



Exploring the role of Eco-innovation in Nepalese SMEs for Corporate Sustainability

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Abstract

Purpose: The purpose of this study is to explore the role of eco-innovation in Nepalese SMEs, specifically about corporate sustainability. The research aims to understand how eco-innovation is integrated into SMEs' operations and to identify the drivers, barriers, and enablers of such practices in the Nepalese context.

Design/methodology/approach: This qualitative research employs a Transcendental Phenomenology approach. Data was collected through semi-structured interviews with SME stakeholders and focus group discussions. Purposive sampling was used to select participants, and the analysis followed Moustakas' (1994) phenomenological method to identify themes and subthemes related to eco-innovation and corporate sustainability in SMEs.

Findings: The study identifies several themes, including the challenges SMEs face in implementing eco-innovation, such as resource constraints and regulatory barriers. It also explores the enablers, like educational initiatives and supportive policies, which can help SMEs overcome these challenges. Eco-innovation significantly contributes to corporate sustainability by addressing economic, social, and environmental concerns. The study offers practical insights into how SMEs can integrate eco-innovation into their business strategies for long-term sustainability.

Conclusion: The study highlights the importance of eco-innovation in Nepalese SMEs for corporate sustainability, despite challenges like cost, stakeholder awareness, and regulatory barriers, with leadership and organizational culture playing key roles.

Implications: This study contributes to the understanding of eco-innovation in emerging economies by emphasizing the roles of leadership, organizational culture, and supportive policies in driving corporate sustainability. It highlights the need for awareness campaigns, financial incentives, and policy reforms to help Nepalese SMEs adopt eco-innovation practices and integrate sustainability into their business strategies.

JEL Classification: Q01, Q56, M14, L25

Introduction

As the significance of sustainability has increased globally, businesses are under increasing pressure to align their practices with social, environmental, and economic goals. The United Nations Sustainable Development Goals (SDGs), especially SDG 9, promote sustainable industrialization and foster innovation (Brodny & Tutak, 2023). Small and Medium Enterprises (SMEs) are fundamental to this effort because more than 90% of global businesses provide significant employment, especially in developing economies (World Economic Forum, 2022; Heenkenda et al., 2022). However, in the context of developing economies, SMEs face different problems including regulatory challenges, limited access to finance, and less technical knowledge which makes it difficult for SMEs to develop the economics their transaction to sustainability. (Heenkenda et al., 2022; OECD, 2023).

Nepal is a developing economy, and SMEs significantly contribute to economic development through employment opportunities. However, these SMEs face significant challenges in



managing their environmental impact in contributing to sustainable growth (Singh et al., 2009; UN Nepal, 2024). Eco-innovation, as defined by Pichlak and Szromek (2021), involves the development of products, processes, and business models that reduce environmental impact and enhance resource efficiency. Gupta et al. (2021) highlights that eco-innovation encompasses practices such as cleaner production methods, sustainable supply chain management, and energy efficiency improvements. Despite its growing importance, there remains a gap in understanding how eco-innovation is implemented in Nepalese SMEs, which face unique challenges in their journey toward corporate sustainability (Mishra & Aithal, 2022). Eco-innovation practices such as environmentally friendly products, and resource-efficient products allow SMEs to maintain the balance the economic, environmental as well as social objectives (Bag et al., 2022; Widya-Hasuti et al., 2018; Munoz-Pascual et al., 2019).

Nepal is a developing economy, and SMEs significantly contribute to economic development through employment opportunities. However, these SMEs face significant challenges in managing their environmental impact in contributing to sustainable growth (Singh et al., 2009; UN Nepal, 2024). Although there is a huge possibility, a very limited number of Nepalese SMEs adopt eco-innovation. The main problems are financial constraints, poor infrastructure, and regulatory challenges which pull SMEs from achieving the advantages of eco-innovation (Geng et al., 2021; Klewitz & Hansen, 2014). Eco-innovation can drive improvements in brand reputation, customer satisfaction, operational efficiency, and profitability, particularly when it is supported by effective regulations and policies (Martins et al., 2022; Bag et al., 2022).

