African Journal of Applied Research
Vol. 12, No. 2 (2026), pp.118-136
http://www.ajaronline.com
https://doi.org/10.26437/ajar.v12
Received February 8, 2025
Peer reviewed: June 18, 2025
Revised: February 22, 2026
Published: March 2026

INVESTIGATING ENERGY USE AND SUSTAINABILITY AWARENESS IN INDIGENOUS COMMUNITIES OF SOUTH-WEST AND SOUTH-SOUTH NIGERIA

Obanor, E. I.[1], Dirisu, J. O.[2,5], Kilanko, O. O.[3], and Oyedepo, S. O.[4]
[1,2,3] Department of Mechanical Engineering, Covenant University, Ota, Ogun State, Nigeria.
[4]Department of Mechanical/Biomedical Engineering, Bells University of Technology, Ota, Ogun State, Nigeria.
[5]Department of Mechanical and Mechatronic Engineering, Central University of Technology, Free State, South Africa.
[1]enoch.obanorpgs@stu.cu.edu.ng
[2]joseph.dirisu@covenantuniversity.edu.ng

ABSTRACT

Purpose: To evaluate energy practices and sustainability awareness across the chosen states in the South-West and South-South regions of Nigeria.

Design/Methodology/Approach: A quantitative research design was used. The questionnaire was given to the residents of four states (Ogun, Lagos, Edo, and Delta). A stratified sampling method was employed to ensure that selected communities were sampled, with a target population of 400 and 387 respondents. The data were examined using descriptive statistics, including mean scores, frequency distributions, and standard deviations, calculated with SPSS.

Research Limitation: The research is confined to four states in Nigeria, which may limit the generalisability of the findings to other regions.

Findings: Renewable energy has significant potential to alleviate energy poverty and address environmental issues, especially in communities dissatisfied with existing fossil-fuel-based energy services. The study focuses on such policy interventions, targeted investments in renewable energy infrastructure, and public awareness campaigns.

Practical Implication: The practical implications span from household electricity bills to national energy security, requiring investment and behavioural shifts to fully realise its potential.

Social Implications: Renewable energy use and sustainability education can be promoted by ensuring better access to reliable energy, environmental responsibility, and long-term socio-economic development in Nigeria through minimising inequality.

Originality and Value: The study offers a comparative, multi-regional perspective and introduces the integration of SDG-based education as a strategic pathway for enhancing sustainable energy adoption, thereby bridging the gap between policy frameworks and grassroots implementation.

Keywords: *Awareness. climate action. renewable energy. sustainability. transition*

ISSN: 2408-7920
Papers were presented at the 3rd International Conference on Sustainable Infrastructural Development, held at Covenant University, Ota, Ogun State, Nigeria, September 2-4, 2024.

African Journal of Applied Research
Vol. 12, No. 2 (2026), pp.118-136
http://www.ajaronline.com
https://doi.org/10.26437/ajar.v12
Received February 8, 2025
Peer reviewed: June 18, 2025
Revised: February 22, 2026
Published: March 2026

INTRODUCTION

Access to renewable energy is key to catalysing social growth and rescuing our environment (Lukashevych et al., 2024). In Nigeria, electricity coverage is not yet widespread, and this is the aspect that impedes economic development and limits access to education and overall well-being, especially in rural areas where coverage is minimal (Cantarero, 2020; Adewuyi et al., 2020). The country's excessive reliance on traditional fossil fuels contributes to environmental degradation and poses long-term sustainability risks. That is why, now more than ever, the need to explore and use alternative energy sources such as solar, wind, hydro, biomass, and geothermal is essential (Obanor et al., 2025; Dirisu et al., 2024). Renewable options are more sustainable and cleaner, aligning with the world's efforts to address climate change and achieve the Sustainable Development Goals (SDGs) (Enoch et al., 2025; Ajayi et al., 2022).

The Lagos contingency valuation study conducted by Nduka (2023) found that households are willing to pay (WTP) to discontinue using diesel generators and switch to solar PV. It implies that the value many households attach to high-quality, low-emission electricity is significant and that they are willing to pay a premium, particularly when they can finance the upfront costs. This implies that affordability and design of financing are core to uptake (Nduka, 2023). The study by Christian and Effiong (2023) assessed community-based renewable projects in Nigeria and found that they produced positive socio-economic outcomes when they involved local participation, shared benefits, and capacity building. Nevertheless, their results also indicate that many are pilot-scale projects with sustainability issues when local ownership and maintenance plans are weak.

Although WTP has been reported, there is a lack of systematic research that simultaneously considers sustainability awareness (knowledge of SDG7/13 and renewable energy options). This is the gap that the present study fills. The research will seek to understand energy use habits, sustainability consciousness, and the challenges encountered by indigenous people residing in South-West and South-South Nigeria. In particular, the research objectives are to: assess the existing situation regarding energy access and utilisation in these areas; evaluate the views and attitudes of community members towards renewable energy and sustainability; determine the impediments towards the implementation of sustainable energy practices; and find the extent of sustainability awareness in these communities and how this affects their decisions that relate to energy.

This research is driven by the need to address energy poverty, environmental issues, and the lack of sustainability awareness in Nigeria. The study will provide new knowledge and information useful for policy interventions by focusing on SDGs 7 (Affordable and Clean Energy) and 13 (Climate Action) and facilitating the use of renewable energy technologies (Dirisu et al., 2024).

ISSN: 2408-7920
Papers were presented at the 3rd International Conference on Sustainable Infrastructural Development, held at Covenant University, Ota, Ogun State, Nigeria, September 2-4, 2024.

African Journal of Applied Research
Vol. 12, No. 2 (2026), pp.118-136
http://www.ajaronline.com
https://doi.org/10.26437/ajar.v12
Received February 8, 2025
Peer reviewed: June 18, 2025
Revised: February 22, 2026
Published: March 2026

Moreover, it is essential to raise sustainability awareness in local communities to foster a culture of environmental responsibility and enable informed energy-use choices. The work is used to emphasise the gaps in energy accessibility and sustainability consciousness, and to identify potential ways to improve, thereby contributing to the elaboration of specific policies and interventions (Obanor et al., 2024). By exploring the community's views and challenges, the research will be of great help to stakeholders in developing meaningful interventions that enhance sustainable energy use, sensitise people to the importance of sustainability, and improve the living standards of inhabitants in these states.

The research points to possible shortcomings, including weaknesses in the community questionnaire responses and in the overall extrapolation of results to other regions or situations within Nigeria.

The work delivered contributions, including a thorough examination of existing energy consumption and satisfaction among indigenous populations, as well as an understanding of local perceptions and issues. The remaining part of the paper is organised as follows: the research method, comprising data collection and analysis, is presented. This paper outlines important insights and implications. Lastly, the policy and future research recommendations are stated.

