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Green Entrepreneurial Practices Adoption Among Small and Medium Enterprises: Evidence from Niger State, Nigeria

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Abstract

Small and Medium Enterprises (SMEs) are widely recognised as the key contributors to Nigeria's economic development; despite their economic importance, SME operations frequently leave considerable environmental trails. The pursuit of sustainable entrepreneurship has brought Green Entrepreneurial Practices (GEPs) to the forefront, emphasising the integration of environmental responsibility into business decision-making. This research explores the adoption patterns of Green Entrepreneurial Practices among Small and Medium enterprises with particular emphasis on the extent of their adoption, the preferred green practices and the challenges impeding their successful implementation. The study adopted a mixed-methods design, and data were gathered from 400 SMEs based on a sample size calculated using Taro Yamane (1967), utilising structured questionnaires, key informant interviews (KIIs), and focus group discussions (FGDs). The study combined descriptive and inferential statistics with qualitative narratives. Findings indicate that SMEs in Niger State adopt GEPs selectively, prioritising low-cost, high-return strategies such as operational efficiency and green marketing. Practices such as product innovation, sustainability reporting, and employee engagement are less widely embraced, reflecting barriers related to finance, technology, and knowledge. Interview and FGD evidence revealed that while SMEs recognise the value of advanced green practices, their adoption is constrained by the high cost of green technologies, limited access to training, weak regulatory enforcement, and market pressures from customers who prioritise affordability over eco-friendliness. The study concludes that SMEs adopt GEPs pragmatically, balancing the immediate need for financial survival with gradual efforts toward sustainability. It recommends targeted government interventions, including subsidies for green technologies, simplified compliance processes, enhanced awareness campaigns, and sector-specific capacity-building initiatives.

Keywords: Green entrepreneurship, SMEs, Adoption patterns, Sustainability, Niger State, Nigeria

Introduction

Small and Medium Enterprises (SMEs) remain the lifeblood of economic development across the world, and particularly in developing economies such as Nigeria. They account for over 80% of employment opportunities and contribute significantly to Gross Domestic Product (GDP), making them indispensable for poverty alleviation, innovation, and wealth creation (SMEDAN & NBS, 2021). In Niger State, SMEs are found across key sectors including agriculture, manufacturing, services, and retail, providing livelihoods for thousands of households. Despite their pivotal role, however, SMEs are frequently associated with unsustainable practices such as inefficient resource utilisation, indiscriminate waste disposal, and reliance on environmentally harmful technologies (Osakwe et al., 2022). These practices not only threaten environmental sustainability but also undermine the long-term competitiveness of SMEs.

The growing threats of climate change, land degradation, and pollution have necessitated a shift in entrepreneurial orientation from the narrow pursuit of profit to the integration of sustainability principles. This has given rise to the concept of Green Entrepreneurial Practices (GEPs), which involve embedding environmentally responsible and socially inclusive strategies into the creation, operation, and growth of enterprises (Liu et al., 2022).

Green entrepreneurship emphasises balancing profitability with ecological preservation and social well-being, positioning entrepreneurs as critical agents of sustainable development. At the global level, GEPs align with international commitments such as the Paris Climate Accord and the United Nations Sustainable Development Goals (SDGs), particularly Goal 8 (Decent Work and Economic Growth), Goal 9 (Industry, Innovation, and Infrastructure), and Goal 13 (Climate Action).

In Nigeria, policy frameworks such as the National Environmental Standards and Regulations Enforcement Agency (NESREA) Act and the Renewable Energy Master Plan have highlighted the urgency of promoting sustainable enterprise development (Davis & Kotowski, 2022). Nevertheless, the extent of adoption of GEPs among Nigerian SMEs remains uneven. While some enterprises have embraced energy efficiency, eco-branding, and waste minimisation strategies, many others continue to prioritise immediate profitability over environmental stewardship (Enahoro, 2019). Financial constraints, technological gaps, inconsistent regulatory enforcement, and low consumer demand for eco-friendly products continue to act as barriers to widespread adoption.

The case of Niger State illustrates these dynamics vividly. As a strategically located state in North-Central Nigeria, with close ties to the Federal Capital Territory (FCT), Niger State hosts a wide range of SMEs that provide vital goods, services, and employment (Enyi et al., 2023). However, SMEs in the state also face challenges of poor infrastructure, limited access to modern technologies, and weak institutional support (Oluwamehinola & Chima, 2023). At the same time, the state faces environmental problems such as deforestation, flooding, and waste mismanagement, which makes the adoption of green practices not only desirable but necessary.

