

Policy Interventions and Adaptive Strategies for Climate Change Resilience in Nigeria: Assessing Sustainable Development Pathways

¹Simon Oluwatoyin Obadahun & ²Elizabeth Gambo Tsuzom

¹Department of Public Administration, Federal University Dutsin-Ma, Katsina State, Nigeria.

²Sultanate Center of Economic Research and Innovation,
Federal University Dutsin-Ma, Katsina State, Nigeria.

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Abstract

Climate change remains one of the most significant threats to sustainable development in Nigeria, affecting agriculture, health, etc. The objective of this study is to assess the nature and effectiveness of policy interventions and adaptive strategies implemented to address climate vulnerabilities in low-resource settings. Using qualitative review of national and subnational policy documents, complemented by secondary data from development agencies, the study analyses the linkages between governance structures, institutional capacity, and climate resilience outcomes. Findings reveal that Nigeria has developed several adaptation policies: The National Climate Change Policy, the National Adaptation Strategy and Plan of Action (NASPA-CCN), and state-level frameworks. Implementation remains limited by weak institutional coordination, insufficient financing, etc. The study highlights the importance of integrating adaptive governance, stakeholder collaboration, and evidence-based policy instruments to achieve inclusive and sustainable climate resilience. Recommendations emphasize the need for enhanced capacity building and increased political will to translate policy into implementation.

Keywords: *Climate change adaptation; Policy interventions; Sustainable development; Resilience*

Corresponding Author: Simon Oluwatoyin Obadahun

Background to the Study

Climate change poses a profound challenge to global development, with disproportionate effects on developing countries like Nigeria. Rising temperatures, erratic rainfall, and increased flooding have intensified environmental degradation, food insecurity, and poverty. These dynamics threaten progress toward the Sustainable Development Goals (SDGs), particularly those related to poverty reduction, health, water, and climate action. The Nigerian context illustrates the interconnection between environmental vulnerability and socio-economic fragility, where climate-related shocks deepen existing inequalities and hinder long-term development planning (Intergovernmental Panel on Climate Change IPCC, 2023).

Over the past two decades, Nigeria has experienced growing recognition of the urgent need to implement effective climate adaptation measures. National policy frameworks such as the National Climate Change Policy (NCCP) and the National Adaptation Strategy and Plan of Action on Climate Change for Nigeria (NASPA-CCN) have been developed to mainstream adaptation into national and sectoral planning. However, gaps persist between policy formulation and on-ground implementation due to fragmented institutional arrangements, inadequate financing, and low awareness at the community level (Federal Ministry of Environment, FME, 2021). Several Sustainable Development Goals (SDGs) and targets relate to Climate Change adaptation, chief among them are: Goal 13 Climate Action, which focuses specifically on combating climate change and its impacts. It emphasizes the need for urgent actions to mitigate greenhouse gas emissions, adapt to the effects of climate change, and promote sustainable development that is low-carbon and climate-resilient. Targets 13.1 emphasizes strengthen resilience and adaptive capacity to climate-related hazards and natural disasters. Target 13.2 integrate climate change measures into national policies, strategies, and planning.

This study examines how Nigeria's climate policies and interventions have contributed to enhancing adaptive capacity, resilience, and sustainable development. It assessed key challenges in policy coordination, financing, and stakeholder participation, exploring how governance systems can evolve to support more inclusive and evidence-based adaptation practices. The central research question guiding this study is: How effective are Nigeria's current policy interventions in fostering adaptive capacity and resilience against climate change impacts? The central research objective guiding this study is: To assess Nigeria's current policy interventions in fostering adaptive capacity and resilience against climate change impacts. By achieving this objective, the study contributes to understanding the intersection between climate governance, development planning, and environmental sustainability in low-resource contexts. This work is subdivided into 6 sections: following the introduction is the literature review, the third part focuses on the methodology used. Section four is concerns with the result and findings. The fifth section concentrates on the discussion of findings, and the final part, which is the sixth part, is devoted to the conclusion and recommendations.

