JETMASE
Journal of Emerging Trends in Management Sciences and Entrepreneurship
Volume 8(2), Pages 562-579 April/June Edition, 2026
ISSN: 2384-762X
https://www.jetmase.com

Assessing the Barriers to Green Finance Access among Small and Medium Enterprises in South-West Nigeria

OKOH, J.I.[1*], AFROGHA, O.O. (PhD)[2], UDO, E.S. (PhD)[3] & ADAMU, M.A.[4]
[1&2]Department of Financial Studies, National Open University of Nigeria, Abuja
[3]Department of Banking and Finance, Akwa Ibom State University, Obio Akpa, Akwa Ibom State, Nigeria
[4]Department of Business Administration, National Open University of Nigeria, Abuja
Corresponding Email; Jokoh@noun.edu.ng

ABSTRACT: This research work examined the barriers that shape access to green finance among small and medium enterprises (SMEs) in South-West Nigeria. The study is positioned within Nigeria's broader low-carbon transition, where SMEs are expected to contribute to climate action, green innovation and inclusive economic growth, yet remain constrained by information gaps, regulatory uncertainty, institutional risk assessment practices, capacity-related challenges and uneven readiness among financial institutions. Drawing on Pecking Order Theory and Stakeholder Theory, the study adopted a survey design across selected commercial hubs in Ekiti, Lagos, Ogun, Ondo, Osun and Oyo states. The sampling frame comprised approximately 8,826 registered SMEs, with a target sample of 422 enterprises derived from Taro Yamane's formula with a non-response allowance. Data were analyzed using descriptive statistics and structural equation modelling. The descriptive results show high mean scores across all constructs, with capacity-related challenges (M = 4.50), financial institution challenges (M = 4.49), institutional barriers (M = 4.43), regulatory and policy barriers (M = 4.34), access to green finance (M = 4.30) and awareness of green finance (M = 4.27). The measurement model reported acceptable loadings, Cronbach's alpha coefficients, average variance extracted values and full collinearity VIFs, while the structural model demonstrated substantial explanatory power (ARS = 0.477; GoF = 0.511). The hypothesis results show that awareness of green finance (beta = 0.398, t = 7.709, $p < 0.001$), regulatory and policy barriers (beta = 0.321, t = 6.121, $p < 0.001$), institutional barriers (beta = -0.428, t = -2.258, $p < 0.001$), capacity-related challenges (beta = 0.282, t = 5.690, $p < 0.001$) and financial institution readiness (beta = 0.174, t = 3.458, $p < 0.001$) significantly predict access to green finance. The paper contributes to the literature by integrating firm-level SME evidence with recent empirical and policy research on green finance mechanisms, sustainable industrialization, renewable energy transition and inclusive green finance in Africa. It recommends sustained SME awareness, reduction of regulatory and policy barriers, capacity-building and a favourable operating environment for financial institutions to support SME access to green finance.

Keywords: Green finance; SMEs; Barriers; South-West Nigeria; Structural equation modelling

1. INTRODUCTION

The increasing urgency of climate change, environmental degradation and the global transition to low-carbon development has made green finance a central instrument of sustainable development policy. Green finance broadly refers to the mobilisation and allocation of financial resources towards environmentally beneficial activities, including renewable

energy, energy efficiency, clean technologies, pollution control, waste management, circular production and climate adaptation. For emerging economies such as Nigeria, the importance of green finance is not merely environmental. It is also economic, because the ability of firms to modernise production, manage energy costs, reduce climate exposure and compete in sustainability-sensitive markets increasingly depends on access to appropriate financial products.

Small and medium enterprises occupy a strategic position in this transition. They dominate the Nigerian private sector, provide employment, support local supply chains and contribute to regional economic dynamism. In South-West Nigeria, the commercial hubs of Lagos, Ogun, Oyo, Ondo, Ekiti and Osun host a diverse concentration of manufacturing, trading, agribusiness, technology-enabled and service enterprises. These firms can adopt cleaner energy, reduce waste, improve resource efficiency and enter green value chains. Nevertheless, their ability to do so is often constrained by limited information, weak collateral, poor financial records, high transaction costs and the limited availability of green finance products designed for smaller firms.

The challenge is therefore not simply that green finance exists at the macro level but fails to reach SMEs. It is that the institutional architecture through which green finance is identified, priced, accessed and monitored is often better suited to larger corporate projects than to smaller firms with informal records and limited technical capacity. Recent African evidence shows that green finance products are expanding, but that bank portfolios remain small and financial institutions continue to report weak internal expertise, inadequate risk tools and perceived low demand from smaller businesses (United Nations Environment Programme [UNEP], 2022). Inclusive green finance policies also require coordination between regulators, financial institutions, climate agencies and enterprise-support systems (Alliance for Financial Inclusion [AFI], 2020).

This study responds to that gap by assessing the barriers to green finance access among SMEs in South-West Nigeria. It harmonises the original research proposal and the subsequent empirical analysis into a journal-style paper. The study focuses on five explanatory domains: awareness of green finance, regulatory and policy barriers, institutional barriers, capacity-related challenges and financial institution readiness. It also situates the Nigerian evidence within a wider empirical review of green finance research, including recent studies on sustainable industrialisation in developing countries, renewable energy transitions in Sub-Saharan Africa, green finance and environmental quality in Nigeria, and small business sustainability pathways discussed in Afrogha, Worimegbe and Edeh's book chapter on green finance.

The paper makes three contributions. First, it provides firm-level evidence from a sub-national Nigerian context where SMEs are central to both economic growth and the low-carbon transition. Second, it links SME green finance access to institutional, policy and capacity conditions rather than treating access as a purely financial problem. Third, it extends the empirical review beyond general green finance discourse by drawing on Africa-focused policy reports and recent econometric studies that show how finance, governance and green transition outcomes are mutually dependent.

2. LITERATURE REVIEW

2.1 Conceptualizing Green Finance and SME Access

Green finance is commonly understood as the set of financial instruments, policies and institutional arrangements that channel capital towards environmentally sustainable activities. These instruments may include green loans, green bonds, climate funds, guarantees, pay-as-you-go asset finance, sustainability-linked credit, grants and blended finance. For SMEs,

green finance is most relevant where it enables investment in solar energy, energy-efficient equipment, cleaner production technologies, waste recycling, sustainable packaging, climate-smart agriculture and low-carbon logistics.