It is against this backdrop that this study investigates the adoption of Green Entrepreneurial Practices among SMEs in Niger State. The study is both relevant and timely. At a

period when sustainability is gaining global and national attention, there is a critical need to generate empirical evidence on how SMEs in Niger State are responding to the green entrepreneurship agenda. By examining adoption patterns, constraints, and implications for performance, this study provides insights that can inform policymaking, strengthen SME competitiveness, and contribute to Nigeria's broader sustainable development goals. Specifically, it addresses three research questions:

1. What types of GEPs are adopted by SMEs in Niger State?
2. What factors influence the adoption of these practices?
3. What challenges hinder SMEs from adopting advanced green practices?

By answering these questions, the study contributes to the literature on sustainable entrepreneurship in Nigeria, providing empirical evidence on how SMEs navigate the balance between economic survival and environmental responsibility.

Concept of Green Entrepreneurship

Green entrepreneurship is increasingly regarded as one of the most transformative approaches to enterprise creation and management in the twenty-first century. Unlike conventional entrepreneurship, which is often motivated by profit maximisation and rapid market expansion, green entrepreneurship integrates sustainability principles into the core of business operations (Enyi et al., 2023). This approach seeks to reconcile the tension between economic growth and ecological preservation by ensuring that entrepreneurial activities contribute not only to financial prosperity but also to social welfare and environmental sustainability.

Dean and McMullen (2017) define green entrepreneurship as entrepreneurial activity that addresses market failures associated with environmental degradation while simultaneously creating economic opportunities. This definition highlights two important dimensions: first, that green entrepreneurs are problem-solvers who respond to environmental challenges such as waste generation, climate change, and resource depletion; and second, that they are innovators who transform these challenges into opportunities for growth and competitiveness (Enahoro, 2019). By bridging these two dimensions, green entrepreneurs occupy a unique position as agents of both economic transformation and ecological stewardship.

Within the Nigerian context, the concept of green entrepreneurship is particularly relevant. Nigeria, as Africa's most populous country, is confronted with extensive environmental challenges arising from deforestation, soil erosion, oil pollution, industrial emissions, and poor waste management (Osakwe et al., 2022). Small and Medium Enterprises, though central to national development, often contribute significantly to these challenges through inefficient production processes and resource misuse. Therefore, embedding sustainability within SMEs through green entrepreneurship offers a viable path to mitigate environmental degradation while sustaining livelihoods (Gao et al., 2023).

The global push for green entrepreneurship is further reinforced by the Sustainable Development Goals (SDGs), particularly Goal 8 (Decent Work and Economic Growth), Goal 9 (Industry, Innovation and Infrastructure), and Goal 13 (Climate Action). These goals call for innovation-driven industrialisation and urgent action to combat climate change while sustaining economic opportunities (Enyi et al., 2023). Similarly, Nigeria's international commitments, such as the Paris Agreement on Climate Change, underscore the need for businesses, including SMEs, to adopt practices that reduce greenhouse gas emissions and improve environmental performance (Davis & Kotowski, 2022).

Beyond global commitments, green entrepreneurship also aligns with Nigeria's national policies. Agencies like the National Environmental Standards and Regulations Enforcement Agency (NESREA)

and programmes such as the Renewable Energy Master Plan demonstrate efforts to integrate sustainability into business and industrial development (Ischei et al., 2024). SMEs, by virtue of their size and flexibility, are particularly well-positioned to adopt such initiatives. Yet, in reality, their adoption remains inconsistent due to financial and institutional challenges (Osakwe et al., 2022).

In essence, green entrepreneurship represents more than a business trend; it is an imperative for sustainable development. For SMEs in Niger State and Nigeria at large, it offers a pathway to reconcile economic competitiveness with ecological preservation, positioning them not only as contributors to national GDP but also as custodians of environmental integrity.

Green Entrepreneurial Practices

Green Entrepreneurial Practices (GEPs) are the practical manifestations of the green entrepreneurship concept. They refer to the operational strategies, routines, and initiatives that enterprises implement to align business processes with principles of sustainability. These practices range from basic efficiency measures to advanced sustainability systems, reflecting the diversity of strategies available to entrepreneurs depending on resources and institutional contexts.

Operational efficiency is often regarded as the most accessible entry point for SMEs. It encompasses measures such as reducing energy consumption, minimising waste, recycling materials, and optimising resource use. By focusing on efficiency, SMEs achieve a dual advantage: lowering operational costs while simultaneously reducing environmental harm (Abdullah & Ismail, 2019). Many Nigerian SMEs have embraced efficiency-driven measures such as switching to energy-efficient bulbs, minimising fuel consumption, and improving waste management because they produce immediate and visible savings (Enyi et al., 2023).

