



**RENEWABLE ENERGY GOVERNANCE AND POLICY IMPLEMENTATION GAPS TO
POVERTY ALLEVIATION IN NIGERIA**

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Abstract

Globally, governments are transitioning from fossil fuels to renewable energy in recognition of its potential for sustainable development and poverty alleviation through expanded access to affordable and reliable power. Despite being endowed with abundant renewable energy resources and establishing frameworks such as the National Renewable Energy and Energy Efficiency Policy (NREEEP), the Renewable Energy Master Plan (REMP), and the National Energy Transition Plan (NETP), Nigeria has failed to translate these policies into tangible outcomes, as implementation has remained inconsistent and limited in scope. This paper examines renewable energy governance in Nigeria, focusing on policy implementation gaps and their implications for socio-economic development and poverty reduction. Employing a qualitative review of policy documents, institutional structures, and stakeholder perspectives, the study identifies weak governance mechanisms, inadequate financing, duplication of regulatory bodies, technological deficits, and socio-cultural barriers as critical impediments to policy implementation. These barriers hinder rural electrification and constrain small-scale enterprises, perpetuating poverty and limiting economic inclusion. Despite these implementation gaps, climate financing initiatives, decentralization of off-grid renewable energy systems, and growing private-sector participation present viable pathways toward linking energy access with poverty alleviation strategies. The paper concludes that aligning renewable energy policies with community-based development programs, promoting inclusive governance, and improving institutional coordination are essential for bridging Nigeria's energy gap and fostering inclusive, sustainable growth. To bridge these gaps, the paper recommends strengthening institutional coordination, increasing financing for rural electrification, and integrating community engagement with poverty-focused energy strategies.

Keywords: Governance, Policy implementation, Poverty alleviation, Renewable energy sustainability

INTRODUCTION

Energy is fundamental to national development worldwide. Nigeria, Africa's most populous nation with over 220 million people and one of the continent's largest economies, faces a severe energy crisis that profoundly shapes its socio-economic development. The country's energy crisis and poverty levels are deeply intertwined (Jack & Jack, 2025). This interconnection has persistently hindered sustainable development and poverty alleviation efforts (Somoye, 2023). Despite abundant natural resources, including crude oil, natural gas, coal, sunlight, water bodies, rainfall, and wind, Nigeria continues to struggle with chronic electricity shortages and alarming levels of energy poverty (Adebayo & Ainah, 2024).

Electricity generation has consistently fallen short of demand over the past decade. Although installed generation capacity stands at approximately 12,000MW, actual available capacity remains between 3,000MW and 5,000MW due to infrastructural deficits, poor gas supply, vandalism, insecurity, corruption, and operational inefficiencies. Nigeria frequently experiences national grid collapses, making the national power supply unreliable (Amadi & Ekeng, 2024). These collapses impose substantial economic losses on both the country and its citizens (Ogunwuyi et al., 2024). Consequently, many Nigerians either live without electricity or rely on personal generation, which comes at high cost and carries negative environmental consequences (Adebobola et al., 2023; Algami, 2023).

Power shortages have far-reaching consequences, including stifled industrial growth, elevated business costs, reduced productivity, inadequate service delivery, poor digital connectivity, and limited access to quality education (Bao, 2024). Urban, semi-urban, and rural areas all suffer from poor power supply, perpetuating poverty across society (Nneze, 2024). Even in urban areas, many citizens lack sufficient power for daily activities (Ikemba et al., 2024).

The connection between Nigeria's energy crisis and poverty cannot be overstated. The nation's natural resource wealth has not translated into improved living standards (Ogbeide-Osaretin, 2021). Poverty persists due to high inflation, unemployment, inadequate social safety nets, rapid population growth, and inequality (Adeyemi-Tijani, 2025). Many households spend significant portions of their income on generators, diesel, kerosene, fuel, gas, and firewood (Adeyemi-Tijani, 2025). Nigeria has yet to harness opportunities from solar and biomass energy. The relationship between inadequate energy access and poverty remains a vicious cycle, poverty limits energy access, while energy

deprivation restricts job creation, investment, and economic diversification, perpetuating poverty (Sannio, 2021).

Renewable energy offers a pathway to address Nigeria's energy crisis through off-grid solutions, poverty reduction, and inclusive economic growth (Bello et al., 2024). Reliable energy is essential for improving livelihoods, supporting industrial development, and transforming the country's power narrative. However, Nigeria's renewable energy governance faces significant challenges, including overlapping institutional mandates, weak inter-agency coordination, and inconsistent policy implementation. The implementation stage remains particularly problematic. Although policies such as the Renewable Energy Policy (REP) and National Renewable Energy and Energy Efficiency Policy (NREEEP) establish clear goals, their effectiveness is undermined by inadequate political commitment, insufficient funding, manpower shortages, and corruption. Frequent policy changes, bureaucratic bottlenecks, and weak monitoring and evaluation have further stalled renewable energy deployment.

