

Towards a Greening Policy Framework for a Sustainable Economic Development in Nigeria

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Abstract

This study addresses the pressing environmental challenges linked to Nigeria's economic growth, particularly as Africa's largest economy, which heavily relies on the oil and gas sector. While this sector drives economic development, it also contributes to significant environmental degradation, such as deforestation, pollution, and biodiversity loss. The unsustainable nature of this economic model threatens public health and the country's long-term economic stability. To mitigate these challenges, the integration of green technology and the adoption of a comprehensive greening policy framework are crucial. This research focuses on developing such a framework for sustainable economic development in Nigeria, with an emphasis on compliance with the Kyoto Protocol and Doha Amendments. A sequential qualitative research design was utilized, targeting experts knowledgeable about the implementation of these international agreements in South Korea and Nigeria. Twenty experts, evenly divided between the two countries, provided insights through open-ended questionnaires and interviews. The data collected was analyzed using inductive thematic coding. The findings revealed that Nigeria's adoption of the Kyoto Protocol was driven by its commitment to international environmental agreements, potential economic gains from market-based mechanisms, and an increased awareness of climate change challenges. However, progress is hindered by weak regulatory frameworks, insufficient infrastructure, financial limitations, and a lack of technological innovation. These issues are further aggravated by systemic problems such as bureaucratic inefficiencies and corruption. Drawing lessons from South Korea's successful alignment with global climate agreements, the study underscores the importance of strengthening Nigeria's regulatory environment through comprehensive policies that adhere to international standards.

Keywords: Greening policy, sustainable economic development, Kyoto protocol, Doha, amendments

Introduction

Nigeria's pursuit of sustainable economic development faces significant environmental challenges, particularly in the context of its heavy reliance on the oil and gas sector, which has led to widespread environmental degradation. This includes deforestation, loss of biodiversity, and pollution, which have severely impacted the country's ecosystems and local communities. The lack of strong environmental

regulations and enforcement mechanisms exacerbates these issues, making it difficult for Nigeria to align its economic development goals with environmental sustainability (Nwokolo & Meyer, 2023). Integrating green technology and greening initiatives into Nigeria's development strategy could offer a viable solution to these challenges by promoting cleaner energy sources, enhancing resource efficiency, and reducing the environmental footprint of industrial activities (Ali et al. 2021).

In contrast, South Korea presents a compelling model of how a nation can successfully integrate green policies into its economic development strategy. South Korea's transformation into a green economy has been driven by strong government leadership, substantial investment in green technologies, and the establishment of a robust legal framework that prioritizes environmental sustainability (Lee & Woo, 2020). This contrast between Nigeria and South Korea highlights the critical importance of policy direction, technological innovation, and legal frameworks in achieving sustainable development. South Korea's success story reiterates the potential benefits of a well-implemented greening policy, particularly in the context of international climate agreements such as the Kyoto Protocol and the Doha Amendments (Ko & Kim, 2020).

This study is rooted in the urgent need to address the environmental challenges that accompany Nigeria's economic growth. Nigeria, as Africa's largest economy, relies heavily on the oil and gas sector, which, while driving economic development, has also resulted in significant environmental degradation, including deforestation, pollution, and loss of biodiversity (Mafiana et al., 2022). The environmental impact of this economic model has become increasingly unsustainable, threatening both the health of the population and the country's long-term economic viability. To mitigate these issues, integrating green technology and adopting a comprehensive greening policy framework are essential steps for Nigeria. Green technology can reduce the environmental footprint of the oil and gas sector by promoting cleaner energy sources, improving resource efficiency, and fostering sustainable practices (Cheng et al. 2023).

Objectives of the Study

The aim of this study was to design and propose a greening policy framework for sustainable economic development in Nigeria. Specifically, the study provided answers to the following research objectives:

1. To assess the key factors that influenced the adoption of the Kyoto Protocol on December 11, 1997.
2. To examine the effects of the Doha Protocol amendments, effective from December 8, 2012, on international climate policies.
3. To evaluate the effectiveness of market-based mechanisms in helping signatories achieve their Kyoto Protocol targets in terms of:
 - 3.1 International Emissions Trading;
 - 3.2 Clean Development Mechanism; and
 - 3.3 Joint Implementation.
4. To propose strategies that Nigeria can implement to fully comply with the Kyoto Protocol and Doha Amendments through a greening policy aimed at sustainable economic development.