Green marketing has also gained traction as SMEs recognise the reputational benefits of eco-branding. Through environmentally conscious advertising, packaging, and customer engagement, SMEs position themselves as responsible and forward-looking. For example, SMEs in the services and retail sectors often highlight eco-friendly sourcing or reduced plastic use as part of their market strategy. By doing so, they not only retain customers but also tap into emerging markets that value sustainability (Abdullah & Ismail, 2019).

Product innovation is another critical GEP, though less commonly adopted due to its resource intensity. It involves restructuring processes to cut ecological effects, integrating life cycle assessment codes, and making products with longer longevity or lower emissions. For manufacturing SMEs, product innovation encompasses initiatives such as the adoption of biodegradable packaging and developing energy-efficient products (Ischei et al., 2024). Despite its resource-intensive nature, product innovation contributes to long-term competitiveness and business sustainability, permitting SMEs to distinguish themselves progressively in environmentally friendly markets (Enyi et al., 2023).

The adoption of sustainability metrics and reporting reflects a high level of organisational commitment to environmental sustainability. This encompasses organised evaluation, disclosure, and dissemination of a firm's eco-friendly effect, energy utilisation, and management of waste (Oluwamehinola & Chima, 2023). Universally, sustainability reporting is widely recognised as a mechanism for enhancing corporate transparency and accountability. In Nigeria context, sustainability reporting is emerging, particularly among SMEs owing to perceptions that it is costly and requires substantial technical expertise (Abdullah & Ismail, 2019).

For the successful implementation of GEPs, employee engagement is likewise imperative. Training employees on sustainability, fostering environmental responsibility in organisational culture, and inspiring environmental practices within establishments are vital for GEPs integration. The successful

implementation of operational changes and sustainability initiatives largely depends on employee participation and awareness (Oluwamehinola & Chima, 2023).

For GEPs to be viewed as isolated initiatives, they should be understood as a variety of interconnected strategies pursued incrementally in line with a firm's context and resource capacity. In Niger State, for instance, SMEs' adoption configurations differ extensively, depicting changes in sector, size, resources, and organisational experience (Davis & Kotowski, 2022). Despite these differences, GEPs prove their potential to provide ecological, social, and economic benefits consecutively.

Barriers to Adoption of Green Entrepreneurial Practices

Although the importance of GEPs is extensively acknowledged, their adoption varies considerably across firms and contexts, mainly in emerging markets. Several systemic constraints continue to hinder the effective transition of SMEs from traditional to green entrepreneurship (AbdulAziz et al., 2019).

Prime among these is funding. Environmentally friendly technologies, green certifications, renewable energy systems, and ecological raw materials necessitate substantial advance venture (Audu, 2022).

Limited access to credit and high cost of borrowing make such investments prohibitively expensive for SMEs. Enahoro (2019) argued that limited financial resources remain the primary constraint hindering sustainability transitions of SMEs. This clarifies why SMEs desire to embrace affordable processes like energy conservation while limiting investment in capital-intensive and innovation-driven strategies.

In addition to financial constraints, technological obstacles remain a major impediment to the adoption of GEPs. Numerous SMEs depend on obsolete machinery that is unproductive and ecologically destructive. Availability to obtain modern, energy-saving technologies is constrained by high cost, inadequate infrastructure, and weak supply chains (Audu, 2022). Nigeria's unreliable energy source further complicates these encounters, deterring SMEs from participating in sustainable energy schemes or innovative technology that need steady power.

Regulatory and compliance pressures likewise discourage Small and Medium Enterprises. Though Nigeria has advanced environmental laws and standards through agencies such as NESREA, implementation continues to be uneven, feeble, and occasionally discriminatory (Ajike & Nwakoby, 2022). Many entrepreneurs view compliance requirements as a significant financial burden, indeterminate, and occasionally punitive rather than supportive. This reduces their willingness to voluntarily adopt green entrepreneurial practices.

Limited knowledge and technical skill gaps present another major obstacle. The limited technical expertise and inadequate training of SME operators hinder the successful implementation of green entrepreneurial initiatives. Numerous entrepreneurs acknowledged consciousness of sustainability perceptions in FGDs led in Niger State, but admitted that they lack the required practical knowledge concerning incorporating them into their operations (Akpan et al., 2023).

Cultural and market-related factors also constitute significant obstacles to the adoption of GEP. Price considerations often outweigh environmental concerns among consumers in Nigeria, particularly those in lower-income groups. Thus, SMEs experience slight motivation to participate in eco-friendly substitutes in the absence of strong market demand. AbdulAziz et al. (2019) perceived that low consumer demand for environmentally friendly products discourages SMEs from investing in sustainability business practices, especially as consumers see additional costs as related to eco-friendly production.

