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# Climate Change Mitigation and Adaptation Policies in Nigeria

**Daniel Mevayerore Igbini[1]✉, Veronica Uchechukwu Ikenga[2], Jeremiah Avwenaghogho Oharisi[3]**

[1]*Department of Political Science, Faculty of the Social Sciences, Delta State University, Abraka, Nigeria*
[1*]Email: igbinidaniel@delsu.edu.ng

[2]*Department of Agricultural Economics, Faculty of Agriculture, Delta State University, Abraka, Nigeria*
[2]Email: ikenga-veronica@delsu.edu.ng

[3]*Department of Law, Faculty of Law, Igbinedion University, Okada, Nigeria*
[3]Email: oharisijerry@gmail.com

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## ABSTRACT

Climate change has become one of the most pressing environmental and socio-economic challenges globally, and Nigeria is particularly vulnerable due to its reliance on agriculture, energy production, and natural resources. This study examined the policies and strategies adopted by the Nigerian government to mitigate and adapt to the impacts of climate change, highlighting their effectiveness, challenges, and implications for sustainable development. Employing a historical research design, the study analyzed secondary data from government policy documents, environmental reports, academic literature, and international climate agreements to trace the evolution of climate policies in Nigeria over time. The study was anchored on the Sustainable Development Theory, which emphasizes the integration of environmental, social, and economic considerations in policy planning to ensure the long-term well-being of society. Findings indicate that Nigeria has developed a range of mitigation and adaptation policies, including the National Climate Change Policy, the National Adaptation Strategy and Plan of Action (NASPA), and participation in the Paris Agreement. These policies have led to some progress in renewable energy development, afforestation programs, and community-based adaptation projects. However, challenges such as weak institutional capacity, inadequate funding, poor enforcement mechanisms, and limited public awareness continue to undermine policy effectiveness. The study concluded that Nigeria's climate policies are ambitious but constrained by systemic and structural weaknesses. To move from policy formulation to measurable outcomes, the country must strengthen governance, boost domestic financing, and prioritize inclusive, community-driven approaches. It is recommended, among others, that the government should strengthen institutional capacity and policy enforcement by improving coordination among ministries, agencies, and state governments, while building technical expertise and establishing robust monitoring systems to ensure accountability.

**Keywords:** *Climate Change; Mitigation; Adaptation; Policies; Sustainable Development*

**Contribution/Originality:** This study contributes to knowledge by offering a historical and multidimensional analysis of Nigeria's climate change mitigation and adaptation policies within the framework of Sustainable Development Theory. It goes beyond environmental impacts to assess socio-economic and governance dimensions of national climate strategies. The research systematically examines key instruments, including the National Climate Change Policy, the National Adaptation Strategy and Plan of Action, and Nigeria's commitments under the Paris Agreement, highlighting both achievements and structural limitations. By identifying institutional weaknesses, funding gaps, and enforcement challenges, the study critically evaluates policy implementation and proposes governance-centered, community-driven approaches to improve measurable climate outcomes in Nigeria.

## 1. INTRODUCTION

Climate change stands as one of the most urgent global challenges of the 21st century, exerting wide-ranging effects on ecosystems, economies, and human well-being. Nigeria, the most populous nation in Africa and its largest economy, is particularly at risk due to its reliance on climate-sensitive sectors like agriculture, forestry, fisheries, and energy (Okafor et al., 2024). Rising temperatures, irregular rainfall, flooding, drought, desert encroachment, and coastal erosion are already disrupting food systems, infrastructure, health, and livelihoods. These environmental stresses are intensified by population growth, widespread poverty, rapid urbanization, and governance difficulties, all of which reduce the country's ability to adapt effectively (Brookings Institution, 2022). Consequently, the pursuit of mitigation and adaptation strategies has become a crucial element of Nigeria's sustainable development and national security agenda.

In recent years, Nigeria has taken significant steps toward building a climate policy framework that addresses both adaptation and mitigation. The Federal Government introduced the National Climate Change Policy (2021–2030), the National Adaptation Plan, and the National Renewable Energy and Energy Efficiency Policy, in addition to cross-sectoral strategies in areas such as agriculture, waste, transportation, and health (Federal Republic of Nigeria, 2021). Importantly, the Climate Change Act of 2021 created a legal foundation for achieving net-zero emissions by 2060, while mandating five-year carbon budgets and the establishment of coordinating institutions to drive implementation (Olujobi, 2024). These initiatives are aligned with Nigeria's global obligations under the Paris Agreement, reaffirmed in its updated Nationally Determined Contribution (NDC) of 2021, which commits to reducing greenhouse gas emissions by 20% unconditionally and up to 47% with international support by 2030 (Federal Republic of Nigeria, 2022).

Mitigation policies in Nigeria focus primarily on reducing dependence on fossil fuels and expanding renewable energy options such as solar, wind, and hydropower. Given the country's continued dependence on oil and gas revenues, the government faces the twin challenge of maintaining economic growth while reducing emissions. The 2022 Energy Transition Plan is a landmark initiative aimed at achieving universal energy access, reforming the power sector, and scaling up cleaner energy sources to lessen reliance on fuelwood and fossil fuels (Climate Action Tracker, 2022). Still, realizing these goals requires major investments, advanced technologies, and stronger governance to address barriers such as inadequate infrastructure, limited private-sector involvement, and policy inconsistencies (IUCN, 2022).