Literature Review

Overview of Global Perspective on Climate Change Adaptation

Globally, climate change adaptation has become central to the discourse on sustainable development. The Intergovernmental Panel on Climate Change (IPCC, 2023) identifies adaptation as a multidimensional process involving technological, institutional, and behavioral changes to moderate the adverse impacts of climate variability. Across both developed and developing countries, research highlights that adaptation strategies are most effective when integrated into existing development and governance systems (Adger et al., 2019; Klein et al., 2021). International frameworks such as the Paris Agreement (2015) and the United Nations Framework Convention on Climate Change (UNFCCC) have further emphasized the need for national governments to adopt locally led adaptation approaches that address both mitigation and resilience. Studies in Asia and Latin America demonstrate that success in adaptation often depends on strong institutional arrangements, effective community participation, and sustained financing mechanisms (Huq & Reid, 2020). Despite global commitments, low- and middle-income countries continue to face structural barriers such as limited financial resources, inadequate data systems, and governance weaknesses (Thomas & Twyman, 2020). These challenges are particularly acute in sub-Saharan Africa, where adaptive capacity is undermined by poverty, conflict, and weak institutional frameworks.

Climate Change Adaptation in Africa

Across the African continent, adaptation efforts have been shaped by the dual challenge of environmental degradation and underdevelopment. Studies suggest that Africa contributes the least to global greenhouse gas emissions yet bears a disproportionate share of climate impacts (United Nations Economic Commission for Africa UNECA, 2022). Major adaptation priorities in African countries include agriculture, water resource management, and health system strengthening. Several regional frameworks, such as the African Union Climate Change Strategy (2022–2032) and the Comprehensive Africa Agriculture Development Program (CAADP), promote integration of adaptation into development planning. However, scholars argue that implementation gaps persist due to dependence on donor funding, inadequate national ownership, and limited institutional capacity (Abid et al., 2019; Ford et al., 2020).

Decentralized governance and local innovation are increasingly recognized as essential for building resilience in rural African communities (Stringer et al., 2021). Evidence from Ethiopia, Kenya, and Ghana shows that empowering local institutions, women, and youth can enhance adaptive outcomes and sustainability (Ofori et al., 2020).

Climate Policy and Adaptation in Nigeria

Nigeria's vulnerability to climate change arises from its heavy reliance on rain-fed agriculture, rapid urbanization, and limited adaptive infrastructure. Research indicates that climate-related disasters, particularly flooding and desertification, have intensified over the past two decades (Adenle et al., 2017). These impacts threaten food security, health, and rural

livelihoods, making it an urgent development priority. To address these challenges, the National Climate Change Policy (NCCP), the National Adaptation Strategy and Plan of Action on Climate Change for Nigeria (NASPA-CCN), and more recent initiatives under the National Council on Climate Change (NCCC) were designed to integrate climate considerations into national planning (Federal Ministry of Environment, FME, 2021). Nonetheless, implementation is inhibited by fragmented institutional coordination and inadequate budgetary support (Nwankwo & Adebayo, 2022). Empirical studies show that while adaptation measures such as climate-smart agriculture, reforestation, and community-based disaster risk reduction have been piloted in several states, scaling up remains limited due to insufficient technical capacity and weak monitoring systems (Okpara et al., 2019). Furthermore, the lack of inclusive participation, particularly from women, youth, and persons with disabilities, constrains equitable adaptation outcomes (Ozor & Nnaji, 2021).

Identification of Gaps and Limitations

Despite substantial policy development, existing literature reveals critical gaps between policy design and implementation in Nigeria. Most adaptation studies focus on sectoral interventions without examining intersectoral coordination mechanisms. There is limited research on how institutional structures and governance frameworks shape adaptive outcomes at local levels (Oruonye, 2020). Additionally, few studies have evaluated the effectiveness of Nigeria's adaptation policies using empirical evidence or participatory approaches. This study seeks to fill these gaps by critically assessing Nigeria's climate policy interventions through the lens of governance, financing, and inclusiveness, assessing their implications for sustainable development.

