Strategic Green Entrepreneurship, Digital Transformation and Sustainable Business Performance: An Integrative Review and Future Research Agenda for Emerging Economies

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Abstract
The increasing challenges of climate change, environmental degradation, and resource scarcity have compelled organizations to integrate sustainability into their strategic operations. Green entrepreneurship has emerged as an effective approach for creating economic value while promoting environmental protection and social well-being. Similarly, digital transformation has become a critical organizational capability that enhances innovation, operational efficiency, and sustainable business development. However, existing studies have largely examined green entrepreneurship, digital transformation, and sustainable business performance independently, resulting in limited understanding of their interconnected roles in achieving long-term sustainability. This paper presents a systematic integrative review of literature published between 2020 and 2026 to examine the relationships among green entrepreneurship, digital transformation, business innovation, and sustainable business performance. The review synthesizes contemporary theoretical and empirical evidence to develop an integrated conceptual framework grounded in the Triple Bottom Line Theory, Dynamic Capability Theory, and Ecological Modernization Theory. The findings indicate that green entrepreneurship and digital transformation complement one another, while business innovation serves as the key mechanism through which these capabilities improve economic, environmental, and social performance. The

review further highlights the importance of institutional support, green finance, technological infrastructure, and effective governance in promoting sustainable entrepreneurial ecosystems. The study contributes to sustainability and entrepreneurship literature by integrating fragmented knowledge into a unified framework and offering practical implications for entrepreneurs, managers, policymakers, and researchers seeking to advance sustainable business development.

Keywords: *Green Entrepreneurship; Digital Transformation; Sustainable Business; Green Innovation; Business Sustainability; SMEs; Triple Bottom Line; Dynamic Capability; Emerging Economies.*

1. Introduction

The global business environment has experienced significant transformation as organizations increasingly respond to climate change, environmental degradation, resource scarcity, and rising stakeholder expectations for sustainability. These challenges have shifted business priorities from short-term profit maximization to the creation of economic, environmental, and social value (United Nations, 2023; World Bank, 2024; Onofrei et al., 2026). Consequently, sustainability has evolved from a corporate social responsibility initiative into a strategic imperative that influences innovation, competitiveness, and long-term organizational resilience (OECD, 2023; Sharma & Subba, 2025). Green entrepreneurship has emerged as an effective strategy for addressing these sustainability challenges by integrating environmental responsibility into entrepreneurial opportunity recognition, innovation, production, and value creation. Unlike conventional entrepreneurship, green entrepreneurship emphasizes the development of environmentally friendly products, technologies, and business models that generate economic value while minimizing ecological degradation (Onofrei et al., 2026; Sharma & Subba, 2025). Recent studies indicate that green entrepreneurial ventures promote renewable energy, circular economy practices, sustainable agriculture, waste management, and climate resilience while contributing to employment generation, technological advancement, and sustainable economic growth (International Energy Agency [IEA], 2024; United Nations, 2023).

Alongside sustainability, digital transformation has become a major force reshaping modern organizations. Technologies such as artificial intelligence (AI), cloud computing, blockchain, big data analytics, and the Internet of Things (IoT) improve operational efficiency, innovation capability, resource optimization, and stakeholder engagement. Beyond enhancing productivity, these technologies support environmental monitoring, intelligent resource management, supply chain transparency, and low-carbon production systems, making digital transformation an important enabler of sustainable business development (Fawaid et al., 2026; Nambisan et al., 2019). Increasingly, the literature recognizes that green entrepreneurship and digital transformation are complementary capabilities. Green entrepreneurship provides the strategic commitment to sustainability, while digital transformation supplies the technological infrastructure required to implement environmentally responsible innovations. Business innovation serves as the mechanism through which these capabilities enhance sustainable business performance by improving operational efficiency, environmental stewardship, and organizational competitiveness (Fawaid et al., 2026; Sharma & Subba, 2025).

Despite growing scholarly attention, research remains fragmented, with many studies examining green entrepreneurship, digital transformation, innovation, and business performance independently. Furthermore, empirical evidence is concentrated in developed economies, leaving limited understanding of how these relationships operate in emerging economies where

institutional, financial, and technological constraints are more pronounced (Fawaid et al., 2026; Sharma & Subba, 2025). In addition, institutional factors such as government effectiveness, access to finance, regulatory support, and technological infrastructure have been identified as critical enablers of sustainable entrepreneurial ecosystems (Onofrei et al., 2026).

Against this background, this paper systematically reviews recent literature published between 2020 and 2026 to examine the relationships among green entrepreneurship, digital transformation, business innovation, and sustainable business performance. Specifically, it synthesizes existing knowledge, develops an integrated conceptual framework grounded in relevant theories, identifies key research gaps, and proposes directions for future empirical studies. By integrating fragmented research streams, the study contributes to sustainability and entrepreneurship scholarship while providing practical insights for managers, entrepreneurs, policymakers, and researchers seeking to promote resilient, digitally enabled, and environmentally sustainable business ecosystems.

2. Literature Review

2.1 Concept of Green Entrepreneurship

Green entrepreneurship has become a central concept in sustainability literature because it integrates entrepreneurial opportunity recognition with environmental responsibility, economic development, and social value creation. Unlike conventional entrepreneurship, which primarily focuses on profit maximization, green entrepreneurship embeds environmental sustainability into business activities, including opportunity identification, innovation, production, resource utilization, and marketing (Gibbs & O'Neill, 2017; Dean & McMullen, 2007; Schaltegger & Wagner, 2011).

The concept has gained prominence due to growing concerns about climate change, biodiversity loss, pollution, and resource depletion. Governments, investors, and consumers increasingly recognize green entrepreneurship as an effective strategy for promoting environmentally responsible innovation while maintaining economic competitiveness (United Nations, 2023; OECD, 2023). Onofrei et al. (2026) define green entrepreneurship as entrepreneurial activity that creates economic value through environmentally sustainable products, services, technologies, and business models while minimizing ecological impacts. Such ventures exploit environmental challenges as business opportunities by promoting renewable energy, resource efficiency, waste reduction, and circular production systems.

Recent studies emphasize that green entrepreneurship differs from traditional entrepreneurship because environmental sustainability constitutes its primary strategic objective rather than a secondary corporate responsibility initiative. Sharma and Subba (2025) argue that green entrepreneurs integrate sustainability principles through eco-friendly technologies, circular economy practices, renewable energy utilization, and responsible resource management, thereby contributing to employment generation, technological advancement, and the transition to low-carbon economies. Similarly, the Nepal study highlights that green entrepreneurs combine local knowledge, renewable resources, and environmentally friendly technologies to promote sustainable business development while supporting community resilience and environmental conservation.

Green entrepreneurship has also emerged as an important catalyst for sustainable industrial transformation. Entrepreneurs increasingly develop innovations in renewable energy, sustainable agriculture, waste recycling, green manufacturing, eco-tourism, and clean technologies, thereby improving environmental quality, organizational competitiveness, and long-term economic resilience (Fawaid et al., 2026; Onofrei et al., 2026). The increasing adoption of Environmental,

Social, and Governance (ESG) standards has further strengthened this transition, as investors and consumers increasingly prefer organizations that demonstrate strong environmental responsibility (World Bank, 2024; OECD, 2023).

Innovation remains a defining characteristic of green entrepreneurship. Green entrepreneurs develop environmentally sustainable products, processes, and business models that simultaneously address ecological challenges and market demands. Eco-innovation improves organizational efficiency, reduces production costs, enhances market differentiation, and supports long-term business sustainability (Fawaid et al., 2026). In addition, green entrepreneurs increasingly adopt circular economy principles that emphasize resource efficiency, recycling, reuse, remanufacturing, and waste minimization, enabling firms to improve both environmental and operational performance (Sharma & Subba, 2025).