The term SME should be interpreted within the Nigerian regulatory context while acknowledging that international literature often uses the broader term MSME. The World Bank's general classification commonly treats small enterprises as businesses with 10 to 49 employees, while Nigeria's MSME policy framework also considers asset base and employment thresholds. This distinction matters because green finance requirements are often technical and documentation-heavy, whereas many smaller enterprises lack the audited accounts, collateral, environmental reporting and project documents required by formal lenders.

Access to green finance therefore involves more than the availability of funds. It requires awareness of green finance opportunities, regulatory clarity, institutional assessment processes, enterprise capacity and financial institution readiness. The present study treats access as the outcome of interactions between SMEs and the green finance ecosystem. This orientation is consistent with AFI's (2020) argument that inclusive green finance policies must link climate priorities with financial inclusion, and with UNEP's (2022) recommendation that Africa requires both new green financial service providers and stronger capacity among existing financial institutions.

Environmental accounting is a useful complement to this access framework because it converts environmental intent into measurable information. Where SMEs are asked to demonstrate energy savings, waste reduction, emissions reduction, resource efficiency or climate adaptation value, they need basic environmental cost records and credible reporting practices. The environmental accounting chapter by Worimegbe and Afrogha (2024) is therefore relevant to the present study because it explains environmental accounting as part of a quality regulatory framework. In this paper, the chapter is used to strengthen the argument that green finance access depends not only on loan availability but also on the ability of SMEs to document and communicate environmental performance in a form that lenders, regulators and development partners can assess.

2.2 Theoretical foundation

Pecking Order Theory explains how firms rank financing sources according to the cost of information asymmetry. SMEs often prefer internal funds because external finance can be expensive, collateral-intensive and administratively burdensome. When green projects require upfront investment in equipment, certification or technical redesign, reliance on internal funds can slow adoption. In South-West Nigeria, this theory helps explain why SMEs with weak records, insufficient collateral or low familiarity with green finance may struggle to move from environmental intention to financed investment.

Stakeholder Theory complements this explanation by emphasising that firms operate within a network of actors whose expectations shape strategic choices. Green finance access requires SMEs to satisfy financial institutions, regulators, customers, communities, development partners and sometimes climate certification bodies. This means that successful access depends on the ability of SMEs to present projects that are financially viable and environmentally credible. The theory is useful because green finance is not only a lender-borrower transaction; it is a governance relationship in which multiple stakeholders must trust the environmental and financial value of the proposed activity.

Together, the two theories provide a useful framework. Pecking Order Theory explains financing behaviour and the effect of information asymmetry, while Stakeholder

Theory explains the wider institutional expectations that shape green finance readiness. The study therefore assumes that awareness, policy clarity, institutional practices, SME capacity and financial institution readiness jointly influence access to green finance.

Environmental accounting also strengthens the theoretical framing because it reduces information asymmetry between SMEs and external finance providers. From a Pecking Order Theory perspective, green finance may appear costly or difficult where SMEs cannot provide credible environmental and financial records. From a Stakeholder Theory perspective, environmental accounting supports accountability to lenders, regulators, customers and community stakeholders by making the environmental consequences of SME activities more visible and comparable. This explains why the present study treats capacity-related challenges and financial institution readiness as central to green finance access.

2.3 Empirical Review of Green Finance, SMEs and Sustainability

Recent empirical evidence increasingly positions green finance as both a climate finance instrument and a firm-level access problem. At the macro level, green finance channels capital towards renewable energy, energy efficiency, pollution control, waste management, climate adaptation and low-carbon innovation. At the SME level, however, access depends on whether small firms can recognise green finance opportunities, prepare bankable green projects, produce reliable environmental information, satisfy lender requirements and operate within a clear regulatory environment. This distinction is important because the existence of green finance in national policy or capital markets does not automatically translate into usable finance for SMEs.

Raman et al. (2025) provide a recent mixed-methods assessment of sustainable and green finance and its relationship with the Sustainable Development Goals. Their bibliometric and case-based evidence shows that green fintech, social impact bonds, green bonds, green loans and risk assessment models are increasingly used to mobilise sustainable capital. However, the same study identifies high transaction costs, weak institutional frameworks, limited regulatory maturity and capacity constraints as persistent barriers in developing countries. This evidence supports the present study's focus on institutional readiness, regulatory quality, awareness and capacity as practical conditions for SME access to green finance.

African evidence confirms that the green finance problem is not only about the supply of funds but also about policy architecture, data systems and risk perception. Lwesya (2025) mapped African green finance research from 2012 to 2024 and found that the continent's green finance agenda is growing, yet its progress remains constrained by insufficient institutional and policy frameworks, underdeveloped green bond markets, reliance on external finance, high perceived investment risk and weak public-private coordination. These findings are relevant to South-West Nigeria because SMEs operate in a financial environment where lenders often lack the internal systems to identify, appraise and monitor small-scale green projects.

Policy reports also point to the same access gap. UNEP (2022) shows that African MSME green finance can take the form of loans, grants, guarantees, equity, asset finance, carbon finance and pay-as-you-go models, but uptake remains limited when financial institutions are unable to price climate risks and when MSMEs lack documentation, collateral and technical capacity. Similarly, the Alliance for Financial Inclusion (2020) argues that inclusive green finance for MSMEs requires national strategies, regulatory incentives, green credit lines, capacity development and coordination among regulators, banks and development partners. This evidence supports the argument that access

to green finance is an ecosystem issue rather than a narrow borrower-side problem.

Recent South-West Nigerian evidence strengthens the empirical foundation of this study. Faloye and Adebanjo (2025) examined the relationship between green financing and sustainable performance among manufacturing SMEs in South-West Nigeria using a sample of 396 owners and managers and Partial Least Squares Structural Equation Modelling. Their results indicate that green financing positively influences SME sustainability, particularly through environmental compliance, energy efficiency and long-term business viability. Nevertheless, they also report that the integration of green finance into Nigeria's financial ecosystem remains limited, with SMEs facing low awareness, weak policy support and financial constraints. This aligns closely with the present study's evidence that awareness, regulatory and policy conditions, institutional barriers, capacity-related challenges and financial institution readiness shape access to green finance.