This study explores does eco-innovation can promote corporate sustainability within Nepalese SMEs. Similarly, this study explains the drivers, barriers, and enabling factors in context of Nepal's socio-economy. Likewise, the previous studies primarily focus on large firms or SMEs in developed context, this study fills the critical knowledge gap by addressing exploring the study in context of developing economic nation i.e. Nepal where SMEs play major contribution in the economy. Furthermore, this study aims to inform policy recommendations that helps SMEs to adopt eco-innovation as a strategy for sustainable growth, fostering the corporate resilience and aligning with international sustainable framework (Heenkenda et al., 2022; UN Nepal, 2024).

Literature Review

Numerous studies have investigated eco-innovation, each employing varied methods of data analysis to examine its impact on firm performance, sustainability, and regulatory compliance. Quantitative approaches dominate the literature, with studies by Auken and Madrid-Guijarro (2008) identifying a correlation between eco-innovation and improved financial performance in Spanish SMEs, while Brammer and Millington (2008) provide insights into the reciprocal effects of corporate social and financial performance in UK firms. Similarly, Bos-Brouwers (2009) examined Dutch SMEs, emphasizing the role of eco-innovation as a strategic tool for accessing niche markets and differentiating from competitors. Recent quantitative studies continue this trend; Almeida (2021) examines the Brazilian context, finding eco-innovation to be a critical factor in enhancing competitive advantage, while Becerra-Vicario et al. (2023) expand on these findings by exploring the complexities of eco-innovation adoption in Latin American SMEs, identifying external pressures, like customer demand and environmental regulations, as primary motivators.

In contrast, qualitative studies such as those by Massa and Testa (2008) and Triguero et al. (2013) find valuable insights into the nuanced enablers and barriers of eco-innovation in SMEs. Massa and Testa (2008) examined Italian SMEs, finding that internal factors such as organizational culture and management commitment

significantly affect eco-innovation adoption. Triguero et al. (2013) further highlights the role of public intermediaries, like local authorities and consultancies, in promoting eco-innovation in European SMEs, advocating for stronger policy support to facilitate collaborative networks.

Geographically, the majority of research on eco-innovation within SMEs has focused on Europe, reflecting the region's proactive stance on environmental regulations and sustainability. Studies by Triguero et al. (2013) and Bos-Brouwers (2009) in particular emphasize that European SMEs benefit from supportive regulatory frameworks and funding opportunities, which encourage eco-innovation. Triguero et al. (2013) analyzed Spanish firms and found that regional policies significantly affect eco-innovation adoption rates, supporting the argument that institutional support is crucial. Outside Europe, studies in emerging economies, though fewer, reveal a different set of challenges. Singh and Chakraborty (2021) explored Indian manufacturing SMEs and found that while eco-innovation improves sustainability performance, resource constraints and lack of policy support often hinder its adoption. Munodawafa and Johl (2019) examined SMEs in South Africa, highlighting that limited access to capital and technical expertise are substantial barriers to eco-innovation, reinforcing the need for tailored policies to address these unique challenges.

Objective-wise, recent studies have contributed valuable insights to the understanding of eco-innovation within SMEs, with each focusing on distinct aspects of corporate sustainability. Munodawafa and Johl (2019) emphasize the importance of corporate sustainability by identifying key drivers and barriers influencing eco-innovation adoption. Triguero et al. (2013) focus on the role of intermediaries in fostering eco-innovation, highlighting the importance of collaboration with local authorities and consultancies. Ekins (2010) discusses eco-innovation within a policy framework, advocating for comprehensive environmental policies that support technological transitions. Similarly, Zhang and Walton (2016) examined the relationship between eco-innovation and the performance of business in green-oriented SMEs, finding that environmental commitment and orientation to resource efficiency are critical factors in achieving competitive advantage. Mazzanti (2018) offers a broader perspective, analyzing the global scientific landscape of research in eco-innovation and identifying the circular economy as an emerging focus. Gallego-Alvarez et al. (2011) employ resource-based theory to explore the reciprocal relationship between CSR and innovation, suggesting that companies with strong CSR commitments are more inclined to invest in eco-innovation.