Despite policy formulation and adoption, concrete outcomes remain elusive due to widening implementation gaps. Private sector participation and public-private partnerships are constrained by unstable policy environments, while communities and local governments lack the institutional support needed for decentralized renewable energy systems. This paper investigates renewable energy governance and policy implementation gaps in relation to poverty alleviation in Nigeria. It addresses the question: "How can gaps in energy governance and policy implementation be addressed to alleviate poverty in Nigeria?" The paper provides background on Nigeria's energy crisis, states the research problem and objectives, presents the research question and significance, and offers conceptual and theoretical frameworks.

LITERATURE REVIEW

Conceptual Review

Renewable Energy

A comprehensive understanding of Nigeria's renewable energy resources is fundamental to achieving sustainable development and addressing the nation's persistent energy crisis. Renewable energy sources offer a viable pathway to enhance energy security and mitigate climate change in a

country that remains heavily reliant on fossil fuels while its vast clean energy resources remain largely untapped.

Solar energy represents arguably the most significant renewable energy resource in Nigeria. The country receives high Global Horizontal Irradiation (GHI), with some regions in northern Nigeria experiencing estimated diffuse solar irradiation ranging from 3.46kWh/m² to 5.48kWh/m² (Adediji et al., 2021). This substantial solar potential provides high photovoltaic capacity applicable to both off-grid and grid-scale energy supply (Fu, 2023). Despite this natural advantage, Nigeria has struggled to harness solar energy effectively. According to Olaniyan et al. (2024), over 90 million Nigerians-predominantly residing in rural and remote areas-lack access to grid electricity, and even those connected to the national grid face unreliable supply due to fragile infrastructure that cannot guarantee steady power delivery.

Biomass energy presents another significant opportunity for Nigeria, given the country's robust agricultural sector, large rural population, and diverse vegetation. Biomass involves the conversion of organic materials into usable energy. Unfortunately, this potential has been grossly underutilized (Uzoagba et al., 2024). Many countries are transitioning to modern, sustainable energy through biomass, which can provide clean cooking gas and power generation (Pavithiran et al., 2024). This contrasts favorably with Ethiopia, where biomass already serves as a significant source of cooking gas for households, demonstrating the viability of biomass energy systems in sub-Saharan African contexts (Benti et al., 2021). Hydropower serves as a natural resource for energy generation, with the Kainji, Jebba, and Shiroro dams contributing to the national grid. According to Yusuf (2025), hydropower is the only renewable energy source significantly utilized in Nigeria. However, substantial potential exists for small and medium-scale hydro projects to serve off-grid communities, though this opportunity remains largely unexploited.

Wind energy potential in Nigeria is comparatively lower than solar and hydropower, yet meaningful opportunities exist, particularly in coastal and offshore areas and parts of northern Nigeria that experience higher wind speeds. However, wind energy remains almost entirely untapped in Nigeria (Akporhonor, 2024), with limited data collection, inadequate feasibility studies, and insufficient investment hindering development.

Energy Governance

Energy governance in Nigeria encompasses the complex network of institutions, laws, policies, actors, and decision-making processes that shape the production, distribution, and consumption of energy resources. This governance architecture has evolved through decades of policy reforms, institutional restructuring, and legislative interventions. The Ministry of Petroleum Resources oversees the exploration, production, and commercialization of petroleum products, supervising the Nigerian Upstream Petroleum Regulatory Commission (NUPRC) and the Nigerian Midstream and Downstream Petroleum Authority (NMDPRA). The Nigerian National Petroleum Company Limited (NNPCL) manages exploration, refining, and marketing activities, including Nigeria's three government-owned refineries.

The Ministry of Power formulates electricity sector policies and supervises key agencies including the Nigerian Electricity Regulatory Commission (NERC), Transmission Company of Nigeria (TCN), Nigerian Electricity Management Services Agency (NEMSA), and the Rural Electrification Agency (REA). These institutions collectively manage electricity generation, transmission, distribution, and regulatory functions. The Energy Commission of Nigeria (ECN) oversees national energy policies and conducts research, planning, and data gathering necessary for informed government decisions. The Federal Ministry of Environment conducts environmental assessments and ensures alignment with renewable energy targets and decarbonization objectives.

The Petroleum Industry Act of 2021 restructured the oil and gas regulatory architecture, commercialized the Nigerian National Petroleum Company (NNPC) into NNPCL, and established provisions for host community development and environmental compliance. These represent significant efforts by the Nigerian government to ensure energy security in the country. The Electric Power Sector Reform Act (EPSRA) of 2005 privatized the electricity industry by removing government monopoly and unbundling the power sector into Generating Companies (GenCos), Transmission Company of Nigeria (TCN), and Distribution Companies (Discos). This reform aimed to improve efficiency, attract private investment, and expand access.

Nigeria has also established multiple renewable energy policies geared toward renewable energy growth. The National Renewable Energy and Energy Efficiency Policy (NREEEP), established in 2015, aims to support energy accessibility through renewable and clean energy adoption, aligning

Nigeria with global sustainability trends. The Renewable Energy Master Plan (REMP) is aimed at increasing renewable energy contributions to Nigeria's energy mix and achieving long-term sustainable development through solar, wind, biomass, and hydro energy. The REMP encompasses policy development, financing mechanisms, energy deployment strategies, capacity building initiatives, and public awareness campaigns.