LITERATURE REVIEW

The research is based on proven laws of energy behaviour and innovation diffusion. For example, the Theory of Planned Behaviour (TPB) holds that attitudes, social norms, and perceived control are the causes of intentions (and, consequently, actions). Positive beliefs in renewable energy and self-belief in the potential to adopt (e.g., financially) would predict energy uptake (Pokubo et al., 2024).

In a similar manner, there are described models of the Energy Ladder vs. Stacking, implying a shift of households to fuels: rather than a smooth transition between traditional and modern sources, many low-income families use a combination of multiple sources (energy stacking) (Pokubo et al., 2024; GIZ, 2015). This piling is what our Nigerian respondents actually use (Constant use of generators and biomass with grid power), which aligns with Pokubo et al. (2024), who found that both rural and urban homes in Nigeria co-use traditional fuels and generators, with only partial replacement by LPG or solar.

The Diffusion of Innovations theory posits that the diffusion of a new technology depends on perceptions of its advantages and the technology's visibility in the community. Empirical

ISSN: 2408-7920
Papers were presented at the 3rd International Conference on Sustainable Infrastructural Development, held at Covenant University, Ota, Ogun State, Nigeria, September 2-4, 2024.

African Journal of Applied Research
Vol. 12, No. 2 (2026), pp.118-136
http://www.ajaronline.com
https://doi.org/10.26437/ajar.v12
Received February 8, 2025
Peer reviewed: June 18, 2025
Revised: February 22, 2026
Published: March 2026

studies indicate that households in developing nations embrace solar PV mostly when they observe social evidence and know how to finance it (Nduka, 2023; Christian & Effiong, 2023). Nduka (2023) confirmed in Lagos that solar PV is highly valued in households because Nigerians prefer reliable, low-emission power and are willing to pay more for it, provided it can fully replace noisy diesel generators. This conclusion means that the attitude is positive when the technology is evidently fulfilling needs; however, adoption is achieved by lowering the cost of entry (e.g., monthly payment plans).

In context, Nigeria's energy policy environment highlights the significance of renewables but indicates limited implementation. It has been analysed that Nigeria is endowed with solar, hydro, and biomass energy, but yields less than 4500MW to serve over 200 million citizens (Adeshina et al., 2024). The recent Energy Transition Plan and the Renewable Energy Master Plan aim to scale solar; however, reports highlight systemic obstacles: poor funding, deteriorating infrastructure, reliance on imports, and weak policy enforcement (Dinneya-Onuoha, 2025; Obanor, 2025).

Adeshina et al. (2024) clearly call for legal and regulatory reform, off-grid integration, and public-private partnerships to fulfil demand and climate objectives. Likewise, Obanor et al. (2025) demonstrate that in Nigeria, the academic focus has shifted towards decentralised systems and equity, but practical projects are constrained by financing issues and local implementation. Although there is policy rhetoric, SDGs and clean energy awareness at the grassroots are low (Ontoyin et al., 2025). Okposin (2020) cautions that although SDG7 is crucial, there is no legal or financial backing for renewable energy sources, and society is not always aware of international targets. This study bridges this gap by empirically linking SDG awareness to community attitudes, thereby informing targeted policy and educational interventions.

METHODOLOGY

Research Design

The present research adopted a quantitative cross-sectional study design to determine the pattern of energy use, awareness of sustainability, and behavioural orientation towards the use of clean energy among indigenous people in South-West and South-South Nigeria.

The quantitative design was suitable because it allowed systematic measurement of respondents' perceptions, attitudes, and experiences using standardised, structured measures. The cross-sectional method was appropriate because it could collect data at a single point in time on various states and subsequently compare differences across regions in terms of

ISSN: 2408-7920
Papers were presented at the 3rd International Conference on Sustainable Infrastructural Development, held at Covenant University, Ota, Ogun State, Nigeria, September 2-4, 2024.

African Journal of Applied Research
Vol. 12, No. 2 (2026), pp.118-136
http://www.ajaronline.com
https://doi.org/10.26437/ajar.v12
Received February 8, 2025
Peer reviewed: June 18, 2025
Revised: February 22, 2026
Published: March 2026

awareness rates, perceptions of energy and its problems, attitudes toward renewable energy, and perceptions of government action.

The main data collection instrument was a structured questionnaire. The scale was a set of Likert-scale questions that addressed the main constructs of understanding sustainable energy, awareness of SDGs 7 and 13, adequacy of the energy sources in the household, perceived obstacles, approval of government action, readiness to enrol in community-based projects, and intentions to change the current energy sources to renewable sources. The Likert responses were numerically coded (1 = Very Low/Very Negative to 5 = Very High/Very Positive) to allow statistical analysis.

Population and Sampling Technique

People living in the indigenous communities of the chosen states in the South-West and South-South regions of Nigeria formed the target population for this study. Such communities have been selected because they are representative of different socio-economic environments, varying access to grid electricity, and varying exposure to sustainability-related programmes. In particular, this research focused on communities in Ogun, Lagos, Edo, and Delta States, as they represent both urban-peri-urban agglomerations and indigenous rural communities.

A stratified sampling method was used to ensure equal representation across both geopolitical regions. The states were initially divided into two categories, namely South-West and South-South, and communities within each state were purposively sampled based on accessibility, size, population, and known difficulties with energy access. In every community, systematic random sampling was used to select households and individuals, and all nth available and willing resident adults were approached to join the research.

The research aimed at 400 respondents, consistent with social surveys of heterogeneous populations. Among the distributed questionnaires, 387 valid responses were retrieved, which corresponds to a 96.7 percent response rate, which is acceptable in the field-based energy and development research.

To provide further comparative information, the dataset included more distinct samples from specific local clusters, including 50 and 64 respondent subgroups, which provided contextual insight into differences in awareness, behavioural tendencies, and conditions of energy access across locations. These subsets were examined descriptively and incorporated into the reporting of regional variations.

ISSN: 2408-7920
Papers were presented at the 3rd International Conference on Sustainable Infrastructural Development, held at Covenant University, Ota, Ogun State, Nigeria, September 2-4, 2024.

African Journal of Applied Research
Vol. 12, No. 2 (2026), pp.118-136
http://www.ajaronline.com
https://doi.org/10.26437/ajar.v12
Received February 8, 2025
Peer reviewed: June 18, 2025
Revised: February 22, 2026
Published: March 2026

The sampling methodology ensured equal representation of respondents from the two regions, thereby increasing the generalisability of the study to other similar indigenous communities in South-West and South-South Nigeria.

Data Collection

Some local communities in the south-south and south-west regions of Nigeria were also sampled, with questionnaires administered to identify grassroots views and opinions on energy access, needs, challenges, and preferences. The questionnaires were issued in two states in the south-west region and two states in the south-south region, with a focus on some local communities in the states, as indicated in Table 1.

