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Renewable Energy Transition in Nigeria: Public Perception, Community Engagement, and Strategies for Achieving Sustainable Economic Development

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Abstract

This study examines the renewable energy transition in Nigeria with particular emphasis on public perception, community engagement, and strategies for achieving sustainable economic development. Using a mixed-methods research design, quantitative data were collected from 300 respondents through structured questionnaires and complemented with qualitative insights from key stakeholder interviews and focus group discussions. Descriptive statistics and econometric techniques, including Ordinary Least Squares and logistic regression models, were employed to assess the economic impacts of renewable energy adoption and to identify key determinants influencing adoption decisions. The findings reveal that renewable energy adoption has a statistically significant positive effect on economic outcomes, including job creation, energy cost savings, and local economic development. The results further indicate that public awareness, income levels, access to financing, and policy support significantly influence the likelihood of renewable energy adoption, with access to finance emerging as the most critical factor. Despite strong recognition of renewable energy's benefits, challenges related to affordability, limited financing options, and uneven public awareness persist, particularly in rural communities. The study concludes that renewable energy can serve as a practical pathway to sustainable economic development in Nigeria when supported by coherent policy frameworks, inclusive financing mechanisms, and active community participation. The findings provide valuable policy-relevant insights for accelerating Nigeria's transition toward a resilient and sustainable energy future.

Keywords: *Renewable Energy Transition; Public Perception; Community Engagement; Sustainable Economic Development.*

Introduction

The global transition toward renewable energy has become a central pillar of sustainable development discourse, driven by escalating climate change impacts, energy security concerns, and the need for inclusive economic growth. Developing economies, particularly those in Sub-Saharan Africa, face a dual challenge of expanding energy access while reducing dependence on fossil fuels (International Energy Agency [IEA], 2023). Nigeria, Africa's most populous country and largest economy, exemplifies this dilemma, as persistent electricity deficits coexist with abundant renewable energy resources, including solar, wind, biomass, and small hydropower (Oyedepo, 2014; Ibrahim et al., 2025). Consequently, the renewable energy transition has emerged as a strategic pathway for addressing Nigeria's energy poverty while promoting sustainable economic development.

Despite Nigeria's vast renewable energy potential, the pace of transition remains slow, constrained by structural, institutional, and socio-cultural factors (Sadiq et al., 2025). Public perception plays a critical role in shaping energy transitions, as societal acceptance influences policy effectiveness, technology adoption, and long-term sustainability (Sovacool, 2014). In Nigeria, perceptions of renewable energy are shaped by issues of affordability, reliability, awareness, and trust in government-led initiatives (Akinwale, Jesuleye, & Siyanbola, 2018; Al-

Amin et al., 2025). Understanding how households and communities perceive renewable energy is therefore essential for designing transition strategies that align with local needs and expectations.

Community engagement is increasingly recognised as a determinant of successful renewable energy deployment, particularly in developing contexts (Hafizu et al., 2025). Participatory approaches enhance social acceptance, foster local ownership, and reduce resistance to new energy infrastructures (Walker & Devine-Wright, 2008). In Nigeria, limited community involvement in energy planning has often led to project abandonment and public scepticism (Edomah, Foulds, & Jones, 2017). Strengthening community engagement mechanisms can bridge the gap between national renewable energy policies and grassroots realities, ensuring that energy transitions are socially inclusive and locally grounded.

The renewable energy transition also holds significant implications for sustainable economic development in Nigeria. Beyond environmental benefits, renewable energy can stimulate job creation, support rural development, and enhance industrial productivity through improved access to energy (IRENA, 2022). Decentralised renewable energy systems, such as mini-grids and solar home systems, are particularly relevant for underserved rural communities, where they can catalyse local entrepreneurship and reduce regional development disparities (Bhattacharyya, 2015; Ologbonori et al., 2025). However, realising these benefits requires coherent strategies that integrate economic planning with energy and social policies.