The findings across these studies are diverse but collectively highlight common themes. Quantitative studies by Auken and Madrid-Guijarro (2008), Brammer and Millington (2008), and Becerra-Vicario et al. (2023) confirm a positive correlation between eco-innovation and financial performance, while emphasizing the impact of external pressures, such as regulatory compliance and consumer demand. In green-oriented SMEs, Triguero et al. (2013) and Singh and Chakraborty (2021) underscore the role of eco-innovation in promoting performance of the business. Qualitative research further complements these findings by revealing context-specific insights; Triguero et al. (2013) and Ekins (2010) highlight the significance of public intermediaries and robust policies, while Mazzanti (2018) discusses eco-innovation as a key factor in advancing the circular economy. Dyllick and Hockerts (2002) and Gallego-Alvarez et al. (2011) also call for a more comprehensive approach to sustainability, arguing that organizations must move beyond eco-efficiency toward true sustainable development.

Despite the substantial body of international literature, the role of eco-innovation in Nepalese SMEs remains underexplored. Existing studies predominantly focus on larger firms in developed regions, overlooking the unique socio-economic conditions of SMEs in

Nepal. In the Nepalese context, limited access to financial resources, a shortage of technical expertise, and regulatory challenges are significant barriers to eco-innovation, underscoring the need for context-specific research (Auken & Madrid-Guijarro, 2008; Bos-Brouwers, 2009; Becerra-Vicario et al., 2023). Addressing this gap is essential to inform policy and practice that can support Nepalese SMEs in adopting sustainable business practices, ultimately contributing to a more resilient and eco-innovative business environment.

Methods

Nepalese SMEs are grounded in interpretivism, which emphasizes the understanding of reality through social constructs like language, individual perceptions, and shared experiences (Bryman & Bell, 2015). This research paradigm is chosen to capture the subjective experiences of SMEs in adopting eco-innovation practices. The study aims to uncover the barriers and drivers influencing eco-innovation within Nepalese SMEs, with a particular focus on how these factors impact their sustainability efforts. By embracing interpretivism, the study recognizes that knowledge is shaped by the unique socio-economic and environmental contexts in which businesses operate.

This study adopts a multiple case study design, following Merriam's (1998) approach. This method allows for a detailed exploration of eco-innovation practices across various SMEs, providing comprehensive insights into how these businesses navigate sustainability goals. By focusing on six participants through purposive sampling, the research ensures a diverse representation of experiences, offering a broader understanding of eco-innovation's role within the Nepalese context.

The data analysis process was involved inductive coding of interview transcripts, where emerging themes will be identified and categorized. This approach was allowed the researcher to build a thematic framework that aligns with existing literature while also highlighting new insights specific to the Nepalese SME landscape. The findings will play a significant role in contributing to the understanding of how eco-innovation encourages corporate sustainability, providing valuable implications for policy formulation, business strategies, and academic discussions.

Results and Analysis

In this study, two female and four male participants from the different SMEs are practicing eco-innovation. Four of the participants own the business while the remaining are working in the managerial position. The details of the participants are summarized and listed below in Table 1.

Table 1: Profile of the Study Participants

Companies	Sector	Respondents Position	Type of Interview
Company A	Fashion	Owner	Physical Interview
Company B	Fashion	Managing director	Online Interview
Company C	Fashion	Managing Director	Physical Interview
Company D	Personal care products	Owner	Online Interview
Company E	Home products	Owner	Physical Interview
Company F	Home appliances	Owner	Physical Interview