The selection of these sites was informed by their accessibility, their wide range of socio-economic profiles, and the differences in the degree of energy accessibility observed in these regions. Data collection was conducted in two ways: physical distribution of questionnaires in communities that were not too far and easily accessible, and electronic surveys in communities that were more distant. This approach ensured every target community could be involved, regardless of location. The questionnaires were aimed at achieving a target of 400 respondents, but only 387 respondents were valid.

Table 1: Distribution of questionnaires across local communities

Item	State	City	Towns
SOUTH-WEST	Ogun State	Ota	Benja
			The Bells
			Canaan Land
	Lagos State	Lagos	Aguda
			Awoyaya
SOUTH-SOUTH	Edo State	Benin City	Ugbor Village
			Adesuwa
	Delta State	Udu	Oku-Layout
			Usiefrun
			Mofor

ISSN: 2408-7920
Papers were presented at the 3rd International Conference on Sustainable Infrastructural Development, held at Covenant University, Ota, Ogun State, Nigeria, September 2-4, 2024.

African Journal of Applied Research
Vol. 12, No. 2 (2026), pp.118-136
http://www.ajaronline.com
https://doi.org/10.26437/ajar.v12
Received February 8, 2025
Peer reviewed: June 18, 2025
Revised: February 22, 2026
Published: March 2026

The selected locations were chosen to represent a wide range of energy access situations in these communities. The study adhered to ethical standards by ensuring informed consent from all participants, maintaining confidentiality, and complying with guidelines for conducting research involving human participants (Aithal & Aithal, 2020).

Data Analysis

The collected questionnaire data were distributed to identify insights into community perspectives on energy access, needs, challenges, and preferences in Nigeria. The data were then imported into SPSS by assigning numerical values to the categorical responses for ease of analysis. The following descriptive statistical measures were computed using SPSS.

i. Frequency distribution: this is the number of respondents for each category of the questions.

ii. Mean: this is the average score for each question, either Likert scale or numerical data (Abu-Bader, 2021). It is given as

$$\mu = \frac{1}{N}\sum_{i=1}^{N}(x_i - \mu)^2 \qquad (equation\ 1)$$

where $\mu =$ Mean
$N =$ number of respondents
$x_i =$ Score for the ith respondent

iii. Median: This is the middle score of the responses when arranged in ascending order (Abu-Bader, 2021). It is given as

$$M = x_{\left(\frac{N+1}{2}\right)} \qquad (equation\ 2)$$

iv. Standard deviation: Measures the dispersion or variability of responses around the mean (Abu-Bader, 2021). It is given as

$$\sigma = \sqrt{\frac{1}{N}\sum_{i=1}^{N}(x_i - \mu)^2} \qquad (equation\ 3)$$

Integration of Findings

Community questionnaires allowed the researchers to gain an indigenous perspective on the issues and opportunities of transitioning to sustainable, clean energy in Nigeria. The questionnaires will provide in-depth information on the use and perceptions of community energy, enabling a comparative analysis across regions. The approach provides an efficient insight into local energy challenges, which directly contributes to plans to enhance access to energy and encourage environmentally friendly energy sources.

ISSN: 2408-7920
Papers were presented at the 3rd International Conference on Sustainable Infrastructural Development, held at Covenant University, Ota, Ogun State, Nigeria, September 2-4, 2024.

African Journal of Applied Research
Vol. 12, No. 2 (2026), pp.118-136
http://www.ajaronline.com
https://doi.org/10.26437/ajar.v12
Received February 8, 2025
Peer reviewed: June 18, 2025
Revised: February 22, 2026
Published: March 2026

RESULTS AND DISCUSSION

This segment presents the outcomes of the study of data gathered using structured questionnaires in local communities in Nigeria. The questionnaire aimed to collect information on their awareness of sustainability objectives, other aspects of energy access and use patterns, their interest in clean energy alternatives, perceptions of energy-related issues, and perceptions of government roles. The interpretation of the responses to the questionnaires will provide insight into the community members' energy demands, priorities, and opinions, helping better understand the opportunities and challenges of switching to sustainable energy sources in the area.

Demographic Profile of Respondents

Before delving into the analysis of questionnaire responses, it is essential to provide an overview of the demographic profile of respondents from the local communities. This includes information such as age, gender, educational background, and occupation, which can provide context for interpreting the survey findings and identifying potential disparities or trends within the sample population as depicted in Figures 1, 2, 3 and 4. These demographics are comparable to those reported in the survey by Adeshina et al. (2024).

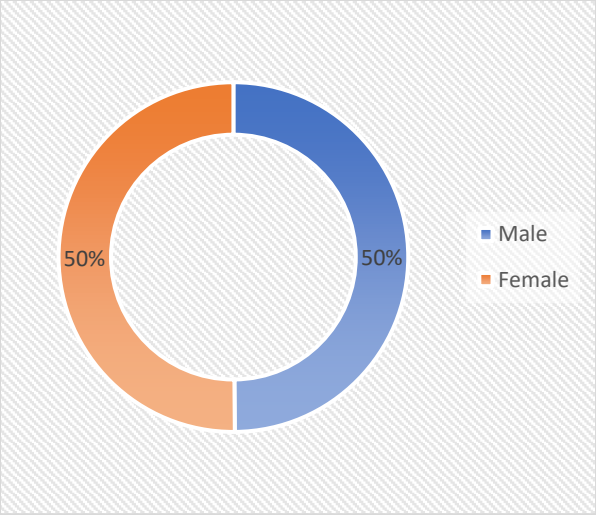


Figure 1: Age of respondents

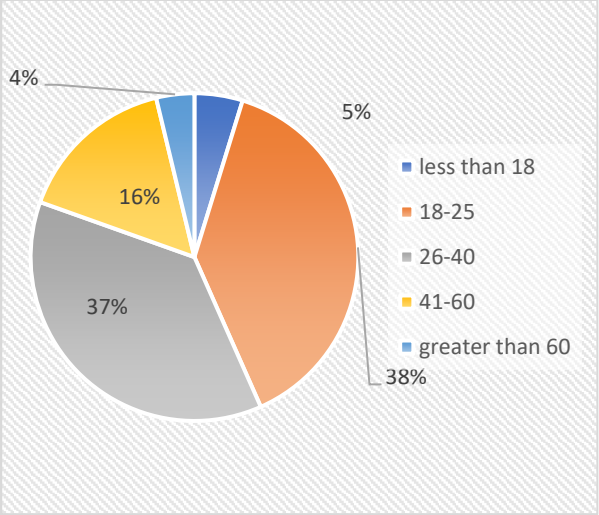
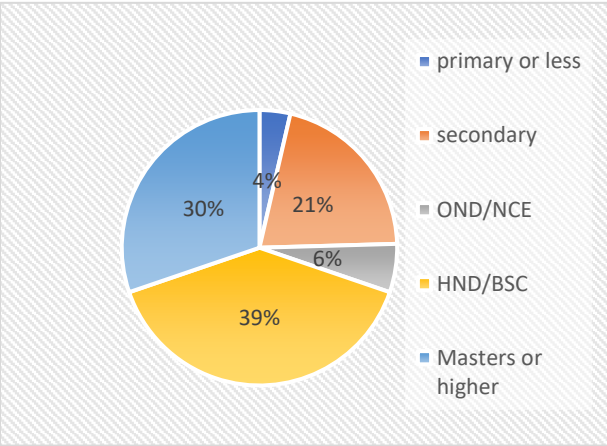


Figure 2: Age of respondents

ISSN: 2408-7920
Papers were presented at the 3rd International Conference on Sustainable Infrastructural Development, held at Covenant University, Ota, Ogun State, Nigeria, September 2-4, 2024.

