# The Impact of Business Innovation and Green Supply Chain Management on Operational Sustainability in Thailand's Food Processing Industry

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## Abstract

Today, organizations around the world are facing intense competitive challenges alongside growing environmental and social pressures, making traditional business practices focused solely on short-term profit insufficient for achieving long-term competitive advantage. As a result, organizations must adapt by adopting business innovations such as product, process, and business model innovations to enhance operational efficiency and drive sustainability in a systematic way. At the same time, the application of green supply chain management (GSCM) has become increasingly important, as it helps reduce environmental impacts and supports sustainable operations. Previous research has shown that GSCM can serve as a mediating mechanism linking innovation to organizational performance, particularly in developing countries. However, in the context of Thailand's food processing industry, there remains a lack of empirical studies that integrate these components into a single conceptual model. This study therefore aims to fill this knowledge gap by examining the causal relationships between business innovation, GSCM, and operational sustainability, with the goal of generating insights that are valuable for policymaking and strategic planning in the context of sustainable development.

**Keywords:** Business Innovation, Green Supply Chain Management, Operational Sustainability, Food Processing Industry

## Introduction

Nowadays, organizations around the world are facing increasingly intense business competition, alongside growing pressures from environmental issues and social changes. Traditional business practices that focus solely on short-term profit are no longer sufficient to secure long-term competitive advantage. Organizations are therefore compelled to adapt by developing innovations that respond to the economic, social, and environmental dimensions of sustainability (Bernal-Torres et al., 2023). This need is especially relevant for Thailand's food processing industry, which plays a vital role in the national economy and exports. Enhancing operational practices in alignment with sustainability principles has thus become an essential and unavoidable mission.

One of the key strategies that can help drive organizations in Thailand's food processing sector toward tangible sustainability is the adoption of business innovation including product innovation, process innovation, and business model innovation. These innovations not only improve operational efficiency but also act as catalysts for systemic transformation toward sustainability (Le et al., 2022; Makhlouf et al., 2023). Simultaneously, the concept of Green Supply Chain Management (GSCM) has gained recognition as a crucial mechanism for

 

reducing the environmental impact of business activities and enhancing sustainable operational performance (Abdallah & Al-Ghwayeen, 2020; Gelmez et al., 2024). The integration of GSCM with innovative strategies has thus become a growing trend among forward-thinking organizations.

Khan et al. (2022) highlight that GSCM can serve as a "linking mechanism" between technological innovation and operational performance. Meanwhile, Junaid et al. (2022) found that sustainable supply chain integration fosters green innovation, positively influencing organizational performance particularly in the context of developing countries. In addition, Novitasari and Agustia (2022) suggest that the synergy between GSCM and green innovation can transform an organization's commitment to corporate social responsibility (CSR) into concrete operational outcomes. Makhlouf et al. (2023) further emphasizes the role of GSCM as an intermediary that translates innovation and Total Quality Management (TQM) into organizational sustainability.

However, despite the growing body of research in this area, empirical studies that directly link "business innovation" and "green supply chain management" to "operational sustainability" within the specific context of Thailand's food processing industry remain scarce. This sector is characterized by unique organizational cultures, varying enterprise sizes, and differing capacities to adopt innovation. Moreover, previous studies often examine innovation or GSCM in isolation, without exploring their combined effects within an integrated framework. As a result, there remains a lack of in-depth understanding of the overall influence these factors have on sustainability in this specific industry.

Therefore, this study is crucial in addressing this knowledge gap by examining the effects of business innovation and GSCM on operational sustainability. It also aims to analyze the causal relationships among these factors in the real-world context of Thailand's food processing industry. The findings will contribute empirical insights that are valuable for both policymakers and business leaders seeking to align their strategies with sustainable development goals.

## Research methodology

This research is based on a theory elaboration approach is the study of concepts and theories by using the existing descriptive methods and presenting a conceptual framework derived from the synthesis of theoretical variables discovered with logical and theoretical explanations. together with the discovery of empirical data Theoretical elaboration method for supporting the idea. The proposed framework is based on deductive reasoning. To lead development of the model to study the causal relationship between the latent variable, the observed variable, as well as the direct effect and the indirect effect of the Impact of Business Innovation and Green Supply Chain Management on Operational Sustainability in Thailand's Food Processing Industry.

### The conceptual framework development

The conceptual framework developed in this research is based on the integration of the concept of sustainable performance with the drivers of business innovation and green supply chain management, which is defined by.