Against this backdrop, this study examines renewable energy transition in Nigeria through the lenses of public perception, community engagement, and strategic pathways for sustainable economic development. By situating social acceptance and participatory governance at the centre of energy transition discourse, the study contributes to a more holistic understanding of how renewable energy can drive inclusive and sustainable growth. Such insights are critical for policymakers, practitioners, and development stakeholders seeking to accelerate Nigeria's transition toward a resilient and low-carbon energy future.

Literature Review and Theoretical Framework

Conceptual Review

Renewable Energy

Renewable energy refers to energy derived from naturally replenishing sources such as solar, wind, hydropower, biomass, and geothermal resources, which are considered environmentally sustainable due to their low greenhouse gas emissions and minimal ecological footprint compared to fossil fuels. The adoption of renewable energy is central to global efforts to mitigate climate change, enhance energy security, and diversify energy supply systems (International Energy Agency [IEA], 2023). In developing countries such as Nigeria, renewable energy is particularly significant because it can help address chronic electricity shortages through decentralised systems, including solar mini-grids and standalone technologies, while supporting inclusive growth and reducing reliance on imported fuels (Oyedepo, 2014; Dickson et al., 2025).

Public Perception

Public perception encompasses the beliefs, attitudes, awareness, and levels of acceptance of individuals or groups toward specific technologies or policies (Muye et al., 2025). In the context of renewable energy, public perception strongly influences technology adoption, investment outcomes, and the success of policy implementation (Sovacool, 2014). Positive perceptions are often associated with environmental benefits, energy reliability, and long-term cost savings, whereas negative perceptions may arise from concerns about affordability, technical reliability, or inadequate information (Akinwale et al., 2018). In Nigeria, limited public awareness and mistrust of energy institutions have been identified as significant barriers to widespread acceptance of renewable energy, underscoring the importance of targeted sensitisation and education initiatives.

Community Engagement

Community engagement refers to the active involvement of local stakeholders in the planning, decision-making, implementation, and management of development initiatives that affect their livelihoods (Suleiman et al., 2025). Within renewable energy projects, effective community engagement enhances social acceptance, promotes local ownership, and improves project sustainability by aligning interventions with community priorities (Walker & Devine-Wright, 2008). In many Nigerian contexts, weak stakeholder participation has contributed to resistance and project failure, particularly in rural electrification schemes (Edomah et al., 2017; Inyang et al., 2025). Therefore, participatory governance and inclusive engagement frameworks are critical for fostering trust and ensuring the long-term success of renewable energy initiatives.

Sustainable Economic Development

Sustainable economic development refers to a development trajectory that meets present economic needs without compromising the ability of future generations to meet their own needs, integrating economic growth, social equity, and environmental protection (Mansur et al., 2025). Renewable energy is a key enabler of sustainable economic development, as it supports job creation, industrial

productivity, and poverty reduction while minimising environmental degradation (International Renewable Energy Agency [IRENA], 2022). In developing economies such as Nigeria, expanding access to affordable and reliable renewable energy can stimulate rural development, enhance small and medium-scale enterprises, and reduce regional inequalities, thereby contributing to long-term economic resilience (Bhattacharyya, 2015).

Theoretical Review

Diffusion of Innovations Theory

The Diffusion of Innovations Theory, developed by Rogers (2003), is highly relevant to the study of renewable energy transition in Nigeria because it explains how new ideas and technologies are communicated, adopted, or rejected within a social system over time. The theory posits that adoption decisions are influenced by perceived attributes of an innovation—relative advantage, compatibility, complexity, trialability, and observability—as well as by communication channels, social networks, and opinion leaders. In the context of renewable energy, public perception directly shapes how these attributes are evaluated, while community engagement functions as a critical communication mechanism that facilitates awareness, trust, and social learning (Sovacool & Griffiths, 2020). In Nigeria, where renewable energy technologies are often perceived as costly or unreliable, the diffusion process can be hindered by low awareness and weak institutional trust. Applying this theory enables the study to systematically analyse how community participation, information dissemination, and socio-cultural dynamics influence the acceptance and uptake of renewable energy technologies, thereby linking social processes to sustainable economic development outcomes.