African Journal of Applied Research
Vol. 12, No. 2 (2026), pp.118-136
http://www.ajaronline.com
https://doi.org/10.26437/ajar.v12
Received February 8, 2025
Peer reviewed: June 18, 2025
Revised: February 22, 2026
Published: March 2026



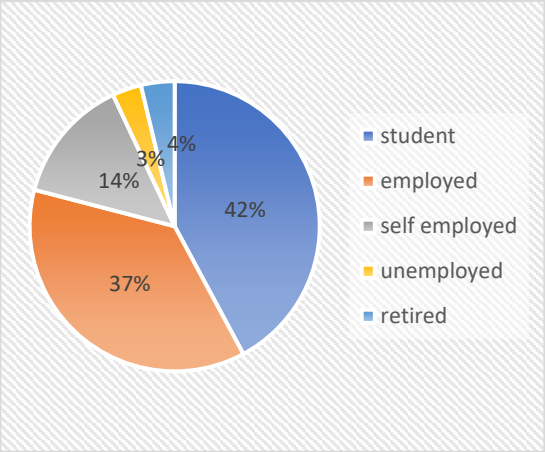


Figure 3: Educational background of respondents *Figure 4: Employment status of responden*

Table 2 depicts the mean scores of the variables. The variables above directly map to the study's aim. For example, energy access and utilisation are gauged by "adequacy of sources" and "challenges", while sustainability awareness is captured by "understanding of sustainable energy" and "SDG familiarity". Attitudes are reflected in "importance of transition" and "satisfaction with progress", and behavioural intentions in "willingness to participate" and "recommend actions". Notably, respondents rated the importance of transitioning as very high (mean≈3.91), indicating strong positive attitudes toward renewable energy. This aligns with the Theory of Planned Behaviour: favourable attitudes tend to produce stronger intentions to act. However, the low mean scores for government performance (≈2.21–2.23) reveal a perceived institutional barrier.

Table 2: Mean scores for key variables

Variable	**Mean Score**	**Std. Deviation**
Importance of transitioning to sustainable energy	3.908	1.3252
Confidence in the benefits of SDG achievement	3.573	1.3788
Likelihood of recommending actions to accelerate adoption	3.544	1.2149
Willingness to participate in community-led initiatives	3.339	1.3713
Adequacy of current energy sources	3.192	1.1471
Assurance about the future of sustainable energy	3.176	1.2343
Understanding of sustainable & clean energy	3.163	1.2580
Engagement in sustainable energy discussions/activities	2.900	1.3151
Familiarity with SDGs 7 and 13	2.803	1.4891

ISSN: 2408-7920
Papers were presented at the 3rd International Conference on Sustainable Infrastructural Development, held at Covenant University, Ota, Ogun State, Nigeria, September 2-4, 2024.

African Journal of Applied Research
Vol. 12, No. 2 (2026), pp.118-136
http://www.ajaronline.com
https://doi.org/10.26437/ajar.v12
Received February 8, 2025
Peer reviewed: June 18, 2025
Revised: February 22, 2026
Published: March 2026

Variable	Mean Score	Std. Deviation
Satisfaction with resources for promoting sustainable energy	2.686	1.1403
Satisfaction with the progress of sustainable energy adoption	2.690	1.1579
Familiarity with sustainable energy initiatives/projects	2.640	1.3078
Challenges in accessing/using energy	2.548	1.1175
Effectiveness of government policies	2.234	1.0786
Satisfaction with the government's effort	2.205	1.2315

Awareness of Sustainable Development Goals

The survey included questions to gauge community awareness of sustainability goals, particularly those related to energy access, environmental conservation, and climate action. Analysis of responses provides insights into the extent to which community members are familiar with initiatives such as Sustainable Development Goal 7 (SDG 7) on Affordable and Clean Energy and SDG 13 on Climate Action. The analysis shows that awareness of the Sustainable Development Goals should be a top priority, as the majority of indigenes in local communities are unaware of the Goals and initiatives, as depicted in Figure 5.

This observation is in agreement with secondary sources. Indicatively, as Okposin (2020) notes, Nigeria's energy objectives are usually legally constructed but fail to trickle down to the grassroots. In practice, this means sustainability education is required. Poor awareness of the SDGs suggests that individuals are unlikely to make climate-friendly decisions without clear benefits. The data showed that those who were aware of the SDGs or climate initiatives gave higher scores for recommendations of actions and future confidence. This is reflected in international studies in which information about international targets increases pro-environmental intentions (Ontoyin et al., 2025). Thus, a single obvious approach is to introduce SDG material into the community outreach, schools, and media - to attach abstract objectives to local practical benefits (e.g., health benefits of using clean cooking, employment of installing solar).

When asked about their understanding of sustainable and clean energy, only about 38% had substantial knowledge, with an average score of 2.8. This shows the lack of awareness of sustainable energy. A similar result was obtained when they were asked about their knowledge of the Sustainable Development Goals: 69% of the population were unsure of their familiarity, with a mean score of 2.64. This corroborates the bibliometric finding by Obanor et al. (2025) that Nigeria's research and programs often outpace on-the-ground implementation. One

ISSN: 2408-7920
Papers were presented at the 3rd International Conference on Sustainable Infrastructural Development, held at Covenant University, Ota, Ogun State, Nigeria, September 2-4, 2024.

African Journal of Applied Research
Vol. 12, No. 2 (2026), pp.118-136
http://www.ajaronline.com
https://doi.org/10.26437/ajar.v12
Received February 8, 2025
Peer reviewed: June 18, 2025
Revised: February 22, 2026
Published: March 2026

interviewee noted that ongoing projects tend to be pilot-scale without local handover plans, echoing Christian & Effiong's observation that weak local ownership is a frequent pitfall.