The analysis of the interview data revealed four central themes pertinent to the adoption of eco-innovation within Nepalese SMEs. The first theme underscores the importance of eco-innovation, which is further divided into two subthemes: Environmental Challenges and Sustainable Practices and Competitive Edge and Market Positioning. These subthemes illustrate how eco-innovation contributes to addressing environmental issues and enhances market positioning for SMEs. The second theme highlights the challenges in adopting eco-innovation, encompassing sub-themes such as Cost and Awareness as Barriers and Regulatory and Policy Hurdles. This theme emphasizes the financial and informational limitations, alongside policy-related obstacles, that impede the adoption process for SMEs. The third theme centers on the positive outcomes and alignment with long-term sustainability goals. It comprises subthemes like Reduction of Environmental Footprint and Economic and Social Contributions, demonstrating the tangible benefits of eco-innovation in terms of environmental impact and broader economic and social advantages. Finally, the fourth theme focuses on the integration of eco-innovation into business strategy. This theme includes sub-themes on Leadership Influence and Organizational Culture Challenges in Integration and the Need for Supportive Policies. These subthemes highlight the role of leadership and organizational culture in facilitating eco-innovation and underscore the necessity for supportive policies to overcome integration challenges.

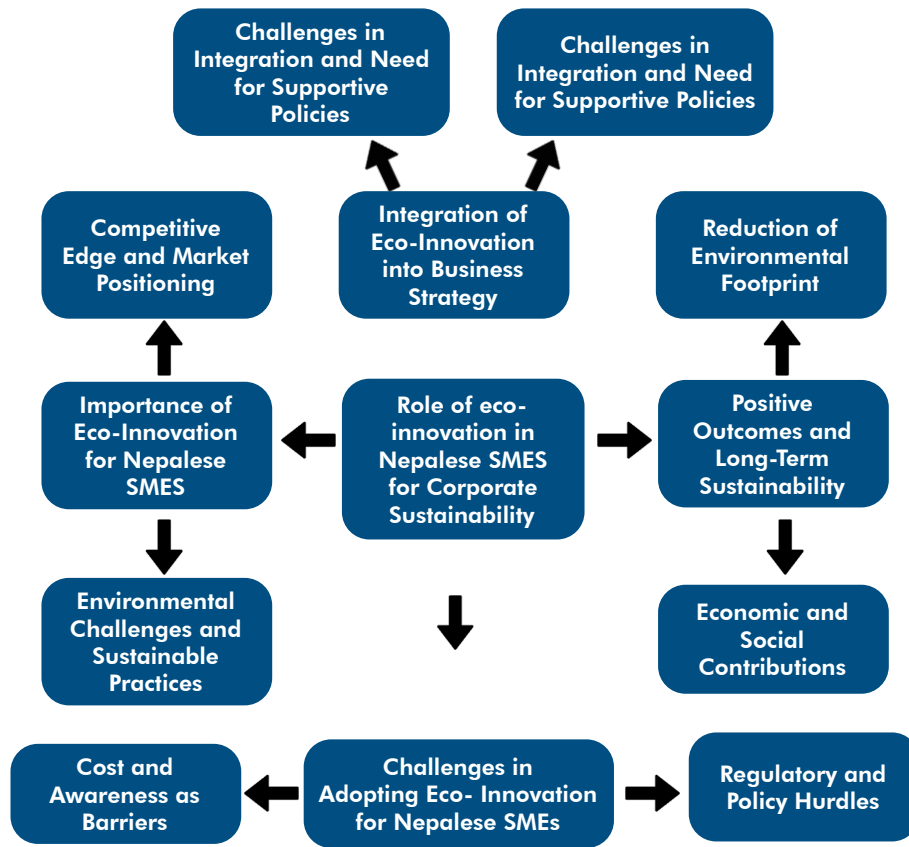


Figure 1: Conceptualized Themes

Theme 1: Importance of Eco-Innovation for Nepalese SMEs

Eco-innovation plays an important role in addressing environmental challenges while fostering corporate sustainability. The excerpts from K5 and K6 shed light on this theme.