Empirical Review

Ojo et al. (2021) adopted a mixed-methods design that integrated survey data with case study evidence to examine the influence of technological innovation on renewable energy uptake in Nigeria. Their findings demonstrate that improvements in solar technologies, notably increased efficiency and declining installation costs, have played a substantial role in accelerating the adoption of solar energy across the country. The study further underscores the relevance of off-grid and decentralised energy systems in addressing electricity deficits in hard-to-reach and rural communities. Overall, the authors conclude that sustained investment in research and development is essential to advancing technological solutions that enhance the feasibility and scalability of renewable energy in Nigeria.

Empirical evidence from Oyedepo (2012) and Adeshina (2024) highlights the substantial economic gains from renewable energy deployment in Nigeria. Oyedepo's qualitative assessment projects that the large-scale adoption of renewable energy could generate more than 1 million jobs by 2030, with pronounced benefits for rural areas with high unemployment. Complementing this, Adeshina's quantitative analysis reveals that renewable energy initiatives can lower energy expenditures by up to 30%, thereby supporting local economic growth. Together, these studies suggest that renewable energy contributes to economic development through multiple channels, including employment generation, reduced production costs, and local economic stimulation. Given Nigeria's unemployment challenge, these benefits reinforce the importance of policy interventions that prioritise renewable energy as a catalyst for inclusive economic growth.

Research by Nnaji et al. (2010) and GIZ (2023) identifies a range of interrelated barriers constraining renewable energy adoption in Nigeria. Nnaji et al. emphasise structural challenges, including weak infrastructure, regulatory inefficiencies, and limited access to finance, all of which undermine investor confidence. Expanding on this, GIZ highlights socio-cultural constraints, including low public awareness and scepticism toward renewable energy technologies. These barriers collectively create an unfavourable environment for renewable energy development, suggesting that piecemeal solutions are insufficient. Addressing these challenges requires an integrated approach that involves regulatory reforms, infrastructure investment, and sustained public sensitisation through multi-stakeholder collaboration.

Insights from IRENA (2020) and the World Bank (2021) focus on the critical role of financing mechanisms in advancing renewable energy projects in Nigeria. IRENA emphasises innovative financial instruments, such as green bonds and blended finance, as well as public–private partnerships (PPPs), as practical means of mobilising capital for renewable energy investments. Similarly, the World Bank documents the effectiveness of PPP arrangements in enhancing the financial viability and risk-sharing capacity of renewable energy projects. These findings suggest that improving access to tailored financing solutions is central to overcoming investment barriers and that policymakers must create enabling regulatory and institutional frameworks to attract both domestic and international capital.

The importance of policy coherence is emphasised in studies by the Energy Commission of Nigeria (2005) and Adeshina (2024), which examine the role of governance frameworks in renewable energy development. The Energy Commission's assessment of the Renewable Energy Master Plan (REMP) indicates that although the plan provides strategic direction, its impact has been limited by weak

implementation and institutional bottlenecks. Adeshina further argues that inconsistent and unclear policies deter private sector participation. These studies collectively suggest that stable, transparent, and long-term policy frameworks are essential for building investor confidence and ensuring effective project execution, highlighting the need to address bureaucratic inefficiencies within Nigeria's energy governance system.

Empirical evidence from Chineke and Igwiro (2008) and GIZ (2023) underscores the significance of community engagement in the successful implementation of renewable energy projects. Chineke and Igwiro demonstrate that involving local communities during project planning and execution enhances acceptance and satisfaction with project outcomes. Similarly, GIZ reports that renewable energy interventions have generated positive social outcomes, including improved living standards in rural areas. These findings indicate that participatory approaches foster trust, local ownership, and social sustainability, suggesting that policymakers and developers should prioritise community involvement and awareness-building to maximise the long-term benefits of renewable energy initiatives.

Finally, studies by Ojo et al. (2021) and IRENA (2020) reiterate the centrality of technological innovation in accelerating renewable energy adoption in Nigeria. While Ojo et al. highlight the impact of advances in solar technologies on adoption rates, IRENA draws attention to emerging innovations such as energy storage systems and smart grids that enhance reliability and system efficiency. Collectively, these studies suggest that technological progress, when combined with supportive policies and financing, can significantly improve renewable energy performance and penetration in Nigeria.