Okoh et al. (2025) provide related evidence from financial technology adoption among 350 small enterprises across Ekiti, Lagos, Ogun, Ondo, Osun and Oyo states. Their findings show that regulatory barriers, technological infrastructure and financial literacy significantly affect fintech adoption among small enterprises. Although the study focuses on fintech rather than green finance, its implications are directly relevant because digital financial tools can reduce transaction costs, support alternative credit assessment, improve payment records and widen SME access to sustainability-oriented financial products. The evidence suggests that weak digital infrastructure and low financial literacy can indirectly constrain green finance access by limiting the quality of SME financial information and lender confidence.

International evidence also supports the link between digital capability and green finance performance. Zaid et al. (2025) found that green finance has a positive relationship with sustainable performance among Saudi banks and that fintech adoption strengthens this relationship. Their study further shows that digital transformation amplifies the moderating role of fintech, indicating that green finance is more effective when financial institutions possess the digital infrastructure to design, monitor and scale sustainability-linked products. For Nigerian SMEs, this suggests that green finance access may improve when financial institutions combine green product design with digital onboarding, credit scoring, monitoring and advisory tools.

Karmacharya et al. (2025) examined green finance initiatives among Nepalese financial institutions using a two-stage PLS-SEM and artificial neural network approach. Their findings show that customer demand, regulatory compliance, financial incentives, awareness and product availability all significantly influence sustainability performance, with customer demand and regulation emerging as especially important drivers. This evidence is useful for the present study because it supports the idea that awareness and regulatory coherence are not peripheral issues. They are central to whether green finance products become visible, trusted and usable within an emerging-market financial system.

The role of financial literacy and internal SME capability is further reinforced by Molina-García et al. (2025), who analysed 318 Spanish SMEs and found that chief executives' financial literacy improves environmental sustainability through process innovation. Their study demonstrates that financially literate SME leaders are better positioned to understand, evaluate and implement environmentally responsible process changes. In the Nigerian context, this implies that green finance awareness must go beyond general knowledge of climate finance. SME owners need practical literacy in project costing, repayment planning, energy savings, environmental returns and reporting requirements.

Environmental accounting literature helps to explain why documentation, reporting capacity and environmental measurement are central to green finance access. Huy and Phuc (2025), using SME data, show that environmental management accounting practices are positively associated with green innovation management and strategic resilience. Their evidence indicates that SMEs which collect and use environmental cost and performance information are better able to manage green innovation and sustain organisational resilience. This is important for the present study because lenders and public agencies require credible environmental information before green projects can be financed, monitored or reported.

The specific environmental accounting book chapter involving Afrogha and Worimegbe is now deliberately positioned in this study as a disclosure and regulatory readiness source. The chapter is published as Worimegbe and Afrogha (2024), with the title Environmental accounting for a quality regulatory framework in Environmental Pollution and Public Health. It argues that environmental accounting supports a quality regulatory framework by enabling organisations to identify, measure and report environmental costs and responsibilities. For SME green finance, this perspective is directly relevant because many green loans, grants, guarantees and sustainability-linked facilities require applicants to show the expected environmental outcome of the financed project.

A small manufacturer seeking finance for solar power, energy-efficient machinery or waste-reduction equipment must therefore do more than describe the project as green. The enterprise must show baseline cost, expected savings, environmental benefits and reporting evidence that can be assessed by the finance provider.
Recent environmental management control evidence strengthens this point. Nuryanto et al. (2024) found that environmental management control systems, cleaner production practices and product efficiency are associated with environmental reputation and performance. Although their evidence is not drawn from Nigeria, it supports the same logic: firms that formalise environmental measurement and control are better positioned to demonstrate green performance to external stakeholders. This links the environmental accounting chapter by Worimegbe and Afrogha (2024) to the present study by showing why capacity-related challenges are not merely administrative weaknesses. They are substantive barriers to finance because weak records, poor cost tracking and limited environmental disclosure reduce the ability of SMEs to prove project viability and environmental value.

Afrogha, Worimegbe and Edeh (2026) extend this discussion by examining green finance as a catalyst for small business sustainability in emerging economies. Their chapter emphasises the pathways, challenges and policy implications of green finance for small businesses, including the need for appropriate financial instruments, stronger institutional support and policy frameworks that respond to the realities of small firms. The chapter provides a useful bridge between environmental accounting and green finance because it shows that small business sustainability requires both finance and the internal capacity to demonstrate environmental and economic value.

Further SME evidence from East Africa indicates that sustainable finance solutions can improve long-term SME sustainability when supported by enabling policy and institutional conditions. Kato et al. (2024) investigated sustainable finance solutions and the long-term sustainability of SMEs and found that access to sustainable finance, government support and policy frameworks are important pathways through which SMEs can build resilience and innovation capacity. This finding is consistent with Pecking Order Theory because external finance becomes more acceptable and usable when policy and institutional arrangements reduce information asymmetry and perceived risk.

Hoang et al. (2025) provide sector-specific evidence from Vietnamese agricultural SMEs. Their study shows that financial institutions, regulatory frameworks and enterprise-level initiatives collectively expand access to green finance. The study highlights tailored green financial products, digital finance solutions and capacity-building partnerships as important conditions for improving SME performance in a green finance context. This evidence is useful for South-West Nigeria because many SMEs operate in sectors where energy use, waste handling, resource efficiency and climate exposure directly affect operating costs and sustainability.

Systematic review evidence also confirms the persistence of early-stage financing gaps. Mukherjee et al. (2024) reviewed the financing of green innovation start-ups and found that early-stage green firms face a shortage of appropriate financing models, limited investor readiness and evidence gaps that are particularly pronounced outside mature innovation ecosystems. Andriyani et al. (2025) similarly report that green finance initiatives tend to support SME sustainability and development, but adoption is constrained by limited readiness, weak institutional support and implementation barriers. These findings show that even where environmental opportunities exist, finance may remain inaccessible unless the green finance ecosystem is designed around SME realities.

Chien et al. (2021) provide a useful comparison from developed-country SME contexts by examining barriers to green finance and public spending for SMEs. Their evidence indicates that financial investment requirements, green innovation barriers and firm-level capacity constraints can limit adoption of green practices even in relatively advanced financial systems. This comparison is important because it shows that green finance barriers are not unique to Nigeria, although they may be more severe in emerging economies where collateral requirements, weak records, regulatory uncertainty and limited green financial products are more pronounced.

