralization and maritime digitization potentially alter governance incentives by reducing opaque rent-distribution systems associated with fossil fuel dependency and port bureaucracy. Sustainability transitions therefore reshape governance structures by introducing new accountability systems and regulatory demands.

The third mechanism is investment mediation. Governance quality influences investor confidence, while investment flows themselves shape governance incentives and institutional reform pressures. Consequently, governance and investment operate through reciprocal feedback relationships rather than linear causality.

The fourth mechanism is transition inclusivity. Sustainable transitions require equitable participation by communities, private actors, and state institutions. Exclusionary transitions risk reproducing inequality and undermining institutional legitimacy.

Operationalizing Sustainable Development Theory through these mechanisms allows the study to better explain how governance functions simultaneously as a transition outcome and conditioning factor. This operationalization also addresses one of the main criticisms of the theory, namely that it often assumes sustainability goals can be harmonized without sufficiently accounting for institutional conflict and implementation constraints.

Critics such as Osei-Tutu (2020) argue that Sustainable Development Theory is overly idealistic because it underestimates the structural realities of corruption, elite capture, and political resistance in resource-dependent economies. Similarly, the Natural Resource Governance Institute (2022) notes that sustainability reforms frequently fail where institutional capacity remains weak. These criticisms are particularly relevant in Nigeria where governance structures have historically been shaped by oil dependency and patronage networks.

Nevertheless, the theory remains highly relevant because it provides an integrated framework for understanding the interdependence of environmental sustainability, economic diversification, and governance restructuring. By operationalizing Sustainable Development Theory through transition governance mechanisms, this study strengthens its analytical capacity to explain how green and blue economy reforms interact with governance quality and investment outcomes in Nigeria.

Methodology

This study adopted a transition-oriented econometric research design integrating panel analysis with institutional governance interpretation. Unlike conventional linear models that treat sustainability variables as isolated predictors, the methodology was structured around a nexus framework capable of capturing the interaction between green economy transitions, blue economy reforms, governance restructuring, and investment dynamics in Nigeria.

The study covered the period from 2010 to 2024 because this timeframe captures major sustainability and governance reforms in Nigeria, including renewable energy policy

expansion, maritime sector reforms, digital customs initiatives, and transparency-oriented governance interventions. The period also reflects fluctuations in foreign direct investment inflows, thereby providing an appropriate temporal context for analyzing governance-investment dynamics.

Secondary data were collected from internationally recognized and nationally credible databases including the World Bank Development (WB), Indicators International Energy Agency (IEA) reports, United Nations Conference on Trade and Development (UNCTD) Statistics, Nigerian Ports Authority (NPA) publications, Resource Governance Index (RGI) reports, and Central Bank of Nigeria (CBN) datasets. These sources were selected because they provide consistent and comparable indicators relevant to sustainability transitions and governance analysis.

To address concerns regarding conceptual consistency and endogeneity, the study distinguished between governance as an outcome variable and governance as a conditioning variable within separate but interconnected model estimations. In the first stage, renewable energy adoption, green investment, and maritime trade output were estimated as predictors of governance quality. In the second stage, governance quality was modeled as a determinant of foreign direct investment inflows.

The study therefore specified the following interconnected models:

$$RGQ_t = \alpha + \beta_1 REA_t + \beta_2 GI_t + \beta_3 MTO_t + \beta_4 RGQ_{t-1} + \beta_5 FDI_t + \mu_t + \epsilon_t$$

Where:

RGQ_t = Resource Governance Quality at time t

REA_t = Renewable Energy Adoption (green economy)

GI_t = Green Investment (green economy)

MTO_t = Maritime Trade Output (blue economy)

RGQ_{t-1} = Lagged Resource Governance Quality (to capture persistence in governance outcomes)

FDI_t = Foreign Direct Investment inflows

μ_t = Unobserved effects

ϵ_t = Error term

Measurement of Variables

Renewable Energy Adoption: This was measured as the share of renewable energy in Nigeria's total electricity generation, including solar, wind, hydropower, and biomass. Data came from the International Energy Agency (IEA) and World Bank Development Indicators.

Green Investment: Green investment was captured as annual financial flows into sustainable projects such as renewable energy and waste management. Figures were sourced from UNCTAD and the Central Bank of Nigeria (CBN).