Research Gap

Despite the growing body of empirical literature on renewable energy in Nigeria, a clear research gap remains regarding the integrated analysis of social, community, and economic dimensions of the energy transition. Existing studies have primarily examined technological innovation (Ojo et al., 2021), economic impacts such as job creation and cost reduction (Oyedepo, 2012; Adeshina, 2024), financing mechanisms (IRENA, 2020; World Bank, 2021), policy frameworks (Energy Commission of Nigeria, 2005; Adeshina, 2024), and barriers to adoption (Nnaji et al., 2010; GIZ, 2023) in isolation. While these studies provide valuable sector-specific insights, there is limited empirical evidence that simultaneously links public perception and community engagement with renewable energy adoption outcomes and sustainable economic development, particularly at the sub-national and community levels. Moreover, few studies adopt a holistic, stakeholder-centred approach that captures how socio-cultural factors interact with policy, technology, and financing to shape renewable energy transitions over time. This gap underscores the need for comprehensive research that integrates public perception, community participation, and strategic policy analysis to understand better how renewable energy can drive inclusive and sustainable economic development in Nigeria.

Methodology

Research Design

This study adopts a mixed-methods research design, integrating quantitative and qualitative approaches to provide a comprehensive examination of renewable energy transition in Nigeria, with particular emphasis on public perception, community engagement, and pathways to sustainable economic development. The mixed-methods design is appropriate for capturing both measurable outcomes and in-depth contextual insights, thereby enabling a robust assessment of how renewable energy adoption influences economic development while being shaped by social and institutional factors.

The quantitative component involves collecting numerical data through structured surveys and analysing relevant secondary data. This component is designed to evaluate the economic implications of renewable energy adoption, including employment generation, energy cost savings, and investment patterns. In contrast, the qualitative component relies on semi-structured interviews and focus group discussions with key stakeholders—such as policymakers, renewable energy practitioners, community leaders, and project developers—to explore issues related to public perception, community participation, adoption barriers, and the effectiveness of existing policy frameworks. Together, these methods ensure methodological triangulation and enhance the validity of the findings.

Population of the Study

The target population comprises stakeholders directly involved in or affected by renewable energy development in Nigeria. These include government officials and policymakers from ministries, departments, and agencies responsible for energy planning and regulation; industry experts such as project developers, engineers, and consultants within the renewable energy sector; community leaders representing areas hosting or impacted by renewable energy projects; and representatives of financial institutions that provide funding and financial services for renewable energy investments. This diverse population allows the study to capture multiple perspectives across the renewable energy value chain.

Sampling Techniques and Sample Size

Stratified random sampling is employed for the quantitative survey to ensure adequate representation of key stakeholder

groups, including policymakers, industry experts, community representatives, and financial actors. The population is first categorised into strata based on stakeholder roles, after which respondents are randomly selected within each stratum. For the qualitative component, purposive sampling is used to identify key informants with relevant expertise, experience, and direct involvement in renewable energy initiatives.

A total of approximately 300 respondents are targeted for the quantitative survey, a sample size considered sufficient to achieve statistical reliability and generalizability. These respondents are proportionately distributed across the identified strata. For the qualitative analysis, between 20 and 30 key informants are selected for in-depth interviews, complemented by two to three focus group discussions involving community members. Each focus group comprises 6–10 participants to facilitate meaningful interaction and detailed discussion.

Study Area

The study is conducted in Nigeria, with Niger State selected as a case study due to its substantial renewable energy potential and increasing deployment of renewable energy projects. Niger State benefits from high solar irradiance levels and has witnessed growing adoption of off-grid solutions such as solar home systems and mini-grids, particularly in underserved rural communities. Both urban and rural locations within the state are included to capture spatial variations in energy access and adoption patterns.