Taken together, these barriers underscore that the adoption of GEPs by SMEs is not merely a matter of willingness or awareness. Rather, it reflects systemic challenges rooted in financial access, technological capability, regulatory frameworks, knowledge diffusion, and consumer behaviour.

Overcoming these barriers requires coordinated interventions from government, development partners, and SME associations.

Theoretical Framework

The theoretical foundation of this study is based on three complementary perspectives: Resource-Institutional Theory; Based View (RBV); and the Triple Bottom Line (TBL). Collectively, these three theories provide a robust theoretical foundation for explaining adoption and non-adoption of Green Entrepreneurial Practices (GEPs) among Small and Medium Enterprises (SMEs) in Niger State.

Institutional Theory

Institutional Theory explains how external institutional pressures influence organisational behaviour. DiMaggio and Powell (1983) confirm that firms operate within institutional environments where coercive, normative, and mimetic pressures influence conformity to prevailing institutional expectations. With respect to GEPs, these institutional pressures comprise industry trends, regulatory requirements, customer expectations, and societal norms.

Coercive pressures arise from government regulations and public policies that require firms to comply with them. For instance, the National Environmental Standards and Regulations Enforcement Agency (NESREA) enforces environmental standards that guide the operation of SMEs in Nigeria. Although regulatory enforcement is uneven, SMEs may implement selected green entrepreneurial practices to meet regulatory demands or to escape consequences (Akpan et al., 2023). Normative pressures arise from societal values and professional norms, industry standards. In Nigeria, public awareness of climate change and environmental degradation has increased significantly in recent years, and SMEs are progressively expected to exhibit corporate social responsibility. Mimetic pressures arise when firms emulate competitors that have successfully adopted green practices to enhance legitimacy or competitiveness (Ajike & Nwakoby, 2022). For example, when SMEs in Minna or Bida adopt sustainability marketing and gain favourable customer responses, others may be encouraged to emulate them to remain competitive and meet evolving market expectations.

Institutional Theory is mainly worthwhile for clarifying why SMEs adopt eco- practices that do not generate immediate financial return but enhance legitimacy, reputation and societal expectation. The theory further explains why adoption may be inconsistent among SMEs. Greater regulatory enforcement and consumer activism encourage SMEs to adopt green entrepreneurial practices, while firms in rural areas with limited institutional oversight may exhibit a lower level of adoption.

Resource-Based View (RBV)

While Institutional theory stresses outsourcing, the Resource-Based View (RBV) emphasises that the capability of firms to attain and sustain competitive benefit is determined by their ownership and disposition of rare, valuable, unique, incomparable, and irreplaceable resources (Barney, 1991). From an RBV perspective, GEPs represent valuable strategic resources that generate competitive advantage while improving environmental performance (Ischei et al., 2024). Eco-branding, waste reduction and energy efficiency practices do not merely lessen operational costs; in addition, they function as valuable intangible assets that improve organisational competitiveness.

Resource Base View offers a valuable framework for firms in Niger State, explaining why firms that integrate sustainability into their operations are more likely to achieve superior long-term performance than their competitors (Osakwe et al., 2022). For example, an SME that invests in renewable energy or green packaging may incur upfront costs; however, in the long run gains reputational capital and

achieves a reduction in production costs. These strategically embedded resources are difficult to imitate, thereby generating a sustained competitive advantage.

Resource Base View, Yet, indicate the constraints of Small and Medium Enterprises. Small and Medium Enterprises frequently encounter challenges in obtaining the resources desired for sustainability, dissimilar to large businesses with substantial financial resources. Consequently, many adopt low-cost sustainability practices like operational efficiency that require minimal financial investment, instead of innovation-driven strategies such as eco-design or sustainability reporting, which typically have higher implementation costs (AbdulAziz et al., 2019). Therefore, the Resource Base View assist in explaining the discerning adoption outlines perceived among Small and Medium Enterprises, where limited resources determine entrepreneurial strategic decisions.

Triple Bottom Line (TBL)

The Triple Bottom Line framework, developed and popularised by Elkington (1997), broadens the assessment of organisational performance beyond financial performance to encompass social wellbeing (people) and environmental sustainability (planet). The framework advocates balancing to achieve economic prosperity, social responsibility, and environmental sustainability. According to the Triple Bottom Line framework, organisational success is measured by balancing economic outcomes but also by their contributions to social responsibility and environmental sustainability (AbdulAziz et al., 2019). Triple Bottom Line Framework (TBL) explains the persistence risks of concentrating exclusively on economic outcomes; however, disregarding social wellbeing and environmental sustainability responsibilities of Small and Medium Enterprises (SMEs) in Niger State. Although financial outcomes are often a concern of survival-driven entrepreneurs, the TBL framework indicates that overlooking environmental sustainability may undermine long-time organizational performance through regulatory sanctions, reputational risks, and reduced market competitiveness (Davis & Kotowski, 2022). Likewise, overlooking social well-being tasks, like community engagement and employee welfare, can weaken over time steadiness and progression.

