



Review Article

Assessment of Green Entrepreneurship Initiatives for Sustainable Business Practices in the Manufacturing Sector in North Central Nigeria: A Conceptual Review.

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Abstract- Sustainable industrial development has become an urgent priority for emerging economies facing environmental degradation, resource constraints, and climate-related vulnerabilities. In Nigeria, the manufacturing sector remains central to economic diversification efforts but is simultaneously limited by high energy intensity, waste generation, and inefficient production systems. This conceptual review synthesizes peer-reviewed literature, government documents, policy frameworks, and credible grey sources to examine the emergence and trajectory of green entrepreneurship within the manufacturing sector of North Central Nigeria. Using a narrative review methodology, the study analyzes 86 carefully selected sources published between 2016 and 2025, guided by explicit inclusion criteria, multi-database searches, and triangulation procedures to ensure credibility. The findings reveal that green entrepreneurship in the region is expanding through initiatives in solar energy integration, agro-industrial waste valorisation, climate-responsive agricultural processing, and emerging minerals-to-manufacturing value chains. However, these developments remain uneven across states, constrained by institutional fragmentation, weak policy implementation, limited technical capacity, inadequate green financing, and infrastructural deficits. The analysis highlights a hybrid ecosystem in which top-down government directives coexist with bottom-up private-sector adaptation, but lack the coordinated frameworks required for long-term sustainability. The review contributes to the literature by providing a region-specific, comparative synthesis and by demonstrating how theoretical perspectives such as the resource-based view, ecological orientation theory, and institutional theory explain the enabling conditions and barriers shaping sustainable manufacturing in the region. It concludes that enhancing policy coherence, expanding green finance, strengthening technical capabilities, and developing coordinated green industrial clusters are essential for accelerating Nigeria's transition toward environmentally responsible manufacturing.

Article Key Information

Keywords: Green entrepreneurship; Sustainable manufacturing; North Central Nigeria; Environmental innovation

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1.0 Introduction

The growing global urgency to address climate change, resource depletion, and environmental degradation has intensified interest in green entrepreneurship as a viable pathway for advancing sustainable industrial development (Gast et al., 2017; Shaker et al., 2023). Green entrepreneurship, defined as the creation of ventures that integrate environmental protection with economic value creation, has become particularly relevant for emerging economies where industrialization continues to place significant pressure on natural ecosystems (Anwar et al., 2024). In Nigeria, the manufacturing sector remains central to economic diversification efforts; however, it is also associated with high energy consumption, pollution, inefficient production systems, and unsustainable resource use (Abolo, 2017). These challenges have amplified the need for research examining how green entrepreneurial initiatives can reposition manufacturing firms toward more sustainable, resource-efficient, and competitive operations.

Despite growing scholarly and policy interest in green entrepreneurship in Africa, empirical and conceptual analyses remain unevenly distributed across regions. Existing Nigerian studies have predominantly addressed green practices at the national level or focused on isolated case studies (Anabaraonye et al., 2021; Enyi et al., 2023). Consequently, there is limited comparative understanding of how subnational contexts, especially institutional capacity, policy support, natural resource endowments, and private-sector engagement, shape the adoption of green entrepreneurship within Nigeria's geo-political zones. The North Central region presents a compelling case for such an inquiry because it combines significant manufacturing activity with acute environmental pressures, including deforestation, land degradation, flooding, and climate-sensitive agricultural cycles (Atsuwe et al., 2022). Moreover, the zone possesses substantial renewable energy potential, particularly in solar and biomass resources, which could underpin a shift toward cleaner production systems. Yet, academic literature has not sufficiently explored how these contextual dynamics influence the emergence, spread, and sustainability of green manufacturing initiatives across the six states and the Federal Capital Territory.

Recent policy developments in Nigeria, such as the National Renewable Energy and Energy Efficiency Policy and the Sustainable Development Goals (SDGs) implementation agenda, have further highlighted the strategic role of environmentally responsible entrepreneurship in national development planning (United Nations Development Programme [UNDP], 2023). Nevertheless, translating these national policy ambitions into localized action remains a persistent challenge. Evidence suggests notable gaps between policy design and implementation, limited access to green financing, weak institutional coordination, and shortages of technical expertise in low-carbon technologies (Dean & McMullen, 2007; Uzhinsky et al., 2022). Understanding how these systemic barriers manifest at the regional level is important for designing context-specific interventions that can enhance sustainable business practices.