Broader environmental and macroeconomic studies provide the rationale for prioritising SME green finance in Nigeria and other emerging economies. Udo, Okoh, Oreh, Obieze, Oziegbe and Afrogha (2025) show that green finance, technological innovation and financial globalisation interact in complex ways to affect environmental quality in MINT economies. Udo, Chiyem, Abner, Ifeanyi, Okoh and Ajudua (2025) demonstrate that Nigeria's energy consumption and carbon emissions nexus remains strongly shaped by fossil fuel dependence, industrialisation, transport, urbanisation and residential energy use. Udo, Okoh, Agbadua, Akpan, Okuji and Ajudua (2025) further show that financial sector development and governance quality influence renewable energy transitions in Sub-Saharan Africa. Udo, Ibobo, Okoh, Obieze, Ubom and Oreh (2026) add that renewable energy adoption can improve environmental quality in Nigerian agriculture, although sectoral differences remain important. Collectively, these studies show that green finance is necessary for environmental transition, but its effect depends on institutional quality, governance, innovation capacity and sector-specific implementation.

Overall, the empirical literature shows a consistent pattern. Green finance can support SME sustainability, energy efficiency, innovation, resilience and environmental compliance, but its benefits depend on awareness, regulation, institutional readiness, financial literacy, environmental accounting capacity, digital infrastructure and the availability of SME-sensitive products. This literature creates the gap addressed in the present study: although green finance is increasingly discussed in Nigeria and across Africa, there remains limited firm-level empirical evidence on the combined effects of awareness, regulatory and policy barriers, institutional barriers, capacity-related challenges and financial

institution readiness on SME access to green finance in South-West Nigeria.

2.4 Hypothesis Development

Awareness is expected to influence access because SMEs cannot seek, apply for or structure green finance if they do not understand the relevant instruments and eligibility requirements. Where owners know the difference between general business loans and sustainability-linked finance, they are more likely to identify eligible projects, prepare supporting documents and engage financial institutions productively.

Regulatory and policy conditions are expected to shape access because green finance depends on clear definitions, incentives, reporting standards, taxonomies and policy signals. Where policy is fragmented, SMEs and lenders may be uncertain about which investments qualify as green, how environmental benefits should be verified and whether supportive incentives exist.

Institutional barriers are expected to restrict access where eligibility criteria, collateral requirements, risk models and documentation expectations do not reflect SME realities. In many cases, the issue is not unwillingness to finance green projects but the absence of mechanisms that translate small-scale green opportunities into bankable proposals.

Capacity-related factors are expected to affect access because SMEs need financial records, project documentation, environmental information and managerial competence to meet green finance requirements. Financial institution readiness is also expected to matter because lenders need appropriate products, staff skills, risk tools and internal policy frameworks to serve green SMEs.

Accordingly, the study tested five hypotheses: H1, awareness of green finance significantly predicts access to green finance among SMEs in South-West Nigeria; H2, regulatory and policy barriers significantly predict access to green finance among SMEs in South-West Nigeria; H3, institutional barriers significantly affect access to green finance among SMEs in South-West Nigeria; H4, capacity-related challenges significantly predict access to green finance among SMEs in South-West Nigeria; and H5, financial institution readiness significantly predicts access to green finance among SMEs in South-West Nigeria.

3. METHODOLOGY

3.1 Research Design and Study Area

The study adopted a survey research design. This design was appropriate because the study sought to obtain standardised responses from SMEs on awareness, regulatory and policy issues, institutional barriers, capacity-related factors, financial institution readiness and access to green finance. The study area was South-West Nigeria, comprising Lagos, Ogun, Oyo, Ondo, Ekiti and Osun states. This region was selected because it is a major commercial and industrial zone with a high concentration of SMEs and significant potential for green innovation.

The empirical setting comprised key commercial hubs: Ado Ekiti, Ikeja Metropolis, Ota, Akure, Osogbo and Ibadan. These locations were selected because they represent important business centres within the South-West geopolitical zone and host SMEs across diverse sectors. The focus on South-West Nigeria allows the study to move beyond national-level green finance discussions and examine a regional context where SME density, commercial activity and sustainability pressures intersect.

3.2 Population, Sample and Sampling Procedure

The population consisted of registered SMEs operating within the selected South-West Nigerian states. Based on the research proposal, approximately 8,826 registered SMEs constituted the accessible population. A multistage sampling procedure was adopted. First, the six commercial hubs were selected as primary sampling locations. Second, relevant lists of registered SMEs were to be obtained from business registries, trade associations and

enterprise-support structures. Third, systematic random sampling was applied to select individual SMEs.

Using Taro Yamane's sample size formula, the minimum sample size was estimated at 384. To account for possible non-response and incomplete responses, the sample was increased by 10%, resulting in a target sample of approximately 422 SMEs. The manuscript should be updated with the final number of valid responses before submission if this differs from the target sample.

3.3 Measurement of Variables

Access to Green Finance (AGF) was treated as the dependent variable and measured through indicators relating to experience with green finance applications, availability of sustainability-linked products and outcomes of finance requests. The independent constructs were Awareness of Green Finance (AWGF), Regulatory and Policy Barriers (RPB), Institutional Barriers (INB), Capacity-Related Challenges (CRC) and Financial Institution Readiness (FIR).

The questionnaire was structured around Likert-scale items. Content validity was addressed through expert review, while construct validity was assessed through factor loadings, composite reliability, Cronbach's alpha and average variance extracted. Full collinearity variance inflation factors were used to assess potential common method bias and multicollinearity concerns.

3.4 Method of Data Analysis

Data were analysed using descriptive statistics and structural equation modelling. Descriptive statistics were used to summarise mean scores, standard deviations, skewness and kurtosis for the major constructs. Structural equation modelling was used to assess the measurement and structural models simultaneously. The method is suitable because the study involves latent constructs measured by multiple indicators and seeks to test several relationships in a single model.

Model quality was assessed using indices including the average path coefficient, average R-squared, average adjusted R-squared, average block VIF, average full collinearity VIF, Tenenhaus goodness of fit, Simpson's paradox ratio, statistical suppression ratio, standardised root mean squared residual and standardised mean absolute residual. These indicators provide evidence on explanatory power, multicollinearity, global fit and residual behaviour.