The TBL framework offers a comprehensive framework for assessing the sustainability of SMEs' practices. Operational efficiency and green marketing contribute to the profit dimension of the TBL framework, enhancing financial performance and market competitiveness, whereas product innovation and sustainability reporting are essential for promoting environmental sustainability under the planet dimension (Morrin-Simba, 2023). In contrast, employee engagement relates to the people dimension. By integrating GEPs across the economic, social and environmental dimensions, SMEs can progress from short-term survival strategies to long-term sustainability business practices (Davis & Kotowski, 2022).

As a whole, Institutional Theory, Resource-Based View, and Triple Bottom Line frameworks provide a comprehensive theoretical framework for explaining the adoption of Green Entrepreneurial Practices (GEPs) among SMEs. While Institutional Theory explains the influence of external institutional Pressure. Resources Based-View highlight the role of internal resources and capabilities, and the Triple Bottom Line framework emphasises the economic, social, and environmental objectives. In achieving sustainable organisational performance.

This combination of these perspectives is principally significant for understanding SMEs in Niger State, where financial limitations, inconsistent regulatory enforcement, and consumer preferences interact to shape adoption of GEPs. While Institutional Theory enlightens organisational conformity, the Resource-Based View explains why resource scarcity leads to selective adoption of GEPs, whereas the Triple Bottom Line (TBL) offers a normative vision of what balanced economic, social and

environmental sustainability is. Mutually, these theories provide a strong groundwork for evaluating adoption outlines and for suggestion intercessions that can enable Small and Medium Enterprises to overcome systemic obstacles.

Theoretical Framework of the Study

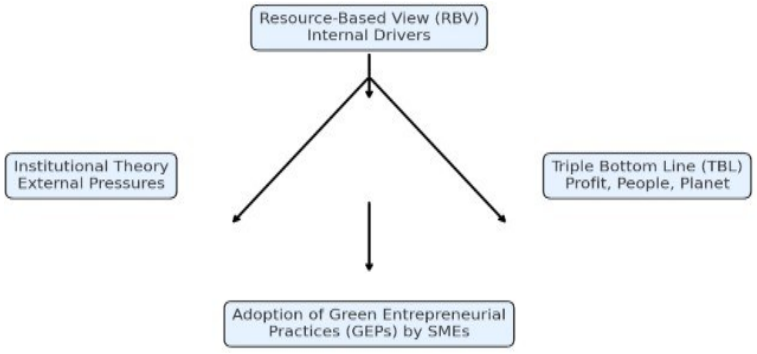


Figure 1. Theoretical Framework

The integrated theoretical framework explains how internal organisational resources, external institutional pressures, and the pursuit of balanced sustainability collectively influence the adoption of Green Entrepreneurial Practices among Small and Medium Enterprises.

Study Area

The study is conducted in Niger State, which is situated in the North-Central geopolitical zone of Nigeria. Niger State covers an estimated 76,363 km², making it the largest state in Nigeria in terms of landmass (NSG, 2018). The study area is geographically located between latitude 8º30'00"N and 11º30'00"N, and longitude 3°30'00"E and 7°20'00"E. The state exhibits a diverse physical landscape, with elevation ranges from approximately 100 to 450 meters above sea level, comprising rivers, valleys, hills, and plains. The state shares boundaries with Kaduna State to the northeast, Kebbi State to the northwest, Kwara State to the southwest, and the Federal Capital Territory (FCT) to the southeast (Sahntali, 2021). The state also shares an international boundary with the Republic of Benin along its western border.

Administratively, Niger State consists of three senatorial districts- Niger North, Niger East, and Niger South- made up of 25 Local Government Areas (LGAs) (Sahntali, 2021). Minna, the capital of Niger State, serves as the principal administrative and political centre, while Bida, Kontagora, Suleja, and Mokwa constitute other major urban centres within the state. This administrative structure facilitates resource allocation, governance, and coordinated development planning across the state.