Environmental Challenges and Sustainable Practices: This sub-theme emphasizes the importance of challenging the environmental issue for Nepalese SMEs through eco-innovation, considering eco-innovation as one of the significant strategies for promoting sustainable business and encouraging environmental responsibility as highlighted by K5’s insights on Environmental Challenges and Sustainable Practices. Excerpt (K5): *“In the context of Nepalese SMEs, eco-innovation is a crucial strategy, facing environmental challenges.”* This statement highlights the significance of eco-innovation in the context of Nepalese SMEs, showing it as a vital strategic response to environmental issues. It suggests that eco-innovation is not merely a choice but a necessity for Nepalese SMEs. This approach helps to align with the global shift towards sustainability and reinforces the interrelation between businesses and environmental accountability.

Competitive Edge and Market Positioning: Adopting eco-innovation provides Nepalese SMEs an important competitive edge, enhancing their positions in the market and boosting the resource efficiency as indicated by K6’s understanding on the opportunities for the businesses. Excerpt (K6): *“Eco-innovation provides greater*

opportunities such as competitiveness, market positioning, and resource efficiency.” This statement emphasizes that by integrating eco-innovation effectively with the business strategy, Nepalese SMEs can achieve a competitive advantage and better market positioning, while also promoting resource efficiency.

Theme 2: Challenges in Adopting Eco-Innovation for Nepalese SMEs

Nepalese SMEs face different issues in adopting the eco-innovation strategy as highlighter by K5 and K6, such as cost limitations, awareness gaps, and the essential for supportive policies

Cost and Awareness as Barriers: Nepalese SMEs encounter significant challenges in the process of adopting eco-innovation due to financial constraints. Some of the challenges are low investment, high production costs as well as lack of awareness. Well-regulated strategies, supportive policies, and awareness campaigns are required to address these obstacles. Excerpt (K5): *“Cost constraints and lack of awareness in adopting eco-innovation are the major challenges in SMEs adopting eco-innovation ”.*

Regulatory and Policy Hurdles: Nepalese small and medium-sized enterprises (SMEs) face significant challenges in adopting eco-innovation, primarily due to regulatory complexities and insufficient supportive policies. Streamlining regulations and developing conducive policies are essential to promote sustainable practices within the business sector as given in Excerpt (K6): *“Contextual factors*

influencing adoption include regulatory challenges and the impact of government policies." This excerpt highlights that the decision-making process for SMEs in adopting eco-innovation is significantly shaped by regulatory challenges and the influence of government policies. It underscores the necessity of creating a supportive regulatory environment to facilitate sustainable innovation."

Theme 3: Positive Outcomes and Long-Term Sustainability Goals

Nepalese SMEs are increasingly acknowledging the value of embedding eco-innovation into their broader business strategies to achieve long-term growth. This theme explores the ways in which these businesses are integrating sustainable practices into their overarching organizational frameworks.

Reduction of Environmental Footprint: Adopting eco-innovation allows Nepalese SMEs to effectively reduce their carbon and environmental footprint by minimizing waste and optimizing resource consumption. This practice significantly contributes to sustainability, as emphasized by K2's insights on reducing environmental impact. Excerpt (K2): "Eco-innovation helps to reduce the negative impact in the environment by reducing the carbon footprint" emphasizing that adopting eco-innovation practices ultimately results in positive, sustainable outcomes.

Economic and Social Contributions: Eco-innovation fosters the integration of economic growth and social well-being. It supports job creation, and sustainable livelihoods, and enhances community welfare, aligning with long-term sustainability objectives, as highlighted by K3's insights on economic and social contributions. Excerpt (K3): "Eco-innovation helps to contribute to social well-being and the economic growth aligned with the sustainable goal", illustrates that the effective implementation of eco-innovation practices fosters economic development while enhancing community social well-being, aligning with sustainability objectives.

Theme 4: Integration of Eco-Innovation into Business Strategy

The integration of eco-innovation encompasses subthemes such as leadership influence and organizational culture. However, challenges like initial costs and policy gaps underscore the necessity for diverse strategies to support adoption by businesses.