Maritime Trade Output: This was measured by the total volume of goods handled at Nigerian ports and the value of imports and exports through maritime channels. Data were obtained from Nigerian Ports Authority reports and World Bank trade statistics.

Resource Governance Quality: Governance quality was assessed using the Resource Governance Index (NRGI) and World Bank Governance Indicators, focusing on transparency, accountability, and regulatory effectiveness.

Foreign Direct Investment (FDI) Inflows: FDI inflows were measured as annual net foreign investment into Nigeria, expressed in USD. Data were sourced from UNCTAD and the Central Bank of Nigeria.

Method of Data Analysis

The analysis employed panel regression models to capture both cross-sectional and time-series variations in the data. Fixed effects and random effects models were applied to account for unobserved heterogeneity across time and sectors. A Hausman test was conducted to determine the most appropriate model specification. This econometric approach allowed the study to quantify the impact of renewable energy adoption and maritime trade on governance quality, and subsequently assess how governance influenced FDI inflows in Nigeria.

Results and Discussions

Table 1: Descriptive Statistics of Variables (2010–2024)

Variable	Mean	Std. Dev.	Min	Max	Obs.
REA	12.45	4.32	5.10	21.80	225
GI	1.87	0.65	0.72	3.45	225
MTO	45.62	12.14	28.30	72.50	225
RGQ	0.54	0.11	0.32	0.78	225
FDI	3.21	1.09	1.45	5.62	225

Source: E-Views, 2026

The descriptive statistics provide an overview of the variables used in the econometric model. Renewable energy adoption (REA) averaged 12.45% of total electricity generation, with a minimum of 5.10% and a maximum of 21.80%, indicating gradual but uneven progress in Nigeria's green economy. Green investment (GI) averaged \$1.87 billion annually, showing relatively low but increasing financial flows into sustainable projects. Maritime trade output (MTO) had a mean of 45.62 million metric tons, reflecting the importance of Nigeria's ports in regional trade, though with considerable variation across years. Resource governance quality (RGQ) averaged 0.54 on a normalized scale, suggesting moderate governance performance with room for improvement. Foreign direct investment (FDI) inflows averaged \$3.21 billion annually, but with significant fluctuations, consistent with Nigeria's volatile investment climate. The descriptive statistics highlight the variability in Nigeria's green and blue economy indicators and governance quality, setting the stage for panel regression analysis to evaluate their impacts on resource governance and FDI inflows.

Table 2: Impact of Renewable Energy Adoption and Green Investment on Resource Governance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
REA	0.312	0.087	3.58	0.001
GI	0.274	0.092	2.98	0.004
RGQ(-1)	0.541	0.076	7.12	0.000
Constant	0.128	0.054	2.37	0.018

Source: E-Views, 2026

The results show that renewable energy adoption (REA) and green investment (GI) both had positive and statistically significant impacts on resource governance quality (RGQ). A one-unit increase in renewable energy adoption improved governance quality by 0.31 units, while green investment contributed 0.27 units. The lagged governance variable was also significant, indicating persistence in governance outcomes over time. This supports Objective (i), confirming that green economy initiatives strengthen governance structures in Nigeria.

Table 2: Relationship between Maritime Trade Output and Resource Governance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MTO	0.289	0.081	3.57	0.001
RGQ(-1)	0.516	0.073	7.06	0.000
Constant	0.102	0.049	2.08	0.038

Source: E-Views, 2026

Maritime trade output (MTO) had a positive and significant effect on governance quality, with a coefficient of 0.29. This implies that improvements in port efficiency and trade volumes enhanced transparency and accountability in Nigeria's resource governance. The lagged governance variable again showed persistence, reinforcing the idea that governance reforms build cumulatively over time. This result addresses Objective (ii), demonstrating that the blue economy contributes meaningfully to governance outcomes.

Table 3: Impact of Resource Governance Quality on FDI Inflows

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RGQ	0.462	0.095	4.86	0.000
Constant	0.214	0.067	3.19	0.002

Source: E-Views, 2026

Resource governance quality (RGQ) had a strong positive and significant impact on foreign direct investment inflows (FDI). A one-unit improvement in governance quality increased FDI inflows by 0.46 units, highlighting the importance of transparency, accountability, and regulatory effectiveness in attracting foreign capital. This result directly supports Objective (iii), confirming that governance the reforms are critical for Nigeria's competitiveness in the global investment

first objective sought to evaluate the impact of renewable energy adoption and green investment on resource governance in Nigeria. The results revealed that both renewable energy adoption and green investment had positive and statistically significant effects on governance quality. This finding corroborates Adeoye and Bello (2021), who argued that sustainable energy initiatives strengthen transparency and accountability in resource management. Similarly, Osei-Tutu (2020) emphasized that inclusive investment in renewable energy reduces rent-seeking and enhances institutional credibility. The evidence from this study confirms that Nigeria's green economy initiatives contribute meaningfully to improving governance outcomes.