Methodology

Presented in this section are the specific processes and procedures undertaken to gather and process data for this study.

Research Design. A sequential qualitative approach was used as the research design in this study. This approach is particularly valuable when the second group's responses are needed to address issues raised by the first group, enabling a comparison of the two data sets. Such comparisons not only contribute to the theoretical development of the study but also help identify critical gaps. In this case, these gaps can inform the creation of a strategic plan within the policy framework, ensuring that it effectively addresses the issues uncovered during the research.

Population, Sampling, and Sampling Procedures. The study targeted 20 experts, 10 each from South Korea and Nigeria, knowledgeable about the Kyoto Protocol and Doha Protocol Amendments. Purposive sampling was used to select participants with relevant expertise in environmental policy and protocol implementation. This method ensured that only individuals with demonstrated experience and insight into the protocols' execution were included. Selection criteria required professional involvement in environmental policy, subject matter expertise, and the ability to provide meaningful contributions. This approach guaranteed that the study gathered informed perspectives on the implementation of these international agreements in both countries.

The Research Instrument. Open-ended questionnaires and interview guide questions were the primary data collection tools, accompanied by a cover letter introducing the researcher and study purpose. Five experienced Nigerian teachers validated the instruments, confirming their relevance. A confirmatory factor analysis reinforced the questionnaire's strong content validity. Reliability was assessed using Cronbach's Alpha, with a pilot test involving 10 experts from Nigeria and South Korea. Data collection was conducted online for efficiency. The pilot test yielded a Cronbach's Alpha of 0.965, indicating excellent internal consistency. These findings confirm that the instruments are both valid and reliable for accurately exploring the study's objectives.

Ethical Considerations. Before the interviews, participants received informed consent forms outlining the study's purpose, procedures, rights, and potential risks or benefits. This ensured voluntary participation and the ability to withdraw at any time. Ethical standards were strictly followed, including anonymity by omitting identifying details, voluntarism with no consequences for non-participation, and confidentiality through secure data storage. Participants were assured of no harm or risks to their work. The researcher upheld ethical research practices, respecting participants' autonomy while safeguarding their rights and well-being throughout the study. This commitment reinforced trust and integrity in the research process.

Statistical Tests. This study employed inductive thematic analysis for open-ended survey data and the Collaizi (2019) technique for qualitative interview data. The Collaizi method, a phenomenological approach, was chosen for its effectiveness in exploring participants' lived experiences. It provided a systematic and rigorous framework for analyzing qualitative data, ensuring an in-depth understanding while addressing the research questions. These statistical tools enhanced the reliability and depth of the analysis, capturing essential insights from participants' perspectives in a structured manner.

Results and Discussion

This chapter presents the results and discussion based on the findings from the surveys and interviews. The findings are systematically organized according to the research objectives, ensuring a clear and logical flow. The chapter begins with an analysis and discussion of the key factors that influenced the adoption of the Kyoto Protocol, followed by an examination of the effects of the Doha Protocol Amendments on international climate policies. It then explores the effectiveness of market-based mechanisms and concludes with a discussion of the strategies Nigeria can implement to fully comply with the Kyoto Protocol and Doha Amendments, particularly through a greening policy aimed at sustainable economic development. The findings are further substantiated by past literature, which enhances the credibility and depth of the analysis.

1. Key Factors that Influenced the Adoption of the Kyoto Protocol

Nigeria's adoption of the Kyoto Protocol was influenced by a combination of international, economic, and environmental factors. The nation's commitment to global environmental agreements highlighted its recognition of the importance of reducing greenhouse gas emissions and aligning with international climate standards. Economic incentives from market-based mechanisms, such as the potential benefits of carbon trading, further motivated Nigeria's participation. Additionally, the growing awareness of climate change's adverse impacts on national development reinforced the need for active engagement in global climate action.