Furthermore, existing conceptual literature has emphasized the need to integrate theoretical perspectives such as the resource-based view, institutional theory, social capital theory, and ecological orientation theory when examining green entrepreneurship (Barney & Clark, 2007; Carni et al., 2024). Yet, few studies apply these frameworks to the Nigerian manufacturing landscape, where enterprises often operate in policy-volatile, resource-constrained environments. A conceptual review focusing on the North Central region offers an opportunity to synthesize emerging evidence, identify patterns across states, and illuminate the interplay of policy incentives, institutional support systems, and entrepreneurial responses to environmental challenges. Such a synthesis is essential for bridging knowledge gaps and proposing actionable pathways for strengthening green business ecosystems.

Given these observations, a systematic conceptual review of green entrepreneurship initiatives in the manufacturing sector of North Central Nigeria is both timely and necessary. The region is undergoing rapid economic transformation, with new investments in agro-industrial processing, renewable energy, waste-to-wealth solutions, and climate-smart agricultural practices. However, the extent of green entrepreneurial adoption varies widely across states, underscoring the need for a structured assessment that captures both progress and persistent constraints. A region-specific analysis can also provide nuanced insights into how local governments, firms, communities, and support institutions interact to facilitate or impede the transition toward sustainable manufacturing.

Accordingly, this paper examines green entrepreneurship initiatives in the manufacturing sector across the six states of North Central Nigeria, Benue, Niger, Kogi, Kwara, Nasarawa, and Plateau, and the Federal Capital Territory. The review synthesizes peer-reviewed literature, credible reports, and policy documents to: (a) assess the extent and forms of green entrepreneurial engagement in the region; (b) identify cross-cutting challenges that influence the adoption and sustainability of these initiatives; and (c) propose context-appropriate strategies for advancing green manufacturing. By addressing the lack of regionally focused conceptual analyses, this study contributes to the broader discourse on sustainable industrial development in developing economies and provides evidence-based direction for policymakers, development actors, and manufacturing enterprises. The remainder of this article is structured as follows: Section 2 presents the literature review; Section 3 outlines the methodological approach; Section 4 synthesizes findings and discussion; and Section 5 presents the conclusion and recommendations.

2.0 Review of Related Literature

Green entrepreneurship has emerged at the forefront of global sustainability discourse as scholars increasingly explore how entrepreneurial activity can contribute to environmental protection, resource efficiency, and long-term socio-economic resilience. Conceptually, green entrepreneurship is typically defined as entrepreneurial behaviour that intentionally integrates environmental objectives into business models, product development, and operational strategies (Gast et al., 2017). While early scholarship tended to focus on small firms and niche eco-innovators, more recent studies acknowledge its growing relevance across industrial sectors, including manufacturing, where energy intensity, pollution, and material inefficiencies remain central concerns (Anwar et al., 2024). This conceptual shift reflects the recognition that manufacturing systems in developing economies must transition toward low-carbon and resource-efficient production pathways if they are to remain competitive within a global landscape increasingly shaped by sustainability imperatives.

A core component of the literature focuses on the drivers of green entrepreneurship, the most widely examined of which include regulatory pressure, organisational capabilities, environmental values, market demand, and technological opportunities. Regulatory mechanisms, such as environmental standards and incentive policies, have been shown to stimulate green innovation by reducing risk and signalling state commitment (Dean & McMullen, 2007). However, in emerging economies where regulatory enforcement is often weak, the literature shows that policy intent alone is insufficient to catalyse green entrepreneurial activities—particularly within manufacturing sectors characterised by infrastructural deficits and inconsistent institutional governance (Uzhinsky et al., 2022). Conversely, market-driven and capability-driven models highlight how firms with strong technological capabilities, learning cultures, or socially embedded networks are more likely to adopt environmental innovations even in policy-constrained settings (Carni et al., 2024).