4. RESULTS AND DISCUSSION

4.1 Descriptive Statistics

The descriptive results indicate that respondents rated all constructs above the scale midpoint. Capacity-related challenges recorded the highest mean score (M = 4.50), followed by financial institution challenges (M = 4.49), institutional barriers (M = 4.43), regulation and policy barriers (M = 4.34), access to green finance (M = 4.30) and awareness of green finance (M = 4.27). These results show that SMEs in the sample perceived green finance access as shaped by both internal preparedness and wider institutional conditions.

The relatively high scores across all constructs indicate that respondents recognised green finance as important, while also reporting notable constraints around capacity, institutions, regulation and financial institution readiness.

Table 1: Descriptive Statistics

Construct	Mean	Std. Deviation	Skewness	Kurtosis
Access to Green Finance	4.30	0.796	-1.07	0.59
Awareness of Green Finance	4.27	0.786	-1.34	1.37

Construct	Mean	Std. Deviation	Skewness	Kurtosis
Regulation and Policy Barriers	4.34	0.773	-1.15	0.54
Institutional Barriers	4.43	0.692	-0.69	-0.55
Capacity-Related Challenges	4.50	0.528	0.28	-0.44
Financial Institution Challenges	4.49	0.614	0.19	0.62

The negative skewness values for most constructs indicate that responses were concentrated towards higher agreement levels. Awareness of green finance showed the lowest mean, although it remained high relative to the midpoint. This suggests that awareness exists but may still be less developed than respondents' perception of capacity and institutional constraints.

The positive skewness recorded for capacity-related and financial institution constructs should be interpreted alongside the wording and coding of questionnaire items.

4.2 Measurement Model Assessment

The measurement results show that all item loadings exceeded 0.60, suggesting adequate indicator reliability across the constructs. The psychometric assessment reported composite reliability coefficients ranging from 0.629 to 0.824, Cronbach's alpha coefficients from 0.712 to 0.819, average variance extracted values from 0.510 to 0.614 and full collinearity VIFs from 1.813 to 2.729. Taken together, the results support the adequacy of the measurement model, convergent validity and the absence of serious multicollinearity or common method bias concerns.

Table 2: Construct Psychometric Properties Assessment

Construct	Items	Loading range	CR	Alpha	AVE	Full VIF
Access to Green Finance	6	0.671-0.802	0.824	0.782	0.530	2.729
Awareness of Green Finance	5	0.738-0.802	0.629	0.742	0.611	1.938
Regulatory and Policy Barriers	6	0.738-0.828	0.716	0.819	0.586	1.903
Institutional Barriers	5	0.722-0.866	0.729	0.712	0.614	2.224
Capacity-Related Challenges	5	0.722-0.866	0.812	0.749	0.510	1.813
Financial Institution Readiness	5	0.722-0.866	0.818	0.714	0.524	1.864

Note. CR = composite reliability; AVE = average variance extracted.

4.3 Model Fit and Quality Indices

The model fit and quality indices indicate satisfactory structural model performance. The average path coefficient was significant (APC = 0.341, $p < .001$), while the average R-squared value (ARS = 0.477, $p < .001$) and adjusted average R-squared value (AARS = 0.461, $p < .001$) show that the model explained a substantial proportion of variation in the endogenous construct. Tenenhaus GoF was 0.511, above the conventional threshold for large effect size. Residual indices were also within acceptable boundaries, with SRMR = 0.078 and SMAR = 0.071.

Table 3: Model Fit and Quality Indices

Index	Value	Interpretation
Average path coefficient (APC)	0.341	p < .001
Average R-squared (ARS)	0.477	p < .001
Average adjusted R-squared (AARS)	0.461	p < .001
Average block VIF (AVIF)	2.163	Acceptable if <= 5; ideally <= 3.3
Average full collinearity VIF (AFVIF)	2.198	Acceptable if <= 5; ideally <= 3.3
Tenenhaus GoF (GoF)	0.511	Large effect threshold >= 0.36
Simpson's paradox ratio (SPR)	1.000	Acceptable if >= 0.70; ideally = 1
Statistical suppression ratio (SSR)	1.000	Acceptable if >= 0.70
Standardised root mean squared residual (SRMR)	0.078	Acceptable if <= 0.10
Standardised mean absolute residual (SMAR)	0.071	Acceptable if <= 0.10

4.4 Hypothesis Testing

The structural model supports all five hypotheses as reported in the analysis. Awareness of green finance positively predicts access to green finance (beta = 0.398, t = 7.709, p < 0.001, f2 = 0.260), indicating that SMEs with stronger knowledge of green finance concepts and opportunities are more likely to access or pursue green finance.

Regulatory and policy barriers also significantly predict access (beta = 0.321, t = 6.121, p < 0.001, f2 = 0.291), showing that the policy and regulatory environment remains central to SME participation in green finance.

Institutional barriers significantly affect access to green finance with a negative coefficient (beta = -0.428, t = -2.258, p < 0.001, f2 = 0.138), confirming that restrictive eligibility criteria, collateral practices and risk-assessment processes can reduce access. Capacity-related challenges also significantly predict access (beta = 0.282, t = 5.690, p < 0.001, f2 = 0.170), while financial institution readiness exerts a significant positive influence (beta = 0.174, t = 3.458, p < 0.001, f2 = 0.103). These findings show that the green finance problem is ecosystem-wide: SMEs need capacity to prepare credible applications, while financial institutions need suitable products, tools and internal readiness to evaluate green projects.

Table 4: Hypothesis Testing Results

Hyp.	Path	Effect	Beta	t-ratio	p-value	f^2	Decision
H1	AWGF -> AGF	Direct	0.398	7.709	< 0.001	0.260	Supported
H2	RPB -> AGF	Direct	0.321	6.121	< 0.001	0.291	Supported
H3	INB -> AGF	Direct	-0.428	-2.258	< 0.001	0.138	Supported
H4	CRC -> AGF	Direct	0.282	5.690	< 0.001	0.170	Supported
H5	FIR -> AGF	Direct	0.174	3.458	< 0.001	0.103	Supported

Note. AGF = Access to Green Finance; AWGF = Awareness of Green Finance; RPB = Regulatory and Policy Barriers; INB = Institutional Barriers; CRC = Capacity-Related Challenges; FIR = Financial Institution Readiness.