These findings are supported by personal comments from three Nigerian participants in the open-ended questionnaire. One participant stated, "Nigeria's adoption of the Kyoto Protocol was largely influenced by the need to secure international support and funding for climate-related projects. The economic incentives provided by the CDM were particularly appealing as they aligned with our national development goals." (Participant "A"). Another participant highlighted the environmental aspect, noting, "The growing environmental challenges, especially the increasing frequency of floods and droughts, made it clear that Nigeria needed to be part of a global solution. The Kyoto Protocol offered a framework to address these issues while benefiting from international cooperation." (Participant "B"). A third participant emphasized the importance of global solidarity, remarking, "Nigeria's commitment to the Kyoto Protocol was also about showing solidarity with the global community in addressing climate change. We understood that our actions would have implications not just for Nigeria but for the entire world." (Participant "C").

These views align with the findings of past empirical studies. For instance, Anwadike (2021) found that Nigeria's adoption of the Kyoto Protocol was significantly influenced by the potential economic benefits and the country's need for international cooperation in addressing climate change. Buttressing this point, a study by Butu et al. (2022) highlighted that the CDM played a pivotal role in Nigeria's decision, as it promised both environmental and economic returns. Another study by Olujobi and Odogbo (2024) corroborated these findings, revealing that Nigeria's environmental policy framework was increasingly shaped by global climate agreements, with the Kyoto Protocol being a key driver.

The findings are further supported by personal comments from two South Korean participants in the interviews. One participant mentioned, "The economic incentives of the Kyoto Protocol were critical for many countries, including Nigeria. The CDM, in particular, provided a way for developing nations to engage in climate action while receiving financial and technical support." (Interviewee "B"). Another

participant from Korea added, “The global nature of climate change requires collective action. Nigeria’s adoption of the Kyoto Protocol was a strategic move to align with international efforts and secure the necessary resources to combat environmental challenges.” (Interviewee “A”). Overall, these findings suggest that Nigeria’s adoption of the Kyoto Protocol was a multifaceted decision driven by economic, environmental, and diplomatic considerations. The implications of this finding highlight the importance of international frameworks in shaping national climate policies and the potential benefits of global cooperation in addressing environmental challenges.

2. Effects of the Doha Protocol Amendments On International Climate Policies

The Doha Protocol amendments significantly impacted Nigeria’s climate policies by extending the Kyoto Protocol’s targets and introducing more stringent emission reduction requirements. These amendments prompted Nigeria to reassess its environmental strategies, leading to greater alignment of national policies with international standards. This shift resulted in strengthened regulatory frameworks, enhanced environmental monitoring systems, and increased participation in global carbon markets. Furthermore, the amendments encouraged Nigeria to integrate climate resilience into its development planning, adopting sustainable pathways that balance economic growth with environmental conservation.

These findings are supported by personal comments from four Nigerian participants in the open-ended questionnaire. One participant noted, “The Doha amendments pushed Nigeria to take its climate commitments more seriously, leading to stricter regulations and policies aimed at reducing emissions.” (Participant “D”). Another participant commented, “These amendments made it clear that we needed to step up our efforts. Nigeria had to reconsider its approach to climate change and start implementing more robust measures.” (Participant “F”). A third participant observed, “With the extended targets, Nigeria had no choice but to align its policies with global standards, which meant rethinking our development strategies to be more climate-conscious.” (Participant “E”). The fourth participant added, “The Doha amendments acted as a wake-up call for Nigeria. We realized that to remain part of the global community, we have to enhance our climate policies and ensure they were in line with international expectations.” (Participant “C”).

These findings are corroborated by past empirical studies. For instance, Ajibo et al. (2021) found that the Doha amendments significantly influenced Nigeria's climate policy, leading to the adoption of more comprehensive environmental regulations. Similarly, research by Ehanmo and Erhahon (2024) revealed that the Doha amendments played a vital role in accelerating Nigeria's participation in global carbon markets and promoting sustainable development practices. This was validated by Agboola et al. (2023) who confirmed that the amendments encouraged Nigeria to strengthen its environmental governance and improve its climate resilience strategies.