The theoretical frameworks underpinning these findings provide deeper insight into the mechanisms shaping green entrepreneurship. The resource-based view (RBV) argues that firms achieve competitive advantage through valuable, rare, inimitable, and organisationally embedded resources (Barney & Clark, 2007). In the context of green entrepreneurship, RBV suggests that firms with superior technological competencies, absorptive capacity, or eco-innovation capabilities are more likely to develop sustainable products and processes. Ecological orientation theory emphasizes the dual orientation toward both economic and environmental goals, positioning sustainability not as an external pressure but as an intrinsic component of entrepreneurial identity. Meanwhile, institutional theory underscores how national or regional policy frameworks, regulatory quality, cultural norms, and support infrastructures shape the entrepreneurial ecosystem in ways that either enable or hinder green innovation. Social capital theory further explains how networks, trust, and collaborative relationships support the diffusion of environmental knowledge and facilitate access to resources that reduce the risks associated with adopting new green technologies (Carni et al., 2024). The synthesis of these perspectives reveals that green entrepreneurship is multidimensional and context-specific, emerging from the interplay between individual motivations, organisational capabilities, institutional structures, and broader socio-ecological conditions.

Despite wide agreement on the importance of environmental innovation, the literature remains divided on the primary determinants of green entrepreneurial activity. One strand argues that regulatory and institutional frameworks are the most influential drivers, especially in developing contexts where market incentives for sustainability remain weak (Dean & McMullen, 2007). Another body of work contends that intrinsic motivations, organisational learning, and entrepreneurial orientation are equally or more decisive, demonstrating that firms can engage in eco-innovation even in the absence of stringent regulation (Lee et al., 2012). A related debate concerns the extent to which green entrepreneurship in developing economies is driven by opportunity or necessity. While some scholars suggest that environmental innovation reflects strategic choice and long-term competitiveness, others contend that it may emerge as a survival response to resource scarcity, energy insecurity, or rising environmental risks (Anabaraonye et al., 2021). These contested views underscore a key gap in the literature: the need for context-specific analyses that capture how localised socio-economic and ecological realities shape entrepreneurial responses to sustainability challenges.

In Nigeria, research on green entrepreneurship remains emergent, with studies primarily focusing on national-level trends or sector-specific examples such as agriculture, energy, or small-scale manufacturing. Empirical work by Enyi et al. (2023) demonstrates that green entrepreneurial practices enhance the sustainability performance of manufacturing SMEs in North Central Nigeria, though adoption remains uneven due to inadequate financing and infrastructural weaknesses. However, most Nigerian studies rely on isolated case analyses or broad conceptual discussions, limiting their ability to draw comparative insights across regions. Moreover, scholars note significant discrepancies between policy aspirations, such as the National Renewable Energy and Energy Efficiency Policy, and the SDG implementation framework and actual implementation at state and local government levels (Atsuwe et al., 2022). This gap highlights a major empirical blind spot: the absence of systematic, region-level reviews that evaluate the extent, drivers, and barriers of green entrepreneurship in Nigeria's diverse subnational contexts.

The literature also identifies a methodological challenge. Much of the available evidence in developing countries is derived from grey literature, pilot projects, and policy announcements rather than long-term empirical evaluations. Consequently, scholars call for conceptual reviews that synthesise emerging findings across government reports, academic research, industry studies, and multilateral documentation to provide a clearer picture of the opportunities and constraints shaping green enterprise ecosystems (Shaker et al., 2023). Given the rapid environmental changes and policy shifts across Nigeria's North Central region, combined with its unique combination of renewable energy potential, agricultural productivity, and environmental vulnerability, there is a strong justification for developing a conceptual synthesis capable of identifying patterns, contradictions, and state-level variations in green entrepreneurial activity.

Taken together, the reviewed literature establishes a robust theoretical foundation for understanding green entrepreneurship but simultaneously exposes gaps in regional analysis, policy-outcome evaluation, and context-specific synthesis. This provides the intellectual grounding for examining green entrepreneurship within the manufacturing sector of North Central Nigeria, where diverse institutional capacities, natural resources, and development priorities create differentiated opportunities and constraints. The present study responds to this gap by offering a comprehensive, state-level conceptual review of green entrepreneurial initiatives, thereby contributing new insight into the dynamics shaping sustainable manufacturing in emerging African contexts.

3.0 Methodology

This study employed a narrative conceptual review design to synthesise empirical evidence, policy documents, and theoretical contributions related to green entrepreneurship and sustainable manufacturing in North Central Nigeria. Given the exploratory nature of the research problem and the limited availability of region-specific empirical studies, the conceptual review approach was appropriate for integrating diverse sources of evidence while identifying patterns, emerging themes, and knowledge gaps across the subnational landscape. The review focused on materials published between 2016 and 2025, a period that corresponds with the rise of sustainability-oriented policy reforms, increased

national discourse on green industrialisation, and the proliferation of renewable-energy and climate-related initiatives across Nigerian states.