Theoretical Framework

This research is anchored in the Social–Ecological Systems (SES) framework and the concept of Adaptive Governance. The proponents of this theory include Urie Bronfenbrenner, a Russian-American developmental psychologist, and Elinor Ostrom, a Nobel laureate in economics. Other contributors include Berkees and Folke, Kurt Lewin. The SES framework posits that human and ecological systems are interconnected and that resilience depends on the ability of institutions and communities to adapt to change (Folke, 2016). Adaptive Governance complements this by emphasizing flexibility, stakeholder participation, and knowledge sharing in policy processes (Chaffin et al., 2014). By applying these frameworks, the study analyses how Nigeria's institutional structures and stakeholder networks influence the country's capacity to respond to climate impacts. The frameworks provide a lens through which policy coherence, institutional coordination, and community participation can be assessed as determinants of resilience.

Theoretical Implications

This study reinforces the applicability of the Social–Ecological Systems (SES) and Adaptive Governance frameworks in analyzing climate policy effectiveness in developing countries. The SES framework elucidates the interdependence of social, institutional, and environmental systems, while adaptive governance explains how participatory and flexible

policy systems enhance resilience. In the Nigerian context, the absence of strong feedback mechanisms between communities and policymakers weakens adaptive capacity. By fostering iterative learning and collaboration, adaptive governance can transform Nigeria's current top-down policy model into a more responsive, inclusive, and evidence-driven system.

Methodology

Research Design and Approach

This study adopted a qualitative research design, focusing on a descriptive and analytical approach to examine Nigeria's climate change adaptation policies and interventions. The qualitative design was appropriate given the study's emphasis on understanding institutional processes, policy frameworks, and stakeholder perspectives rather than quantifying outcomes. The research relied on document analysis and secondary data review to explore how national and subnational institutions have developed and implemented adaptation strategies. The approach enabled in-depth interpretation of policy coherence, coordination mechanisms, and inclusiveness within Nigeria's adaptation governance framework. The use of content analysis further allowed the identification of recurring patterns and themes from diverse sources, thereby supporting a nuanced understanding of institutional challenges and adaptive capacity.

Data Sources

The study utilized secondary data from multiple sources, including:

1. National and subnational climate policy documents, such as the National Climate Change Policy (NCCP, 2021), National Adaptation Strategy and Plan of Action (NASPA-CCN, 2011), and state-level adaptation frameworks.
2. Reports from international organizations (e.g., UNDP, UNEP, and World Bank) on climate resilience and development planning in Nigeria.
3. Academic literature and peer-reviewed articles retrieved from databases such as Google Scholar, ScienceDirect, and JSTOR, focusing on policy effectiveness, governance, and adaptive capacity in Africa.
4. Publications from Nigerian ministries, agencies, and development partners related to environment, agriculture, and energy.

These data sources provided the foundation for triangulating information across policy, institutional, and academic perspectives, thereby enhancing the reliability and validity of findings.

Sampling Strategy and Selection Criteria

Purposive sampling was employed to select policy documents and literature that directly address climate adaptation and resilience in Nigeria. Selection was guided by the following criteria:

- i. Relevance to climate change adaptation and sustainable development.
- ii. Inclusion of national, state, and local perspectives to reflect multi-level governance.
- iii. Accessibility of full-text documents published between 2010 and 2024 to capture recent developments and policy evolution.

In total, 25 policy documents, official reports, and 35 academic publications were reviewed. The combination of policy and scholarly sources ensured comprehensive coverage of both theoretical and practical aspects of adaptation governance.

Data Analysis

The data were analyzed using qualitative content analysis and thematic coding. The process involved systematically reviewing each document to extract key themes related to policy formulation, institutional coordination, financing mechanisms, and inclusiveness. The analysis followed three main steps:

1. **Initial Coding:** Identification of recurring concepts and keywords (e.g., “adaptation,” “governance,” “stakeholder engagement,” “resilience”).
2. **Categorization:** Grouping of similar concepts under broader themes, such as policy coherence, implementation challenges, and community participation.
3. **Interpretation:** Synthesizing findings to draw relationships between institutional structures, adaptation outcomes, and development implications.

The analysis was guided by the Social–Ecological Systems (SES) and Adaptive Governance frameworks, which emphasize the dynamic interaction between environmental, institutional, and social factors. Using these frameworks enabled the researcher to interpret how governance structures, resource allocation, and participatory mechanisms influence Nigeria’s adaptive capacity.