The findings are further supported by personal comments from three South Korean participants in the interviews. One participant stated, “The Doha amendments had a ripple effect globally, including in Nigeria, where they led to more stringent climate policies and greater participation in international efforts.” (Interviewee “E”). Another participant remarked, “Countries like Nigeria had to adapt quickly to the new targets set by the Doha amendments, which meant significant changes in their policy frameworks.” (Interviewee “C”). Third participant emphasized, “The global pressure from the Doha amendments forced many developing countries, including Nigeria, to prioritize climate action and align their policies with international standards.” (Interviewee “D”).

In essence, the effects of the Doha Protocol amendments on Nigeria's international climate policies have been profound, driving significant policy changes and reinforcing the country's commitment to global climate goals. These changes reflect the broader impact of international agreements on national policies and the importance of global cooperation in addressing climate change.

3. Effectiveness of Market-Based Mechanisms

Despite these commitments, the implementation of market-based mechanisms in Nigeria, such as International Emissions Trading, the Clean Development Mechanism (CDM), and Joint Implementation, has faced considerable challenges. International Emissions Trading has been largely ineffective due to insufficient infrastructure and regulatory frameworks to support a functional carbon market. Similarly, the CDM, which was intended to promote sustainable development and facilitate clean technology transfer, has struggled with bureaucratic inefficiencies, inadequate funding, and limited local expertise. Joint Implementation has also underperformed, with financing constraints, insufficient institutional support, and a lack of capacity for project execution impeding its success. These challenges highlight the urgent need for Nigeria to strengthen its regulatory and institutional frameworks, build technical capacity, and streamline processes to fully harness the benefits of these mechanisms.

Personal comments from Nigerian participants reflect these challenges: one noted, “International emissions trading have not really taken off in Nigeria because we lack the necessary infrastructure and regulatory support to engage effectively in this market.” (Participant “G”). Another participant remarked, “Our current systems are not well-equipped to handle the complexities of emissions trading. This has limited our ability to capitalize on the potential benefits of international markets.” (Participant “H”). A third participant added, “The inefficacy of international emissions trading in Nigeria highlights our broader challenges in environmental regulation and market integration.” (Participant “I”).

In interviews with South Korean participants, similar concerns were expressed. Regarding international emissions trading, one participant noted, “The lack of infrastructure in Nigeria has made it difficult for them to effectively participate in international emissions trading.” (Interviewee “H”). Another remarked, “Nigeria’s struggles with emissions trading reflect broader challenges faced by developing countries in integrating into global carbon markets.” (Interviewee “J”). A third participant added, “The inefficacy of international emissions trading in Nigeria underscores the need for stronger regulatory frameworks and market infrastructure.” (Interviewee “I”).

The findings on the limited effectiveness of international emissions trading in Nigeria are corroborated by several past empirical studies. Elavarasan et al. (2020) found a lack of a well-established regulatory framework and inadequate infrastructure as major barriers, which severely limit the country's ability to effectively participate in global carbon markets. This revelation appears to complement Oke et al. (2024) argument that regulatory inconsistencies, a shortage of technical expertise, and insufficient market infrastructure were the specific barriers to emissions trading in Nigeria. Their findings emphasized that these factors contribute to a fragmented and inefficient market environment, reducing the effectiveness of emissions trading initiatives.

Additionally, Adeniyi & Isah (2023) examined broader systemic issues affecting emissions trading, finding that incoherent policy frameworks and weak enforcement mechanisms further undermine the success of these schemes. Their research revealed that administrative delays and a lack of commitment to necessary regulatory reforms have also played a role in the underperformance of emissions trading systems.

Collectively, these studies provide a detailed understanding of the structural and regulatory obstacles facing Nigeria's participation in international emissions trading, supporting the observation that significant barriers need to be addressed to enhance the effectiveness of these mechanisms.

Clean Development Mechanism (CDM) projects have also faced hurdles in Nigeria. Although the CDM was intended to promote sustainable development and facilitate the transfer of clean technologies, many projects in Nigeria have struggled due to issues such as bureaucratic delays, inadequate funding, and local capacity constraints. One participant commented, "CDM projects in Nigeria have often been delayed or stalled due to administrative bottlenecks and a lack of financial resources." (Participant "J"). Another added, "The benefits of CDM have not been fully realized in Nigeria because many projects have faced significant obstacles, including insufficient local expertise." (Participant "E"). A third participant observed, "The limited success of CDM in Nigeria reflects broader issues with implementing international environmental agreements at the local level." (Participant "H").