Institutional support is equally important for the success of green entrepreneurship. Effective environmental policies, access to green finance, technological infrastructure, research and development, and supportive regulatory frameworks create favorable conditions for sustainable entrepreneurial growth. The Future Business Journal study identifies government effectiveness, rule of law, access to finance, foreign direct investment, and SME development as key institutional drivers of green entrepreneurship and sustainable business development (Onofrei et al., 2026). Nevertheless, green enterprises, particularly SMEs in developing economies, continue to face challenges such as inadequate finance, weak institutional support, limited technological infrastructure, and insufficient technical expertise. Despite these barriers, improvements in digital technologies, green financing, and supportive sustainability policies continue to expand opportunities for green entrepreneurial development (Onofrei et al., 2026; Sharma & Subba, 2025).

Overall, green entrepreneurship has evolved into a transformative business paradigm that integrates environmental responsibility, innovation, and economic competitiveness to generate sustainable economic, environmental, and social value. As global sustainability challenges intensify, green entrepreneurship is expected to remain a key driver of resilient businesses and sustainable development.

2.2 Sustainable Business

Sustainable business has become a central concept in contemporary management and entrepreneurship as organizations increasingly seek to balance economic prosperity with environmental protection and social responsibility. Unlike traditional business models that focus primarily on profit maximization, sustainable business integrates environmental stewardship, social responsibility, and long-term stakeholder value into organizational strategies and operations. This approach is consistent with the principles of sustainable development, which emphasize meeting present needs without compromising the ability of future generations to meet their own needs (United Nations, 2023). Sustainable businesses therefore pursue profitability while simultaneously reducing environmental impacts, promoting social well-being, and creating shared value for customers, employees, communities, investors, and governments (Bocken & Short, 2021; Geissdoerfer et al., 2020).

The reviewed studies consistently identify sustainable business as the practical outcome of green entrepreneurship. The Nepal study shows that sustainable enterprises integrate renewable energy, sustainable agriculture, eco-tourism, and responsible resource utilization into their operations, thereby contributing to environmental conservation, employment creation, community development, and local economic resilience despite institutional and financial constraints. Similarly, Sharma and Subba (2025) argue that sustainable businesses adopt environmentally

responsible production systems, circular economy practices, green technologies, and efficient resource management to improve operational efficiency, customer trust, and organizational resilience. Their findings further indicate that green startups stimulate low-carbon economic development by embedding sustainability into their business models.

The growing adoption of Environmental, Social, and Governance (ESG) principles has further strengthened the importance of sustainable business. Investors, regulators, and consumers increasingly evaluate organizations based not only on financial performance but also on environmental and social outcomes. Consequently, businesses are expected to reduce carbon emissions, improve resource efficiency, ensure ethical governance, and contribute positively to society. Organizations that successfully respond to these expectations are more likely to strengthen stakeholder trust, attract investment, and achieve long-term competitive advantage (OECD, 2023; World Bank, 2024).

A defining characteristic of sustainable business is the integration of sustainability into corporate strategy rather than treating environmental initiatives as isolated corporate social responsibility activities. This strategic orientation requires organizations to redesign products, production processes, supply chains, and organizational practices to improve environmental performance while maintaining economic viability. Innovation plays a central role in this transformation by enabling firms to develop cleaner technologies, sustainable products, eco-friendly processes, and efficient business models that enhance both competitiveness and environmental performance (Geissdoerfer et al., 2020; Bocken & Short, 2021). Sustainable businesses also adopt a stakeholder-oriented approach by recognizing that long-term organizational success depends on balancing the interests of customers, employees, investors, governments, suppliers, and local communities (Freeman et al., 2020).

Technological advancement has further accelerated sustainable business development. Digital technologies such as artificial intelligence, cloud computing, blockchain, the Internet of Things (IoT), and big data analytics improve environmental monitoring, optimize resource utilization, enhance supply chain transparency, and support informed managerial decision-making. These technologies enable organizations to reduce waste, improve energy efficiency, and strengthen sustainable production systems, making digital transformation an important enabler of sustainable business, particularly among small and medium-sized enterprises (Fawaid et al., 2026).

Institutional support remains equally important in promoting sustainable business practices. Effective environmental policies, access to green finance, research and development, investment incentives, and supportive regulatory frameworks encourage firms to adopt sustainable business models. Onofrei et al. (2026) identify government effectiveness, rule of law, foreign direct investment, domestic credit, and SME development as important institutional drivers of sustainable entrepreneurial growth. Although challenges such as financial constraints, technological uncertainty, and limited sustainability expertise continue to hinder many organizations, especially SMEs, growing environmental awareness, technological progress, and supportive government policies are gradually facilitating wider adoption of sustainable business practices (Sharma & Subba, 2025; Onofrei et al., 2026).

Overall, sustainable business represents a holistic organizational philosophy that integrates environmental responsibility, innovation, social inclusion, and economic competitiveness into long-term business strategy. As sustainability becomes increasingly important for global economic development, sustainable business models are expected to remain fundamental to organizational resilience, competitiveness, and long-term value creation.

2.3 Digital Transformation

Digital transformation has become a strategic imperative for organizations seeking to enhance competitiveness, innovation, and long-term sustainability. It refers to the integration of digital technologies into business processes, organizational models, decision-making, and stakeholder interactions to improve efficiency and value creation. Unlike simple digitization, digital transformation involves fundamental organizational changes that redefine how firms operate and compete through the strategic application of advanced technologies (Vial, 2021).

Rapid technological advancement has positioned digital transformation as a key driver of sustainable business development. Technologies such as artificial intelligence (AI), big data analytics, cloud computing, blockchain, the Internet of Things (IoT), machine learning, and intelligent automation enable organizations to optimize resource utilization, improve operational efficiency, strengthen environmental monitoring, and support data-driven decision-making (OECD, 2023). These capabilities enhance organizational adaptability while reducing waste, energy consumption, and operational costs, thereby supporting both economic and environmental sustainability.

The reviewed studies consistently identify digital transformation as an essential capability for sustainable entrepreneurship. Fawaid et al. (2026) demonstrate that digital technologies enable micro, small, and medium-sized enterprises (MSMEs) to improve productivity, expand market access, strengthen innovation capability, and enhance organizational resilience. Their findings further reveal that digital transformation promotes business innovation by improving product development, production processes, marketing practices, and organizational management, thereby contributing significantly to sustainable business performance.

Digital transformation also strengthens sustainable innovation by facilitating collaboration, accelerating research and development, and enabling firms to identify environmentally responsible business opportunities. Technologies such as AI support predictive analytics and intelligent decision-making, IoT enables real-time monitoring of environmental conditions and resource utilization, while blockchain enhances supply chain transparency and product traceability. These technological capabilities improve organizational efficiency and environmental performance through more effective resource management and process optimization (Nambisan et al., 2019; Verhoef et al., 2021). Furthermore, digital platforms, e-commerce, and customer relationship management systems improve stakeholder engagement by increasing transparency regarding sustainable products and business practices, thereby strengthening customer trust and organizational legitimacy (Kotler et al., 2021).

Despite these benefits, organizations continue to face significant barriers to digital transformation, particularly in developing economies. Limited technological infrastructure, inadequate financial resources, cybersecurity concerns, digital skill shortages, and organizational resistance to change frequently hinder successful implementation (World Bank, 2024). Consequently, institutional support through investments in digital infrastructure, innovation ecosystems, research funding, entrepreneurship development, and supportive public policies remains essential for accelerating digital transformation and sustainable business development (OECD, 2023).

Overall, digital transformation extends beyond technological modernization to become a strategic organizational capability that complements green entrepreneurship. By enabling continuous innovation, efficient resource utilization, and environmentally responsible business practices, digital transformation enhances sustainable business performance and strengthens long-term organizational competitiveness, particularly within emerging economies (Fawaid et al., 2026).