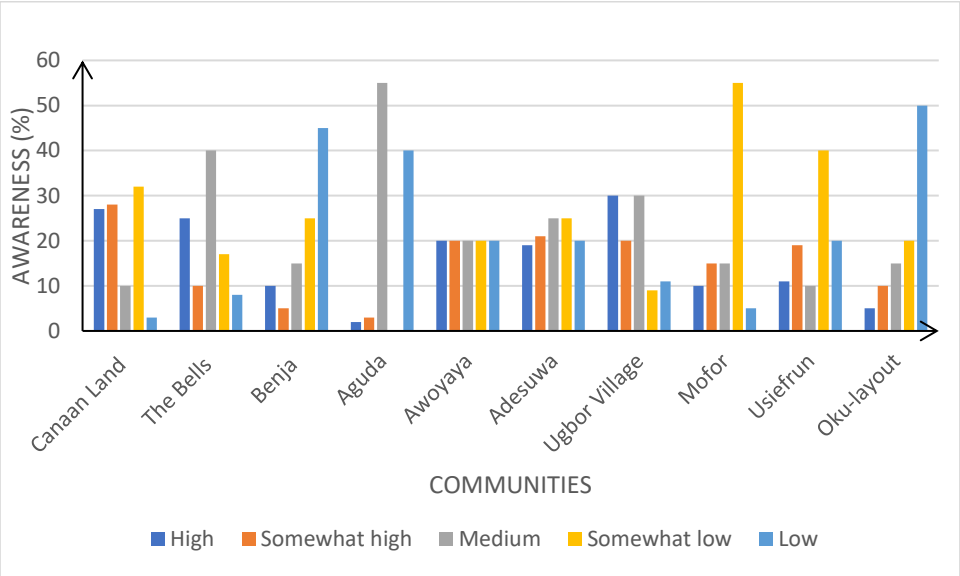


Figure 5: Awareness of indigenes on Sustainability

Preferences for Clean Energy Alternatives

In line with the objectives of promoting sustainable and clean energy sources, the questionnaire sought to assess community preferences for clean energy alternatives. Analysis of responses provides insights into the level of awareness and interest in renewable energy technologies, such as solar photovoltaics, wind turbines, and biogas systems.

Understanding community preferences and priorities can inform the design and implementation of clean energy initiatives that are responsive to local needs. Respondents' responses regarding energy preference stem from their satisfaction with the energy available to them and their knowledge of clean energy sources. Their response could stem from considering the transition a low priority due to other pressing needs in society, or from unawareness of the ongoing transition, given that a higher percentage of respondents consider it unimportant. The same can also be said for the response to their satisfaction regarding the progress of sustainable energy adoption in Nigeria, as depicted in Table 2.

The results are similar to Nduka (2023) Lagos contingent valuation results, which found that Lagos households are willing to pay a premium to switch to solar, completely replacing generators, but adoption is price-elastic. On a similar note, Adeshina et al. (2024) observe that

ISSN: 2408-7920
Papers were presented at the 3rd International Conference on Sustainable Infrastructural Development, held at Covenant University, Ota, Ogun State, Nigeria, September 2-4, 2024.

African Journal of Applied Research
Vol. 12, No. 2 (2026), pp.118-136
http://www.ajaronline.com
https://doi.org/10.26437/ajar.v12
Received February 8, 2025
Peer reviewed: June 18, 2025
Revised: February 22, 2026
Published: March 2026

the lack of financing mechanisms or subsidies leads to stagnation in the adoption of renewables. A large number of our sample reported that they would think about solar panels or biogas if there were a subsidy or loan program. As in Christian and Effiong (2023), positive attitudes toward community solar projects were also observed, though a lack of well-designed financing and maintenance plans can lead to the system's failure. In a way, therefore, the moderate demand we are witnessing appears to be motivated primarily by awareness (or lack thereof) of solutions to affordability.

Energy Access and Usage Patterns

Another key theme explored in the questionnaire was energy access and usage patterns within the communities. Analysis of responses revealed insights into the sources of energy currently utilised by households, including grid electricity from the National Electric Power Authority (NEPA), generators, and traditional biomass. The results show that indigenes depend solely on grid electricity as their primary energy source for daily needs. However, most people rely on backup energy sources during power outages. It was also interesting to discover that some individuals in local communities used traditional biomass (Charcoal) for domestic purposes such as cooking and ironing during power outages, as depicted in Figures 6 and 7.

While the majority of indigenes rely on grid electricity as their primary source, the results showed that most respondents face daily challenges accessing or using energy sources. The respondents' inadequate energy sources further emphasise the need for a transition to sustainable energy sources. Some of the individuals further stated that they would be willing to pay more for Solar PV if the electricity were constant. This result is supported by Nduka's (2023) research. Indicatively, Pokubo et al. (2024) found that one out of five households in Nigeria relied on traditional fuels and slowly adopted modern ones. Similarly, our statistics indicate that even those who answered solar as an alternative still have generators, as solar alone is not sufficient to satisfy demand or simply because they are not entirely sure of its reliability.

ISSN: 2408-7920
Papers were presented at the 3rd International Conference on Sustainable Infrastructural Development, held at Covenant University, Ota, Ogun State, Nigeria, September 2-4, 2024.

African Journal of Applied Research
Vol. 12, No. 2 (2026), pp.118-136
http://www.ajaronline.com
https://doi.org/10.26437/ajar.v12
Received February 8, 2025
Peer reviewed: June 18, 2025
Revised: February 22, 2026
Published: March 2026