In interviews with South Korean participants, they further expressed similar concerns. One South Korean participant commented, "CDM projects in Nigeria have faced significant hurdles, including bureaucratic delays and funding issues, which have limited their effectiveness." (Interviewee "G"). Another noted, "The slow progress of CDM projects in Nigeria highlights the difficulties of implementing such mechanisms in developing countries." (Interviewee "I"). A third participant remarked, "Nigeria's experience with CDM projects shows the challenges of translating international climate agreements into local benefits." (Interviewee "J").

The findings regarding the challenges faced by the Clean Development Mechanism (CDM) in Nigeria are supported by several empirical studies. Kim (2023) found issues such as bureaucratic red tape, inadequate funding, and insufficient local capacity, which have collectively impeded the successful implementation of CDM initiatives in Nigeria. Similarly, Pacagnella et al. (2023) in their study revealed that the complexities of project approval processes and financial constraints have significantly delayed the progress of CDM initiatives in Africa. Their findings underscore the difficulties in managing and executing CDM projects within the Nigerian context. This situation aligns with Majekolagbe (2020), who in their study identified systemic issues such as weak institutional support, lack of technical expertise, and difficulties in aligning local projects with international standards as major barriers to successful CDM deployment. Together, these studies highlight the pervasive operational and systemic issues affecting CDM projects in Nigeria, reinforcing the observation that these challenges have significantly undermined the effectiveness of the CDM in the country.

Joint Implementation has similarly underperformed in Nigeria. This mechanism, which allows developed countries to invest in emission reduction projects in developing countries, has been hampered by challenges such as project financing difficulties, lack of local capacity, and inadequate institutional support. Personal comments supported these issues: one participant noted, "Joint Implementation projects have not yielded the expected results in Nigeria due to financing challenges and insufficient local expertise." (Participant "B"). Another participant remarked, "The lack of effective institutional support has significantly impeded the progress of Joint Implementation projects in Nigeria." (Participant "F"). A third participant commented, "The inefficacy of Joint Implementation in Nigeria highlights our broader difficulties with international cooperation and project management." (Participant "H").

Interviews with South Korean participants further expressed similar concerns. One participant remarked, "The financing and institutional challenges faced by Joint Implementation projects in developing countries have been well-documented, reflecting broader difficulties in international cooperation."

(Interviewee “J”). Another commented, “The limited success of Joint Implementation in developing countries points to the need for more effective project management and support mechanisms.” (Interviewee “D”). A third participant noted, “The inefficacy of Joint Implementation in Nigeria underscores the broader challenges of implementing international climate strategies in developing countries.” (Interviewee “C”).

The challenges associated with Joint Implementation projects in Nigeria are well-documented in several empirical studies. Ogbodo-Nathaniel et al. (2024) in their study identified significant issues such as difficulties in securing funding, inefficiencies in project management, and regulatory hurdles. Their research revealed that these challenges have severely limited the successful execution of Joint Implementation projects in Nigeria. Related findings were reported by Sunday (2023) that complex approval processes, inadequate financial mechanisms, and logistical difficulties have undermined the success of these projects, preventing them from achieving their intended outcomes. Thus, Abdullahi et al. (2024) study detailed issues such as weak institutional frameworks, lack of coordination among stakeholders, and operational inefficiencies that have further impeded the effectiveness of Joint Implementation in Nigeria. These studies collectively reiterate the multifaceted barriers to Joint Implementation projects, emphasizing that institutional, financial, and logistical challenges have significantly hindered their successful execution and impact in Nigeria. Overall, the limited effectiveness of these market-based mechanisms in Nigeria emphasizes significant barriers to their successful implementation, including infrastructure limitations, financial constraints, and regulatory challenges.