Reliability, Validity, and Ethical Considerations

To ensure credibility and reliability, multiple data sources were triangulated, and cross-verification was conducted among academic and policy documents. Peer-reviewed studies were prioritized to strengthen the validity of interpretations. As the study relied solely on secondary data, no direct human participation was involved, thus minimizing ethical risks. All sources were appropriately acknowledged in accordance with APA 7th edition referencing standards, ensuring transparency and academic integrity.

Results

Overview of Findings

The analysis of policy documents and related literature revealed that Nigeria has developed a broad range of policy frameworks addressing climate change adaptation. However, implementation remains inconsistent, primarily due to limited institutional coordination, insufficient financing, and low levels of community engagement. While progress has been made in establishing legal and policy structures such as the National Climate Change Act (2021), systemic barriers continue to constrain effective adaptation practices at national and subnational levels.

Institutional and Policy Landscape

Nigeria’s institutional framework for climate governance has evolved considerably since 2010. The creation of the National Council on Climate Change (NCCC) represents a significant

milestone in providing a centralized mechanism for policy oversight. However, overlaps between federal and state mandates, and between ministries such as the Federal Ministry of Environment (FME), the Ministry of Agriculture, and the Ministry of Water Resources, often lead to fragmentation and duplication of efforts (Nwankwo & Adebayo, 2022). The review revealed that although most national strategies identify adaptation as a priority, operational guidelines and coordination structures remain underdeveloped. For example, while the NASPA-CCN (2011) outlines 13 key adaptation sectors, there are limited monitoring frameworks to assess implementation progress.

Table 1: Summary of Key National Climate Adaptation Policies and Institutional Roles

Policy Document	Year	Focus Areas	Lead Institution	Implementation Status
National Climate Change Policy (NCCP)	2021	Governance, Adaptation, Mitigation	Federal Ministry of Environment	Partially implemented
NASPA-CCN	2011	Agriculture, Water, Health, Livelihoods	FME / NCCC	Limited implementation
Nationally Determined Contribution (NDC)	2021	Low-carbon development, resilience	FME, Ministry of Power	Ongoing
National Adaptation Plan (NAP) – Draft	2023	Cross-sectoral adaptation framework	NCCC	In development

Source: Author's compilation from policy review, 2024

Financing Mechanisms and Resource Mobilization

Financial constraints emerged as a major challenge across all reviewed documents. Despite the establishment of the Climate Change Fund (CCF) under the 2021 Act, disbursement mechanisms remain unclear. International funding from the Green Climate Fund (GCF) and Global Environment Facility (GEF) has supported isolated projects but has not achieved long-term institutional strengthening. At the subnational level, only a few states such as Lagos, Kaduna, and Cross River have budget lines specifically for climate adaptation. Weak financial decentralization limits state governments' ability to implement community-based resilience initiatives. Development partners remain the primary source of funding, creating dependency and sustainability risks (Ford et al., 2020).

Table 2: Sources of Climate Adaptation Financing in Nigeria

Source	Funding Type	Coverage	Challenges Identified
Federal Government Budget	Public sector	National	Limited allocation (<0.5% of total budget)
Development Partners (GCF, GEF, UNDP)	External grants	Project-based	Donor dependency, short project cycles
Private Sector	Corporate social responsibility	Limited sectors	Weak incentives and policy framework
State Governments	Public subnational	Select states	Poor budget prioritization and monitoring

Source: Author's analysis based on policy reports, 2024

Stakeholder Participation and Inclusiveness

Findings clearly indicate limited inclusion of marginalized groups, particularly women, youth, and persons with disabilities, in adaptation policy formulation and implementation. Although several national documents reference “inclusive participation,” practical mechanisms for engagement remain weak. Most consultations occur at the policy design stage but are rarely sustained throughout implementation (Ozor & Nnaji, 2021). Community-based adaptation initiatives, such as the Erosion and Watershed Management Project (NEWMAP) and the Great Green Wall Program, have demonstrated localized success where communities were actively engaged. These examples highlight that inclusivity enhances sustainability, yet such approaches remain exceptions rather than the norm.