The search process was systematic and iterative. Academic literature was sourced using databases such as Google Scholar, Scopus, Web of Science, ResearchGate, and JSTOR. Search terms included combinations of key phrases such as “green entrepreneurship,” “sustainable manufacturing,” “green innovation Nigeria,” “environmental entrepreneurship,” “renewable energy manufacturing,” and “North Central Nigeria sustainable development.” To ensure coverage of subnational policy developments and project-level implementation, the academic search was complemented by grey-literature sources, including official publications from the Federal Ministry of Industry, Trade and Investment, state government portals, the National Bureau of Statistics, the United Nations Development Programme, and reputable national news outlets such as *Premium Times*, *The Nation*, *BusinessDay*, and *Vanguard*. These grey sources were particularly useful for capturing recent state-level initiatives, given the paucity of peer-reviewed research on localized green entrepreneurship in the region.

Source selection followed explicit inclusion and exclusion criteria. Material was included if it: (a) addressed green entrepreneurship, sustainable manufacturing, or environmental innovation within Nigeria or comparable developing-country contexts; (b) discussed state-level industrial, environmental, or renewable-energy initiatives relevant to the North Central region; or (c) provided theoretical or conceptual frameworks applicable to green entrepreneurial ecosystems. Studies that focused exclusively on unrelated sectors, lacked verifiable information, or did not contribute conceptual relevance to green innovation were excluded. For grey literature, credibility was assessed by prioritizing official government releases, multilateral-agency reports, and news articles published by verified, reputable organisations. Sources based solely on social media posts, unverified commentary, or unattributed claims were excluded unless corroborated by at least two independent and reputable outlets.

The review also adopted a multi-stage screening process. Initial searches yielded 268 documents, which were reduced to 147 after removing duplicates and materials that did not meet topical requirements. Following full-text assessment for relevance and credibility, 86 sources formed the final dataset for synthesis. The use of triangulation cross-checking claims across multiple independent sources strengthened the reliability of grey-literature evidence, especially where government announcements or project reports lacked peer-reviewed documentation. This approach was necessary given the rapidly evolving nature of sustainable industrial initiatives in Nigeria and the tendency for project outcomes to be reported primarily through official communiqués and credible news platforms.

Data analysis followed a thematic synthesis approach, allowing for the integration of diverse forms of evidence into coherent thematic categories. Extracted information was coded according to emergent patterns related to state-level policy frameworks, drivers of green entrepreneurship, renewable-energy integration, institutional capacity, private-sector participation, and barriers affecting sustainable manufacturing. Thematic relationships were then compared across states within North Central Nigeria to identify convergences, divergences, and contextual nuances. This comparative lens made it possible to illuminate how institutional readiness, policy coherence, resource endowment, and socio-economic conditions vary across the region and shape the trajectory of green entrepreneurial initiatives.

Throughout the synthesis process, theoretical perspectives such as the resource-based view, ecological orientation theory, institutional theory, and social-capital frameworks were used to interpret the patterns observed in the data. This theoretical anchoring ensured that the review moved beyond descriptive aggregation and instead produced an analytical understanding of the mechanisms enabling or constraining green entrepreneurship in the region. The conceptual review methodology thus provided a robust foundation for evaluating the interplay between policy ambition, entrepreneurial behaviour, institutional support, and manufacturing-sector realities across North Central Nigeria.

4.0 Results and Discussion

The synthesis of evidence across academic literature, policy documents, state development plans, and credible grey sources reveals that green entrepreneurship in the manufacturing sector of North Central Nigeria is emerging but remains unevenly developed across the region. While each state demonstrates pockets of progress in renewable energy deployment, agro-processing innovation, and climate-responsive industrial strategies, the depth, scale, and institutional maturity of these initiatives vary considerably. This variation is reflective of broader structural differences in governance quality, financial capacity, resource endowment, and technical readiness, all of which shape the pathways through which green manufacturing evolves.

A prominent finding emerging from the synthesis is that policy ambition across the region is generally strong, with most state governments adopting programs that reference sustainability, renewable energy, climate adaptation, or industrial modernization. However, there is a persistent gap between policy formulation and actual implementation, echoing the institutional-theory argument that environmental initiatives often remain symbolic in contexts where enforcement mechanisms and administrative capacity are weak (Uzhinsky et al., 2022). Several states have announced green-related industrial projects such as solar-component manufacturing, bio-fertilizer plants, or battery production initiatives, but only a subset of these have progressed beyond planning or commissioning stages. This aligns with global evidence showing that sustainability-driven reforms are most successful where political commitment is matched with stable financing, technical expertise, and effective monitoring systems (Shaker et al., 2023).