Leadership Influence and Organizational Culture: Leadership and organizational culture are important components of eco-innovation. Ethical leadership and a culture rooted in sustainability can help to drive the adoption of eco-friendly practices, which impact the entire organization's practices shifting towards sustainable initiatives. Excerpt (K6): *Leadership and organizational culture influence eco-innovation initiatives within SMEs.* This statement underlines that leadership and organizational culture plays a significant role in promoting eco-innovation within SMEs, highlighting the significance of internal support from the management as well.

Challenges in Integration and Need for Supportive Policies: Integrating eco-innovation presents challenges, including high initial costs. To overcome these barriers, SMEs need supportive policies that foster a conducive regulatory environment and promote sustainable practices.

Excerpt (K1): "Challenges in integration include initial costs and the absence of supportive policies." It underscores that the challenges of integrating eco-innovation into business strategies primarily involve initial investment and production costs, along with the need for supportive policies. This suggests opportunities for improvement within the broader ecosystem.

Discussions

The findings of this qualitative study align with and contribute to existing literature on the complex relationship between eco-innovation and corporate sustainability in small and medium-sized enterprises (SMEs), particularly in the context of Nepal. Eco-innovation has been increasingly recognized as a key factor for addressing environmental challenges while promoting sustainability (Kemp & Pontoglio, 2011). The study explores the importance of eco-innovation, challenges in its adoption, the positive outcomes, and the integration of eco-innovation into business strategy within Nepalese SMEs.

The first theme emerging from the data, the importance of eco-innovation for Nepalese SMEs, is well-supported by previous research, which emphasizes that eco-innovation plays a crucial role in enhancing sustainability efforts by reducing environmental impact while maintaining competitiveness (Horbach et al., 2012). The subthemes, "Environmental Challenges and Sustainable Practices" and "Competitive Edge and Market Positioning," are consistent with studies suggesting that SMEs adopting eco-innovation can significantly reduce their environmental footprint while gaining a competitive advantage (Carrillo-Hermosilla et al., 2010).

K5's insight, which highlights eco-innovation as a necessary strategy for overcoming environmental challenges, is reflected in the broader body of research that indicates SMEs are increasingly pressured to adopt eco-innovative practices to comply with global sustainability trends and local environmental demands (Albort-Morant et al., 2016). Similarly, K6's assertion that eco-innovation provides greater opportunities for market positioning and resource efficiency is consistent with findings by Zailani et al. (2015), who argue that eco-innovation strengthens market competitiveness by appealing to environmentally conscious consumers and improving operational efficiency.

Despite its potential, eco-innovation adoption in Nepalese SMEs faces significant challenges, as highlighted in the second theme. The subthemes "Cost and Awareness as Barriers" and "Regulatory and Policy Hurdles" resonate with findings from prior research, which identify financial constraints and lack of awareness as major barriers to eco-innovation, particularly in developing countries (Kesidou & Demirel, 2012). K5's acknowledgment of the cost challenges in eco-innovation adoption is mirrored in research by Cainelli et al. (2012), who underscore the high upfront costs of eco-innovative technologies, which often deter SMEs from integrating such practices.

The findings also reveal regulatory and policy hurdles as critical obstacles, as SMEs often lack access to supportive government policies or face burdensome regulations (K6). This aligns with Rennings (2000), who argues that policy-induced eco-innovation is vital for overcoming market failures and fostering environmental innovation. The need for streamlined regulations and policy support, as highlighted by the respondents, is well-documented in studies that

advocate for proactive government interventions to encourage SMEs to adopt eco-innovation (Río, 2009).

The third theme, focusing on the positive outcomes of eco-innovation and long-term sustainability goals, is consistent with the established literature on the benefits of eco-innovation. The subtheme "Reduction of Environmental Footprint" reiterates that eco-innovation contributes to the reduction of environmental impacts through efficient resource use and waste minimization (Andersen, 2008). K2's emphasis on the reduction of carbon footprints aligns with findings by Marchi (2012), who identifies eco-innovation as a key contributor to environmental sustainability by lowering greenhouse gas emissions and promoting energy efficiency.