**1. Business Innovation**

In an era of rapid changes in the business environment, organizations must adapt by adopting business innovations to enhance their competitiveness and respond to the Sustainable Development Goals (SDGs). The implementation of business innovation, whether in the form of business model innovation, product innovation, or process innovation has been proven to

have a positive impact on long-term organizational performance. According to Madhavan et al. (2022), who studied the impact of business model innovation on the sustainable performance of processed marine food SMEs in Thailand, business innovation significantly influences environmental, economic, and social performance outcomes. This demonstrates that such innovations contribute to comprehensive and multidimensional sustainability. Similarly, Memon et al. (2024) emphasized the role of responsible innovation as a crucial mechanism linking business creativity to sustainable corporate performance, especially in an era where stakeholders increasingly expect transparency and social value from the business sector. In the same vein, Mokbel Al Koliby et al. (2024) investigated the relationship between entrepreneurial competencies, innovation, and sustainable performance in the manufacturing sector of SMEs. Their findings suggest that innovation plays a vital role in transforming business operations to effectively respond to rapidly changing market conditions and shifting customer demands. Research by Azmat et al. (2023) and Bernal-Torres et al. (2023) highlighted innovation as a key driver that enables organizations to integrate sustainability into logistics and supply chain systems, thereby enhancing both efficiency and social responsibility. The systematic analysis by Kraus et al. (2020) also pointed out that business innovation often leads to changes in supply chain practices such as the selection of environmentally friendly raw materials, the improvement of low-carbon transportation systems, and the use of digital technologies to reduce waste in production processes all of which are core principles of GSCM**.** From the above discussion, the following hypotheses are proposed.

H1: Business innovation has a direct positive influence on sustainable operations.

H2: Business innovation has a direct positive influence on green supply chain management.

**2. Green Supply Chain Management**

In an era where sustainability has become a central pillar of organizational strategy, Green Supply Chain Management (GSCM) has gained increasing attention as a vital tool that enables organizations to achieve their sustainability goals in a tangible way. GSCM refers to a management approach that integrates environmental considerations into every stage of the supply chain process from raw material source, production, and distribution, to waste management and recycling. Khan (2020) emphasizes the critical success factors of GSCM in emerging economies, highlighting that the integration of green concepts into procurement, product design, and logistics systems can enhance resource efficiency, reduce costs, and strengthen corporate social responsibility (CSR) image. Tseng et al. (2019) conducted a comprehensive literature review on GSCM and found that organizations implementing GSCM systematically can significantly improve operational efficiency and reduce environmental risks. Furthermore, GSCM acts as a key mechanism for developing long-term competitive advantages. Similarly, Achillas et al. (2018) assert that GSCM is not merely an environmental approach but a proactive strategy that positively impacts overall organizational performance, particularly in industrial sectors where consumers increasingly demand sustainable production. Ahmad et al. (2022) directly investigated the impact of GSCM practices on sustainable performance. Their findings indicate that GSCM activities such as sustainable procurement, eco-friendly product design, and effective waste control positively influence sustainability across economic, environmental, and social dimensions. Moreover, Martínez-Falcó et al. (2024) suggest that the effectiveness of GSCM in promoting sustainability is significantly enhanced when supported by top management and implemented alongside green innovation strategies. This is because systematic management that spans the entire supply chain from upstream to downstream helps reduce waste, add value, and generate sustainable outcomes. From the above discussion, the following hypotheses are proposed.

H3: Green supply chain management has a direct positive influence on sustainable operations

**3. Operational Sustainability**

In an era where organizations continually face both business and environmental challenges, achieving sustainable operations can no longer be accomplished through traditional approaches. The integration of business innovation, such as product innovation, process innovation, and business model innovation has become a crucial strategy that enables organizations to adapt toward more efficient and resilient operations. Simultaneously, organizations must embed the principles of Green Supply Chain Management (GSCM) to strike a balance between business efficiency and environmental responsibility. However, numerous studies have indicated that business innovation alone may not be sufficient to drive sustainability without being accompanied by environmentally conscious supply chain management. The research by Khan et al. (2022) suggests that GSCM functions as a mediator that effectively translates the impact of technological innovation into tangible outcomes in environmental and operational performance. They argue that business innovation often triggers changes within the supply chain, and when such changes are managed from a green perspective, they can significantly contribute to overall sustainability. Le et al. (2022) emphasize the complementary role of green innovation and GSCM in enhancing an organization's sustainable performance. Their findings show that innovation acts as a catalyst for environmentally friendly practices in logistics and production systems, enabling firms to generate value continuously across economic, social, and environmental dimensions. Similarly, Junaid et al. (2022) find that sustainable supply chain integration promotes green innovation, which in turn positively influences firm performance, especially under conditions of intense competition and limited resources. Abdallah and Al-Ghwayeen (2020) highlight that GSCM serves as a mediating mechanism that translates innovation into effective and environmentally responsible operational outcomes. Meanwhile, Makhlouf et al. (2023) assert that green innovation and Total Quality Management (TQM) reinforce each other, particularly when green supply chain practices are systematically implemented. This empirical support aligns with the work of Gelmez et al. (2024), who argue that GSCM not only helps reduce environmental impacts but also acts as a strategic tool for enhancing long-term competitive advantage. Finally, Novitasari and Agustia (2022) support the notion that GSCM and green innovation jointly mediate the relationship between corporate social responsibility (CSR) initiatives and firm performance. This reinforces the view that the synergy between innovation and green supply chain management is a powerful engine driving organizations toward genuine and lasting sustainability. From the above discussion, the following hypotheses are proposed.