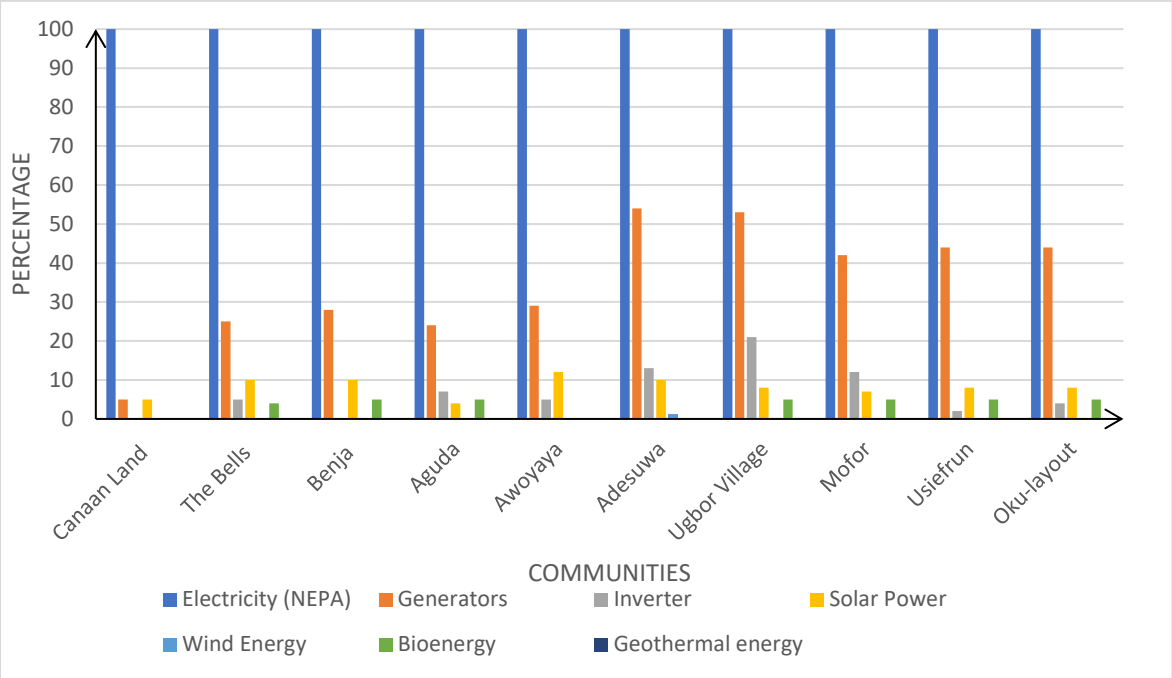


Figure 6: Major energy source of respondents

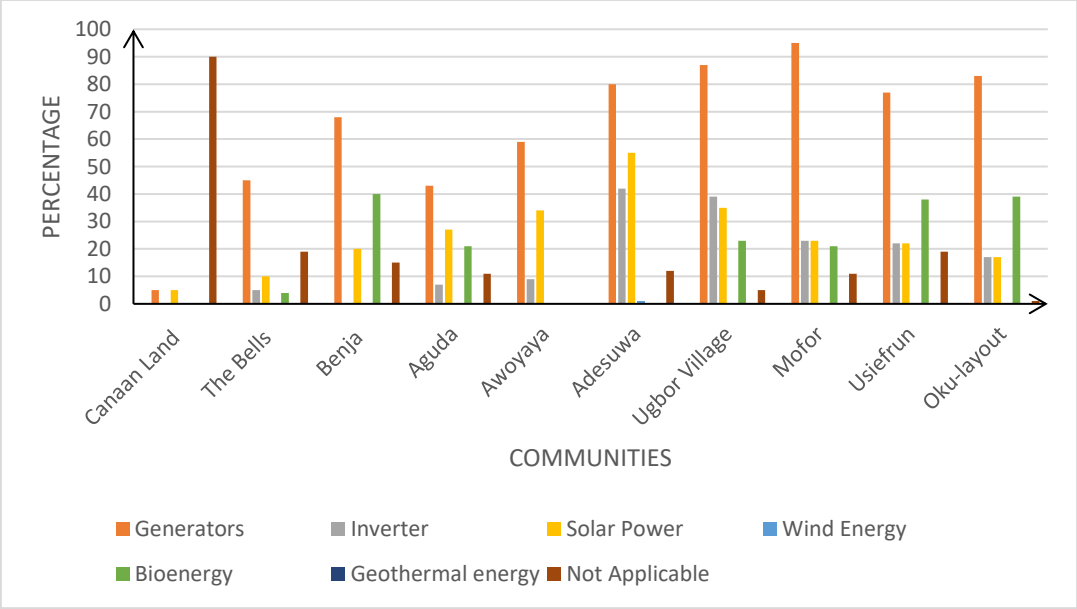


Figure 7: Back-up energy source of respondents

ISSN: 2408-7920
Papers were presented at the 3rd International Conference on Sustainable Infrastructural Development, held at Covenant University, Ota, Ogun State, Nigeria, September 2-4, 2024.

African Journal of Applied Research
Vol. 12, No. 2 (2026), pp.118-136
http://www.ajaronline.com
https://doi.org/10.26437/ajar.v12
Received February 8, 2025
Peer reviewed: June 18, 2025
Revised: February 22, 2026
Published: March 2026

Perceptions on Energy-Related Challenges

The questionnaire solicited community perceptions of energy-related challenges and barriers to adopting clean energy solutions. Analysis of responses sheds light on the socio-economic, technical, and institutional factors that hinder the uptake of sustainable energy technologies and practices. Although a greater number of respondents remain positive about the future of sustainable energy in the country, as shown by a mean score of 3.176, they, however, feel that the resources required to achieve this goal are not readily available, as shown with a mean score of 2.686, and they consider this a major energy challenge in the country.

Common challenges identified in the survey include affordability constraints, limited access to financing, inadequate infrastructure, and limited awareness of available clean energy options. The indigenes also showed little awareness of ongoing renewable energy projects, and some noted that resource availability plays a pivotal role in promoting sustainability. The response from the indigenes aligns with the findings of the research by Christian & Effiong (2023), although their study highlighted that some of the projects were at early stages and that investing in them would maximise sustainable energy potential. It is imperative that renewable energy projects be started first in these local communities.

Perceptions on the role of the Government in the Transition

The citizens' response highlights their satisfaction with the government, as shown in Figure 8. This is largely because the government plays a major role in ensuring the effectiveness of the ongoing transition. It is also imperative that Nigeria's current energy policies be reviewed and revalidated to enhance sustainability and support the transition.

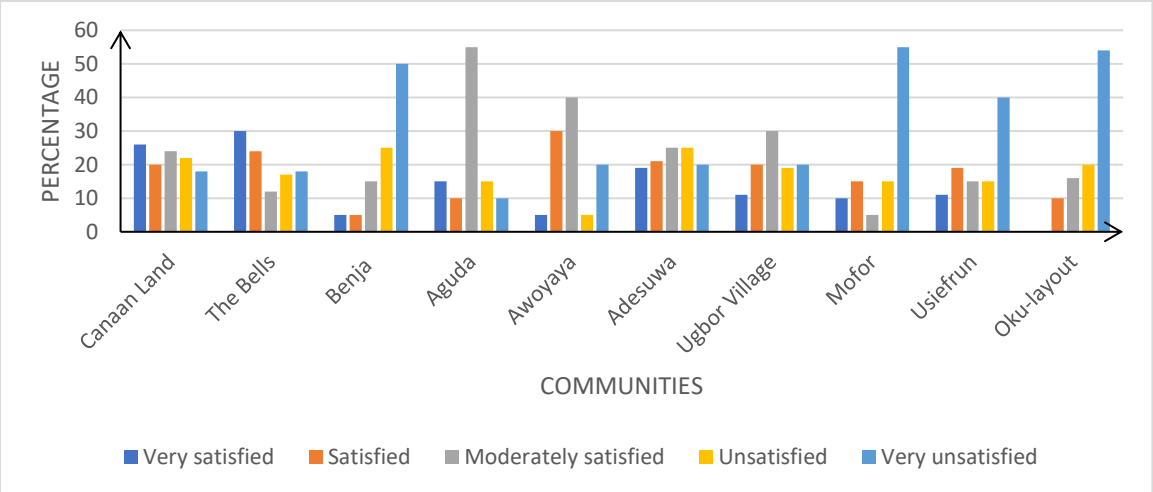


Figure 8: Respondents' satisfaction with the government's efforts in sustainable energy transition

ISSN: 2408-7920
Papers were presented at the 3rd International Conference on Sustainable Infrastructural Development, held at Covenant University, Ota, Ogun State, Nigeria, September 2-4, 2024.