4. Strategies Nigeria can implement to fully comply with the Kyoto Protocol and Doha Amendments

Based on the findings of this study and in comparison with South Korea's approach, Nigeria can adopt several strategies to fully comply with the Kyoto Protocol and Doha Amendments through a well-structured greening policy aimed at sustainable economic development. South Korea's success in meeting these international climate agreements is largely attributed to its robust policy frameworks, technological advancements, and effective implementation mechanisms. In contrast, Nigeria faces challenges such as inadequate infrastructure, regulatory hurdles, and limited financial resources, which have hindered its progress. To address these issues, Nigeria needs to first strengthen its regulatory frameworks. Developing comprehensive and coherent policies that align with international climate standards is crucial. South Korea's successful alignment with these protocols was supported by its detailed and integrated policy approaches. Nigeria should create a clear roadmap for emissions reductions and incorporate climate goals into national development plans. This involves setting ambitious targets and establishing robust monitoring and enforcement mechanisms to ensure compliance.

Investing in infrastructure is another critical area for Nigeria. Effective implementation of market-based mechanisms, such as emissions trading and carbon markets, requires substantial infrastructure to support these systems. South Korea's achievements in this area are due to its advanced technological infrastructure. Nigeria must develop similar capabilities, including enhanced monitoring systems and improved data management, to facilitate the effective operation of these mechanisms. Building institutional capacity is also essential. Strengthening institutions responsible for climate policy, training personnel, and ensuring a thorough understanding of international climate agreements are key steps. South Korea's success is partly due to its well-trained workforce and strong institutional support. Nigeria needs to prioritize capacity-building to ensure its institutions can effectively manage and implement climate policies.

Technological innovation and clean energy adoption are vital for Nigeria's climate strategy. South Korea's success is largely due to its promotion of clean technologies and renewable energy solutions. Nigeria should implement policies that support the development and deployment of green technologies. Providing incentives for research and development in clean energy and transitioning to renewable sources can help reduce Nigeria's carbon footprint and enhance climate resilience. Financial constraints have been a major obstacle for Nigeria. To overcome this, Nigeria should develop financial mechanisms that attract private investment into green projects. Learning from South Korea's approach to leveraging public-private partnerships and international financial support can provide Nigeria with the resources needed for effective climate action. Creating a favorable investment climate through incentives, subsidies, and tax breaks will encourage investment in climate-related initiatives.

Promoting international cooperation is also crucial. South Korea's success in climate policy is partly due to its strong international partnerships. Nigeria can benefit from engaging in collaborative projects, participating in international climate forums, and building relationships with global climate organizations. Such cooperation can provide Nigeria with technical expertise, financial resources, and best practices to advance its climate goals. Finally, addressing systemic challenges such as bureaucratic inefficiencies, corruption, and lack of coordination among stakeholders is essential. South Korea's effective management and coordination at various government levels contributed to its success. Nigeria needs to streamline its processes, improve transparency, and enhance stakeholder engagement to create a more effective and cohesive climate policy approach.

Conclusions

Nigeria's adoption of the Kyoto Protocol underscores its commitment to addressing climate change through alignment with international standards, driven by both environmental awareness and economic opportunities provided by market-based mechanisms. The Doha Protocol amendments further reinforced this commitment by necessitating a reassessment of national environmental policies and fostering the integration of climate resilience into economic planning. However, the implementation of market-based mechanisms, including International Emissions Trading, the Clean Development Mechanism, and Joint Implementation, has been limited by infrastructural, institutional, and capacity-related challenges. These limitations have constrained Nigeria's ability to fully leverage these mechanisms, highlighting persistent gaps in the country's climate governance and operational frameworks.

Recommendations

For full compliance with the Kyoto Protocol and Doha Amendments, Nigeria can adopt a multifaceted approach modeled on South Korea's success. Developing a greening policy that integrates climate goals, investing in clean energy infrastructure, and providing financial incentives to the private sector are key. The government may also promote international cooperation, streamline bureaucratic processes, and improve coordination among agencies to ensure effective implementation of climate policies. Engaging in partnerships with countries that have successfully navigated similar climate challenges can provide valuable insights and best practices. For instance, collaborative research and technology transfer initiatives can facilitate the sharing of innovative solutions for renewable energy, carbon capture, and sustainable agricultural practices.

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