Policy Implementation

Public policy making encompasses different stages or levels, all of which are important. However, policy implementation-typically the fourth stage-has proven persistently problematic in Nigeria. A significant gap exists between policy adoption and execution, and this gap has continued to hinder Nigeria's ability to realize renewable energy objectives and achieve energy security. According to Oludimu and Alola (2022), Nigeria still depends on oil as a source of energy despite various policies promoting renewable energy transition. Access to renewable energy is seen as a pathway to poverty alleviation in Nigeria. Insufficient, expensive, or unavailable renewable energy has stalled efforts toward poverty alleviation. Therefore, there is a direct link between energy access and poverty in Nigeria, as energy deprivation perpetuates socioeconomic exclusion and limits opportunities for economic advancement.

Empirical Review

Policy Landscape and Regulatory Framework

Scholars have consistently identified policy implementation as the primary bottleneck in Nigeria's renewable energy transition, rather than policy formulation itself. Studies by Sambo (2021) and Iwayemi (2008) established that Nigeria does not suffer from a shortage of policies but from persistent implementation deficits that undermine even well-intentioned frameworks. This observation has been corroborated by subsequent research examining the gap between policy ambition and execution in Nigeria's energy sector (Denle, 2020; Ugwu et al., 2022). Empirical evidence suggests that while policymakers have demonstrated awareness of the need for energy transition through successive strategic documents, the translation of these frameworks into tangible outcomes remains elusive (Ajayi, 2019; Ebhota & Tabakov, 2018).

Research on the Renewable Energy Master Plan (REMP), first introduced in 2005 and revised in 2012, reveals significant gaps between its ambitious targets and actual achievements. The plan aimed

to increase renewable electricity generation to 23 percent by 2025 and 36 percent by 2030, with detailed proposals for solar, wind, small hydro, and biomass (Energy Commission of Nigeria & UNDP, 2012). Empirical studies have documented that while the plan conceptually linked rural electrification with local industrial growth and envisioned domestic manufacturing of renewable energy components, implementation has fallen considerably short of these objectives (Oyewo et al., 2021; Okoro & Igwe, 2020). Scholars attribute this shortfall to inadequate funding mechanisms, weak institutional capacity, and insufficient political commitment (Nweke, 2018; Ogunleye, 2017).

The National Renewable Energy and Energy Efficiency Policy (NREEEP) of 2015 represented an attempt to broaden the renewable energy agenda by encouraging private sector involvement, providing fiscal incentives, and addressing technical and regulatory barriers (Federal Ministry of Power, 2015). However, empirical research indicates that investors continue to face mixed policy signals and unpredictable shifts in policy direction, undermining market confidence and private sector participation (Ugwu et al., 2022; Acha et al., 2019). Studies emphasize that while NREEEP acknowledged Nigeria's persistent institutional challenges, it lacked the legal backing and enforcement mechanisms necessary for effective implementation (Denle, 2020; Ajayi, 2019).

The Nigeria Energy Transition Plan (NETP) of 2022 represents the most recent policy framework, positioning renewable energy, particularly solar, at the center of Nigeria's pathway toward net zero emissions by 2060 (Federal Government of Nigeria, 2022). Empirical assessments of the NETP highlight both its strengths and limitations. The plan identifies three critical priorities: modernizing the national grid, expanding off-grid systems, and improving clean cooking solutions—all linked to poverty reduction and economic growth (Ritchie & Roser, 2023). However, scholars note that the plan's emphasis on emerging technologies like hydrogen remains aspirational rather than grounded in feasibility studies, and that implementation mechanisms remain unclear (Onuh, 2024; Ukoima, 2025).

Institutional Fragmentation and Regulatory Challenges

Empirical studies consistently identify institutional fragmentation as a significant barrier to effective renewable energy governance. Research by Ikejemba et al. (2017) and Ugwu et al. (2022) documents how overlapping mandates among agencies—including the Federal Ministry of Power, Federal Ministry of Environment, Nigerian Electricity Regulatory Commission (NERC), Rural Electrification Agency (REA), and Energy Commission of Nigeria (ECN)—create confusion,

delays, and inefficiencies. The lack of clear role delineation and coordination mechanisms results in contested jurisdictions and accountability deficits, where no single entity bears full responsibility for outcomes (Adejumo-Ayibiowu, 2015; Ighoshemu & Ogidiagba, 2022).

The Nigerian Electricity Regulatory Commission's Mini Grid Regulation of 2016 and Embedded Generation Regulation have been widely cited as foundational steps that unlocked private investment in off-grid solar by establishing clear operational and tariff rules (NERC, 2016; IEA, 2017). However, empirical evidence suggests that regulatory implementation remains inconsistent, with bureaucratic delays and weak enforcement limiting their effectiveness (World Bank, 2022; UNDP, 2021). Similarly, while the Rural Electrification Agency has driven significant donor-supported renewable energy deployment through programs like the Nigeria Electrification Project, studies indicate that its capacity is often stretched thin, leading to project delays and sustainability challenges (REA, 2020; World Bank, 2020).