African Journal of Applied Research
Vol. 12, No. 2 (2026), pp.118-136
http://www.ajaronline.com
https://doi.org/10.26437/ajar.v12
Received February 8, 2025
Peer reviewed: June 18, 2025
Revised: February 22, 2026
Published: March 2026

Table 3: Respondents' participation in projects focused on transitioning to sustainable energy

	SOUTH-WEST		SOUTH-SOUTH		Total	Percent	Cumulative percent
	Frequency	Percent	Frequency	Percent			
Definitely willing	42	26	27	12.1	69	18	18
Somewhat willing	27	16	38	17.0	65	17	35
Neutral	56	34	65	29.1	121	31	66
Somewhat not willing	10	6	43	19.3	53	14	80
Not willing	29	18	50	22.4	79	20	100
Total	164	100.0	223	100.0	387	100	

The government, in fulfilling its duty, would also ensure citizens' participation in sustainable energy-related projects, as this is a major concern in the country. Once these policies are put in order, the participation of the citizens in these projects would not be a major concern, as depicted in Table 3.

Table 4: Responses of individuals in the recommendation of actions to accelerate the adoption of sustainable energy practices

	SOUTH-WEST		SOUTH-SOUTH		Total	Percent	Cumulative percent
	Frequency	Percent	Frequency	Percent			
Very unlikely	9	5	32	14.3	41	11	11
Somewhat unlikely	27	16	47	21.1	74	19	30
Neutral	70	43	76	34.1	146	38	68
Likely	21	13	22	9.9	43	11	79
Very likely	36	23	46	20.6	82	21	100
Total	164	100.0	223	100.0	387	100	

In addition, once citizens are fully aware of the ongoing transition and sustainable development goals, the government can take their recommendations, as they would be willing to offer them, as shown in Table 4. In other words, while people agree that renewable energy is needed, they feel the authorities have not delivered, consistent with the study by Adeshina et al. (2024), which highlights weak policy enforcement.

ISSN: 2408-7920
Papers were presented at the 3rd International Conference on Sustainable Infrastructural Development, held at Covenant University, Ota, Ogun State, Nigeria, September 2-4, 2024.

African Journal of Applied Research
Vol. 12, No. 2 (2026), pp.118-136
http://www.ajaronline.com
https://doi.org/10.26437/ajar.v12
Received February 8, 2025
Peer reviewed: June 18, 2025
Revised: February 22, 2026
Published: March 2026

CONCLUSION

This research contributes to the existing understanding of energy consumption and sustainability consciousness among indigenous people in South-West and South-South Nigeria and highlights the urgent need to begin developing in line with Sustainable Development Goals 7 and 13. The results also indicate that indigenous people depend on traditional biomass for cooking and heating, have limited access to electricity, and lack awareness of sustainable energy options. Despite these, there is growing awareness among community members of the value of clean energy technologies in enhancing livelihoods and environmental conditions. The study contributes several significant findings to the literature on the adoption of sustainable energy, energy behaviour, and community-level transition dynamics in developing countries, specifically in the Nigerian context.

To begin with, the research provides empirical evidence of the relationship between sustainability awareness, as measured by knowledge of SDGs 7 and 13, and clean energy adoption in indigenous communities. Although past research in Nigeria has seen the willingness to pay, infrastructure, or policy impediments, very few have quantitatively determined how the level of awareness translates into a measure of change like willingness to engage in community-led projects, probability to suggest and recommend actions to pursue clean energy, or optimism about the future of sustainable energy. With the help of mean-score analysis and a large multi-state sample, this study addresses this important gap.

Second, the research study provides new regional comparative knowledge by comparing the respondents between South-West and South-South Nigeria. The available literature usually dwells on individual states or community case studies. The research contributes to the scientific community because it demonstrates that there are region-specific disparities in energy satisfaction, perceptions of government performance, and involvement in sustainability discourse, which reveal the lack of even distribution in energy transition in Nigeria at the grassroots. This evidence can be used to design region-specific policy and intervention frameworks.

Third, this study contributes to methodological practice in energy behaviour studies by illustrating the importance of statistical profiling of mean scores in understanding the community's perceptions and difficulties regarding energy access. The combination of descriptive statistics and well-defined behavioural constructs provides a model which can be replicated later to undertake community-based energy evaluation in Africa and other developing countries.

Fourth, the research supports the argument for community participation by demonstrating that readiness to participate in sustainable energy programs is medium, although awareness and satisfaction with the government initiative are low. This implies that there would be a latent support of renewable energy projects within the community that would be unlocked through specific awareness campaigns and through better access to resources, an observation that has

ISSN: 2408-7920
Papers were presented at the 3rd International Conference on Sustainable Infrastructural Development, held at Covenant University, Ota, Ogun State, Nigeria, September 2-4, 2024.

African Journal of Applied Research
Vol. 12, No. 2 (2026), pp.118-136
http://www.ajaronline.com
https://doi.org/10.26437/ajar.v12
Received February 8, 2025
Peer reviewed: June 18, 2025
Revised: February 22, 2026
Published: March 2026

practical implications for policymakers, NGOs, and development partners in their efforts towards rural electrification and clean energy spread.

Lastly, the paper contributes to the wider literature on sustainability transition by showing the intricate nature of the interactions among awareness, behavioural intention, government policy perception, and energy adequacy in influencing community attitudes toward renewable energy. The empirical demonstration of these connections by research on indigenous Nigerian societies adds theoretical insights to the study of socio-technical transitions in a context characterised by energy poverty, inadequate infrastructure, and weak sustainability education.

The research suggests that community work and awareness activities are to be conducted in order to inform and empower native communities regarding the advantages of using sustainable energy as well as the need to take some climate action. It further suggests that policymakers should invest in renewable energy infrastructure and supportive energy regulations to enable the shift towards cleaner energy sources.

Furthermore, there should be capacity-building programmes to develop local skills and capabilities in renewable energy technologies, entrepreneurship and local economic growth. Stakeholders such as governments, non-governmental organisations, and other private-sector organisations must also work together to mobilise resources and enable partnerships to promote sustainable energy programs. With such measures in place, Nigeria is able to take major steps towards SDGs 7 and 13, ensuring universal access to affordable, reliable, sustainable, and modern energy for everyone in the country, as well as in the fight against climate change and the promotion of environmental sustainability globally.

Acknowledgement

The Authors want to express their gratitude to Covenant University's administration and CUCRID Directorate for their support.

REFERENCES

Abu-Bader, S. H. (2021). *Using statistical methods in social science research: With a complete SPSS guide*. Oxford University Press, USA.