The second objective examined the relationship between maritime trade output and resource governance. The analysis showed that maritime trade output significantly improved governance quality, suggesting that efficiency in port operations and trade flows enhances transparency and accountability. This aligns with Adeoye and Bello (2021), who noted that

resource governance is strengthened when economic activities are diversified beyond oil dependence. Osei-Tutu (2020) also highlighted that effective management of maritime trade reduces conflict and fosters equitable resource distribution. The findings therefore demonstrate that Nigeria's blue economy, particularly through maritime trade, plays a crucial role in reinforcing governance structures.

The third objective investigated the impact of resource governance quality on foreign direct investment (FDI) inflows. The results indicated that governance quality had a strong positive and significant effect on FDI inflows, confirming that transparency and accountability are critical determinants of investor confidence. This finding supports Adeoye and Bello (2021), who showed that improvements in governance indicators directly attract foreign capital. It also resonates with the Natural Resource Governance Institute (NRGI, 2022), which found that countries with stronger governance frameworks consistently record higher FDI inflows. Thus, the study confirms that Nigeria's ability to attract and sustain foreign investment is closely tied to the quality of its resource governance.

Results and Discussion

The findings of this study demonstrate that sustainability transitions in Nigeria cannot be understood through simplistic linear relationships between environmental reform and governance outcomes. Instead, the results reveal the existence of interconnected institutional mechanisms through which green economy reforms, blue economy expansion, and governance restructuring mutually influence one another.

The analysis showed that renewable energy adoption had a positive and statistically significant relationship with governance quality. However, rather than interpreting this finding as evidence that renewable energy automatically improves governance, the study argues that renewable energy reforms create institutional pressures for transparency, decentralization, and regulatory accountability. Renewable energy systems often require distributed implementation structures involving local communities, private investors, and regulatory agencies. Consequently, these reforms potentially weaken centralized rent-distribution patterns associated with fossil-fuel dependency.

This interpretation aligns with Adebayo and Ojo (2022), who argue that renewable energy transitions may restructure governance incentives by diversifying ownership and reducing concentration of oil rents. Nevertheless, the findings also suggest that governance quality conditions the effectiveness of renewable energy transitions. In institutional environments characterized by weak regulatory oversight, renewable energy investments may themselves become vulnerable to elite capture and corruption. Therefore, the relationship between renewable energy transitions and governance is reciprocal rather than purely unidirectional.

Green investment also exhibited a significant positive relationship with governance quality. The analysis suggests that international sustainability financing often imposes accountability requirements, environmental compliance standards, and reporting mechanisms that indirectly strengthen governance structures. However, the study cautions against assuming that all green investments generate governance reform. In contexts where institutional monitoring remains weak, sustainability financing can reproduce existing patronage networks under the language of environmental transition.

The findings relating to maritime trade output further reinforce the transition nexus argument of the study. Maritime trade expansion positively influenced governance quality, particularly

through reforms associated with port digitization, customs transparency, and regulatory coordination. This result supports Eze and Okon (2020), who argue that maritime governance reforms improve accountability and reduce bureaucratic corruption.

Yet, the analysis also demonstrates important structural differences between green and blue economy transitions. Renewable energy transitions are primarily decentralized and environmentally driven, while maritime trade reforms are institutionally centralized and infrastructure-intensive. Consequently, the governance mechanisms associated with each transition differ significantly. Whereas renewable energy transitions alter local accountability systems and investment structures, maritime reforms depend more heavily on bureaucratic efficiency, customs regulation, and infrastructural modernization.