Adaptation, however, has received even greater attention because the effects of climate change are already widespread. For example, recurring floods in the Niger Delta displace households and damage farmland, while desertification in the North reduces crop yields and contributes to resource conflicts. To counter these impacts, adaptation policies emphasize climate-smart agriculture, afforestation, improved water management, coastal protection, and the development of early warning systems (Okafor et al., 2024). The National Adaptation Plan also prioritizes resilience building in high-risk sectors, alongside community-level capacity development and livelihood diversification (Federal Republic of Nigeria, 2021). Despite this progress, studies show that adaptation measures are still underfunded, poorly coordinated, and unevenly implemented across regions, largely due to weak institutions and insufficient monitoring frameworks (Brookings Institution, 2022).

Although policy development has advanced, Nigeria continues to grapple with serious implementation challenges. While the Climate Change Act represents a step forward, questions remain over enforcement mechanisms and overlapping institutional roles. Coordination among federal, state, and local governments is weak, and climate considerations are often inconsistently integrated into wider economic and development policies (Olujobi, 2024). The heavy reliance on international climate finance also means that success in both mitigation and adaptation depends on external funding, concessional loans, and private investment (Climate Action Tracker, 2022). Without stable domestic funding systems, the pace of progress is likely to remain slow.

Scholars have also pointed to gaps in research and policy integration, noting that most attention has been devoted to agricultural adaptation, while less effort has been directed toward strengthening institutions, promoting governance reforms, or designing inclusive financing strategies (Okafor et al., 2024). Bridging these gaps will require closer collaboration between government agencies, civil society, academia, and international partners. Stronger monitoring and evaluation mechanisms are also necessary to track progress, ensure accountability, and guide policy adjustments with reliable evidence. This study, therefore, examined the policies and strategies adopted by the Nigerian government to mitigate and adapt to the impacts of climate change, highlighting their effectiveness, challenges, and implications for sustainable development.

### 1.1 Literature Review

Climate change can be understood as a persistent alteration in global or regional climate systems, largely triggered by rising concentrations of greenhouse gases (GHGs) in the atmosphere from human activities such as fossil fuel combustion, deforestation, and industrial operations (Intergovernmental Panel on Climate Change [IPCC], 2022). Although natural variations in climate have always occurred, the rapid rate of change in recent decades is largely man-made, resulting in shifting temperatures, erratic rainfall, and more frequent extreme weather events. In Nigeria, the impacts of climate change are already visible, manifesting in increasing heat, irregular rainfall, desertification, flooding, and coastal erosion that disrupt communities and livelihoods (Okafor et al., 2024).

The country's exposure to climate change is shaped by both its location and socio-economic conditions. Northern Nigeria struggles with desert encroachment and drought, which undermine food security and intensify competition over dwindling natural resources. Central states experience reduced crop yields due to unpredictable rainfall, fueling farmer-herder tensions. In the coastal Niger Delta and Lagos, rising sea

levels and recurrent floods displace residents, destroy farmland, and threaten local economies. These pressures are worsened by population growth, rapid urbanization, poverty, and weak infrastructure (Brookings Institution, 2022). Consequently, climate change in Nigeria is more than an environmental issue, it is also a development and security challenge with implications for national stability and long-term growth.

Mitigation, in this context, refers to intentional efforts to cut or prevent GHG emissions to slow climate change. This involves expanding renewable energy, improving energy efficiency, adopting low-carbon technologies, reforestation, and reforms in agriculture, transport, and waste management (IPCC, 2022). In Nigeria, mitigation has unique complexities because of the country's dependence on fossil fuels, especially oil and gas, which remain central to government revenues and foreign exchange earnings.

Nigeria's updated Nationally Determined Contribution (NDC) of 2021 sets ambitious targets of reducing GHG emissions by 20% unconditionally and 47% with international support by 2030 (Federal Republic of Nigeria, 2022). These pledges emphasize decarbonizing energy, modernizing transportation, improving waste management, and advancing climate-smart agriculture. Complementing these efforts, the 2022 Energy Transition Plan (ETP) provides a roadmap toward achieving net-zero emissions by 2060. The plan prioritizes renewable energy expansion, upgrading electricity infrastructure, and replacing biomass with cleaner fuels, while relying on natural gas as a transition fuel (Climate Action Tracker, 2022). For instance, Nigeria has set a goal to generate 30 GW of renewable energy by 2030.

Mitigation also includes land use and forestry reforms. With deforestation driven by agriculture, fuelwood demand, and urban expansion, initiatives such as REDD+ and tree-planting campaigns are vital for sequestering carbon while supporting biodiversity and livelihoods (Okafor et al., 2024). However, mitigation policies face persistent obstacles, including limited funding, weak enforcement, insufficient private sector engagement, and a lack of advanced technologies (IUCN, 2022). Moreover, Nigeria's reliance on petroleum revenues creates an economic dilemma: transitioning to low-carbon development without undermining fiscal stability.

Adaptation, on the other hand, focuses on strategies to cope with and reduce the negative consequences of climate change while taking advantage of any potential opportunities. Unlike mitigation, which tackles the causes of climate change, adaptation directly addresses its impacts. For Nigeria, adaptation is particularly pressing since climate risks are already severe and projected to worsen (Okafor et al., 2024). The federal government has adopted a priority, embedding it in frameworks such as the National Adaptation Strategy and Plan of Action (NASPA), the National Climate Change Policy (2021–2030), and the Climate Change Act of 2021 (Federal Republic of Nigeria, 2021). These policies target resilience-building across vulnerable sectors such as agriculture, health, water, and coastal systems.