Stakeholder Engagement and Local Implementation

Research highlights the weak role of state and local governments in renewable energy governance, despite their proximity to community structures and local realities. Empirical studies document that the centralization of electricity generation and transmission under federal control has sidelined subnational governments, preventing projects from being tailored to local needs (Ugwu et al., 2022; Ikejemba et al., 2017). Communities report that renewable installations, particularly solar mini-grids, demonstrate greater sustainability when state and local actors participate directly in maintenance and community engagement (Okoro & Igwe, 2020; Agarwal, 2013).

The empirical literature reveals several consistent findings. First, Nigeria's renewable energy policies are comprehensive on paper but lack the legal backing, funding mechanisms, and institutional capacity necessary for effective implementation (Denle, 2020; Ugwu et al., 2022). Second, institutional fragmentation and overlapping mandates create coordination failures that delay projects and undermine accountability (Ikejemba et al., 2017; Ajayi, 2019). Third, the weak role of subnational governments and local communities in energy governance results in projects that fail to align with ground realities, reducing adoption and sustainability (Ebhotu & Tabakov, 2018; Ogunleye, 2017). Fourth, heavy reliance on donor funding and international partnerships, while important, reflects the inadequacy of domestic financing mechanisms and raises questions about long-term sustainability (World Bank, 2022; Nweke, 2018).

These empirical findings collectively demonstrate that Nigeria's renewable energy challenges are not primarily technical but governance-related, with weak institutional frameworks, inadequate coordination, and insufficient political will perpetuating implementation gaps. Addressing these challenges requires strengthening institutional capacity, clarifying roles and responsibilities, enhancing stakeholder engagement, and developing sustainable financing mechanisms.

Theoretical Review

The study is predicated on two theoretical lenses, interwoven into each other: Governance Theory and Policy Implementation Theory. These frameworks are a good foundation for analyzing the disjuncture between Nigeria's well-articulated renewable energy policies and tangible outcomes in poverty alleviation. The two theories undergird this work on the premise that the nation's energy crisis is not merely technical or infrastructural; rather, it is a crisis of governance and execution.

Governance theory shifts focus from the traditional, state-centric concept of “government” towards a more dispersed and multi-stakeholder process of “governance”. This is a process through which society is steered by a dynamic network of actors including the state, private sector, civil society organizations, and international donors (Mayntz, 2003). Duit and Galaz (2008) has noted that the basic tenets underlying this theory are accountability, transparency, participation, responsiveness, and the rule of law as the bedrock for effective societal steering. Applying this to the Nigerian renewable energy sector, the theory provides a critical perspective that helps in diagnosing the systemic weaknesses of the regulatory environment (Adejumo-Ayibiowu, 2015). This is exemplified by the proliferation of agencies such as the Rural Electrification Agency (REA), Nigerian Electricity Regulatory Commission (NERC), and the Energy Commission of Nigeria (ECN) without clear hierarchy, delineation of roles, and coherent coordination mechanism, exemplifying governance failure. Fragmentation creates a labyrinthine system leading to policy confusion, duplication of efforts, contested jurisdictions, and ultimately, accountability deficits where no single entity can be fully responsible for failures (Adejumo-Ayibiowu, 2015). In addition, governance theory helps explain how poor stakeholder engagement, especially the lack of meaningful incorporation of local communities and small-scale private investors in the design of policies, leads to technically sound but sociologically ill-fitting policies against ground-level realities. A lack of fit breeds local

resistance and low adoption rates, undermining the potentials of renewable energy to reduce poverty (Ighoshemu & Ogidiagba, 2022).

While the formulation of policy often attracts political and public interest, it is implementation that represents the crucible in which policies either succeed or fail. Policy Implementation Theory, especially from the top-down and bottom-up models, provides crucial insight into the process. The top-down model-the focus is always on directives and control from central policymakers-is mainly applicable in Nigeria's energy sector (Paudel, 2009). According to this model, for implementation to succeed, policies must have objectives clearly set out, a clear legal framework, and adequate financial and technical resource allocation (Howlett, 2019). Most renewable energy policies in Nigeria, such as the NREEEP and REMP, are bedeviled by aspirational yet unclear targets, while the most important deficiency is a chronic lack of dedicated financing, realistic timelines, and technological capacity. Such misalignment between policy ambition and actual implementation resources creates a big and predictable gap.