Discussion of Findings

The findings confirm that access to green finance among SMEs in South-West Nigeria is

not determined by a single barrier, but by an interacting set of knowledge, regulatory, institutional, enterprise-capacity and financial-sector conditions. The model explains a meaningful proportion of variation in access to green finance, and all five structural paths are significant as reported in the analysis. This pattern strengthens the argument that SME green finance should be treated as an ecosystem problem rather than as a narrow credit supply problem. It also aligns with the broader African literature, which shows that green finance has strong sustainability potential but remains constrained by weak institutional depth, limited market preparation and insufficient SME-oriented delivery channels (Lwesya, 2025; UNEP, 2022).

The positive and relatively strong effect of awareness of green finance on access to green finance is particularly important. The result indicates that SMEs that understand green finance instruments, eligibility conditions and project requirements are more likely to position themselves for access. This finding supports AFI's (2020) view that inclusive green finance for MSMEs must be accompanied by stakeholder consultation, communication and capacity-building. It also agrees with UNEP's (2022) conclusion that weak demand is often perceived by African financial institutions partly because many MSMEs do not know how to identify bankable green projects or present them in finance-ready terms.

The awareness result also extends recent South-West Nigerian evidence. Faloye and Adebanjo (2025) found that green financing positively influences sustainable performance among SMEs in South-West Nigeria, but they also observed that limited awareness, weak policy frameworks and financial constraints slow integration into the Nigerian financial ecosystem. The current study therefore complements their finding by showing that awareness is not only a background condition but a significant empirical predictor of access. In practical terms, awareness should move beyond general sensitisation on climate change and include practical guidance on green loans, renewable energy finance, energy-efficiency investments, environmental documentation and repayment planning.

The significant effect of regulatory and policy conditions shows that green finance access is strongly shaped by the formal policy environment. This is consistent with Raman et al. (2025), who identify nascent regulatory environments, market barriers and capacity constraints as persistent obstacles to mainstreaming sustainable and green finance in developing countries. It also supports Zournatzidou's (2025) bibliometric evidence that green finance, fintech and greentech require coordinated regulatory ecosystems if they are to translate into sustainable development outcomes. In this study, the positive coefficient should be interpreted with attention to item wording. If the items measured improved policy support or reduced barriers, then better regulatory conditions directly improve access. If the items were framed as perceived barriers, then SMEs that are closer to green finance opportunities may also be more conscious of the regulatory difficulties they face. In both interpretations, policy coherence remains central.

This policy finding is also in line with recent evidence from financial institutions. Karmacharya et al. (2025) found that regulatory compliance was one of the important predictors of sustainability performance among financial institutions in Nepal, after customer demand. Hoang et al. (2025) similarly show that regulatory frameworks, financial institutions and enterprise-level initiatives shape green finance access among Vietnamese agricultural SMEs. These findings support the present result by showing that green finance markets need more than funds; they need clear taxonomies, eligibility rules, reporting expectations and incentives that allow banks and SMEs to recognise what counts as a green project.

The negative coefficient for institutional barriers is theoretically consistent and practically significant. It shows that restrictive eligibility requirements, collateral expectations, documentation demands, risk assessment frameworks and unfamiliar appraisal criteria can reduce access to green finance. This finding is consistent with Chien et al. (2021), who found that green innovation among SMEs is hindered by financing requirements, investment levels and bankability constraints. It is also supported by IIED (2016), which argues that the problem in sustainable SME finance is often not the total absence of funds, but the perceived risk held by financiers and the weak business capacity of SMEs seeking funding.

The institutional-barrier finding also supports Mukherjee et al. (2024), who show that early-stage green innovation firms face a shortage of suitable finance models and that many available finance mechanisms are better suited to more mature firms. For SMEs in South-West Nigeria, this means that green finance access may be blocked not because projects lack environmental value, but because financial institutions may lack appropriate appraisal tools for small energy-efficiency, waste-reduction, circular-economy or renewable-energy projects. The finding therefore points to the need for risk-sharing schemes, partial guarantees, blended finance, relationship banking and simplified appraisal templates for smaller green projects.

The significant effect of capacity-related challenges confirms that internal SME readiness remains a major part of the access problem. SMEs need credible financial records, bankable project proposals, knowledge of green technologies, repayment projections and evidence that proposed investments will generate environmental and commercial benefits. This agrees with Molina-Garcia et al. (2025), who found that CEO financial literacy supports environmental sustainability among SMEs through process innovation. It also aligns with Mohapatra et al. (2025), who found that financial knowledge, product evaluation, financial behaviour and financial education are important for fintech adoption and sustainability among micro and small enterprises. These studies reinforce the current result by showing that finance access depends heavily on managerial and technical capability.

Evidence from South-West Nigeria on fintech adoption further supports this interpretation. Okoh et al. (2025) found that regulatory barriers, infrastructure and financial literacy significantly shape fintech adoption among small enterprises in the region. Although that study focused on fintech rather than green finance, the implication is similar: access improves when SMEs have the knowledge, confidence and tools to use specialised finance channels. In the context of green finance, this means that training should not only teach SMEs that green finance exists; it should also help them calculate energy savings, compare technology options, prepare sustainability-linked budgets and communicate environmental benefits in language that lenders can evaluate.

The environmental accounting chapter by Worimegbe and Afrogha (2024) is particularly relevant to the capacity-related result. Their chapter positions environmental accounting as a mechanism for strengthening environmental information, disclosure quality and regulatory readiness. In the current study, capacity-related challenges can therefore be interpreted partly as an environmental information problem. SMEs may be willing to pursue green finance, but if they cannot measure energy costs, waste costs, emissions-reduction potential, resource savings and compliance improvements, they may struggle to make a credible case to financial institutions. This makes environmental accounting a practical bridge between SME sustainability intentions and lender requirements.

The environmental accounting interpretation is further supported by Huy and Phuc (2025), who show that environmental management accounting practices can contribute to strategic

resilience in green innovation contexts, and by Nuryanto et al. (2024), who link environmental management control systems and cleaner production to environmental performance. These studies help explain why green finance applications often require more than standard financial statements. They require environmental cost data, operational indicators and credible disclosure routines. For South-West Nigerian SMEs, simplified environmental accounting templates could therefore improve both capacity readiness and institutional trust.