Agriculture, which employs over 70% of Nigerians, is highly climate sensitive. Climate-smart agriculture (CSA) has been promoted as a core adaptation measure, involving improved crop varieties, irrigation technologies, agroforestry, and sustainable soil management (Food and Agriculture Organization [FAO], 2021). For instance, northern farmers are adopting drought-resistant crops, while flood-prone southern communities are shifting to resilient crop types and improved drainage.

In water management, adaptation efforts focus on expanding irrigation networks, enhancing water storage, and strengthening flood and drought early-warning systems. Coastal regions, especially Lagos and the Niger Delta, require embankments, mangrove restoration, and community relocation to reduce exposure to flooding (Brookings

Institution, 2022). In the health sector, adaptation involves building capacity to manage climate-sensitive diseases such as malaria and cholera, while urban planning now considers flood prevention, heat mitigation, and water supply in fast-growing cities like Lagos, Kano, and Abuja.

Despite these interventions, adaptation in Nigeria remains constrained by financing gaps, weak institutional capacity, and poor coordination among government agencies. Many local governments lack the technical and financial resources to implement effective adaptation strategies, and most initiatives depend heavily on external donor support, raising questions about sustainability (Olujobi, 2024). Social challenges such as low public awareness, poor monitoring, and weak enforcement further limit progress (IUCN, 2022).

Although mitigation and adaptation are often discussed as separate policy areas, in Nigeria they are deeply interconnected. For instance, tree planting functions as a mitigation strategy by absorbing carbon dioxide, while also acting as an adaptation tool by controlling soil erosion and improving water retention. Likewise, investments in renewable energy help cut greenhouse gas emissions and, at the same time, expand energy access in rural areas, strengthening community resilience to climate-related disruptions. Climate-smart agricultural practices also demonstrate this overlap by lowering methane emissions from farming while boosting food security in the face of shifting weather patterns.

This interdependence underscores the importance of pursuing an integrated national strategy that combines both approaches. The Climate Change Act of 2021 marks significant progress in this regard by requiring the development of carbon budgets and mandating that adaptation measures be incorporated into broader development plans (Federal Republic of Nigeria, 2021). Still, achieving meaningful results will depend on overcoming persistent challenges of coordination, monitoring, and enforcement across federal, state, and local government levels.

### 1.2 Overview of Climate Change in Nigeria

Climate change stands out as one of the most critical developmental challenges confronting Nigeria, with its impacts already being felt across different regions and sectors. Scientific evidence shows that Nigeria is highly exposed due to its geographical spread, heavy reliance on climate-sensitive sectors such as agriculture, and relatively weak adaptive capacity (Intergovernmental Panel on Climate Change [IPCC], 2022). Observable shifts in climate patterns have been recorded, and projections warn of worsening conditions if comprehensive mitigation and adaptation strategies are not urgently applied.

In recent decades, Nigeria has experienced a consistent rise in temperature, with the average annual temperature increasing by around 1.1°C since the 1970s (World Bank, 2021). Projections indicate a further increase of between 1.5°C and 4.5°C by 2100 under high global emissions scenarios (IPCC, 2022). Rainfall has become increasingly unpredictable, with shorter rainy seasons and prolonged dry spells disrupting agricultural activities (Okafor et al., 2024). Flooding events are more frequent and severe, particularly in the Niger Delta and urban centers like Lagos, where poor drainage systems combined with sea-level rise magnify risks. In contrast, northern Nigeria is facing intensifying droughts and desertification, with the Sahara Desert advancing southward at roughly 0.6 kilometers annually (United Nations Environment Programme [UNEP], 2021). Rising sea levels also pose a serious long-term threat, with

estimates suggesting an increase of 0.3 to 1 meter by the end of the century, endangering low-lying settlements in Lagos and the Niger Delta (Brookings Institution, 2022).

The consequences of these climatic changes cut across agriculture, health, infrastructure, and human security. Agriculture, which provides livelihoods for more than 70% of Nigerians, is highly vulnerable to shifting weather patterns. Erratic rainfall and rising temperatures reduce crop productivity, endanger livestock, and worsen post-harvest losses (Food and Agriculture Organization [FAO], 2021). This exacerbates food insecurity and increases the likelihood of hunger, especially among smallholder farmers lacking modern farming technologies.

Public health is also at risk, as climate change fuels the spread of malaria, cholera, and meningitis, while rising heatwaves contribute to heat stress and cardiovascular complications. Floodwater frequently contaminates drinking supplies, aggravating the spread of waterborne diseases (World Health Organization [WHO], 2022). Critical infrastructure such as roads, bridges, and power installations also suffers repeated damage from flooding and erosion. In urban centers like Lagos and Abuja, floods disrupt businesses, damage property, and displace communities (Brookings Institution, 2022).

Climate change further drives migration and conflict. In the north, advancing desertification reduces farmland and water supplies, intensifying competition between herders and farmers. This has triggered violent clashes and forced migration to urban centers, deepening insecurity and displacement in fragile areas (International Crisis Group, 2022). Climate impacts in Nigeria vary considerably across regions. In the north, high temperatures, persistent droughts, and desertification remain the dominant threats, undermining agriculture and livestock rearing while fueling violent resource-based conflicts (Okafor et al., 2024). In the central belt, erratic rainfall patterns worsen tensions between farmers and herders.