As one of Nigeria's largest and most populous states, Niger State faces persistent energy challenges, including frequent power outages, heavy reliance on fossil fuels, and limited rural electrification. Renewable energy is increasingly viewed as a strategic solution to these challenges, with implications for economic growth, energy security, and social development. Cultural norms, local beliefs, and community dynamics are recognised as influential factors in technology acceptance, making the state an appropriate context for examining public perception and community engagement in renewable energy transition.

Model Specification

To address the study objectives, two econometric models are specified to analyse the economic impacts of renewable energy adoption and the factors influencing adoption decisions.

The first model assesses the economic effects of renewable energy adoption using a multiple linear regression framework. This model evaluates the relationship between renewable energy deployment and key economic indicators, such as job creation and energy cost savings:

$$Y_i = \beta_0 + \beta_1 RE_i + \beta_2 X_i + \varepsilon_i$$

Where (Y_i) represents economic outcome indicators for region (i); (RE_i) denotes the level of renewable energy adoption (e.g., installed capacity or number of projects); (X_i) is a vector of control variables including GDP per capita, population, education level, and infrastructure quality; (\beta_0) is the intercept; (\beta_i) are parameters to be estimated; and (\varepsilon_t) is the error term.

The second model examines the determinants of renewable energy adoption using a logistic regression approach, appropriate for binary outcomes indicating whether a community has adopted renewable energy technologies:

$$\text{Logit}(Pi) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_k X_k + \varepsilon_t$$

Where (Pi) denotes the probability of renewable energy adoption in community i; X_1, X_2,,X_k represent explanatory variables such as awareness level, income, access to finance, and policy support; and (\beta_i) are coefficients to be estimated.

3.6 Estimation Techniques

The multiple linear regression model is estimated using Ordinary Least Squares (OLS), subject to the standard assumptions of linearity, independence, homoscedasticity, and normality of residuals. The logistic regression model is estimated using maximum likelihood estimation (MLE), which is suitable for models with dichotomous dependent variables and provides efficient parameter estimates.

Diagnostic Tests

To ensure the robustness and reliability of the estimated models, several diagnostic tests are conducted. For the OLS model, multicollinearity is examined using the Variance Inflation Factor (VIF), heteroscedasticity is tested using the Breusch–Pagan or White test, and residual normality is assessed through the Shapiro–Wilk test and Q–Q plots. For the logistic regression model, the Hosmer–Lemeshow test is used to evaluate goodness of fit, while the link test is applied to detect potential specification errors.

Variable Description, Measurement, and Data Sources

The study variables are grouped into dependent, independent, and control variables. Economic impact indicators include job creation, measured by the number of jobs generated by renewable energy projects, and energy cost savings, measured as the average reduction in energy expenditure among households and firms using renewable energy systems. Renewable energy adoption is captured as a binary variable indicating whether a community has renewable energy technologies.

Key independent variables include the level of renewable energy adoption, awareness of renewable energy technologies, household income, access to financing, and perceived policy support. Control variables comprise GDP

per capita, population size, education level, and infrastructure quality. Data are sourced from household and community surveys, government reports from the National Bureau of Statistics and the Energy Commission of Nigeria, project implementation records, financial institution surveys, and relevant international databases. This combination of primary and secondary data enhances the study's reliability and analytical depth.

Data Presentation and Analysis of Results

Introduction

This section presents and analyses the empirical results of the study on renewable energy transition in Nigeria, with specific attention to public perception, community engagement, and strategies for achieving sustainable economic development. The analysis is based on quantitative data obtained from 300 survey respondents and is complemented by econometric estimations. Emphasis is placed on understanding the socioeconomic profile of respondents, perceptions of renewable energy adoption, and the economic and institutional factors that influence adoption and sustainability outcomes.

Data Presentation and Method of Analysis

Primary data for the study were obtained through structured questionnaires, supplemented by interviews and relevant secondary sources. Descriptive statistics were used to summarise respondents' socioeconomic characteristics and perceptions of renewable energy. Inferential analysis was conducted using Ordinary Least Squares (OLS) and Logistic Regression to examine the economic impacts of renewable energy adoption and identify key determinants of adoption decisions. Qualitative insights were used to enrich and contextualise the quantitative results.