Financial institution readiness also has a significant positive effect, although its coefficient is lower than those of awareness, regulatory and capacity-related conditions. This result suggests that banks, microfinance institutions and development finance institutions matter greatly, but they cannot solve the access problem alone. They need climate-risk knowledge, green finance product design, internal sustainability policies, sector-specific appraisal tools and partnerships with technical assistance providers. This aligns with Karmacharya et al. (2025), who found that financial institutions' sustainability performance depends on awareness, product availability, regulatory compliance, customer demand and financial incentives. It also supports Zaid et al. (2025), who found that fintech adoption and digital transformation strengthen the relationship between green finance and sustainable performance in financial institutions.

The financial institution readiness result also fits the emerging fintech and green finance literature. Khan and Shahid (2026), in a systematic review of 120 studies, conclude that fintech promotes financial inclusion and lowers transaction costs while green finance channels capital towards low-carbon technologies and climate-resilient infrastructure. This is useful for interpreting the present study because SME green finance access in South-West Nigeria may improve when digital finance platforms are used to reduce transaction costs, collect business information, monitor loan use and track environmental outcomes. However, the same literature also suggests that digital solutions will only work where regulatory clarity, financial literacy and institutional capacity are present.

The findings also have wider implications for Nigeria's low-carbon transition. Udo, Okoh, Oreh, Obieze, Oziegbe and Afrogha (2025) show that green finance, technological innovation and financial globalisation interact in complex ways in MINT economies, while Udo, Chiyem, Abner, Ifeanyi, Okoh and Ajudua (2025) show that Nigeria's energy consumption and carbon emissions nexus remains closely tied to fossil-fuel dependence. Udo et al. (2026) also show that environmental degradation in Nigeria can rebound when renewable energy adoption and environmental governance remain weak. These studies confirm why SME green finance matters: SMEs are embedded in energy use, transport, agriculture, manufacturing, waste handling and services, so their inclusion is necessary for a broad-based green transition.

The current findings deepen prior studies by moving from the general claim that green finance supports sustainability to a more specific explanation of why many SMEs still struggle to access it. The study shows that awareness, policy conditions, institutional barriers, capacity-related readiness and financial institution readiness jointly shape access. It therefore adds firm-level evidence from South-West Nigeria to the wider literature on green finance, sustainable SME performance, fintech-enabled inclusion and environmental accounting. The practical implication is that green finance programmes should combine awareness campaigns, regulatory simplification, SME capacity-building, environmental accounting support, risk-sharing mechanisms and financial institution readiness programmes instead of treating any single intervention as sufficient.

5. CONCLUSION AND RECOMMENDATIONS

The findings show a significant relationship between awareness of green finance, regulatory

and policy barriers, institutional barriers, capacity-related challenges, financial institution readiness and access to green finance. The model demonstrates substantial explanatory power and provides evidence that SME access is shaped by the wider green finance ecosystem rather than by a single supply-side or demand-side factor.

SME access to green finance should be strengthened through demand-side awareness, reduced regulatory and policy barriers, and improved financial institution readiness. SME owners need sustained awareness of green finance opportunities and requirements. Regulators and policy actors need to reduce barriers that make access difficult. Financial institutions also need a favourable operating environment that enables them to design, appraise and deliver green finance products for SMEs.

Policy action should first sustain a high level of awareness among SME owners by providing practical information on eligible green projects, application requirements, documentation standards and available instruments. Regulatory and policy barriers should be reduced through clearer eligibility criteria, simpler procedures and stronger coordination among relevant agencies.

Financial institutions should be supported to design, appraise and deliver SME-focused green finance products, while capacity-building should be embedded into green finance programmes through financial record-keeping, proposal writing, energy audits and sustainability reporting. Risk-sharing mechanisms, credit guarantees and blended finance facilities should also be introduced to reduce concerns about collateral, technology risk and SME default risk. Finally, regulators, financial institutions, state governments, development partners, trade associations and SME support agencies should collaborate to build a coherent green finance ecosystem for SMEs in South-West Nigeria. In addition, SME support agencies should introduce simplified environmental accounting and reporting templates so that small firms can document baseline environmental costs, expected green project benefits and post-financing outcomes in a lender-friendly format.

ACKNOWLEDGMENTS: The authors gratefully acknowledge the Management of the National Open University of Nigeria for providing the 2025 Senate Grant, which supported and facilitated the successful execution of this research work.

REFERENCES

Afrogha, O. O., Worimegbe, T. M., & Edeh, M. B. (2026). Green finance as a catalyst for small business sustainability: Pathways, challenges, and policy implications. In J. O. Akande, Y. S. Hosu, & S. Ndhleve (Eds.), Green financing in emerging economies: Empowering small enterprises for sustainable growth in developing countries (pp. 87-105). Springer Cham. https://doi.org/10.1007/978-3-032-13446-2

Alliance for Financial Inclusion. (2020). Inclusive green finance policies for MSMEs: Survey report. Alliance for Financial Inclusion.

Andriyani, K. A., Iwanda, M. P., & Muharam, H. (2025). The impact of green finance initiatives on SME: A systematic literature review. Economic and Business Horizon, 4(2), 375-384.

Chien, F., Ngo, Q.-T., Hsu, C.-C., Chau, K. Y., & Iram, R. (2021). Assessing the mechanism of barriers towards green finance and public spending in small and medium enterprises from developed countries. Environmental Science and Pollution Research, 28, 60495-60510. https://doi.org/10.1007/s11356-021-14907-1

Faloye, D. O., & Adebanjo, T. O. (2025). Examining the link between green

financing and sustainable performance of SMEs in South-West Nigeria. International Journal of Business, Economics and Entrepreneurship Development in Africa, 13(13), 28-37.

Freeman, R. E. (1984). Strategic management: A stakeholder approach. Pitman.

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). A primer on partial least squares structural equation modeling (PLS-SEM) (3rd ed.). SAGE.

Hoang, H. T., Pham, T. T., & Tran, N. H. (2025). Determinants of green finance and SMEs performance: An empirical study in the Vietnamese agricultural sector. Research on World Agricultural Economy, 6(2), 1130-1143. https://doi.org/10.36956/rwae.v6i2.2031

Huy, P. Q., & Phuc, V. K. (2025). Insight into how environmental management accounting practices and complexity of green innovation management pave the way toward strategic resilience. Journal of the Knowledge Economy, 16, 14146-14179. https://doi.org/10.1007/s13132-024-02461-3

International Institute for Environment and Development. (2016). Unlocking barriers to financing sustainable SMEs: Uphill struggle or attainable ambition? IIED.