In the south, especially the Niger Delta, flooding, erosion, and sea-level rise are the most pressing concerns. These challenges threaten farmlands, fisheries, and vital oil and gas installations, which remain the backbone of Nigeria's economy. Coastal megacities like Lagos are especially at risk, with millions projected to face displacement in the event of significant sea-level rise (UNEP, 2021). Meanwhile, the rainforest areas are experiencing large-scale deforestation and biodiversity loss, which intensifies both mitigation and adaptation challenges.

Thus, climate change in Nigeria is altering ecosystems, threatening livelihoods, and creating socio-economic instability. Rising temperatures, erratic rainfall, desertification, floods, and sea-level rise pose both immediate and long-term risks. These impacts extend beyond the environment, affecting agriculture, food security, health, infrastructure, and national security. To effectively address these challenges, Nigeria requires policies that reflect regional variations and integrate robust mitigation and adaptation measures into its developmental agenda.

### 1.3 Mitigation Policies in Nigeria

Nigeria's approach to climate mitigation is shaped by its commitments under the Paris Agreement and national strategies designed to cut greenhouse gas (GHG) emissions while still pursuing economic growth. As Africa's most populous country and one of its largest emitters, Nigeria faces the complex task of lowering emissions without undermining energy access, industrial expansion, or poverty reduction goals (Climate Action Tracker, 2022).

### i. Nigeria's Nationally Determined Contributions (NDCs)

The country first submitted its Nationally Determined Contribution (NDC) in 2015 and revised it in 2021. In the updated pledge, Nigeria committed to cutting GHG emissions by 20% unconditionally and by up to 47% conditionally by 2030, compared to a business-as-usual scenario (Federal Republic of Nigeria, 2021). Achieving the conditional target depends on external support through international climate finance, technology transfer, and capacity-building initiatives. The NDC covers multiple sectors, including energy, agriculture, transport, and waste management. It prioritizes actions such as reducing methane emissions in oil and gas, expanding renewable energy, advancing climate-smart farming, and strengthening waste management systems. The revised NDC is considered more ambitious than the initial version, signaling stronger political commitment to tackling climate risks and promoting green growth (UNFCCC, 2022).

### ii. The Energy Transition Plan

At the heart of Nigeria's mitigation agenda is the Energy Transition Plan (ETP), launched in 2022. The plan lays out a pathway to reach net-zero emissions by 2060, while guaranteeing universal access to energy. It focuses on expanding renewable energy sources, using natural gas as a transitional fuel, and phasing out fuelwood use (Energy Transition Office, 2022). The ETP sets a target of generating 30 gigawatts of renewable energy by 2030, particularly from solar and wind power. It emphasizes extending both grid and off-grid electricity solutions to improve rural access and reduce reliance on diesel generators. Natural gas is positioned as a "bridge fuel" to support energy security while reducing emissions compared to coal and oil. Additionally, the plan prioritizes shifting households away from traditional biomass and fuelwood, still widely used for cooking, to cleaner options like liquefied petroleum gas (LPG) and electricity. This shift not only reduces deforestation but also addresses health risks linked to indoor air pollution.

### iii. Transport, Waste, and Industry Policies

Mitigation measures also target transport, waste, and industry, all major contributors to emissions. In the transport sector, policies encourage cleaner fuels, vehicle efficiency, and expanded public transit. Lagos, for example, has invested in bus rapid transit (BRT) systems and is exploring electric buses to reduce urban air pollution (Adebayo et al., 2022). Waste management strategies are aimed at lowering methane emissions from landfills. The government is strengthening regulations against open dumping while promoting recycling and composting. A national plan to ban single-use plastics, announced in 2024, aligns with these efforts and reflects broader sustainability goals (Reuters, 2024). Industry-focused mitigation measures include improving energy efficiency and lowering emissions in oil, gas, cement, and manufacturing sectors. Reducing gas flaring remains a priority, given Nigeria's long history as one of the top flaring countries globally. Current initiatives emphasize leak detection, repair programs, and stricter enforcement within oil and gas operations (World Bank, 2022).

### iv. Forests and Land-Use Management

Deforestation and land-use change continue to drive a significant share of emissions in Nigeria. To address this, the government is implementing programs under the Reducing Emissions from Deforestation and Forest Degradation (REDD+) framework. Nigeria's national REDD+ strategy is designed to conserve forests, enhance carbon sequestration, and provide alternative livelihoods for rural communities (UN-REDD Programme, 2021). Tree planting and reforestation projects have also gained traction, particularly in northern states battling desertification. These initiatives not only capture carbon but also help prevent erosion, protect biodiversity, and restore degraded ecosystems (Okafor et al., 2024). Despite these advances, several challenges hinder Nigeria's mitigation agenda. Financing is the most significant obstacle. Estimates suggest the Energy Transition Plan alone requires over $400 billion in investment by 2060, yet access to international climate finance has been limited, and domestic sources remain insufficient (Energy Transition Office, 2022).

Nigeria's heavy dependence on oil revenues poses another dilemma. While fossil fuels drive government income and foreign exchange, they are also the largest source of emissions. Transitioning away from oil risks fiscal instability, but continued reliance undermines long-term climate commitments (Brookings Institution, 2022). Institutional barriers further complicated progress. Weak enforcement of regulations, fragmented coordination among agencies, limited technical expertise at subnational levels, and inadequate infrastructure, including unreliable electricity grids, slow down the implementation of renewable energy and low-carbon technologies (IUCN, 2022).