Monitoring, Evaluation, and Learning (MEL) Systems

The review found that Nigeria lacks a unified monitoring and evaluation framework for adaptation. Reporting responsibilities are spread across multiple ministries and agencies, resulting in fragmented data. The absence of baseline indicators for climate resilience further complicates tracking progress. International partners have introduced short-term MEL frameworks in donor-funded projects; however, these are rarely institutionalized within government systems. Consequently, Nigeria's adaptation progress reports to the UNFCCC often rely on aggregated estimates rather than empirical data (UNECA, 2022).

Summary of Key Findings

Thematic analysis identified five dominant challenges influencing adaptation effectiveness in Nigeria:

1. Institutional fragmentation among federal, state, and local governments.
2. Insufficient financing and reliance on donor-driven projects.
3. Weak monitoring systems and data management frameworks.
4. Limited stakeholder inclusion, particularly of vulnerable populations.
5. Low political will and policy continuity, leading to inconsistent implementation.

Together, these factors contribute to slow progress in achieving climate resilience and sustainable development outcomes.

Discussion of Findings

The findings from this study reveal that Nigeria's climate change adaptation policies are well-articulated but weakly implemented. This pattern reflects what scholars such as Agrawal and Lemos (2015) describe as the “implementation gap,” a disconnect between policy ambition and on-the-ground outcomes. Despite the establishment of key frameworks like the National Climate Change Policy (NCCP) and the National Council on Climate Change (NCCC), adaptation efforts remain hindered by fragmented institutional arrangements, limited financing, and low stakeholder participation.

This outcome supports the Adaptive Governance theory, which emphasizes flexibility, coordination, and participation as essential components of resilience (Chaffin et al., 2014). In Nigeria's case, rigidity in bureaucratic structures and limited cross-sectoral coordination have prevented adaptive learning and knowledge sharing. Consequently, climate adaptation efforts tend to be short-term and project-based rather than systemic and sustainable.

Comparison with Existing Research

The findings are consistent with previous studies across sub-Saharan Africa that highlight similar institutional and financial constraints. For instance, Ford et al. (2020) note that African countries often adopt comprehensive adaptation policies but fail to operationalize them due to weak governance capacity. Similarly, Ofori et al. (2020) and Abid et al. (2019) emphasize the need for devolved, community-driven adaptation mechanisms to enhance sustainability. Comparatively, countries such as Kenya and South Africa have made progress by integrating adaptation planning within broader national development frameworks (Stringer et al., 2021). Nigeria's centralized governance approach, while useful for coordination, may limit the flexibility required for localized responses. The country's reliance on donor funding also mirrors patterns observed across other developing nations, where sustainability challenges arise once external funding ends (Huq & Reid, 2020).

Policy and Institutional Implications

The study highlights that effective climate adaptation in Nigeria requires an integrated, multi-level governance approach. Strengthening coordination between federal, state, and local institutions is critical to overcoming fragmentation. The Social-Ecological Systems (SES) framework underscores that adaptation success depends on the capacity of social institutions to manage environmental feedback through participatory decision-making (Folke, 2016). Institutionally, this means developing clearer mandates for ministries and agencies involved in climate governance, supported by joint planning and performance accountability mechanisms. Embedding adaptation goals into national development plans and budgetary processes would also enhance ownership and sustainability. Financially, Nigeria must prioritize domestic resource mobilization to reduce donor dependency. Establishing transparent mechanisms for the Climate Change Fund under the 2021 Act could improve

long-term financing for resilience projects. This aligns with the Paris Agreement's principle of national ownership of climate finance.

Inclusion and Social Equity Dimensions

One of the study's most significant findings concerns the limited inclusion of marginalized populations in adaptation planning. This aligns with observations by Ozor and Nnaji (2021), who argue that social inequality constrains adaptive capacity in low-resource settings. Despite policy rhetoric promoting inclusiveness, women, youth, and persons with disabilities are often excluded from decision-making processes. Incorporating inclusivity is not only a human rights imperative but also enhances the effectiveness of adaptation initiatives. Inclusive participation fosters local knowledge integration, increases community ownership, and ensures that adaptation measures address diverse vulnerabilities. Programs such as the Great Green Wall have demonstrated that community-led approaches improve sustainability and social cohesion (UNECA, 2022).