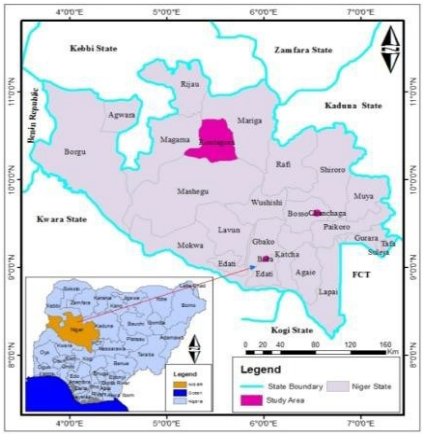


Figure 2: Map of Niger State Showing Study Area.
Source: Modified From Administrative Map of Niger State

The State is characterised by a tropical continental climate with two clearly defined seasons: the wet season, which lasts from April to October and the dry season, which extends from November to March. Rainfall distribution in the state varies from about 1,100 mm in the northern region to 1,600 mm in the southern region, with the highest precipitation recorded during July and August. Niger State experiences a warm tropical climate with an average temperature of 25ºC in December and 33ºC in April (Balarabe & Usman, 2015).

The favourable rainfall and temperature conditions promote extensive agricultural activities, which constitute the backbone of the state's economy.

The State is richly endowed with diverse natural resources and renewable energy sources. The state possesses substantial hydropower resources and hosts the Kainji, Shiroro, and Jebba dams, which are major sources of electricity generation in Nigeria (Yusuf et al., 2023). The state also enjoys abundant solar radiation, with average solar irradiation approximately 5.5 kWh/m²/day, providing favourable conditions for the development of solar energy projects (Yusuf et al., 2023). Notwithstanding its substantial renewable energy potential, Niger State still faces an electricity supply deficit, frequent blackouts, and considerable dependence on fossil-powered generators. The coexistence of abundant renewable energy resources and persistent energy shortage underscores the importance of examining renewable energy adoption as a pathway to environmental sustainability.

The economy of Niger State is predominantly agrarian, with agriculture employing over80% of the population. The fertile agricultural land supports the farming of essential crops such as rice, yam, sorghum, cassava, millet, maize, and peanuts, as well as cattle farming (Sahntali, 2021). In addition to supporting fishing and agriculture, the Niger and Kaduna rivers facilitate economic activities, while trade and small-scale enterprises aid the local economy's development. However, deficiencies in infrastructure, unstable energy supply, and climate variability remain significant challenges to the state's economic growth and development.

Given its abundant renewable energy potential, diverse economic activities, and persistent energy challenges, Niger State provides an ideal context for examining environmental sustainability and renewable energy adoption. Notwithstanding its vast hydropower and solar energy resources, the state remains confronted with recurring energy challenges and considerable dependence on fossil fuels, which hinder economic progress and environmental sustainability (Audu, 2022). These distinct attributes provide an appropriate context for evaluating the potential of renewable energy technologies to support sustainable development (Yusuf et al., 2023).

METHODOLOGY

This study adopted a mixed-methods research design, combining quantitative and qualitative methods to offer an all-inclusive analysis of the adoption of Green Entrepreneurial Practices (GEPs) among Small and Medium Enterprises (SMEs) in Niger State. The adoption of a mixed-methods approach was based on the need to integrate statistical generalisation with contextual depth, thus improving the rationality and fruitfulness of the findings.

The study population comprised all registered Small and Medium Enterprises (SMEs) functioning across the three senatorial zones of Niger State, covering manufacturing, agriculture, services, and retail sectors. It was basic to use a multi-stage sampling procedure to guarantee satisfactory sectoral and geographical representation, given the multiplicity of the Small and Medium Enterprises landscape. The first stage involved stratifying SMEs by sector to ensure adequate representation of manufacturing, agriculture, services, and retail. The second stage involved the application of proportional allocation to reflect the relative distribution of each sector within the state. In the final stage, systematic sampling was employed within each stratum to select respondents, thereby ensuring adequate representation of both newly established and matured firms. The sampling procedure produced a sample size of 400 SMEs, which was considered adequate for strong statistical analysis and was determined in accordance with Yamane's (1967) sample size formula for finite populations.

The study employed multiple data collection methods, including structured questionnaires, complemented by key informant interviews (KIIs) and focus group discussions (FGDs) to ensure

comprehensive understanding of the research problem. The questionnaire was specifically designed to elicit data on the types of Green Entrepreneurial Practices adopted, the determinants of GEPs, and the obstacles compelling its application. Key Informant Interviews (KIIs) were conducted with representatives of SME associations and appropriate government agencies to elicit expert perspectives on the policy, institutional, and regulatory environment affecting GEPs adoption. Focus Group Discussions were conducted with owners of SME in Minna, Bida, and Kontagora to explore their experiences, perceptions, and practical challenges regarding the adoption of green entrepreneurial practices. The use of multiple data collection instruments facilitated methodological triangulation, enhancing credibility, breadth and depth of evidence obtained.