Nigeria has established an ambitious set of mitigation policies, anchored by its revised NDCs and Energy Transition Plan. These policies cover diverse sectors, from energy and transport to waste management, industry, and forestry, reflecting a holistic approach to emissions reduction. However, achieving the 2060 net-zero target will require massive financial investment, stronger institutions, and a careful balance between fossil fuel dependence and green development. Closing these gaps will be vital if Nigeria is to transition to a low-carbon future while safeguarding inclusive economic growth.

## 1.4 Adaptation Policies in Nigeria

### i. National Adaptation Plan and Strategies

Nigeria's climate adaptation efforts are guided by its National Adaptation Plan (NAP), which sets out a strategic pathway for addressing climate risks across different sectors. Prepared by the Federal Ministry of Environment, the NAP emphasizes integrating climate resilience into both national and subnational development agendas, with a particular focus on agriculture, health, water resources, and coastal systems (Federal Ministry of Environment, 2020). The framework also highlights the importance of capacity building, technology transfer, and active stakeholder participation to ensure adaptation is not limited to government action but also involves local communities. In addition, states are adopting context-specific frameworks, such as the Lagos Climate Adaptation and Resilience Plan, which applies the NAP principles to urban settings (Lagos State, 2025). Nonetheless, the successful implementation of these strategies has been slowed by financial and institutional constraints.

### ii. Climate-Smart Agriculture and Food Security Initiatives

With over 70% of Nigerians engaged in agriculture, the sector is highly exposed to shifting rainfall, drought, and desertification. To respond, Nigeria has introduced climate-smart agriculture (CSA) practices, which include adopting drought-resistant crops, improved irrigation, sustainable soil management, and agroforestry. Supported by both the Food and Agriculture Organization (FAO) and national agencies, CSA programs aim to build resilience among farmers facing shorter rainy seasons and extreme climate events (FAO, 2021). These initiatives also improve post-harvest handling and storage, reducing food losses. However, widespread adoption has been limited by inadequate access to loans, modern farm inputs, and timely climate information (AP News, 2024).

### iii. Water Resources and Flood/Drought Management

Adaptation policies also focus on water resource management, as Nigeria simultaneously faces seasonal floods in the south and recurring droughts in the north. Key strategies include watershed protection, dam construction, irrigation system rehabilitation, and groundwater recharge initiatives (Federal Ministry of Environment, 2020). For flood-prone regions, the Nigerian Hydrological Services Agency has been improving weather forecasting and early-warning systems, though coverage and efficiency remain uneven across states (PreventionWeb, 2023). The devastating floods of 2022 and 2024 underscored the urgent need for cross-border water management and closer cooperation with neighboring countries sharing transboundary rivers (Reuters, 2024).

### iv. Coastal Protection in Niger Delta and Lagos

Communities in Lagos and the Niger Delta are particularly vulnerable to sea-level rise, storm surges, and coastal erosion. To address this, Nigeria is adopting a combination of hard infrastructure solutions, such as seawalls, levees, and drainage systems, and ecosystem-based measures, including mangrove restoration and wetland preservation (Akpan et al., 2024). Lagos has integrated coastal resilience into its urban planning through zoning rules and flood-control schemes, while in the Niger Delta, mangrove replanting and afforestation programs not only shield coastlines but also provide livelihoods for local communities. These initiatives demonstrate the value of combining engineering projects with natural ecosystem protection.

### v. Disaster Risk Reduction and Early Warning Systems

The Nigerian government has also prioritized disaster risk reduction (DRR) to lessen the impacts of climate-related hazards. The National Emergency Management Agency (NEMA) oversees DRR initiatives, which include community preparedness programs and emergency response frameworks (NEMA, 2019). Early-warning capabilities are gradually expanding, with the Nigeria Centre for Disease Control (NCDC) issuing alerts on flooding, drought, and climate-sensitive diseases (NCDC, 2021). Pilot projects on anticipatory action, where communities take preventive

measures based on forecasts, have produced positive outcomes but require more funding and stronger national coordination to be scaled effectively (PreventionWeb, 2023).

### vi. Institutional and Community-Level Adaptation Practices

Adaptation in Nigeria also depends heavily on local and community-driven efforts. Grassroots initiatives such as rainwater harvesting, group tree planting, and conflict mediation between farmers and herders are examples of community-based adaptation practices. These approaches combine traditional knowledge with modern techniques to build resilience (UN-REDD, 2021). At the institutional level, ministries often collaborate with NGOs, research institutes, and development partners to carry out pilot projects. Encouragingly, communities in the north are adopting water-harvesting techniques alongside CSA practices, while coastal communities in the south are increasingly leading mangrove restoration efforts (Akpan et al., 2024).

Despite clear progress, Nigeria's adaptation agenda continues to face several challenges. Financing remains a major obstacle, as most projects are heavily dependent on external donors, with limited domestic funding threatening their long-term sustainability once international support ends (Federal Ministry of Environment, 2020). Institutional weaknesses further undermine effectiveness, as weak interagency coordination and poor policy enforcement mean that many adaptation strategies remain largely on paper rather than being fully implemented (IUCN, 2022). In addition, data and technical gaps persist, with inadequate climate data and insufficient local forecasting capacity making it difficult to support evidence-based decision-making (NCDC, 2021). Social equity issues also present a significant barrier, as vulnerable groups such as smallholder farmers, women, and internally displaced persons are often excluded from adaptation benefits, raising serious concerns about inclusivity (FAO, 2021). To overcome these barriers, Nigeria will need greater financial investment, institutional reforms, and stronger community-driven approaches that ensure equitable access to adaptation benefits.