Monitoring, Evaluation, and Learning (MEL) Implications

The absence of a unified monitoring and evaluation system undermines Nigeria's ability to measure progress and adapt policies over time. According to Klein et al. (2021), robust MEL systems enable governments to engage in “adaptive management,” an iterative process of policy improvement based on evidence and feedback. Nigeria's adaptation governance could benefit from the establishment of a national MEL framework integrated into the National Climate Change Act. This would involve defining measurable indicators for resilience, tracking adaptation outcomes, and institutionalizing data-sharing among ministries and agencies. Additionally, capacity building at the subnational level is vital for effective data collection and reporting.

Conclusion and Recommendations

This study examined Nigeria's policy interventions and adaptive strategies for climate change resilience, drawing on the Social–Ecological Systems (SES) and Adaptive Governance frameworks. The analysis revealed that while Nigeria has made notable progress in developing policy instruments such as the National Climate Change Policy (NCCP), the National Adaptation Strategy and Plan of Action (NASPA-CCN), and the National Climate Change Act (2021), significant implementation challenges persist. Key findings indicate that institutional fragmentation, limited financing, weak monitoring systems, and low stakeholder inclusion continue to undermine effective adaptation. The absence of coherent inter-ministerial coordination and inadequate engagement with local communities reduces the sustainability of interventions. Furthermore, donor dependency and the absence of a robust national monitoring and evaluation framework hinder long-term policy learning and accountability. Despite these challenges, the emergence of the National Council on Climate Change (NCCC) provides an institutional opportunity to strengthen governance coherence, promote inclusive participation, and embed adaptation into Nigeria's broader sustainable development agenda.

Contribution to Development Practice and Theory

This study contributes to the growing body of knowledge linking climate governance, adaptive capacity, and sustainable development in low-resource contexts. By applying the SES and Adaptive Governance frameworks, it demonstrates the importance of multi-level coordination, stakeholder participation, and institutional learning in addressing climate risks. The study extends theoretical understanding by illustrating how governance flexibility and participatory mechanisms influence adaptation outcomes. Practically, it underscores the need for integrating climate policy within national development planning to ensure that adaptation becomes an ongoing process rather than a short-term response.

Policy Recommendations

Based on the findings, the following recommendations are proposed to enhance the effectiveness of climate change adaptation in Nigeria:

1. Strengthen Institutional Coordination:

Establish clear roles and communication channels among federal, state, and local governments through an integrated governance framework under the NCCC.

2. Enhance Domestic Climate Financing:

Operationalize the Climate Change Fund (CCF) to mobilize local resources, incentivize private sector participation, and reduce dependency on external donors.

3. Mainstream Adaptation into National Planning:

Integrate climate adaptation targets into the National Development Plan and state-level budgets to ensure alignment with sectoral policies.

4. Promote Inclusive Participation:

Institutionalize mechanisms for involving women, youth, and persons with disabilities in policy formulation and implementation. Inclusive approaches increase legitimacy, local ownership, and sustainability.

5. Develop a National Monitoring, Evaluation, and Learning (MEL) Framework:

Create a unified MEL system with measurable indicators for resilience, enabling evidence-based decision-making and adaptive learning across institutions.

6. Invest in Capacity Building and Data Systems:

Strengthen technical capacity for data collection, climate modelling, and early warning systems. Encourage partnerships with universities and research institutions to enhance knowledge generation.

7. Foster Regional and Global Collaboration:

Leverage South–South cooperation and partnerships with international organizations to share knowledge, technology, and best practices in adaptation governance.

Limitations and Future Research

The study was limited by its reliance on secondary data, which may not fully capture evolving local realities or informal adaptation practices. Future research should employ a mixed-method approach of both primary and secondary sources to integrate quantitative climate data and community-level perspectives. Comparative analyses across African countries could also deepen understanding of what governance arrangements most effectively drive adaptation and resilience.

Concluding Reflection

Nigeria's pathway to climate resilience depends on transforming policy ambition into sustained institutional action. Building adaptive governance systems that are participatory, flexible, and evidence-driven will not only mitigate the impacts of climate change but also advance the nation's broader sustainable development goals. The lessons drawn from this study reaffirm that resilience is not achieved through policies alone, but through the collective capacity of people, institutions, and knowledge systems to adapt and innovate in the face of uncertainty.

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