Adeshina, M. A., Ogunleye, A. M., Suleiman, H. O., Yakub, A. O., Same, N. N., Suleiman, Z. A., & Huh, J. S. (2024). From potential to power: advancing Nigeria's energy sector through renewable integration and policy reform. *Sustainability*, *16*(20), 8803.

Adewuyi, O. B., Kiptoo, M. K., Afolayan, A. F., Amara, T., Alawode, O. I., & Senjyu, T. (2020). Challenges and prospects of Nigeria's sustainable energy transition with lessons from other countries' experiences. *Energy Reports*, *6*, 993–1009.

ISSN: 2408-7920
Papers were presented at the 3rd International Conference on Sustainable Infrastructural Development, held at Covenant University, Ota, Ogun State, Nigeria, September 2-4, 2024.

African Journal of Applied Research
Vol. 12, No. 2 (2026), pp.118-136
http://www.ajaronline.com
https://doi.org/10.26437/ajar.v12
Received February 8, 2025
Peer reviewed: June 18, 2025
Revised: February 22, 2026
Published: March 2026

Aithal, A., & Aithal, P. S. (2020). Development and validation of survey questionnaire & experimental data–a systematic review-based statistical approach. *International Journal of Management, Technology, and Social Sciences (IJMTS)*, *5*(2), 233-251.

Ajayi, O. O., Mokryani, G., & Edun, B. M. (2022). Sustainable energy for national climate change, food security and employment opportunities: Implications for Nigeria. *Fuel Communications*, *10*, 100045.

Cantarero, M. M. V. (2020). Of renewable energy, energy democracy, and sustainable development: A roadmap to accelerate the energy transition in developing countries. *Energy Research & Social Science*, *70*, 101716.

Christian, E. U. A., & Effiong, A. I. (2023). Community-Based Renewable Energy Projects for Sustainable Development in Nigeria. *Journal of Innovations in Engineering and Technology Research*.

Dinneya-Onuoha, E. (2025). Unlocking renewable energy materials in Nigeria: availability, application, and roadmap for sustainability. *RSC Sustainability*, *3*(6), 2534–2566.

Dirisu, J. O., Salawu, E. Y., Ekpe, I. C., Udoye, N. E., Falodun, O. E., Oyedepo, S. O., ... & Kale, S. A. (2024). Promoting the use of bioenergy in developing nations: a CDM route to sustainable development. *Frontiers in Energy Research*, *11*, 1184348.

Dirisu, J.O., Oyedepo, S.O., Olawole, O.C., Somefun, T.E., Peter, N.J., Babatunde, D., Nwaokocha, C.N., Onokwai, A.O., Obanor, E., Alam, M.M. & Kale, S.A. (2024). A comprehensive review of biofuel utilization for household cooking in developing countries: Economic and environmental impacts. *Process Safety and Environmental Protection*, *191*, 585–604.

Enoch, O. I., Salawu, E. Y., Akerekan, O. E., Olaoluwa, O. O., Babafemi, O., Awoyemi, O. O., & Airewa, I. (2025). Leveraging Artificial Intelligence for Optimizing Renewable Energy Systems. *NIPES-JSTR ISSUE*, *7*(1), 1543–1549.

Fuso Nerini, F., Sovacool, B., Hughes, N., Cozzi, L., Cosgrave, E., Howells, M., ... & Milligan, B. (2019). Connecting climate action with other Sustainable Development Goals. *Nature Sustainability*, *2*(8), 674–680.

GIZ (2015). The Nigerian Energy Sector an Overview with a Special Emphasis on Renewable Energy, Energy Efficiency and Rural Electrification. https://www.giz.de/en/downloads/giz2015-en-nigerian-energy-sector.pdf

Lu, Y., Khan, Z. A., Alvarez-Alvarado, M. S., Zhang, Y., Huang, Z., & Imran, M. (2020). A critical review of sustainable energy policies for the promotion of renewable energy sources. *Sustainability*, *12*(12), 5078.

Lukashevych, Y., Evdokimov, V., Polukhin, A., Maksymova, I., & Tsvilii, D. (2024). Innovation in the energy sector: The transition to renewable sources as a strategic step towards sustainable development. African Journal of Applied Research, 10(1), 43-56.

ISSN: 2408-7920
Papers were presented at the 3rd International Conference on Sustainable Infrastructural Development, held at Covenant University, Ota, Ogun State, Nigeria, September 2-4, 2024.

African Journal of Applied Research
Vol. 12, No. 2 (2026), pp.118-136
http://www.ajaronline.com
https://doi.org/10.26437/ajar.v12
Received February 8, 2025
Peer reviewed: June 18, 2025
Revised: February 22, 2026
Published: March 2026

Nduka, E. (2023). Reducing carbon footprint by replacing generators with solar PV systems: a contingent valuation study in Lagos, Nigeria. *Environment and Development Economics*, *28*(4), 387-408.

Obada, D. O., Muhammad, M., Tajiri, S. B., Kekung, M. O., Abolade, S. A., Akinpelu, S. B., & Akande, A. (2024). A review of renewable energy resources in Nigeria for climate change mitigation. *Case Studies in Chemical and Environmental Engineering*, *9*, 100669.

Obanor, E. I., Dirisu, J. O., Kilanko, O. O., Ohunakin, O. S., Ajayi, O. O., & Oyedepo, S. O. (2025). Bibliometric analysis of sustainable energy transition and climate action in sub-Saharan Africa with a focus on Nigeria. *Discover Energy*, *5*(1), 19.

Obanor, E. I., Dirisu, J. O., Kilanko, O. O., Salawu, E. Y., & Ajayi, O. O. (2024). Progress in green hydrogen adoption in the African context. *Frontiers in Energy Research*, *12*, 1429118.

Obanor, E. I. (2025). The role of Legal and Regulatory Governance in Mitigating Risks for Renewable Energy. *Applied Journal of Economics, Law, & Governance, 1(2), 13-148*

Okposin, A. (2020). Curbing E-Waste menace in Nigeria: assessing the regulatory framework. *Chukwuemeka Odumegwu Ojukwu university journal of commercial and property law*, *2*(1).

Ontoyin, E. N., Essandoh-Yeddu, J., & Bamfo-Agyei, E. (2025). A climate-responsive green building framework for Ghana: Integrating mitigation and adaptation strategies. African Journal of Applied Research, 11(2), 77-93.

Parra, C., Kirschke, J., & Ali, S. H. (2020). Ensure access to affordable, reliable, sustainable and modern energy for all. In *Mining, Materials, and the Sustainable Development Goals (SDGs)* (pp. 61–68). CRC Press.

Pokubo, D., Pepple, D. G., & Al-Habaibeh, A. (2024). Towards an understanding of household renewable energy transitions. *Journal of Innovation & Knowledge*, *9*(3), 100521.

ISSN: 2408-7920
Papers were presented at the 3rd International Conference on Sustainable Infrastructural Development, held at Covenant University, Ota, Ogun State, Nigeria, September 2-4, 2024.