The second subtheme, "Economic and Social Contributions," further enriches the discussion by showcasing the broader implications of eco-innovation for economic and social development. As K3 points out, eco-innovation contributes to job creation and community welfare, a finding echoed by studies that associate eco-innovation with increased economic resilience and social benefits (Hojnik & Ruzzier, 2016). This underscores that eco-innovation not only enhances corporate sustainability but also drives socio-economic development, particularly in developing economies like Nepal.

The final theme explores the integration of eco-innovation into business strategy, with leadership influence and organizational culture playing key roles. Previous studies emphasize that leadership commitment and a supportive organizational culture are crucial for embedding eco-innovation within the strategic framework of businesses (Daddi et al., 2016). K6's insights on the influence of leadership and culture align with the work of Klewitz and Hansen (2014), who found that leadership is critical in shaping a sustainability-oriented culture, which, in turn, fosters the adoption of eco-innovative practices.

However, challenges in integrating eco-innovation, including initial costs and the need for supportive policies, were also noted. K1's observation about the cost-related challenges echoes findings by Delmas and Toffel (2008), who emphasize that without appropriate financial and regulatory support, SMEs may struggle to embed eco-innovation into their core business strategy.

Conclusion And Implications

The findings of this qualitative study highlight the vital role eco-innovation plays in driving corporate sustainability in Nepalese SMEs. Through the analysis of four key themes, it became evident that while eco-innovation offers numerous benefits, SMEs in Nepal face several challenges in its adoption and integration. The first theme revealed the importance of eco-innovation in addressing environmental challenges and fostering sustainable business practices, contributing to both resource efficiency and competitive market positioning. Eco-innovation was recognized not only as an environmental necessity but also as a strategic approach for SMEs to gain a competitive edge in the evolving business landscape. However, the second theme shed light on significant barriers to the adoption of eco-innovation, particularly cost constraints and a lack of awareness among SME stakeholders. These challenges are further compounded by complex regulatory frameworks and insufficient policy support, creating additional hurdles for businesses attempting to incorporate sustainable practices. Despite these challenges, the third theme explored the positive

outcomes of eco-innovation, showing its potential for long-term sustainability. Eco-innovation helps reduce environmental footprints and contributes to economic growth and social well-being. This not only leads to reduced waste and resource consumption but also generates job creation and promotes community welfare, aligning with the broader goals of corporate sustainability. The fourth theme focused on the integration of eco-innovation into business strategies. Leadership and organizational culture were identified as pivotal enablers of eco-innovation. A culture that prioritizes sustainability, alongside supportive leadership, can drive successful adoption of eco-friendly practices within SMEs.

This study makes a significant contribution to the growing body of research on eco-innovation by providing a contextual understanding of how Nepalese SMEs navigate the complexities of adopting eco-innovation practices. It reinforces the role of leadership, organizational culture, and supportive policies in overcoming barriers and achieving corporate sustainability. Moreover, the study highlights the importance of reducing environmental footprints and promoting socio-economic development, contributing to both theoretical and practical discussions on eco-innovation in emerging economies.

Similarly, the findings of this study emphasize the need for increasing awareness and education on eco-innovation among Nepalese SMEs, suggesting that targeted campaigns and workshops are crucial to bridging knowledge gaps. Financial challenges can be mitigated through subsidies, grants, and incentives, helping SMEs overcome cost barriers to adopting sustainable practices. Policy reforms are essential to simplify regulations and create a more supportive environment, while strong leadership and a sustainability-focused organizational culture are key to integrating eco-innovation into business strategies. Long-term success for SMEs lies in embedding eco-innovation into their strategic plans, aligning it with broader sustainability and business goals.

Limitation And Future Research

Future research might investigate the long-term effects of eco-innovation on the sustainability of SMEs in Nepal. Another area worth exploring is the influence of government initiatives and policies on promoting eco-innovation and the effectiveness of support mechanisms tailored for SMEs. Moreover, future studies could focus on how collaborations with external entities, including industry groups and NGOs, impact the adoption and practice of eco-innovation, shedding light on how these partnerships contribute to sustainable business models.

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Conflict of Interest

Authors declares no conflict of interest.

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