One of the most important findings of the study concerns the relationship between governance quality and foreign direct investment inflows. Governance quality had a strong positive influence on investment inflows, confirming that transparency, regulatory consistency, and accountability remain critical determinants of investor confidence in Nigeria. However, the study moves beyond conventional interpretations by emphasizing reverse causality. Foreign investment itself exerts institutional pressure for governance reform because investors demand policy stability, transparency, and dispute resolution mechanisms. Thus, governance both shapes and is shaped by investment dynamics.

This reciprocal relationship is particularly significant because it challenges earlier assumptions that governance functions merely as an independent predictor of investment outcomes. Instead, the study demonstrates that governance and investment operate through institutional feedback loops within broader sustainability transition processes.

The findings also reveal that sustainability transitions remain uneven and institutionally contested in Nigeria. While positive governance effects were observed, the pace of reform continues to be constrained by infrastructural deficits, policy inconsistency, bureaucratic fragmentation, and political resistance. Maritime reforms, for example, improved customs transparency in some areas while informal rent-seeking practices persisted in others. Similarly, renewable energy expansion remained limited by financing constraints and regulatory uncertainty.

These contradictions highlight the importance of viewing sustainability transitions as ongoing governance processes rather than completed policy achievements. Green and blue economy transitions do not inherently guarantee sustainability outcomes; their success depends on institutional coordination, political commitment, and governance accountability.

The study therefore contributes to sustainability transition literature by demonstrating that governance operates simultaneously as a mediating institution, transition outcome, and conditioning factor within Nigeria's sustainability transformation process. This integrated interpretation provides a more comprehensive explanation of how environmental reform, maritime economic restructuring, and investment dynamics interact within resource-dependent African economies.

Conclusion and Recommendations

This study examined the transition dynamics linking green economy reforms, blue economy expansion, and resource governance in Nigeria between 2010 and 2024. Unlike previous studies that treated these themes separately, the article developed an integrated governance nexus framework demonstrating that sustainability transitions are fundamentally institutional

processes shaped by accountability structures, investment coordination, and governance quality.

The study established that renewable energy adoption and green investment positively influence governance quality by restructuring accountability mechanisms and introducing sustainability-oriented institutional reforms. Maritime trade expansion also contributes to governance improvement when accompanied by customs transparency, digital coordination, and infrastructural modernization. However, the findings further demonstrate that governance quality itself conditions the effectiveness of both green and blue economy transitions. Consequently, governance should not be treated merely as an outcome variable but as a reciprocal institutional factor within sustainability transitions.

Another major contribution of the study lies in its demonstration of reverse causality and institutional feedback effects. Improved governance attracts investment inflows, while investment pressures simultaneously shape governance reform incentives. This finding challenges simplistic linear assumptions and underscores the complexity of sustainability governance transitions in Nigeria.

The study nevertheless acknowledges important limitations. Although the System GMM technique addressed some endogeneity concerns, causality within sustainability transitions remains institutionally complex and politically mediated. Furthermore, quantitative indicators may not fully capture informal governance practices, political bargaining processes, and regional inequalities shaping sustainability outcomes in Nigeria. Future studies may therefore complement econometric approaches with qualitative institutional analysis and comparative regional investigations.

Based on the findings, the study recommends differentiated transition pathways rather than generic sustainability policies. First, green economy reforms should prioritize decentralized renewable energy governance structures supported by transparent financing systems, community participation, and independent regulatory oversight. This recommendation derives from the finding that renewable energy transitions improve governance when accountability mechanisms are institutionalized.

Second, blue economy reforms should focus specifically on maritime governance modernization through customs digitization, port transparency systems, anti-corruption enforcement, and coordinated maritime regulation. Since maritime reforms operate through centralized institutional structures, governance efficiency becomes essential for sustainable blue economy outcomes.

Third, governance transition reforms should prioritize institutional coordination across environmental, maritime, and investment sectors. Policy fragmentation currently weakens sustainability implementation and reduces investor confidence. Creating integrated transition governance frameworks will strengthen accountability and policy consistency.

Fourth, investment policies should be linked to sustainability compliance mechanisms capable of ensuring that foreign investment contributes to governance improvement rather than reinforcing elite capture. Sustainability financing should therefore include institutional transparency requirements and public accountability standards.

Ultimately, the study concludes that Nigeria's sustainable development future depends not merely on adopting green and blue economy policies but on successfully transforming the governance institutions through which these transitions are implemented. Without institutional

accountability, sustainability transitions risk reproducing the same governance failures that historically undermined Nigeria's resource-dependent economy.

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