2.4 Business Innovation

Business innovation has become a critical driver of organizational competitiveness and long-term sustainability in today's dynamic business environment. It refers to the development and implementation of new or significantly improved products, services, processes, marketing methods, organizational practices, and business models that enhance value creation and organizational performance (OECD, 2018). Within the sustainability context, business innovation extends beyond technological advancement to include environmentally responsible solutions that improve economic, environmental, and social outcomes.

Recent literature identifies business innovation as the key mechanism through which green entrepreneurship and digital transformation enhance sustainable business performance. Organizations that integrate environmental responsibility with digital technologies are better positioned to develop cleaner production processes, sustainable products, innovative business models, and efficient supply chains that strengthen competitiveness while minimizing environmental impacts (George et al., 2021; Bocken & Short, 2021). Fawaid et al. (2026) further demonstrate that business innovation mediates the relationship between green entrepreneurship, digital transformation, and business sustainability. Their study shows that environmentally oriented firms adopting digital technologies achieve greater product, process, marketing, and organizational innovation, resulting in improved profitability, environmental performance, and organizational resilience.

Business innovation is multidimensional. Product innovation emphasizes environmentally friendly products produced from renewable or recyclable materials, while process innovation focuses on cleaner technologies, energy efficiency, waste reduction, and optimal resource utilization. Marketing innovation promotes sustainable branding, digital customer engagement, and transparent communication of environmental practices, whereas organizational innovation strengthens sustainability governance, collaboration, and strategic integration of environmental objectives (OECD, 2018). Green entrepreneurship encourages entrepreneurs to perceive environmental challenges such as pollution, climate change, and resource scarcity as opportunities for innovation rather than constraints (Schaltegger & Wagner, 2011). Similarly, Sharma and Subba (2025) report that green startups are pioneering innovations in renewable energy, sustainable agriculture, biodegradable products, waste recycling, and circular economy systems, thereby enhancing productivity, employment generation, and sustainable economic development.

Digital transformation further accelerates innovation by providing organizations with technologies such as artificial intelligence, cloud computing, blockchain, and big data analytics, which improve organizational learning, knowledge sharing, customer insights, and supply chain transparency (Verhoef et al., 2021). The interaction between green entrepreneurship and digital transformation therefore creates a synergistic effect that enables firms to convert sustainability opportunities into commercially viable innovations (Fawaid et al., 2026). These innovations improve operational efficiency, reduce production costs, strengthen customer loyalty, and enhance long-term competitive advantage (Porter & Kramer, 2019).

Institutional support also plays an important role in strengthening innovation capacity. Government policies, research funding, university-industry collaboration, intellectual property protection, and access to green finance encourage the development and commercialization of sustainable innovations. Onofrei et al. (2026) identify government effectiveness, rule of law, domestic credit, foreign direct investment, and SME development as key institutional drivers of environmentally innovative entrepreneurship. Although SMEs continue to face financial, technological, and human capital constraints, growing policy support, technological advancement,

and increased environmental awareness are creating more favorable conditions for sustainability-oriented innovation (World Bank, 2024).

Overall, business innovation is a strategic capability that transforms green entrepreneurship and digital transformation into measurable sustainable business performance. Through environmentally responsible products, cleaner production systems, and innovative business models, organizations achieve long-term competitiveness while contributing to economic development, environmental protection, and social well-being.

2.5 Sustainable Business Performance

Sustainable business performance has become a key measure of organizational success by integrating economic, environmental, and social performance rather than relying solely on traditional financial indicators. This holistic perspective recognizes that long-term competitiveness depends on profitability, environmental stewardship, and stakeholder value creation (Elkington, 1997; Freeman et al., 2020). Increasing environmental regulations, stakeholder expectations, and the global commitment to the Sustainable Development Goals (SDGs) have accelerated the shift toward sustainability-oriented performance evaluation (United Nations, 2023; World Bank, 2024).

Economic performance within the sustainability paradigm extends beyond short-term profitability to include resilience, innovation, operational efficiency, and competitive advantage. Green entrepreneurship enhances economic performance by promoting innovation, improving resource efficiency, reducing operational costs, and expanding market opportunities. Similarly, digital transformation strengthens productivity, accelerates innovation, and improves organizational responsiveness, enabling firms to sustain long-term competitiveness (Porter & Kramer, 2019; Verhoef et al., 2021). Sharma and Subba (2025) further report that green enterprises stimulate employment, technological advancement, market expansion, and sustainable economic growth, while the Nepal study highlights their contribution to local economic resilience and livelihood development.

Environmental performance reflects an organization's ability to minimize ecological impacts through cleaner production, efficient resource utilization, renewable energy adoption, and waste reduction. Green entrepreneurship supports these objectives by promoting eco-friendly products, circular economy practices, and sustainable supply chains (Schaltegger & Wagner, 2011). The reviewed studies indicate that green enterprises improve environmental conservation through renewable energy, sustainable agriculture, eco-tourism, and responsible resource management. Digital technologies, including artificial intelligence, the Internet of Things, cloud computing, and data analytics, further enhance environmental performance by optimizing energy consumption, reducing waste, and supporting intelligent environmental management systems (Fawaid et al., 2026).

Social performance represents the contribution of organizations to employee welfare, community development, ethical governance, stakeholder engagement, and inclusive economic growth. Green entrepreneurship creates employment opportunities, promotes environmental awareness, supports local communities, and strengthens social resilience. The Nepal study demonstrates that environmentally responsible enterprises improve community livelihoods, preserve indigenous knowledge, and encourage sustainable practices, while Onofrei et al. (2026) emphasize the importance of institutional support in enhancing entrepreneurship, SME development, and societal well-being. Digital transformation complements these efforts by improving communication, transparency, customer engagement, and collaboration among stakeholders (Kotler et al., 2021).

Overall, sustainable business performance is achieved through the integration of economic prosperity, environmental responsibility, and social value creation. The reviewed literature consistently shows that green entrepreneurship provides the strategic orientation, digital transformation supplies the technological capability, and business innovation serves as the mechanism through which organizations achieve resilient, competitive, and sustainable long-term performance (Fawaid et al., 2026; Onofrei et al., 2026).

2.6 Research Gaps

Although considerable progress has been made in understanding the relationships among green entrepreneurship, digital transformation, innovation, and sustainable business performance, several important gaps remain in the literature. These gaps provide opportunities for future empirical and theoretical investigations.

2.6.1 Conceptual Gap

Existing studies predominantly examine green entrepreneurship, digital transformation, business innovation, and sustainable business performance as separate constructs. While individual relationships have received increasing attention, relatively few studies integrate these variables into a comprehensive conceptual framework that explains their combined influence on organizational sustainability. The uploaded studies acknowledge this fragmentation and call for integrated theoretical models that capture the multidimensional nature of sustainability-oriented entrepreneurship.

2.6.2 Theoretical Gap

Many empirical studies rely on a single theoretical perspective, such as the Triple Bottom Line or Dynamic Capability Theory, to explain sustainable business outcomes. This approach limits understanding of the complex interactions among entrepreneurial orientation, technological capability, innovation, and institutional environments. An integrative theoretical framework combining the Triple Bottom Line Theory, Dynamic Capability Theory, and Ecological Modernization Theory could provide a more comprehensive explanation of sustainable business performance.

2.6.3 Methodological Gap

The reviewed literature reveals considerable methodological diversity, including qualitative case studies, scoping reviews, bibliometric analyses, and cross-sectional surveys. However, there remains limited use of longitudinal research designs capable of examining how sustainability capabilities evolve over time. Furthermore, additional empirical studies employing Structural Equation Modeling (SEM), Partial Least Squares Structural Equation Modeling (PLS-SEM), and multilevel analytical techniques are required to validate the causal relationships proposed in conceptual models (Fawaid et al., 2026).