The study employed descriptive and inferential statistical techniques for the quantitative data, complemented by thematic analysis of the qualitative data. Responses from the structured questionnaires were coded and analysed using the Statistical Package for the Social Sciences (SPSS), version 24, producing statistical measures such as means, correlations, and variability pointers that defined adoption trends and variable relationships. Conversely, qualitative data obtained from Key Informant Interviews and Focus Group Discussions were transliterated, coded, and analysis thematic to recognise repetitive patterns, emerging themes, and explanatory narratives that complemented the quantitative findings. The integration of quantitative and qualitative findings combined numerical precision with interpretive depth, thereby providing a balanced understanding of the dynamics of Green Entrepreneurial Practices adoption among SMEs in Niger State.

RESULTS AND DISCUSSION

This section presents the findings of the survey conducted among SMEs in Niger State, complemented by insights obtained from key informant interviews (KIIs) and focus group discussions (FGDs), thereby integrating quantitative and qualitative evidence. The results are presented in tabular form, followed by detailed interpretations that integrate quantitative proof with qualitative perceptions. At the end, a combination of the inclusive discussion is offered.

Adoption Patterns of Green Entrepreneurial Practices

Table 4.1: Adoption of Green Entrepreneurial Practices by SMEs in Niger State (n = 400)

Green Practice	Frequency	Percentage (%)	Mean ($\bar{x}$)	Std. Deviation (SD)
Operational Efficiency	236	59.0	3.87	0.96
Green Marketing	214	53.5	3.74	1.02
Product Innovation	192	48.0	3.41	1.11
Sustainability Metrics	176	44.0	3.25	1.08
Employee Engagement	168	42.0	3.18	1.15

Source: Field Survey, 2025

The findings reveal that small and medium enterprises primarily adopted Green Entrepreneurial (GEPs) Practices related to operational efficiency and green marketing. Over half of the SMEs reported implementing green practices, attributing their adoption primarily to cost reduction and enhanced customer appeal. Evidence from Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs) corroborate this. One SME owner in Minna remarked: “Operational efficiency is a must; it helps us cut costs immediately.” A participant from Bida observed: “Green marketing is inexpensive and effective. Another participant in Kontagora noted: Customers like to hear that our products are eco-friendly.”

Conversely, product innovation, sustainability metrics, and employee engagement exhibited lower levels of adoption, reflecting their greater financial investment and technical expertise. As one respondent explained: "Certification and redesigning products is too costly for us." The standard deviations (stretching between 0.96 and 1.15) also suggest disparity in adoption among SMEs, reflecting differences in size, sector, and availability of resources. These findings are consistent with previous studies (Dean & McMullen, 2017; Enyi et al., 2023; Abdullah & Ismail, 2019), which found that SMEs typically adopted low-cost sustainability initiatives before investing in more resource-intensive GEPs.

Challenges Constraining Adoption of GEPs

Table 4.2: Challenges Faced by SMEs in Implementing GEPs (n = 400)

Challenge Category	Frequency	Percentage (%)	Mean ($\bar{x}$)	Std. Deviation (SD)
Financial Constraints	298	74.5	4.11	0.83
Technological Limitations	264	66.0	3.94	0.91
Regulatory/Compliance Burdens	242	60.5	3.71	1.02
Knowledge and Skill Gaps	238	59.5	3.68	0.97
Market & Cultural Barriers	224	56.0	3.55	1.08

Source: Field Survey, 2025

The table reveals that financial restraints constitute the greatest obstacle hindering SMEs' green practices adoption, followed by technological limitations ranking as the second most critical challenge. Interview findings further supported these results as a manager in Minna emphasised that: "Environmentally friendly machinery and green certifications require substantial funding; notwithstanding that we appreciate the benefits, we lack financial resources to implement them." The findings also reveal significant technological limitations, with many SMEs relying on obsolete equipment and lacking access to green technologies.

Also reported were regulatory burdens, market barriers, and knowledge and skill deficits with major encounters. The respondents further highlighted inconsistencies in environmental regulations and inadequate government support as major obstacles to achieving compliance. A Kontagora-based entrepreneur perceived: "Regulatory standards continue to change, cost of certification is high, and there is inadequate government support to enable compliance." Discussions during the Focus Group Discussions exposed that strong demand for cheaper products limits SMEs' willingness to invest in environmentally friendly substitutes: a participant from Bida stated that, "Affordability is the main priority for our customers; whenever a green product is priced higher, customers tend to purchase the cheaper option."

These outcomes back previous works by Enahoro (2019), Abdullah & Ismail (2019), and AbdulAziz et al. (2019), all of which acknowledged financial, technological, regulatory, and market constraints as major obstacles to sustainability progression in Nigeria.