## 1.5 Theoretical Framework

The theoretical perspective guiding the study was Sustainable Development Theory. The Sustainable Development Theory is largely linked to the World Commission on Environment and Development (WCED), commonly referred to as the Brundtland Commission, which released the influential report *Our Common Future* in 1987. This report advanced the concept of sustainable development, describing it as development that satisfies current needs without undermining the capacity of future generations to meet their own. Although earlier debates on balancing development with environmental protection had taken place, such as during the 1972 Stockholm Conference on the Human Environment, it was the Brundtland Commission that clearly defined the theory and brought it to global prominence.

The Sustainable Development Theory rests on a set of interconnected principles that emphasize the balance between economic growth, environmental protection, and social equity. At its core, the theory argues that development must be pursued in a way that meets present needs without compromising the ability of future generations to meet their own. This principle highlights the importance of intergenerational equity, ensuring that resources and opportunities are not depleted or destroyed for those who come after. Another key tenet is the integration of environmental sustainability into economic and social planning. This means that economic progress cannot be pursued at the expense of

ecosystems, biodiversity, or natural resources. The environment is viewed as the foundation upon which human well-being and economic prosperity depend. In practice, this translates into policies that promote renewable energy, sustainable agriculture, and responsible consumption and production patterns (United Nations, 2022).

Social inclusion and equity form another pillar of the theory. Sustainable development emphasizes reducing inequality within and among societies by ensuring that marginalized and vulnerable populations benefit from development initiatives. This approach aligns with the broader goals of poverty eradication, gender equality, and universal access to basic services such as education, healthcare, and clean water (Sachs et al., 2019). A further tenet of the theory is the promotion of global cooperation and shared responsibility. Since climate change, biodiversity loss, and resource depletion transcend national boundaries, sustainable development requires international collaboration, multilateral agreements, and coordinated global action. This principle is reflected in frameworks such as the Paris Agreement and the United Nations Sustainable Development Goals (SDGs).

Lastly, sustainable development emphasizes long-term thinking and resilience. Rather than focusing solely on short-term economic gains, the theory encourages planning and investment that enhance the capacity of societies and ecosystems to withstand shocks, such as climate change impacts, pandemics, and economic crises. This perspective underscores the interconnectedness of human and natural systems and the need for governance structures that are adaptive and inclusive (Rockström et al., 2021). Thus, the Sustainable Development Theory combines environmental stewardship, social justice, economic viability, and global partnership as essential ingredients for achieving a just and resilient future.

The Sustainable Development Theory is highly relevant to this study because it provides a conceptual framework for understanding how Nigeria can balance economic development with environmental sustainability in the face of climate change. The theory emphasizes the importance of meeting present developmental needs while safeguarding the ability of future generations to meet theirs, which directly aligns with Nigeria's challenge of pursuing growth while managing climate risks. In the context of this study, it highlights why policies on mitigation and adaptation must be designed to protect natural resources, promote energy efficiency, and ensure social equity. It is also relevant because the theory connects climate change responses to broader developmental issues such as poverty reduction, food security, and health. For Nigeria, where poverty and energy insecurity remain pressing challenges, the Sustainable Development Theory reinforces the idea that climate policies should not only address environmental protection but also improve livelihoods and reduce inequalities. This perspective ensures that mitigation and adaptation strategies are people-centered and contribute to long-term resilience.

Another key relevance lies in the emphasis on intergenerational equity and long-term planning. By situating Nigeria's climate actions within a framework that prioritizes future well-being, the theory underscores the need for sustained investment in renewable energy, climate-smart agriculture, and resilient infrastructure. These actions are vital for addressing projected risks such as desertification in the north and coastal flooding in the south. The theory also supports the integration of climate governance into national development planning, which is central to this study's focus on institutional and policy frameworks. It demonstrates why Nigeria's Climate Change Act of 2021, the Nationally Determined Contributions (NDCs), and adaptation strategies are not isolated

interventions but part of a broader vision for sustainable development. Lastly, its global outlook makes it relevant by linking Nigeria's efforts to international cooperation. Since climate change is a transboundary challenge, the Sustainable Development Theory highlights the importance of Nigeria's participation in global agreements like the Paris Accord and its reliance on climate finance, technology transfer, and partnerships with international organizations. This relevance strengthens the study by situating Nigeria's climate actions within both national priorities and the global sustainability agenda.

## 2. METHOD

This study employed the historical research method to examine the evolution of climate change policies and strategies in Nigeria, providing insights into past events, policy developments, and institutional changes and their impact on contemporary governance. It relied on secondary data, including government publications like the National Climate Change Policy and the National Adaptation Strategy and Plan of Action (NASPA), legislative documents, reports from the Federal Ministry of Environment, Nigeria's Nationally Determined Contributions (NDCs), and international agreements such as the UNFCCC and the Paris Agreement. Academic literature, textbooks, conference papers, and reports from organizations like the IPCC also informed the analysis. The study involved collecting and reviewing archival materials and official documents, critically evaluating their credibility and relevance, and analyzing them both chronologically and thematically to trace shifts in policy focus from early environmental regulation to structured climate governance. Findings were interpreted through the lens of Sustainable Development Theory, linking Nigeria's climate policy trajectory to the integration of environmental protection, economic growth, and social inclusion.