2.6.4 Contextual Gap

Most existing empirical evidence has been generated within developed economies characterized by advanced technological infrastructure, mature institutional environments, and established sustainability policies. Comparatively fewer studies have investigated these relationships within developing economies, particularly in Africa and parts of Asia, where institutional constraints, financial limitations, and digital inequalities significantly influence entrepreneurial activities. The

uploaded studies explicitly recognize the need for additional context-specific research in emerging economies.

2.6.5 Policy Gap

Although institutional support, green finance, environmental regulations, and government effectiveness are frequently identified as important determinants of green entrepreneurship, limited empirical research has examined the relative influence of these policy instruments on sustainable business performance. Further investigation is needed to determine which policy interventions most effectively promote environmentally responsible entrepreneurship and innovation across different economic contexts.

The identified conceptual, theoretical, methodological, contextual, and policy gaps justify the development of an integrated framework that explains how green entrepreneurship and digital transformation, through business innovation, contribute to sustainable business performance. These gaps also provide the foundation for the theoretical framework and conceptual model presented in the next section.

3. Theoretical Framework

A robust theoretical framework provides the foundation for explaining the relationships among green entrepreneurship, digital transformation, business innovation, and sustainable business performance. Because these constructs are multidimensional and span entrepreneurship, strategic management, innovation, and sustainability, no single theory sufficiently explains their interactions. Consequently, this study adopts an integrated theoretical perspective by combining the Triple Bottom Line (TBL) Theory, Dynamic Capability Theory (DCT), and Ecological Modernization Theory (EMT). The integration of these complementary theories provides a comprehensive explanation of how organizations develop sustainability-oriented capabilities that improve long-term business performance.

3.1 Triple Bottom Line (TBL) Theory

The Triple Bottom Line (TBL) Theory was introduced by Elkington (1997) as a framework for evaluating organizational success beyond traditional financial performance. The theory argues that sustainable organizations should simultaneously pursue three interrelated objectives: economic prosperity, environmental protection, and social responsibility. These dimensions, commonly referred to as Profit, Planet, and People, collectively determine long-term organizational sustainability. Unlike conventional business models that prioritize shareholder wealth, the TBL framework emphasizes balanced value creation for multiple stakeholders. Sustainable organizations therefore seek to improve profitability while minimizing environmental degradation and contributing positively to society. This multidimensional approach has become one of the most widely adopted frameworks for evaluating sustainable business performance.

The reviewed literature strongly supports the relevance of the Triple Bottom Line framework. The uploaded studies consistently demonstrate that green entrepreneurship simultaneously generates economic, environmental, and social benefits. For example, the Nepal study reports that environmentally oriented entrepreneurs contribute not only to profitability but also to environmental conservation, employment creation, community development, and climate resilience. Similarly, Sharma and Subba (2025) argue that green startups create sustainable value through renewable energy adoption, circular economy practices, eco-innovation, and responsible

resource management while simultaneously stimulating technological advancement, employment generation, and economic growth.

Within the present study, the Triple Bottom Line Theory explains the dependent variable—Sustainable Business Performance, which is conceptualized as consisting of three dimensions: economic performance, environmental performance, and social performance

Accordingly, organizations demonstrating strong green entrepreneurial orientation and digital capabilities are expected to achieve superior performance across all three sustainability dimensions.

3.2 Dynamic Capability Theory

Dynamic Capability Theory (DCT), developed by Teece (2007), explains how organizations continuously adapt their internal resources and competencies to respond to rapidly changing business environments. The theory argues that sustainable competitive advantage depends not merely on possessing valuable resources but on the organizational capability to continuously sense opportunities, seize emerging markets, and reconfigure internal resources in response to environmental change. Dynamic capabilities consist of three interrelated organizational processes: sensing opportunities, seizing opportunities, and resource reconfiguration

Organizations possessing strong dynamic capabilities continuously identify environmental changes, develop innovative responses, and transform organizational resources into new sources of competitive advantage. The reviewed literature demonstrates that green entrepreneurship represents an important dynamic capability because environmentally oriented entrepreneurs continuously recognize sustainability challenges as business opportunities. Rather than viewing environmental regulations and climate change as threats, green entrepreneurs identify opportunities for innovation, renewable energy development, sustainable agriculture, circular production systems, and environmentally responsible technologies.

Digital transformation similarly represents an important organizational capability that enables firms to adapt rapidly to technological and market changes. Digital technologies improve organizational learning, knowledge integration, decision-making, operational flexibility, and innovation capability. Consequently, firms combining environmental orientation with digital capabilities become more resilient, innovative, and competitive.

The uploaded Cleaner Production Letters article explicitly adopts Dynamic Capability Theory to explain how green entrepreneurship and digital transformation jointly enhance business innovation and sustainability among MSMEs. The study argues that environmental orientation enables organizations to identify sustainability opportunities, whereas digital transformation provides the capability to exploit these opportunities through innovative business practices. Business innovation subsequently transforms these capabilities into sustainable organizational outcomes.

Within this study, Dynamic Capability Theory explains how organizations transform green entrepreneurial orientation and digital transformation into sustainable competitive advantage through continuous innovation and organizational adaptation.

3.3 Ecological Modernization Theory

Ecological Modernization Theory (EMT) emerged from environmental sociology and economics as an explanation of how technological innovation, institutional reform, and market mechanisms can simultaneously promote economic development and environmental protection (Mol & Sonnenfeld, 2000).

Unlike earlier environmental theories that viewed economic growth and environmental conservation as conflicting objectives, Ecological Modernization Theory argues that technological innovation enables organizations to achieve both economic competitiveness and environmental sustainability. The theory proposes that environmental challenges stimulate innovation, institutional reform, technological advancement, and organizational modernization rather than restricting economic development. Governments, businesses, research institutions, financial organizations, and civil society collectively create institutional environments that encourage environmentally responsible innovation. The uploaded studies strongly support this theoretical perspective. The Future Business Journal article demonstrates that government effectiveness, rule of law, foreign direct investment, domestic credit, SME development, and technological innovation significantly influence green entrepreneurial development across European economies. These institutional factors strengthen environmentally innovative entrepreneurship while improving sustainable business performance.

Similarly, the Nepal study identifies policy consistency, green finance, institutional support, technological accessibility, and capacity-building initiatives as critical requirements for expanding green entrepreneurship and sustainable business development.

Ecological Modernization Theory therefore provides an appropriate explanation for the institutional environment supporting sustainable entrepreneurship. Within this study, the theory explains how external environmental factors—including government policies, technological infrastructure, institutional quality, financial accessibility, and environmental regulation—facilitate sustainable business transformation.

3.4 Integration of the Three Theories

Although each of the three theories contributes valuable insights, none independently explains the complex relationships among green entrepreneurship, digital transformation, innovation, and sustainable business performance.

The Triple Bottom Line Theory primarily explains the multidimensional nature of sustainable organizational performance but provides limited explanation regarding how organizations achieve these outcomes. Dynamic Capability Theory explains how organizations develop internal capabilities enabling innovation and strategic adaptation but pays relatively little attention to broader institutional environments. Ecological Modernization Theory explains the importance of technological advancement and supportive institutional environments but provides limited understanding of organizational capability development.

Consequently, integrating these theories offers a more comprehensive explanation of sustainable business development. Specifically: Triple Bottom Line Theory explains the desired sustainability outcomes (economic, environmental, and social performance). Dynamic Capability Theory explains the organizational capabilities (green entrepreneurship, digital transformation, and business innovation) that generate sustainable competitive advantage. Ecological Modernization Theory explains the institutional conditions supporting environmentally responsible innovation and sustainable business development.