Complementarily, the bottom-up perspective has challenged the top-down view, emphasizing the indispensable role of street-level bureaucrats and local actors who actually interpret and carry out policies (Khan & Khandaker, 2016). For instance, in Nigeria, the disconnection between federal policy designers in Abuja and the implementers on the local level-including state governments, local council authorities, and community leaders-is stark. It suggests that without the active buy-in, understanding, and operational capacity of these local actors, even the most well-intentioned policies are likely to falter. If the local socio-cultural contexts, economic capacities, and prevailing power structures were not taken into consideration during the implementation phase, it directly impedes the adoption and sustainability of renewable energy solutions. A solar mini-grid project, for example, may fail-not due to technical flaws-but because the community lacks maintenance structures or due to unresolved land tenure issues and hence perpetuates energy poverty.

The integration of Governance Theory and Policy Implementation Theory creates a robust analytical framework for examining Nigeria's renewable energy challenges. This synthesis addresses both the structural and operational dimensions of the policy implementation gap. Governance Theory illuminates the structural and procedural flaws within Nigeria's renewable energy ecosystem. By focusing on the network of actors, this lens reveals systemic weaknesses in the regulatory environment. The proliferation of agencies such as the Rural Electrification Agency (REA), Nigerian

Electricity Regulatory Commission (NERC), and Energy Commission of Nigeria (ECN) without clear role delineation or coordination mechanisms exemplifies governance failure, leading to policy confusion, duplication, and accountability deficits (Adejumo-Ayibiowu, 2015). Additionally, poor stakeholder engagement, particularly the exclusion of local communities from policy design, results in policies that fail to align with ground realities, breeding local resistance and low adoption rates (Ighoshemu & Ogidiagba, 2022).

Complementarily, Policy Implementation Theory, drawing from top-down and bottom-up models-explains operational failures during execution. The top-down perspective reveals that renewable energy policies suffer from unclear targets, chronic financing deficits, unrealistic timelines, and inadequate technological capacity. Simultaneously, the bottom-up perspective exposes the disconnect between federal policymakers and local implementers, including state governments and community leaders (Khan & Khandaker, 2016). Without local buy-in and capacity, even well-intentioned policies falter. A solar mini-grid project may fail not due to technical flaws but because communities lack maintenance structures or face unresolved land tenure issues.

Together, these theories suggest that implementation gaps are not merely technical or financial problems but symptoms of weak multi-level governance structures. This diagnosis moves beyond simplistic explanations toward understanding how governance failures produce and reproduce implementation deficits. The interplay creates a vicious cycle: poor governance results in poorly implemented policies, and policy failures erode public trust and institutional capacity, reinforcing poor governance. As trust diminishes, future policy initiatives become more difficult to implement, and weak institutional capacity makes it harder for agencies to learn from failures.

Ultimately, this cycle stifles renewable energy's potential to catalyze socio-economic development and poverty reduction. Energy access remains constrained, trapping the nation in energy scarcity and economic stagnation, with rural communities and MSMEs bearing the heaviest burden. This integrated framework therefore provides the analytical foundation for understanding Nigeria's slow renewable energy transition. It underscores that addressing governance weaknesses is prerequisite to successful policy implementation and leveraging renewable energy for poverty alleviation. By illuminating both structural and operational dimensions of the implementation gap, this framework guides the analysis of specific barriers examined in subsequent sections.

Gap in the Literature

The existing literature on renewable energy governance and policy implementation in Nigeria reveals a significant gap: while scholars have extensively documented Nigeria's renewable energy potential, policy frameworks, and individual governance challenges, few studies have systematically analyzed the interconnected mechanisms through which governance failures produce specific implementation gaps with direct implications for poverty alleviation. Studies by Denle (2020), Ugwu et al. (2022), and Ajayi (2019) have identified institutional weaknesses and regulatory barriers, while others have examined financing constraints (Nweke, 2018; World Bank, 2022) or socio-cultural factors (Eze & Agboola, 2020). However, existing research largely treats these factors in isolation, failing to recognize how they interact to create a self-reinforcing cycle of poor governance and failed implementation. Furthermore, limited attention has been given to systematically linking implementation barriers to specific poverty alleviation outcomes in rural and underserved communities. This study addresses these gaps by employing an integrated theoretical framework combining Governance Theory and Policy Implementation Theory to systematically trace how governance weaknesses translate into implementation deficits and, consequently, perpetuate energy poverty.

METHODOLOGY

This study adopts a qualitative desktop research approach to examine renewable energy governance and policy implementation gaps in Nigeria. As a desk study, the research relies entirely on secondary data sources, including published academic literature, policy documents, institutional reports, and stakeholder perspectives available in the public domain. The qualitative desktop design enables comprehensive synthesis of findings from diverse sources, identification of patterns across documents, and development of nuanced understanding of the policy implementation challenges facing Nigeria's renewable energy sector.

The study draws on three main categories of secondary data sources: policy and legal documents (including NREEEP, REMP, NETP, EPSRA 2005, and PIA 2021); institutional and organizational reports (from ECN, NERC, REA, Federal Ministries, World Bank, UNDP, and IRENA); and academic literature (peer-reviewed journal articles and scholarly publications). Data analysis is guided by the integrated theoretical framework combining Governance Theory and Policy Implementation Theory, with analysis proceeding through systematic review of policy objectives,

assessment of actual outcomes and challenges, identification of implementation barriers, and categorization through theoretical lenses. As a desk study, this research is limited by reliance on secondary data and focuses on national-level frameworks with limited exploration of sub-national variations, yet provides valuable insights for future empirical research.