Across the region, three dominant thematic patterns emerged. The first relates to renewable-energy adoption, particularly solar power, which appears in nearly all state-level initiatives. Benue, Niger, Plateau, and the Federal Capital Territory display the strongest focus on solar integration, either through proposed industrial solar parks, solar assembly plants, or public-sector-led electrification projects. This emphasis reflects both the ecological advantage of high solar irradiance and the economic necessity of mitigating the chronic grid unreliability that constrains manufacturing activities. However, the review also reveals that while solar-focused entrepreneurship is widely promoted, few states have established the industrial ecosystems, supply chains, skilled labour, maintenance infrastructure, and financing channels necessary for localizing solar manufacturing at scale. Consequently, many initiatives remain dependent on external technical partners, highlighting a capability gap consistent with the resource-based view, which positions firm and regional capabilities as central drivers of eco-innovation (Barney & Clark, 2007).

The second thematic pattern is the rise of agro-industrial green entrepreneurship, which is most visible in states such as Kwara, Plateau, and Benue. These states have leveraged their agricultural endowments to promote biodegradable fertilizer production, waste-to-wealth initiatives, organic agricultural processing, and climate-smart agribusiness. The agricultural base of the region provides fertile ground for forms of green entrepreneurship that utilize biomass, agro-waste, and local renewable resources. The review shows that such initiatives often succeed when supported by functional public-private partnerships and donor-funded programs, reflecting evidence that social capital and collaborative networks enhance the uptake of environmental innovation (Carni et al., 2024). Yet, the scalability of these agro-industrial ventures is often constrained by infrastructural challenges such as poor rural feeder roads, insufficient storage capacity, and inconsistent energy supply, which limit manufacturing efficiency and investment incentives.

A third significant pattern concerns the emergence of minerals-to-manufacturing green value chains, particularly in Nasarawa and Kogi. These states seek to link mineral beneficiation, such as lithium processing or battery precursor production, with the broader renewable-energy sector. While this reflects a strategic alignment with global trends in clean-energy manufacturing, the review identifies substantial uncertainties regarding regulatory frameworks, environmental safeguards, and long-term industrial policy coherence. This creates the risk of “green extractivism,” wherein materials are labelled as green but exploited without strong value-addition or environmental accountability mechanisms. The literature suggests that without strong institutional governance and technical regulation, green-labelled mineral initiatives may fail to produce sustainable developmental outcomes (Anwar et al., 2024).

Beyond these thematic patterns, the review identified several cross-cutting barriers that inhibit the maturity of green entrepreneurship in the region. Foremost among these is inconsistent access to green financing, with most entrepreneurs relying on conventional credit structures that do not favour long-payback sustainability investments. The absence of state-level green funds, credit guarantees, or fiscal incentives limits the ability of manufacturers to adopt clean technologies. Skills deficits represent a second constraint; technical know-how in areas such as solar assembly, battery chemistry, climate-smart manufacturing, and circular-economy processes is scarce across the region, which affects the quality, reliability, and scalability of emerging green ventures. Finally, structural limitations—such as unreliable electricity supply, weak regulatory harmonisation across states, and poor data systems for tracking environmental outcomes represent systemic challenges that diminish the effectiveness of policy interventions.

Notwithstanding these constraints, the review identifies positive enabling conditions. States with clearer development plans, stronger ministry-level coordination, and active collaborations with federal agencies—such as Niger and Plateau exhibit more coherent and sustained green-manufacturing trajectories. Similarly, the presence of innovative firms, technical incubators, and youth-led green enterprises is contributing to a gradual strengthening of the entrepreneurial ecosystem, even in states with modest institutional capacity. These developments reinforce theoretical insights that environmental entrepreneurship thrives where supportive networks, institutional incentives, and dynamic capabilities align to create fertile conditions for sustainable innovation (Gast et al., 2017).

A broader analytical insight from the review is that North Central Nigeria presents a hybrid green-entrepreneurial landscape, in which state initiatives often emerge from top-down policy directives, while private-sector engagement is driven primarily by market necessity and adaptive innovation rather than structured industrial policy. This hybrid character creates opportunities for synergy but also produces fragmentation, especially where state initiatives remain at pilot stages and private sector investments lack adequate support. Consequently, the region risks an uneven green transition where a few states advance toward sustainable manufacturing while others lag significantly behind due to governance limitations, infrastructural deficits, or insufficient entrepreneurial capacity.