## 3. FINDINGS AND DISCUSSION

Nigeria's approach to tackling climate change is shaped by a developing institutional and legal framework that underpins both mitigation and adaptation measures. This framework brings together national legislation, the responsibilities of key ministries, state-level implementation systems, and the participation of non-state actors such as civil society and international organizations. Despite important strides, persistent challenges remain in areas such as coordination, enforcement, and mobilization of adequate financial resources.

One of the most significant milestones in Nigeria's climate governance is the passage of the Climate Change Act (CCA) of 2021. This legislation provides the legal foundation for climate action and sets up mechanisms to integrate climate considerations into national development planning. Among its key provisions is the establishment of a carbon budget, which regulates greenhouse gas (GHG) emissions across different sectors, aligning Nigeria's policies with its Net Zero 2060 target under the Paris Agreement (Federal Republic of Nigeria, 2021).

The Act also established the National Council on Climate Change (NCCC), chaired by the President, to direct overall climate policy. The Council is tasked with ensuring that climate action is integrated into economic planning and that government agencies remain accountable for their commitments. By mandating that both mitigation

and adaptation strategies be mainstreamed into development efforts, the Act provides a comprehensive approach to climate governance (Aina & Adenle, 2022). However, its effectiveness will largely depend on political commitment, sustainable financing, and strong enforcement across federal and state levels.

Different ministries have critical responsibilities in advancing Nigeria's climate agenda. The Federal Ministry of Environment acts as the coordinating body, overseeing climate policy, engaging with international partners, and managing key frameworks such as the Nationally Determined Contributions (NDCs) and the National Adaptation Plan (NAP). The Ministry of Agriculture and Rural Development leads efforts in climate-smart agriculture to strengthen food security, while the Ministry of Power is central to driving renewable energy initiatives and the energy transition (Ogunbiyi, 2022). In addition, the Ministry of Water Resources is tasked with water conservation, flood management, and drought response, issues of particular importance given Nigeria's dual challenges of desertification in the north and flooding in the south (Akinyemi & Efobi, 2023).

Although these ministries highlight the multi-sectoral nature of climate governance, weak coordination among them often undermines policy effectiveness and slows implementation (IUCN, 2022).

While the federal government sets the policy direction, state governments are crucial for on-the-ground implementation. States such as Lagos and Ekiti have developed their own climate action plans, with Lagos notably prioritizing coastal adaptation due to its high exposure to sea-level rise (Lagos State Government, 2022). Nevertheless, many states lack the technical capacity and institutional strength to effectively execute climate policies. This has left adaptation measures fragmented and inadequately funded. Furthermore, disparities between federal and state levels often hinder the domestication of national policies, with some states showing limited commitment to climate integration in development planning (Akinyemi & Efobi, 2023).

Non-state actors, including NGOs, civil society, and international partners, play an important role in complementing government efforts. Organizations like the Nigerian Conservation Foundation promote awareness campaigns, biodiversity conservation, and reforestation projects. Civil society groups (CSOs) contribute by holding policymakers accountable, pushing for transparency in climate finance, and advocating for the inclusion of vulnerable populations in decision-making (Igbokwe, 2022).

International partners also provide critical technical and financial support. The United Nations Development Programme (UNDP), the World Bank, and the Food and Agriculture Organization (FAO) have all backed Nigeria through funding, research, and policy support. Programs such as REDD+ (Reducing Emissions from Deforestation and Forest Degradation), supported by UN-REDD, aim to curb deforestation while supporting local livelihoods (UN-REDD, 2021). Additionally, donor-funded projects have advanced renewable energy, capacity-building, and climate-smart agriculture across the country.

Nigeria's institutional and legal architecture for climate governance is gradually taking shape, with the Climate Change Act of 2021 serving as a key legal instrument. Ministries, state governments, NGOs, civil society, and international organizations all play complementary roles in turning commitments into practical outcomes. However, issues such as fragmented implementation, limited financing, and weak enforcement continue to hinder progress. Strengthening collaboration across all levels of governance and investing in institutional and community capacity will be vital for Nigeria to achieve its climate objectives.

### 3.1 Constraints of Climate Change Mitigation and Adaptation Policies in Nigeria

Nigeria has increasingly acknowledged climate change as a serious developmental challenge, yet the effective implementation of mitigation and adaptation strategies remains elusive. While progress has been made in creating policy frameworks, such as the Climate Change Act of 2021 and the Energy Transition Plan, numerous barriers continue to undermine results. These obstacles are financial, institutional, socio-economic, and political in nature, and they weaken responses at both the national and community levels.

#### i. Inadequate Climate Finance and Reliance on External Donors

A major constraint to climate action in Nigeria is insufficient financing. Effective responses demand massive investments in renewable energy, sustainable agriculture, resilient infrastructure, and early warning systems. For instance, the Energy Transition Plan requires an estimated $400 billion by 2060, which is far beyond Nigeria's present financial capacity (Energy Transition Office, 2022). Domestic budgetary allocations for climate projects remain inadequate, forcing reliance on international donors and multilateral organizations. This dependency creates uncertainty, as external funding tends to be fragmented, project-specific, and unpredictable in the long term (World Bank, 2022). As a result, the expansion of crucial initiatives, such as climate-smart agriculture, REDD+ forest programs, and flood management projects, has been slow (Aina & Adenle, 2022).