DATA CATEGORY	SPECIFIC SOURCES	PURPOSE IN ANALYSIS
POLICY AND LEGAL DOCUMENTS	NREEEP, REMP, NETP, EPSRA 2005, PIA 2021	Identify stated objectives, targets, and implementation strategies
INSTITUTIONAL AND ORGANIZATIONAL REPORTS	ECN, NERC, REA, Federal Ministries, World Bank, UNDP, IRENA	Assess actual outcomes, implementation challenges, and governance weaknesses
ACADEMIC LITERATURE	Peer-reviewed journals, books, scholarly publications	Provide theoretical grounding, empirical evidence, and analytical perspectives
ANALYTICAL FRAMEWORK	Governance Theory and Policy Implementation Theory	Examine structural/procedural flaws and operational/execution failures

Table 1: Summary of Data Sources and Analytical Approach

FINDINGS

The Nexus Between Renewable Energy and Poverty in Nigeria

Energy poverty in Nigeria is really a story of two different worlds living side by side, and the gap between them keeps stretching. National electricity access is often estimated at around 55 percent, but this number hides a much sharper divide. Access climbs to about 84 percent in urban areas, yet drops to roughly 25-26 percent in rural communities, which means a huge number of rural households are basically disconnected from the modern economy (World Bank, 2023; PeopleSuN / Pelz et al., 2023). In practical terms, more than 85 million Nigerians still have no reliable electricity, and for many of them this is not just an inconvenience but a barrier that shapes daily survival (The

Guardian, 2025). It keeps households in the dark, literally and figuratively, and contributes to a sense of being cut off from national development (Pelz et al., 2023).

The socio-economic effects of this deprivation are deep and stubborn. For the rural economy, which relies heavily on Micro, Small, and Medium Enterprises (MSMEs), the lack of electricity strangles productivity and limits any real chance of scaling up. Many business owners rely on petrol and diesel generators that are expensive to run and sometimes break down without warning. The cost of fuel alone eats so seriously into their profits that it becomes difficult to expand or even stay afloat (Olaniyan, 2024). On the social side, impacts are worrying. Poor electricity supply weakens the health system because clinics cannot reliably refrigerate vaccines or operate essential medical equipment, leading to worse outcomes for maternal and child health [though detailed national-level data remains scarce]. Education also suffers. Children in rural communities often cannot study at night, and schools struggle to adopt digital tools because grid electricity is unreliable. Added to this, many households still depend on firewood and charcoal for cooking, and indoor air pollution from these fuels remains a quiet but deadly threat [similar patterns observed in health-energy literature, though not always specific to Nigeria]. That combination feeds into multidimensional poverty, making it extremely hard for affected families to escape the cycle (Olaniyan, 2024; Pelz et al., 2023).

This entrenched cycle, though, is not unbreakable. Nigeria's enormous renewable energy potential offers a practical path for reducing poverty in a way that is both community focused and economically sensible. Solar energy stands out as the most promising option. With high solar potential nationwide, solar home systems (SHS) and mini-grids are already showing results in remote communities where the national grid has never reached (Ukoima, 2025; International Renewable Energy Agency [IRENA] / Energy Commission of Nigeria, 2023). These systems provide lighting, power small appliances, and support refrigeration for agricultural produce, which can be a game-changer for farmers trying to reduce post-harvest losses (Ukoima, 2025).

Other renewable resources also hold real potential. Small hydropower and biomass energy using agricultural residues like rice husks, maize stalks or other crop waste offer possibilities in regions where water resources or farming are concentrated. This could help create entire local value chains that support jobs, improve waste management, and strengthen rural economies (Onuh, 2024; Dinneya-Onuoha, 2025). These renewable energy options open up three reinforcing opportunities for reducing poverty. First, rural electrification directly improves quality of life. It brings lighting,

connection to information, and more productive hours in the evening. Second, the renewable energy value chain itself (manufacturing, installation, maintenance) offers jobs, especially for Nigeria's large youth population. Third, reliable, affordable power helps small businesses operate more efficiently. With dependable electricity, local artisans or agro-processors don't have to rely on costly generators. Their production costs drop, output rises, and they can begin to grow their businesses. In that sense, renewable energy becomes more than a utility bundle. It becomes a tool for social mobility, economic inclusion, and long-term growth for entire communities.

Policy Implementation Gaps in Renewable Energy Governance in Nigeria

Nigeria's renewable energy governance is characterized by a significant gap between policy objectives and actual outcomes, a challenge faced not only in Nigeria but also in other developing nations. Despite the country's abundant renewable energy resources such as solar, wind, and hydro, the realization of these resources into widespread energy access has been hindered by governance issues, political interference, poor financing, and socio-cultural challenges (Ebhotu & Tabakov, 2018).