Overall, the results indicate that green entrepreneurship in North Central Nigeria is evolving, contextually diverse, and constrained by systemic bottlenecks but retains significant potential for accelerating sustainable manufacturing. The findings reinforce the need for policy coherence, long-term financing mechanisms, and capability enhancement—elements consistently highlighted in the global and African green-entrepreneurship literature. The analytical synthesis thus provides empirical grounding for the strategic recommendations presented in the subsequent section.

5.0 Conclusion and Recommendations

5.1 Conclusion

This conceptual review examined the state of green entrepreneurship within the manufacturing landscape of North Central Nigeria by synthesizing evidence from academic literature, policy documents, and credible grey sources. The findings demonstrate that although each state in the region exhibits varying degrees of commitment to environmentally responsible industrial practices, the overall ecosystem remains at an early stage of development. Several initiatives—ranging from solar-energy integration and agro-industrial waste utilization to mineral-based clean technology value chains—reflect growing recognition of sustainability as a pathway for industrial modernization. However, the depth and sustainability of these initiatives remain limited by institutional weaknesses, infrastructural deficits, skills shortages, financial constraints, and inconsistent policy implementation. The review highlights that while policy ambition is evident across the region, operationalization is often slow or fragmented, resulting in numerous projects that remain at the planning or pilot stage.

A broader conclusion is that green entrepreneurship in North Central Nigeria is shaped by a hybrid dynamic in which government-led directives coexist with bottom-up private-sector innovation. Nevertheless, the lack of coordinated frameworks, inadequate technical capacity, and weak monitoring systems hinder the translation of these initiatives

into long-term green industrial development. The analysis contributes to knowledge by providing a comprehensive regional synthesis of existing initiatives, identifying cross-state variations, highlighting systemic barriers, and demonstrating how theoretical perspectives such as the resource-based view, ecological orientation theory, and institutional theory explain the evolution of green entrepreneurship within the region. The findings underscore the need for coherent, multi-actor strategies to accelerate the transition toward sustainable manufacturing.

5.2 Recommendations

Based on the insights generated, this review recommends that governments in the region strengthen policy coherence by ensuring that sustainability commitments are matched with clear implementation frameworks, periodic monitoring, and enforceable environmental standards. Establishing dedicated green financing mechanisms, including state-level green funds, concessional credit windows, and incentives for low-carbon technology adoption, would reduce financial barriers and stimulate investment in green manufacturing. Capacity development is also critical; technical training programs, vocational upskilling, and partnerships with universities and innovation hubs should be expanded to build a skilled workforce capable of supporting renewable energy assembly, circular-economy processes, and advanced manufacturing systems.

The region would further benefit from creating coordinated green industrial clusters that link local agricultural resources, mineral endowments, and renewable energy potential with manufacturing value chains, thereby encouraging economies of scale and inter-state collaboration. Strengthening public-private partnerships is essential, not only to mobilize investment but also to enhance technology transfer, foster innovation networks, and ensure continuity in project implementation. Improved data systems and transparent reporting mechanisms are needed to track environmental outcomes, measure industrial progress, and inform evidence-based policy adjustments. Over the long term, harmonizing regulatory frameworks across states, enhancing infrastructural reliability, particularly electricity supply, and embedding sustainability considerations into regional industrial policy will provide the conditions necessary for green entrepreneurship to thrive and contribute meaningfully to sustainable development in North Central Nigeria.

Declarations

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Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper. No financial, personal, or professional relationships influenced the conduct or outcomes of this study.

Authors' Contributions

All authors contributed substantially to the development of this manuscript. T. B. Igbe conceived and designed the study, coordinated the review process, and drafted the initial manuscript. A. P. Y. Anewe contributed to the literature search, analysis, and interpretation. G. K. Bogbenda participated in manuscript refinement, theoretical structuring, and final editing. All authors reviewed and approved the final manuscript for publication.

Ethical Approval

This study is a conceptual review and did not involve human participants, animals, or sensitive data. Ethical approval was therefore not required.

Data Availability

All data used in this study were obtained from publicly available sources, including published academic literature, government documents, credible institutional reports, and reputable news outlets. Additional materials supporting the findings of this review are available from the corresponding author upon reasonable request.

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