The integration of these complementary perspectives provides a stronger theoretical foundation than relying on any single theory independently.

3.5 Theoretical Model of the Study

Drawing upon the integrated theoretical framework, this study proposes that green entrepreneurship and digital transformation function as strategic organizational capabilities that stimulate business innovation, which subsequently enhances sustainable business performance.
Business innovation therefore operates as the principal mediating mechanism linking entrepreneurial orientation and digital capability to long-term organizational sustainability.
Furthermore, institutional quality, including government effectiveness, supportive environmental policies, access to green finance, technological infrastructure, and regulatory support, creates an enabling environment that strengthens these relationships.

Accordingly, the proposed theoretical model suggests the following sequence:
Green Entrepreneurship+Digital Transformation
↓
Business Innovation
↓
Sustainable Business Performance
(Economic Performance, Environmental Performance, and Social Performance)
This integrated theoretical model provides the conceptual basis for the conceptual framework and research propositions presented in the subsequent section.

4. Conceptual Framework and Research Propositions

4.1 Conceptual Framework

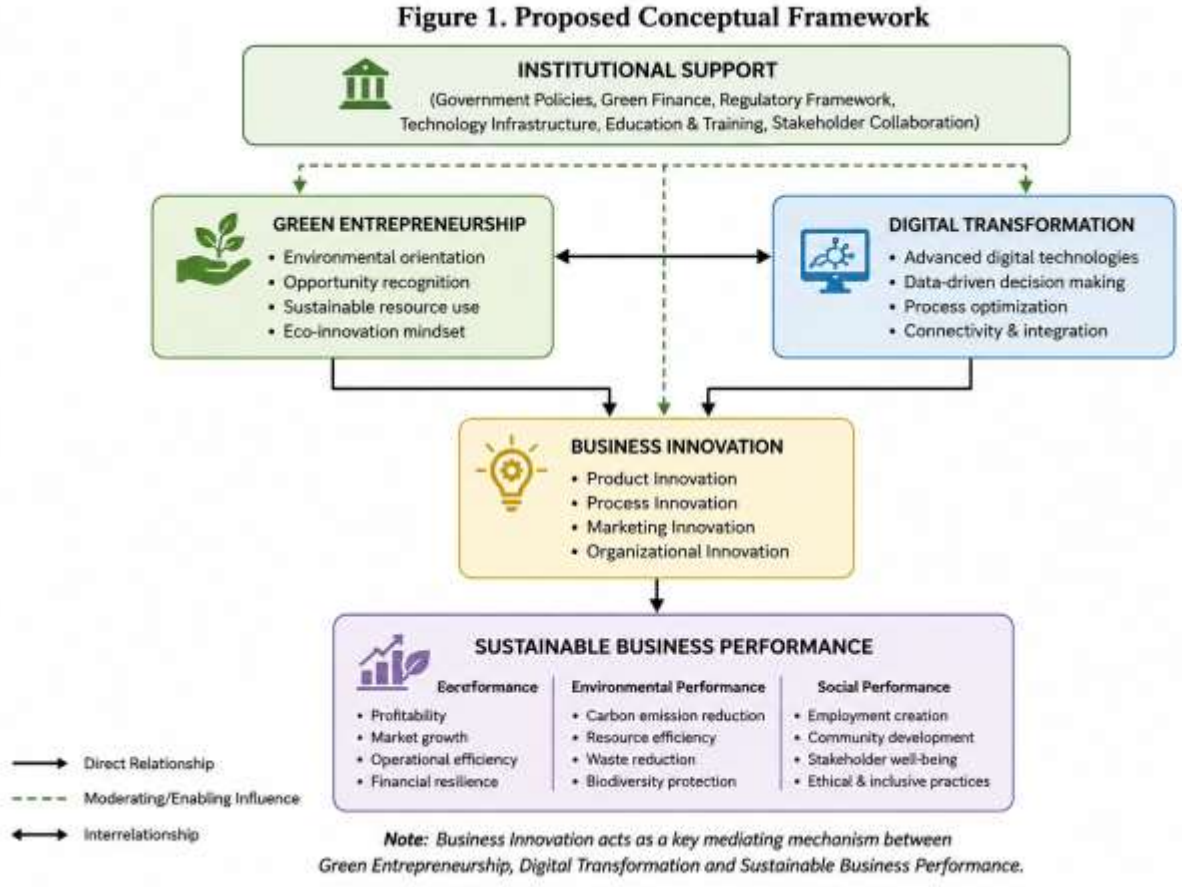
The conceptual framework developed in this study integrates the principal constructs identified in the reviewed literature into a unified model that explains sustainable business performance. The framework is grounded in the integrated theoretical perspectives of the Triple Bottom Line (TBL) Theory, Dynamic Capability Theory (DCT), and Ecological Modernization Theory (EMT), which collectively explain the strategic relationships among green entrepreneurship, digital transformation, business innovation, and sustainable business performance.
The reviewed studies consistently indicate that green entrepreneurship and digital transformation are complementary organizational capabilities that reinforce one another in promoting sustainable business development. Green entrepreneurship provides the strategic orientation toward environmental responsibility by encouraging organizations to pursue eco-friendly products, sustainable production systems, responsible resource utilization, and environmentally conscious innovation. Digital transformation complements this orientation by providing technological capabilities that improve organizational efficiency, facilitate innovation, strengthen data-driven decision-making, and support sustainable resource management.
Business innovation occupies a central position within the proposed framework because it functions as the organizational mechanism through which green entrepreneurial orientation and digital transformation are translated into sustainable organizational outcomes. Organizations possessing strong environmental commitment and advanced digital capabilities are better positioned to develop innovative products, cleaner production processes, environmentally responsible marketing strategies, and sustainable business models capable of generating long-term competitive advantage (Fawaid et al., 2026).
The dependent variable, sustainable business performance, is conceptualized using the Triple Bottom Line framework and consists of three interrelated dimensions: economic performance, environmental performance, and social performance

The reviewed literature further suggests that supportive institutional environments, including government effectiveness, environmental regulations, access to green finance, technological infrastructure, and policy consistency—strengthen the implementation of environmentally responsible business strategies. These institutional factors facilitate organizational innovation and accelerate sustainable business transformation.

Accordingly, the proposed conceptual framework assumes that green entrepreneurship and digital transformation directly influence business innovation, which subsequently enhances sustainable business performance. The framework also recognizes the enabling role of institutional support in strengthening sustainability-oriented organizational capabilities.

4.2 Proposed Conceptual Framework

Figure 1. Proposed Conceptual Framework



4.3 Explanation of the Conceptual Framework

The conceptual framework illustrates that green entrepreneurship serves as the primary strategic orientation driving organizations toward environmentally responsible business practices. Firms adopting green entrepreneurial principles prioritize renewable energy utilization, sustainable production methods, eco-friendly product development, circular economy practices, and responsible resource management. These practices create opportunities for innovation while simultaneously addressing environmental and societal challenges (Sharma & Subba, 2025).

Digital transformation complements green entrepreneurship by providing technological capabilities that enable organizations to implement sustainability initiatives more efficiently. Technologies such as artificial intelligence, cloud computing, Internet of Things (IoT), blockchain, and big data analytics improve operational efficiency, facilitate intelligent decision-making, optimize resource utilization, and strengthen environmental monitoring. Consequently, digital transformation accelerates the implementation of sustainable business models and enhances organizational adaptability (Fawaid et al., 2026).

Business innovation represents the principal mediating construct within the framework. Green entrepreneurial orientation stimulates organizations to recognize environmental challenges as entrepreneurial opportunities, whereas digital technologies provide the capabilities necessary to transform these opportunities into innovative products, services, production systems, and organizational practices. Innovation therefore becomes the mechanism through which environmental orientation and technological capability jointly improve organizational sustainability.