Socioeconomic Characteristics of Respondents

Table 4.1: Descriptive Statistics of Respondents' Socioeconomic Characteristics

Variable	Category	Frequency (n)	Percentage (%)
Age	18–24	45	15.0
	25–34	135	45.0
	35–44	75	25.0
	45–54	30	10.0
	55 and above	15	5.0
Gender	Male	180	60.0
	Female	120	40.0
Educational Level	No formal education	15	5.0
	Primary education	30	10.0
	Secondary education	75	25.0
	Tertiary education	180	60.0
Occupation	Student	30	10.0
	Public sector	90	30.0
	Private sector	120	40.0
	Self-employed	30	10.0
	Unemployed	30	10.0
Location	Urban	210	70.0
	Suburban	60	20.0
	Rural	30	10.0
Monthly Income	< ₦30,000	60	20.0
	₦30,000–₦60,000	90	30.0
	₦61,000–₦100,000	75	25.0
	₦101,000–₦150,000	45	15.0
	> ₦150,000	30	10.0

Source: Field Survey (2025)

Table 4.1 indicates that the respondent pool is mainly youthful and economically active, with nearly half of the respondents (45%) within the 25–34 age bracket. A high proportion of respondents (60%) possess tertiary education, suggesting a

relatively informed population capable of understanding renewable energy technologies. Nevertheless, income distribution shows that about 50% of respondents earn ₦60,000 or less per month, highlighting affordability challenges that may limit investment in renewable energy systems. The dominance of urban respondents (70%) also suggests uneven access to and awareness of financial services between urban and rural communities, underscoring the need for inclusive financing and outreach strategies.

Survey Responses on Renewable Energy Adoption

Table 4.2: Respondents' Perceptions on Renewable Energy Adoption

Research Focus	Response Category	Frequency (n)	Percentage (%)
Economic Benefits	Job creation	195	65.0
	Cost savings	210	70.0
	Energy security	180	60.0
	Local economic development	150	50.0
Financing Mechanisms	Access to loans	120	40.0
	Government grants	90	30.0
	Community funding	60	20.0
	No access to finance	30	10.0
Public Awareness	High	90	30.0
	Moderate	120	40.0
	Low	90	30.0
Growth Strategies	Government incentives	210	70.0
	Awareness campaigns	180	60.0
	Community engagement	150	50.0
	Improved financing	120	40.0

Source: Field Survey (2025)

Table 4.2 shows that respondents strongly acknowledge the economic advantages of renewable energy, particularly cost savings (70%) and employment generation (65%). However, access to financing remains a significant constraint, as only 40% reported access to loans, while 10% indicated having no financing options. Public awareness levels are predominantly moderate, suggesting insufficient sensitisation efforts. Respondents identified government incentives, enhanced awareness campaigns, and stronger community engagement as key strategies for accelerating renewable energy adoption, reinforcing the importance of policy and financial support mechanisms (International Renewable Energy Agency, 2020).

Econometric Analysis

Ordinary Least Squares (OLS) Results

Table 4.3: OLS Regression Results on Economic Impact of Renewable Energy

Variable	Coefficient	Std. Error	t-value	p-value
Intercept	2.50	0.45	5.56	0.000
Renewable Energy Adoption	0.75	0.10	7.56	0.000
GDP per Capita	0.30	0.05	6.00	0.000
Population	-0.02	0.01	-2.00	0.045
Education Level	0.40	0.08	5.00	0.000
Infrastructure Quality	0.25	0.07	3.57	0.001

R^2 = 0.65 | F-statistic = 32.50 (p < 0.01)

Source: Author's Computation (2025)

Table 4.3 demonstrates that renewable energy adoption exerts a positive and statistically significant influence on economic outcomes. Specifically, a unit increase in renewable energy adoption is associated with a 0.75-unit improvement in economic performance indicators, confirming its contribution to job creation, reduced energy costs, and local economic development. Education level and infrastructure quality also significantly enhance economic outcomes, while population growth slightly diminishes per capita benefits. The relatively high R^2 value indicates strong explanatory power of the model.