One of the key issues is the policy objectives and actual outcomes. There is a significant gap between policy goals and actual outcomes in Nigeria. Theoretically, Nigeria has set ambitious goals to increase the share of renewable energy in the national energy mix, reduce carbon emissions, and improve rural electrification. The National Renewable Energy and Energy Efficiency Policy (NREEEP), the Renewable Energy Master Plan (REMP), and the National Energy Transition Plan (NETP) provide frameworks to guide this transition. However, these policies have achieved little success (Denle, 2020).

Studies emphasize that while these frameworks have provided blueprints for energy transition, a lack of harmonized institutional structures, political will, and inadequate funding have resulted in poor outcomes. Furthermore, Nigeria's progress towards renewable energy targets is still underachieved, with renewable energy contributing only about 1% to the national electricity grid, instead of the expected 30% by 2030 (Oyewo et al., 2021). This failure to meet policy goals highlights the level of stagnation in African energy governance, where policies often remain theoretical without sufficient operational mechanisms (Ajayi, 2019). Additionally, even when policies exist, they frequently fail to align with the ground realities of energy access, particularly in rural areas where electrification remains unsolved (Ogunleye, 2017).

Additionally, project delays, failures, and abandonment have often characterized the policy implementation gap in Nigeria's energy sector. Despite various renewable energy initiatives launched by the government and development partners, projects have faced persistent delays, cost overruns, or have been abandoned (Acha et al., 2019). The Solar Power Naija program, meant to provide power to Nigerians, is one such example. Although the project was launched with high hopes, it has been hampered by bureaucratic bottlenecks, lack of coordination between stakeholders, and insufficient funding, leading to delays in its rollout (UNDP, 2021).

Institutional fragmentation in Nigeria's energy sector significantly contributes to project delays. Nigeria's energy policy landscape is characterized by multiple regulatory bodies with overlapping mandates, which often lead to confusion, delays, and inefficiencies in project implementation. Moreover, the lack of strong monitoring and evaluation mechanisms allows poor projects to continue without rectification. A report from the World Bank (2022) also noted that many renewable energy projects are initially launched with good intentions but fail due to mismanagement, lack of proper funding, and ineffective policy enforcement.

Geographical inequities in the distribution of renewable energy solutions are also a major barrier to achieving inclusive energy access. The southern and urban areas of Nigeria, particularly cities like Lagos and Abuja, have been the focus of energy infrastructure projects, while rural and northern regions have little or no renewable energy presence (Okoro & Igwe, 2020). These geographical disparities are not limited to uneven resource distribution but are also tied to political priorities and historical development trends (Agarwal, 2013).

The focus of energy infrastructure development in the urban South has led to a growing gap in energy access between the North and South, exacerbating poverty levels in underserved regions. This regional imbalance in energy access has hampered Nigeria's energy policy goals, which stress the importance of equitable energy access across all regions. Decentralizing energy solutions through off-grid renewable systems, such as solar mini-grids, is one way to address these geographical inequities, but implementation remains slow due to regulatory and financial constraints (Ebhota & Tabakov, 2018).

Denle (2020) also notes that weak governance and institutional capacity have become core issues hindering implementation in Nigeria's renewable energy policies. Weak institutional frameworks, poor regulatory enforcement, and inadequate interagency coordination have contributed to the policy

implementation gap. While policies like the REMP and NETP have set national goals, the Energy Commission of Nigeria (ECN) and other regulatory agencies habitually lack the capacity to enforce compliance with these policies (Denle, 2020).

The decentralization of energy policy to various governmental agencies with unclear or overlapping mandates further obscures the implementation process, as each body works in isolation, leading to disorganization and confusion (Ajayi, 2019). Furthermore, the Nigerian government's institutional weaknesses are exacerbated by a lack of political will to implement policies that would benefit the energy sector. Although renewable energy development has been on the national agenda for decades, political instability and frequent leadership changes have undermined the continuity and consistency required for policy implementation (Ogunleye, 2017)

Also critical are bureaucratic inefficiencies, which constitute a menace to policy implementation gap in Nigeria's renewable energy sector. Persistently, it has been proven that slow decision-making, inefficient approval processes, and excessive red-tapism hinder the progress of renewable energy projects. According to UNDP (2020), the lengthy approval processes and bureaucratic delays is responsible for the setbacks in several renewable energy projects, with many projects being delayed by years or abandoned wholly due to slow government processes. The failure of the Nigerian Electricity Regulatory Commission (NERC) to expedite necessary regulations for the integration of renewable energy into the national grid further illustrates this inefficiency.

Nigeria's bureaucratic inefficiencies affect the timely disbursement of funds for renewable energy projects. Despite the fact that external financing and donor support are often available, the slow pace of fund release and disbursement by government agencies asphyxiates progress. Lack of a well-coordinated funding and procurement system means that even when projects are funded, they often remain undone or incomplete due to poor planning and execution.