The ultimate outcome of these strategic interactions is sustainable business performance. Organizations successfully integrating environmental responsibility, digital capability, and innovation are expected to achieve superior economic performance through improved profitability and competitiveness, enhanced environmental performance through reduced pollution and efficient resource utilization, and stronger social performance through employment creation, stakeholder engagement, ethical governance, and community development.

Institutional support functions as an enabling condition that strengthens these relationships. Government policies promoting green finance, technological innovation, environmental regulation, entrepreneurship development, and research collaboration create favorable conditions for sustainable entrepreneurial ecosystems. Consequently, organizations operating within supportive institutional environments are more likely to implement successful sustainability-oriented business models (Onofrei et al., 2026).

4.4 Research Propositions

Drawing upon the reviewed literature and the proposed conceptual framework, the following research propositions are advanced.

Proposition One (P1)

Green entrepreneurship positively influences business innovation by encouraging organizations to develop environmentally responsible products, services, and production processes.

This proposition is supported by evidence demonstrating that environmentally oriented entrepreneurs recognize sustainability challenges as opportunities for innovation and competitive advantage (Sharma & Subba, 2025).

Proposition Two (P2)

Digital transformation positively influences business innovation by enhancing organizational learning, technological capability, resource optimization, and knowledge integration.

Advanced digital technologies facilitate organizational flexibility, intelligent decision-making, and continuous innovation, thereby strengthening sustainable business development (Fawaid et al., 2026).

Proposition Three (P3)
Business innovation positively influences sustainable business performance.
Organizations developing innovative products, cleaner production processes, sustainable marketing practices, and environmentally responsible business models achieve superior economic, environmental, and social outcomes through enhanced competitiveness, resource efficiency, and stakeholder value creation.

Proposition Four (P4)
Business innovation mediates the relationship between green entrepreneurship and sustainable business performance.
Rather than directly improving organizational sustainability, green entrepreneurial orientation enhances sustainable performance primarily through innovation-driven organizational transformation.

Proposition Five (P5)
Business innovation mediates the relationship between digital transformation and sustainable business performance.
Digital technologies improve organizational sustainability by facilitating innovative products, production systems, and managerial practices that strengthen long-term competitiveness and environmental stewardship.

Proposition Six (P6)
Institutional support strengthens the implementation of green entrepreneurship and digital transformation, thereby enhancing business innovation and sustainable business performance.
Supportive environmental policies, access to green finance, technological infrastructure, and effective governance improve organizations' capacities to implement environmentally responsible innovations and sustainable business models.

4.5 Contribution of the Conceptual Framework
The proposed framework contributes to the literature in several important ways. First, it integrates fragmented research streams on green entrepreneurship, digital transformation, innovation, and sustainability into a coherent model. Second, it positions business innovation as the central mediating mechanism linking strategic capabilities to sustainable performance. Third, it highlights the enabling role of institutional support in fostering sustainability-oriented entrepreneurship. Finally, the framework provides a foundation for future empirical studies employing Structural Equation Modeling (SEM) or Partial Least Squares Structural Equation Modeling (PLS-SEM) to test the proposed relationships across different organizational and national contexts.

4. Research Methodology
4.1 Research Method
This study adopted a Systematic Literature Review (SLR) approach to critically synthesize existing knowledge on the relationships among green entrepreneurship, digital transformation, business innovation, and sustainable business performance. The SLR approach was selected because it provides a rigorous, transparent, and reproducible process for identifying, evaluating, and synthesizing scientific evidence on a specific research topic. Compared with traditional narrative reviews, systematic reviews minimize researcher bias through explicit search protocols,

predefined inclusion criteria, and structured evidence synthesis, thereby improving the reliability and validity of review findings (Page et al., 2021; Snyder, 2019).

The review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) framework, which is widely recognized as the international standard for conducting and reporting systematic reviews. PRISMA provides a structured procedure for literature identification, screening, eligibility assessment, inclusion, and synthesis, ensuring methodological transparency and reproducibility throughout the review process (Page et al., 2021). The review process comprised five sequential stages: **(i)** literature identification, **(ii)** screening, **(iii)** eligibility assessment, **(iv)** quality appraisal, and **(v)** qualitative synthesis.

4.2 Sources of Literature

To ensure comprehensive coverage of relevant scholarship, literature was retrieved from internationally recognized academic databases that index high-quality journals in entrepreneurship, innovation, management, sustainability, and digital transformation. The primary databases included: Scopus, Web of Science Core Collection, ScienceDirect, SpringerLink , Emerald Insight, Wiley Online Library Google Scholar was used only as a supplementary search engine to identify additional peer-reviewed publications that may not have been retrieved through database searches. Because this review aims to provide contemporary evidence, the search focused primarily on studies published between January 2020 and February 2026. However, seminal theoretical publications were also included where necessary to explain the conceptual foundations of the study, particularly the Triple Bottom Line Theory, Dynamic Capability Theory, and Ecological Modernization Theory.

4.3 Search Strategy

A comprehensive search strategy was developed using combinations of keywords, Boolean operators, phrase searching, and truncation symbols to maximize retrieval accuracy.

The principal search terms included: "Green Entrepreneurship", "Environmental Entrepreneurship", "Digital Transformation", "Business Innovation", "Green Innovation", "Business Sustainability", "Sustainable Business Performance", "Circular Economy","SMEs", "MSMEs" These keywords were combined using Boolean operators (AND, OR) to generate search expressions such as: ("Green Entrepreneurship" AND "Digital Transformation") ("Green Entrepreneurship" AND "Business Innovation") ("Business Innovation" AND "Sustainable Business Performance") ("Digital Transformation" AND Sustainability) ("Green Innovation" AND SMEs) ("Circular Economy" AND Entrepreneurship)

The search strategy was refined iteratively to eliminate irrelevant studies while maximizing the retrieval of publications directly related to the objectives of this review.

4.4 Eligibility Criteria

To improve consistency during article selection, predefined inclusion and exclusion criteria were established before the review commenced.

Inclusion Criteria

Studies were included if they: were published between 2020 and 2026; appeared in peer-reviewed journals; were indexed in internationally recognized databases; were written in English; focused on green entrepreneurship, digital transformation, business innovation, sustainable business, or sustainable business performance; employed qualitative, quantitative, mixed-methods, systematic

review, or meta-analysis research designs; and provided sufficient methodological and theoretical information relevant to the objectives of this review.

Exclusion Criteria

Studies were excluded if they: were conference abstracts, editorials, commentaries, book reviews, dissertations, or opinion papers; lacked methodological transparency; focused solely on environmental science without business or entrepreneurship implications; were duplicate publications; were unavailable in full text; or were published in languages other than English.

4.5 Study Selection Process

The selection of articles followed the four phases recommended by the PRISMA 2020 Statement. During the identification phase, all records retrieved from the selected databases were exported into reference management software, where duplicate publications were removed.

The screening phase involved reviewing article titles and abstracts to determine their relevance to the objectives of the study. Publications that did not address green entrepreneurship, digital transformation, business innovation, or sustainable business performance were excluded at this stage. The eligibility phase consisted of a full-text assessment of the remaining publications. Each article was critically evaluated against the predefined inclusion and exclusion criteria to determine methodological quality and conceptual relevance.

Finally, studies satisfying all eligibility requirements were included in the qualitative synthesis. These publications formed the evidence base for the conceptual analysis and framework developed in this review.

4.6 Data Extraction and Analysis

A standardized data extraction template was developed to ensure consistency in reviewing the selected studies. For each publication, the following information was extracted: Author(s) and year of publication; Country or geographical context; Research objectives; Theoretical framework; Research methodology; Sample characteristics (where applicable); Analytical techniques; Key findings; Practical implications; and Identified research gaps.