H4: Business innovation has a positive indirect effect on sustainable operations through green supply chain management.

**Conceptual Framework**

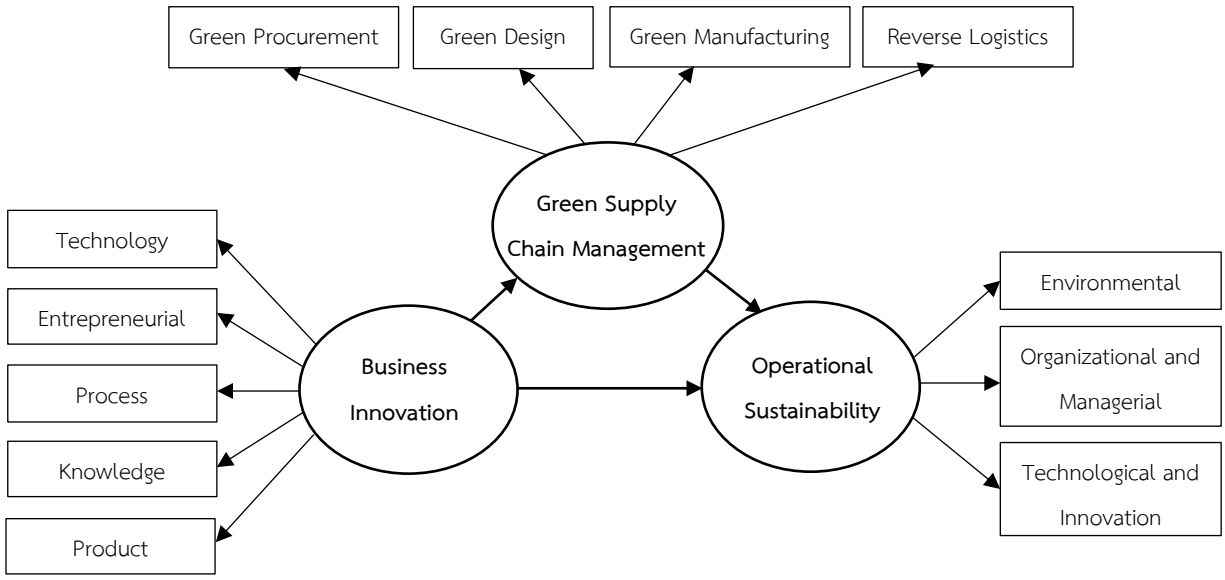


**Figure 1** Conceptual Framework

As in figure 1, the research consisted of three latent variables: Business innovation, green supply chain management, and operational sustainability. Business innovation comprised of fifth indicators are technology, entrepreneurial, process, knowledge, and product. Green supply chain management comprised of fourth indicators are green procurement, green design, green manufacturing and reverse logistics. Operational sustainability comprised of third indicators are environmental, organizational and managerial, and technological and innovation.

## Conclusion

This research is expected to reveal that business innovation and green supply chain management (GSCM) significantly and positively influence the operational sustainability of Thailand's food processing industry. Specifically, the following key findings are anticipated. Business innovation including technological innovation, entrepreneurial orientation, process improvement, knowledge development, and product innovation is expected to have a direct and positive effect on operational sustainability. Firms that adopt innovative business practices are likely to experience improvements in environmental performance, organizational and managerial efficiency, and technological advancement. Business innovation is also anticipated to exert a positive influence on the implementation of green supply chain practices. Companies that embrace innovation are more likely to adopt green procurement, green design, eco-friendly manufacturing processes, and effective reverse logistics, thereby enhancing their environmental responsibility. Effective green supply chain management is expected to contribute directly to the achievement of operational sustainability. By integrating green practices throughout the supply chain, firms can improve resource efficiency, reduce waste, and comply with environmental regulations, all of which support long-term sustainability goals. It is also expected that green supply chain management will partially mediate the relationship between business innovation and operational sustainability. This suggests that innovation enhances sustainability both directly and indirectly through the promotion of green

practices. The findings are expected to provide strategic implications for food processing firms, emphasizing the importance of investing in innovation and green supply chain initiatives as pathways to sustainable growth, competitive advantage, and compliance with global sustainability standards.

**Future research**

Based on the research findings, future studies could explore the impact of external factors such as policies and market trends, conduct comparative research across industries, and examine the role of digital technologies in enhancing business innovation and green supply chain practices. Additionally, longitudinal studies could assess the long-term sustainability outcomes of such practices, while further research could investigate the barriers faced by firms, particularly SMEs in implementing these strategies effectively.

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