Nigeria's energy sector has always been affected by Political interference and corruption and this has affected policy implementation in Nigeria's energy sector. Empirically, it has been proven that the Nigerian energy sector is susceptible to political manipulation, with energy projects being diverted or delayed for political reasons (Eze & Agboola, 2020). Fraud in procurement processes and misallocation of funds further exacerbate the problem, diverting resources that could have been used for renewable energy projects to other areas of less priority (Ajayi, 2019).

Political interference often dictates the success or failure of energy projects, as politicians prioritize short-term benefits or personal gain over long-term energy goals. Moreover, the practice of awarding contracts to politically connected firms-regardless of their capability to deliver undermines project quality and delays progress. This politicization of energy governance has negatively imparted policy goals and actual outcomes.

All of these are compounded by limited financing, which has become one of the most perilous hindrances to achieving Nigeria's renewable energy targets. Despite call for renewable energy, Nigeria faces momentous challenges in securing adequate financing for energy projects. According to the World Bank (2021), the Nigerian government has struggled to allocate sufficient funds for renewable energy projects, relying heavily on international donors and private sector investors to fill the gap. However, inadequate access to finance, principally for small-scale renewable energy projects in rural areas, is still a significant challenge (Nweke, 2018).

Furthermore, budget implementation is often poor, with allocated funds being misappropriated or not released in time to meet project deadlines. The UNDP (2020) and Ajayi (2019) agree that Nigeria's budgetary constraints and mismanagement of funds are major impediments to scaling up renewable energy projects. Poor financial management and insufficient public sector investment in renewable energy undermine policy goals, as projects remain underfunded and unable to meet national energy needs.

CONCLUSION

This paper has examined renewable energy governance and policy implementation gaps in Nigeria, revealing a persistent disconnect between well-articulated policy frameworks and tangible poverty alleviation outcomes. Despite abundant renewable energy resources and comprehensive policies including NREEEP, REMP, and NETP, renewable energy contributes merely 1% to the national grid while over 85 million Nigerians lack reliable electricity access. The study identifies interconnected barriers-governance weaknesses, institutional fragmentation, bureaucratic inefficiencies, political interference, limited financing, technological deficits, and socio-cultural challenges-that collectively perpetuate a vicious cycle of poor policy execution and eroded public trust. Through the integrated lens of Governance Theory and Policy Implementation Theory, the analysis demonstrates that Nigeria's energy crisis is fundamentally a crisis of governance and execution rather than merely a technical or resource constraint.

Energy deprivation has profound socio-economic consequences, particularly for rural communities and MSMEs, stifling productivity, undermining healthcare and education, and perpetuating multidimensional poverty. Yet emerging opportunities-climate financing initiatives, growing private-sector participation, and decentralized off-grid systems-present viable pathways toward linking energy access with poverty alleviation. To bridge Nigeria's energy gap and foster inclusive sustainable growth, deliberate reforms are essential: strengthening institutional frameworks with clear mandates and accountability, enhancing stakeholder coordination between federal and local actors, ensuring adequate financing through improved budget implementation and climate finance leverage, addressing socio-cultural barriers through community engagement, and building domestic technological capacity. Nigeria stands at a critical juncture where the gap between policy ambition and implementation reality must be closed. By aligning renewable energy policies with community-based development programs, promoting inclusive governance, and improving institutional coordination, Nigeria can transform its energy landscape, alleviate poverty, and achieve sustainable development. The path forward requires not just technical solutions but a renewed commitment to governance excellence and policy effectiveness.

RECOMMENDATIONS

Three key recommendations are proposed to address renewable energy governance and policy implementation gaps in Nigeria.

First, government should strengthen institutional frameworks and coordination by streamlining the mandates of energy sector agencies to eliminate duplication and clarify roles and responsibilities. A coordinating body with clear authority should be established to harmonize the activities of the Ministry of Power, NERC, REA, and ECN. Clear performance metrics and monitoring mechanisms should be developed to track agency performance. Regulatory stability is essential for attracting private sector investment. Government should avoid frequent policy shifts that undermine investor confidence while ensuring renewable energy policies have stronger legal backing to secure stable funding.

Secondly, government should significantly increase budgetary allocation for renewable energy projects and ensure timely disbursement of funds. Nigeria should actively leverage climate financing instruments, including the Green Climate Fund and international development partnerships. The Bank of Industry should expand access to credit for renewable energy enterprises, particularly off-

grid providers serving rural communities. A deliberate policy focus should prioritize energy infrastructure development in underserved rural areas and northern regions through decentralized off-grid renewable energy systems, including solar mini-grids and solar home systems.

Finally, government should promote community engagement and socio-cultural sensitivity by incorporating meaningful community participation in renewable energy project design, implementation, and maintenance. Local leaders, women's groups, and traditional institutions should be engaged to ensure cultural appropriateness and community ownership. Awareness campaigns should address socio-cultural barriers to renewable energy adoption. Renewable energy policies should be explicitly linked to poverty reduction strategies to ensure energy interventions benefit vulnerable populations. Energy access should be integrated into broader development programs, including agriculture, education, healthcare, and enterprise development, to maximize poverty alleviation impacts.

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