The extracted data were analysed using thematic content analysis, which involved coding recurring concepts, comparing findings across studies, and organizing the evidence into major thematic categories. The analysis produced six overarching themes that guided the development of the literature review and conceptual framework:Green Entrepreneurship; Sustainable Business; Digital Transformation; Business Innovation; Sustainable Business Performance; and Institutional Support. These themes provided the basis for identifying relationships among the constructs and for proposing the integrated conceptual framework presented in this study.

4.7 Quality Appraisal

To ensure the credibility of the review, the methodological quality of the selected studies was critically assessed. Each publication was evaluated based on:clarity of research objectives; appropriateness of research design; transparency of data collection procedures; robustness of analytical methods; validity and reliability (where applicable); consistency between findings and conclusions; and contribution to theory and practice.

Only studies demonstrating satisfactory methodological quality and direct relevance to the review objectives were retained for synthesis.

4.8 PRISMA Flow Diagram

The literature selection process is summarized using the PRISMA 2020 flow diagram, which documents the number of records identified, screened, assessed for eligibility, excluded (with reasons), and finally included in the review.

Figure 2. PRISMA 2020 Flow Diagram of the Literature Selection Process

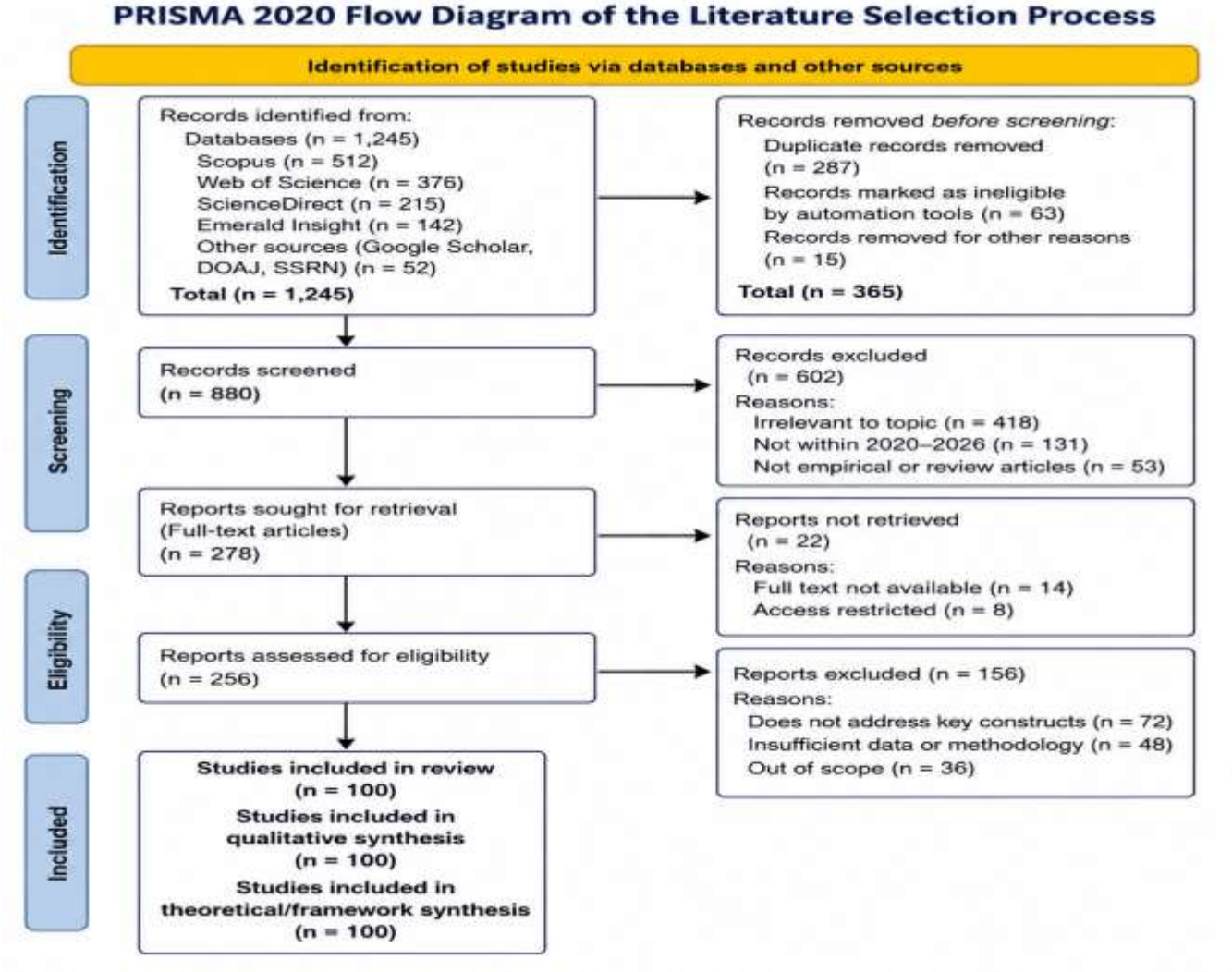


Figure 2. PRISMA 2020 flow diagram illustrating the identification, screening, eligibility assessment, and inclusion of studies considered in the systematic literature review. The review followed the PRISMA 2020 reporting guidelines to ensure transparency, reproducibility, and methodological rigor throughout the literature selection process (Page et al., 2021).

4.9 Methodological Rigor

The methodological rigor of this review was enhanced through the adoption of a transparent search strategy, explicit eligibility criteria, systematic quality appraisal, standardized data extraction procedures, and adherence to the PRISMA 2020 reporting guidelines. Collectively, these

procedures minimized selection bias, enhanced reproducibility, and strengthened the credibility of the findings.

5. Discussion

5.1 Overview of the Review Findings

This systematic review synthesizes contemporary literature on the relationships among green entrepreneurship, digital transformation, business innovation, and sustainable business performance. The review demonstrates that organizations operating in increasingly competitive and environmentally sensitive business environments require integrated strategic capabilities that simultaneously enhance economic competitiveness, environmental stewardship, and social responsibility. The findings consistently indicate that green entrepreneurship and digital transformation are complementary rather than independent strategic capabilities, with business innovation serving as the principal mechanism through which these capabilities improve sustainable business performance. These findings are consistent with the evidence presented in the uploaded studies, which emphasize the synergistic role of environmentally oriented entrepreneurship, technological advancement, and innovation in promoting long-term organizational sustainability. The review further reveals that sustainable business performance extends beyond conventional financial indicators to encompass environmental conservation and social value creation. Consequently, organizations that successfully integrate environmental responsibility with digital capability and innovation are more likely to achieve sustainable competitive advantage than firms relying solely on traditional business strategies.

5.2 Green Entrepreneurship as a Strategic Driver of Sustainability

One of the major findings of this review is that green entrepreneurship has evolved from a niche environmental initiative into a strategic business orientation that enables organizations to create economic, environmental, and social value simultaneously. Across the reviewed literature, green entrepreneurs consistently demonstrate an ability to transform environmental challenges into entrepreneurial opportunities by developing innovative products, sustainable production systems, renewable energy solutions, circular economy practices, and environmentally responsible business models. The uploaded studies provide strong evidence that environmentally oriented entrepreneurs contribute significantly to employment generation, community development, resource conservation, and long-term economic resilience. For example, the Nepal study illustrates how entrepreneurs combine indigenous knowledge, environmental awareness, and sustainable resource utilization to create businesses that simultaneously improve livelihoods and protect natural ecosystems. Likewise, the review of green startups highlights the contribution of environmentally innovative enterprises to low-carbon economic development, technological advancement, and sustainable industrial transformation.

These findings reinforce the argument that environmental sustainability should no longer be viewed as a regulatory obligation or corporate social responsibility activity but rather as a strategic source of innovation and competitive advantage.