Nonetheless, the findings and their interpretations demonstrate that SMEs in Niger State adopt GEPs selectively and slowly, prioritising low-cost practices such as operational efficiency and green marketing. The relatively low adoption of green practices such as product innovation and sustainability reporting can be attributed to financial limitations and weak institutional support. This result-orientation

approach echoes sustenance-focused strategic choices, in line with Dean and McMullen's (2017) disagreement that SMEs in emerging economies adopt sustainability gradually.

The results are also consistent with Enyi et al. (2023), who found that Nigerian SMEs are more likely to adopt practices that offer immediate financial return and enhance their reputation. The findings verify Enahoro (2019), who argued that inadequate financial resources and fragile institutional implementation are the main challenges to the adoption of sustainability metrics and employee engagement practices. The evidence from the Key Informant Interviews and Focus Group Discussions enriches this analysis by demonstrating that Small and Medium Enterprises' adoption decisions are influenced as much by consumer behaviour and weak regulatory enforcement as by their internal awareness and resource availability. This implies that Small and Medium Enterprises' recognition of the importance of green practices alone is insufficient, as their adoption remains contingent upon supportive institutional, financial, and policy frameworks.

The study emphasises that SMEs in Niger State adopt logical survival green strategies. However, institutional obstacles constrain their progression toward comprehensive sustainability. Solving these obstacles through targeted financial incentives, capacity-building programmes, and regulatory reform is essential if Small and Medium Enterprises are to broaden the adoption of green entrepreneurial practices and make meaningful contributions to sustainable development.

Nevertheless, the adoption outlines perceived reflect the challenges acknowledged in this study. Small and Medium Enterprises prefer operational efficiency and green marketing exactly because these practices need relatively little capital and provide immediate benefits. In contrast, product innovation, sustainability reporting, and employee engagement are less prevalent because their implementation is constrained by financial resources, technology capacity, and the burden of regulatory compliance.

Evidence from Focus Group Discussions strengthened these findings. A respondent from Bida explained: "Environmentally friendly designs need innovative technologies and knowledge. We only concentrate on efficiency and low-cost strategies." This rational approach reveals that small and medium enterprises strive to live while progressively responding to sustainability expectations.

CONCLUSION AND RECOMMENDATIONS

Conclusively, **t**he study examined the adoption patterns of Green Entrepreneurial Practices (GEPs) among Small and Medium Enterprises (SMEs) in Niger State, Nigeria. Evidence from survey data, key informant interviews (KIIs), and focus group discussions (FGDs) shows that SMEs adopt GEPs selectively and incrementally. Operational efficiency and green marketing were the most widely practised strategies because they are low-cost and deliver immediate financial and reputational benefits. In contrast, product innovation, sustainability reporting, and employee engagement were less common, reflecting the higher financial, technical, and institutional demands they place on firms.

The study also revealed that SMEs face systemic barriers to adopting GEPs. Financial constraints emerged as the most critical challenge, followed by technological limitations, regulatory and compliance burdens, gaps in knowledge and skills, and market realities such as consumer preference for cheaper products. These constraints compel SMEs to adopt survival-oriented practices while deferring more advanced sustainability commitments.

Thus, the findings confirm that SMEs in Niger State are pragmatic actors balancing economic survival with gradual steps toward sustainability. Without targeted support to address financial, technological, regulatory, human capital, and market barriers, most SMEs will remain locked into basic green practices rather than transitioning to comprehensive and long-term sustainability models.

Based on these conclusions, the study recommends that:

1. Government and financial institutions strengthen financial support mechanisms through subsidies, tax relief, and affordable credit facilities to reduce the burden of acquiring green technologies and certifications.
2. Greater emphasis should be placed on improving access to modern and eco-friendly technologies. Establishing innovation hubs, facilitating technology-sharing among SMEs, and promoting partnerships with universities and research institutes will help bridge the technological gap.
3. Capacity building also needs to be prioritised to address knowledge and skill deficits. Regular training programmes, awareness campaigns, and sustainability workshops organised through SME associations and government agencies will help improve human capital for sustainability.
4. Reforms in regulatory and compliance frameworks are needed. Regulations should be simplified and implemented consistently, with certification processes made more affordable and supportive rather than punitive.
5. There is a need to promote stronger market demand for green products. Public awareness campaigns should be launched to educate consumers on the importance of eco-friendly goods, thereby encouraging demand and creating incentives for SMEs to invest in sustainability. Aligning consumer behaviour with green entrepreneurship will provide SMEs with the motivation to expand beyond basic survival strategies into more comprehensive sustainability practices.

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