#### ii. Weak Institutions and Poor Coordination

Institutional limitations further weaken Nigeria's climate response. Although the Climate Change Act of 2021 established the National Council on Climate Change (NCCC) to provide coordination, ministries and agencies often work independently. This lack of inter-ministerial synergy results in policy overlaps and contradictions (IUCN, 2022). At the state level, the situation is even more challenging as many states lack climate-specific offices, technical expertise, and resources to integrate climate action into development priorities (Akinyemi & Efobi, 2023). Local governments, which are closest to vulnerable populations, face even greater shortages of human and financial capacity.

#### iii. Policy Inconsistency and Weak Monitoring Systems

Policy instability also hampers effective climate governance. Successive administrations frequently alter priorities, causing disruptions to long-term climate programs. Renewable energy policies, for example, are sometimes sidelined due to political shifts or lobbying by fossil fuel stakeholders (Brookings Institution, 2022). Furthermore, monitoring and evaluation of ongoing projects are insufficient, making it difficult to scale successful initiatives or learn from failed ones. Weak accountability mechanisms also widen the gap between ambitious policy design and actual implementation (Ogunbiyi, 2022).

### iv. Low Awareness and Limited Participation

Another key challenge is the low level of public awareness. In many rural communities, where climate impacts are most severe, climate change is perceived as a distant or abstract concept rather than an immediate threat to survival and livelihoods (Okafor et al., 2024). Limited awareness reduces participation in climate programs and adoption of climate-friendly practices such as renewable energy and sustainable farming. In addition, stakeholder engagement often takes a top-down approach, with minimal involvement from local communities, civil society, and traditional leaders. This exclusion leads to weak ownership of policies and poor sustainability outcomes (Igbokwe, 2022).

### v. Socio-Economic Constraints: Poverty, Energy Poverty, and Political Instability

Nigeria's socio-economic conditions represent perhaps the most difficult barrier to overcome. More than 40% of citizens live below the poverty line, meaning immediate survival often takes precedence over long-term adaptation measures (National Bureau of Statistics, 2022). Energy poverty compounds the issue, with millions still depending on fuelwood and charcoal, contributing to deforestation and greenhouse gas emissions (Energy Transition Office, 2022). Political instability, corruption, and insecurity further obstruct climate initiatives. For example, conflict in northern Nigeria undermines agricultural adaptation programs, while oil theft and militancy in the Niger Delta weaken environmental protection efforts (Akinyemi & Efobi, 2023).

Despite having robust policy frameworks and ambitious targets, Nigeria faces persistent obstacles in addressing climate change. Financial shortages, institutional weaknesses, inconsistent policies, poor monitoring, low awareness, and socio-economic realities all limit effective action. Moving forward, Nigeria must prioritize domestic climate financing, strengthen institutional capacity, ensure policy stability, expand community engagement, and address structural poverty and energy access. Without such systemic reforms, the country's climate ambitions, particularly the Net Zero 2060 goal, will remain more aspirational than achievable.

## 4. CONCLUSION

This study explored Nigeria's climate change mitigation and adaptation policies, focusing on institutional, financial, and socio-economic dimensions influencing their effectiveness. The findings show that Nigeria has made notable progress in policy development, particularly with the Climate Change Act of 2021, the Energy Transition Plan, and the National Adaptation Plan. These frameworks reflect the government's acknowledgment of climate change as both a developmental and environmental issue, consistent with its Paris Agreement commitments, including the 2060 net-zero target. However, the analysis indicates that implementation remains weak due to financing gaps, institutional constraints, and inadequate enforcement. Heavy reliance on international donors for climate finance creates uncertainty, as funding is often fragmented and unsustainable. Initiatives such as renewable energy expansion, REDD+ programs, and climate-smart agriculture remain limited in scale because of shortfalls in funding, poor monitoring, and shifting policy priorities.

Institutional fragmentation also undermines progress, as ministries and agencies frequently act in isolation, delaying coordination and implementation. At the state and community levels, climate governance is weaker still, with many states lacking technical expertise or clear strategies to localize national climate policies. Socio-economic challenges, including poverty, energy poverty, and political instability, further reduce grassroots participation, leaving vulnerable populations, especially women, smallholder farmers, and displaced persons, exposed to climate risks.

Adaptation efforts, such as flood and drought management, coastal protection, and climate-smart agriculture, remain crucial but insufficient given the scale of threats. Regional differences deepen the challenge, with northern Nigeria facing desertification and drought, while the south contends with flooding and sea-level rise. Without stronger governance, adequate financing, and inclusive engagement, these risks will continue to endanger food security, livelihoods, and national stability.

In conclusion, Nigeria's climate policies are ambitious but constrained by systemic and structural weaknesses. To move from policy formulation to measurable outcomes, the country must strengthen governance, boost domestic financing, and prioritize inclusive, community-driven approaches. Achieving Nigeria's climate goals will depend not only on international support but also on political commitment, local ownership, and the integration of resilience into long-term development planning. To address the identified gaps and strengthen Nigeria's response to climate change, the following recommendations are proposed:

1. The government should strengthen institutional capacity and policy enforcement by improving coordination among ministries, agencies, and state governments, while building technical expertise and establishing robust monitoring systems to ensure accountability.
2. Nigerian government should increase domestic funding for climate initiatives by dedicating more budgetary resources, creating innovative financing mechanisms such as green bonds, and encouraging private-sector investment in renewable energy, sustainable agriculture, and resilient infrastructure.
3. Policymakers should mainstream climate education and awareness campaigns to improve public understanding and grassroots participation, particularly in rural and vulnerable communities, thereby fostering behavioral change and supporting the adoption of climate-smart practices.

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