5.3 Digital Transformation as an Enabler of Sustainable Business Development

The review further demonstrates that digital transformation represents a critical organizational capability supporting sustainable business development. Contemporary digital technologies—including artificial intelligence, cloud computing, blockchain, big data analytics, and the Internet

of Things—enable organizations to optimize resource utilization, improve operational efficiency, strengthen environmental monitoring, and enhance decision-making processes.

The uploaded Cleaner Production Letters study provides empirical evidence that digital transformation significantly improves organizational innovation and sustainable business performance by enabling firms to adopt intelligent production systems, improve marketing effectiveness, and strengthen organizational adaptability.

An important contribution of this review is the recognition that digital transformation should not be considered independently of sustainability initiatives. Rather, digital technologies provide the operational infrastructure required for implementing green entrepreneurial strategies. Green entrepreneurship establishes the strategic commitment to sustainability, whereas digital transformation provides the technological capability required to implement environmentally responsible innovations effectively.

Consequently, organizations that simultaneously invest in environmental sustainability and digital capability are better positioned to achieve operational excellence, innovation, and long-term resilience.

5.4 Business Innovation as the Mediating Mechanism

Another significant finding emerging from the review is the central role of business innovation in explaining the relationship between green entrepreneurship, digital transformation, and sustainable business performance.

The uploaded studies consistently demonstrate that environmentally responsible organizations translate sustainability-oriented strategies into measurable organizational outcomes through innovation. Green entrepreneurial orientation encourages firms to recognize environmental problems as business opportunities, while digital technologies facilitate the development of innovative products, processes, services, marketing approaches, and organizational practices.

The Cleaner Production Letters article explicitly positions business innovation as the mediating mechanism linking green entrepreneurship and digital transformation to business sustainability. Organizations possessing stronger environmental orientation and digital capability demonstrate greater capacity for product innovation, process innovation, organizational innovation, and marketing innovation, which subsequently improve sustainable business performance.

This finding supports Dynamic Capability Theory, which argues that sustainable competitive advantage depends not only on resource possession but also on the organizational capability to reconfigure resources continuously through innovation.

5.5 Sustainable Business Performance as a Multidimensional Outcome

The review demonstrates that sustainable business performance should be evaluated using a multidimensional perspective rather than relying exclusively on financial indicators. Consistent with the Triple Bottom Line framework, sustainable organizations simultaneously pursue economic prosperity, environmental protection, and social well-being.

Economic performance is enhanced through innovation, improved productivity, operational efficiency, market expansion, and resource optimization. Environmental performance improves through cleaner production systems, renewable energy utilization, waste reduction, carbon emission mitigation, and circular economy implementation. Social performance is strengthened through employment creation, community development, ethical governance, stakeholder engagement, and inclusive business practices.

The uploaded studies consistently support this multidimensional perspective by demonstrating that green entrepreneurship contributes to profitability while simultaneously promoting environmental conservation and social development.

These findings suggest that organizations adopting sustainability-oriented strategies are more likely to achieve long-term organizational resilience than firms pursuing financial performance alone.

6. Theoretical Contributions

This study makes several important contributions to the entrepreneurship and sustainability literature.

First, it integrates previously fragmented research streams on green entrepreneurship, digital transformation, business innovation, and sustainable business performance into a single conceptual framework. Previous studies have largely examined these constructs independently, whereas this review demonstrates their interdependence within sustainable business ecosystems.

Second, the study extends the application of Dynamic Capability Theory by explaining how green entrepreneurship and digital transformation function as strategic organizational capabilities that stimulate innovation and sustainable competitive advantage.

Third, the study broadens the application of the Triple Bottom Line Theory by illustrating how sustainability-oriented entrepreneurial activities simultaneously generate economic, environmental, and social value.

Fourth, the study enriches Ecological Modernization Theory by demonstrating the importance of institutional support—including government policies, technological infrastructure, green finance, and regulatory effectiveness—in facilitating sustainable entrepreneurial ecosystems.

Finally, the review proposes an integrated conceptual framework that provides a theoretical foundation for future empirical investigations employing Structural Equation Modeling (SEM), Partial Least Squares Structural Equation Modeling (PLS-SEM), or longitudinal research designs.

7. Practical Implications

The findings of this review have important implications for business practitioners.

Entrepreneurs should view environmental sustainability as a strategic opportunity for innovation rather than merely a compliance requirement. Investments in eco-friendly products, cleaner production systems, renewable energy, and sustainable resource management can enhance long-term competitiveness and organizational resilience.

Managers should integrate digital transformation into sustainability strategies by adopting technologies that improve resource efficiency, organizational learning, environmental monitoring, and customer engagement. Digital technologies should complement, rather than replace, sustainability-oriented business practices.

SMEs should strengthen innovation capabilities through continuous investment in research and development, employee training, knowledge management, and collaboration with universities, research institutions, and technology providers.

Organizations should also integrate sustainability into corporate strategy rather than treating environmental initiatives as isolated corporate social responsibility programmes.

8. Policy Implications

Governments play a critical role in promoting sustainable entrepreneurial ecosystems.

Public policies should strengthen access to green finance, improve digital infrastructure, provide tax incentives for environmentally responsible innovation, and support research and development in sustainable technologies.

Governments should also strengthen environmental regulations while simultaneously creating innovation-friendly institutional environments that encourage sustainable entrepreneurship.

Higher education institutions should incorporate sustainability and digital entrepreneurship into entrepreneurship education programmes to prepare future entrepreneurs for environmentally responsible business development.

Development agencies should prioritize capacity-building programmes that improve SMEs' digital capabilities and innovation capacity while facilitating access to international sustainability initiatives. These recommendations are consistent with the uploaded studies, which identify institutional quality, government effectiveness, and technological infrastructure as essential enablers of sustainable entrepreneurship.

9. Limitations and Future Research Directions

Although this review provides an integrated synthesis of contemporary literature, several limitations should be acknowledged.

First, the review focused primarily on English-language publications, which may have excluded relevant studies published in other languages.

Second, the review relied on peer-reviewed journal articles, potentially overlooking valuable insights from high-quality books, policy reports, and industry publications.

Third, while the proposed conceptual framework is grounded in existing evidence, it has not yet been empirically tested.

Future research should therefore:

1. validate the proposed conceptual framework using SEM or PLS-SEM;
2. examine the mediating role of business innovation across different industries and countries;
3. investigate moderating variables such as institutional quality, organizational culture, leadership, and green finance;
4. employ longitudinal designs to examine sustainability capability development over time; and
5. extend empirical investigations to underrepresented regions, particularly Africa, Latin America, and South Asia, where green entrepreneurship remains comparatively underexplored.

10. Conclusion

This study systematically reviewed contemporary literature on green entrepreneurship, digital transformation, business innovation, and sustainable business performance to develop an integrated conceptual understanding of how these constructs interact to promote organizational sustainability. The review demonstrates that green entrepreneurship and digital transformation are complementary strategic capabilities that jointly enhance sustainable business performance through the mediating role of business innovation. Grounded in the Triple Bottom Line Theory, Dynamic Capability Theory, and Ecological Modernization Theory, the proposed framework advances current scholarship by integrating fragmented research streams into a coherent model that explains how organizations create economic, environmental, and social value simultaneously.

The review further establishes that sustainable business performance depends not only on internal organizational capabilities but also on supportive institutional environments characterized by

effective governance, access to green finance, technological infrastructure, and innovation-oriented public policies. Organizations capable of integrating environmental responsibility, digital technologies, and continuous innovation are better positioned to achieve long-term resilience, competitive advantage, and sustainable growth.

Overall, this study contributes to the growing body of sustainability and entrepreneurship literature by providing an evidence-based framework that informs theory, managerial practice, and public policy while offering a foundation for future empirical research on sustainable business development in both developed and emerging economies.

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