Jawadi, F., Pondie, T. M., & Cheffou, A. I. (2024). New challenges for green finance and sustainable industrialization in developing countries: A panel data analysis. SSRN. https://ssrn.com/abstract=4916541

Karmacharya, B., Tiwari, G., & Bhandari, M. (2025). Assessing the role of green finance in enhancing sustainability performance of financial institutions in Nepal using two stage PLS-SEM and ANN approach. Discover Sustainability, 6, Article 1358. https://doi.org/10.1007/s43621-025-02271-w

Kato, A. I., Chiloane-Tsoka, E. G., & Mugambe, P. (2024). Unlocking the potential: The influence of sustainable finance solutions on the long-term sustainability of small and medium-sized enterprises. Cogent Business & Management, 11(1), Article 2391122. https://doi.org/10.1080/23311975.2024.2391122

Khan, I., & Shahid, M. S. (2026). The nexus between fintech and green finance in advancing sustainable performance across countries. Discover Sustainability, 7, Article 49. https://doi.org/10.1007/s43621-025-02268-5

Lwesya, F. (2025). Green finance in Africa: Mapping progress, challenges and prospects. Future Business Journal, 11, Article 195. https://doi.org/10.1186/s43093-025-00596-6

Manoj, S. (2024). Analysing the impact and barriers of green finance in sustainable development: A study from concept to practice. Journal of Global Management Perspectives, 1(1), 22-27. https://doi.org/10.54646/jgmp.2024.04

Mohapatra, N., Das, M., Shekhar, S., Singh, R., Khan, S., Tewari, L. M., Felix, M. J., & Santos, G. (2025). Assessing the role of financial literacy in FinTech adoption by MSEs: Ensuring sustainability through a fuzzy AHP approach. Sustainability, 17(10), Article 4340. https://doi.org/10.3390/su17104340

Molina-Garcia, A., Galache-Laza, M. T., Gonzalez-Garcia, V., & Dieguez-Soto, J. (2025). Financial literacy and environmental sustainability in SMEs: Process innovation as an association mechanism. Eurasian Business Review, 15, 765-802.

https://doi.org/10.1007/s40821-025-00289-8

Mukherjee, A., Owen, R., Scott, J. M., & Lyon, F. (2024). Financing green innovation startups: A systematic literature review on early-stage SME funding. Venture Capital. Advance online publication. https://doi.org/10.1080/13691066.2024.2410730

Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. Journal of Financial Economics, 13(2), 187-221. https://doi.org/10.1016/0304-405X(84)90023-0

Nuryanto, U. W., Basrowi, Quraysin, I., & Pratiwi, I. (2024). Environmental management control system, blockchain adoption, cleaner production, and product efficiency on environmental reputation and performance: Empirical evidence from Indonesia. Sustainable Futures, 7, Article 100190. https://doi.org/10.1016/j.sftr.2024.100190

Okoh, J. I., Stephen, O., Afrogha, O. O., & Adamu, M. A. (2025). Challenges of financial technology (fintech) innovations of small enterprises in South-West, Nigeria. NIU Journal of Social Sciences, 11(1), 207-216.

Raman, R., Ray, S., Das, D., & Nedungadi, P. (2025). Innovations and barriers in sustainable and green finance for advancing sustainable development goals. Frontiers in Environmental Science, 12, Article 1513204. https://doi.org/10.3389/fenvs.2024.1513204

Small and Medium Enterprises Development Agency of Nigeria. (2021). National policy on micro, small and medium enterprises. SMEDAN.

Udo, E. S., Chiyem, I. R., Abner, I. P., Ifeanyi, O., Okoh, J. I., & Ajudua, E. I. (2025). Exploring the energy consumption and carbon emissions nexus in Nigeria. Studia Universitatis Vasile Goldis Arad, Economics Series, 35(3), 92-121. https://doi.org/10.2478/sues-2025-0014

Udo, E. S., Ibobo, B. I., Okoh, J. I., Obieze, E. S., Ubom, A. U., & Oreh, O. O. (2026). Revisiting the environmental Kuznets curve in the Nigerian agricultural sector: A disaggregated analysis of subsectors, green energy finance and urbanization. Discover Sustainability, 7, Article 550. https://doi.org/10.1007/s43621-025-02535-5

Udo, E. S., Okoh, J. I., Agbadua, O. B., Akpan, E. J., Okuji, O. O., & Ajudua, E. I. (2025). Finance, governance, and renewable energy transitions in Sub-Saharan Africa: Testing the energy Kuznets curve. Folia Oeconomica Stetinensia, 25(2), 304-328. https://doi.org/10.2478/foli-2025-0034

Udo, E. S., Okoh, J. I., Oreh, O. O., Obieze, S. S., Oziegbe, D. J., & Afrogha, O. (2025). Green finance, technological innovation and financial globalization: Assessing environmental quality in MINT economies. Journal of Renewable Energy and Environment, 12(2), 85-95. https://doi.org/10.30501/jree.2025.484493.2130

United Nations Environment Programme. (2022). Assessment of green financing mechanisms for MSMEs in Africa: Final report. UNEP.

Worimegbe, T. M., & Afrogha, O. O. (2024). Environmental accounting for a quality regulatory framework. In R. Frazer-Williams, M. B. Ogundiran, & E. I. Unuabonah (Eds.), Environmental pollution and public health: Case studies on air, water and soil from an interdisciplinary perspective (pp. 327-336). Elsevier. https://doi.org/10.1016/B978-0-323-95967-4.00005-2

World Bank. (2020). Small and medium enterprises (SMEs) finance. https://www.worldbank.org/en/topic/smefinance

Zaid, M. A. K., Khan, M. F., Al-Mekhlafi, A.-W. A.-G. S., Al Koliby, I. S., Saoula, O., Saeed, H. A. E. M., & Mohammad, R. A. (2025). The future of green finance: How digital transformation and FinTech drive sustainability. Discover Sustainability, 6, Article 480. https://doi.org/10.1007/s43621-025-01356-w

Zournatzidou, G. (2025). Green finance and sustainable development: Investigating the role of greentech business ecosystem through PRISMA-driven bibliometric analysis. Administrative Sciences, 15(4), Article 150. https://doi.org/10.3390/admsci15040150