4.5.2 Logistic Regression Results

Table 4.4: Logistic Regression Results on Determinants of Renewable Energy Adoption

Variable	Coefficient	Std. Error	z-value	p-value
Intercept	-1.20	0.35	-3.43	0.001
Awareness level	0.85	0.20	4.25	0.000
Income level	0.50	0.15	3.33	0.001
Access to financing	1.10	0.25	4.40	0.000
Policy support	0.75	0.18	4.17	0.000

Pseudo R^2 = 0.45 | LR χ^2 = 50.00 (p < 0.01)

Source: Author's Computation (2025)

Table 4.4 reveals that awareness, income, access to financing, and policy support significantly increase the likelihood of renewable energy adoption. Among these variables, access to financing exhibits the most potent effect, emphasising financial constraints as a critical barrier. The results highlight the importance of improving financial inclusion and strengthening policy frameworks to accelerate the uptake of renewable energy.

Diagnostic Tests

Table 4.5: Summary of Diagnostic Test Results

Test	Model	Result	Conclusion
VIF	OLS	< 5	No multicollinearity
Breusch–Pagan	OLS	p = 0.175	Homoscedastic
Shapiro–Wilk	OLS	p = 0.065	Normal residuals
Hosmer–Lemeshow	Logit	p = 0.397	Good model fit
Link Test	Logit	p = 0.210	Correct specification

Source: Author's Computation (2025)

Table 4.5 confirms that both the OLS and logistic regression models satisfy key econometric assumptions, indicating that the estimated results are reliable and robust.

Discussion of Findings

The findings reveal a strong and statistically significant relationship between renewable energy adoption and sustainable economic development outcomes in Nigeria. The econometric results indicate that renewable energy contributes meaningfully to employment generation, energy cost reductions, and local economic development, particularly when supported by favourable educational attainment and infrastructure quality. These outcomes suggest that the renewable energy transition can serve as a viable pathway for inclusive economic growth.

In addition, the results underscore the critical role of policy frameworks and institutional support in driving renewable energy adoption. Respondents emphasised that clear, consistent, and supportive policies reduce investment risk and encourage private-sector participation. This aligns with the existing literature, which identifies policy coherence as a prerequisite for transitioning to cleaner, more resilient energy systems.

Finally, the analysis highlights financing as a central determinant linking policy intentions to actual development outcomes. Access to diverse financing mechanisms—such as loans, grants, and innovative financial instruments—was

found to influence adoption decisions significantly. Overall, the study demonstrates that sustainable economic development through renewable energy is driven by the interplay among economic conditions, financial systems, public awareness, community engagement, and supportive policy environments, rather than by any single factor in isolation.

Conclusion and Recommendation

This study investigated Nigeria's renewable energy transition, focusing on public perception, community engagement, and strategic pathways to achieve sustainable economic development. The empirical findings demonstrate that renewable energy adoption has a significant and positive impact on economic outcomes, including job creation, reductions in energy costs, and local economic development. The results further reveal that awareness levels, income, access to financing, and policy support are critical determinants of renewable energy uptake. Despite Nigeria's vast renewable energy potential, adoption remains constrained by affordability challenges, limited financing options, uneven public awareness, and gaps in policy implementation. Overall, the study confirms that renewable energy can serve as a viable catalyst for sustainable economic development in Nigeria when supported by coherent policies, inclusive financing mechanisms, and active community participation.

Based on these findings, the study recommends that policymakers prioritise the formulation and consistent implementation of long-term, supportive renewable energy policies that provide clear incentives and reduce investment risks. Strengthening access to affordable financing—through public–private partnerships, green financing instruments, and targeted subsidies—should be central to accelerating adoption, particularly in low-income and rural communities. In addition, sustained public awareness campaigns and community engagement initiatives are essential for improving social acceptance and local ownership of renewable energy projects. Investments in education, technical capacity building, and supporting infrastructure will further enhance the economic benefits of renewable energy. Collectively, these measures can create an enabling environment that supports Nigeria's transition to a resilient, inclusive, and sustainable energy-driven economy.

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