WJEMSD

WASD WORLD ASSOCIATION FOR SUSTAINABLE DEVELOPMENT

World Journal of ENTREPRENEURSHIP, MANAGEMENT AND SUSTAINABLE DEVELOPMENT

ISSN: 2042-5961 (Print) | 2042-597X (Online)

WJEMSD V21 N2 2025

DOI: 10.47556/J.WJEMSD.21.2.2025.1

RESEARCH

The Impact of Green Innovation and Management on the Sustainability Performance of the Manufacturing Industry in Vietnam in Southeast Asia

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ABSTRACT

PURPOSE: This study aims to examine the significant impact of the global trade war on the manufacturing industry, particularly focusing on the shift of supply chains to Southeast Asia and the growing importance of green supply chains.

DESIGN/METHODOLOGY/APPROACH: The study utilises empirical data from Vietnam's manufacturing industry to analyse the effects of green innovation, environmental management readiness, and green buying behaviour on corporate sustainability performance. The research methodically explores the direct impact of green innovation on sustainability performance and green purchasing, the mediating role of green buying behaviour, and the moderating effect of environmental management readiness on sustainability outcomes.

CITATION: Chang, C.-T. and Wang, K.-J. (2025): The Impact of Green Innovation and Management on the Sustainability Performance of the Manufacturing Industry in Vietnam in Southeast Asia. *World Journal of Entrepreneurship, Management and Sustainable Development*, Vol. 21, Nos 2, pp.97-113.

RECEIVED: 12 November 2024 / **REVISED:** 23 January 2025 / **ACCEPTED:** 27 January 2025 / **PUBLISHED:** 30 June 2025

FINDINGS: The findings indicate that green innovation positively impacts corporate sustainability and green purchasing. Green buying behaviour significantly enhances sustainability and mediates between innovation and performance, while excessive environmental management readiness may hinder sustainability efforts by negatively moderating this relationship.

ORIGINALITY/VALUE: This study underscores the importance of adopting green innovation as a core strategy for achieving sustainable development and enhancing market competitiveness, particularly in the context of the ongoing global trade war. The research provides valuable insights for manufacturing firms, especially those in Southeast Asia, by highlighting the need to balance innovation with management readiness to effectively develop green supply chains.

KEYWORDS: *Green Supply Chain Management; Buying Behaviour; Corporate Sustainability; Green Innovation*

INTRODUCTION

The ongoing global trade war has led to a significant shift in manufacturing supply chains, with a large-scale migration to the Southeast Asia region. This transition has underscored the critical importance of green supply chain management (Zahoor *et al.*, 2023). Green Supply Chain Management (GSCM) not only contributes to reducing environmental impact but also enhances a company's market image and operational performance (Xu *et al.*, 2022). It is increasingly gaining attention in the manufacturing industry due to its ability to significantly reduce environmental impact and enhance corporate competitiveness (Younis *et al.*, 2016). Therefore, implementing GSCM has become a crucial pathway for manufacturing enterprises to achieve sustainable development.

In the context of global economic turbulence and escalating environmental challenges, Corporate Sustainability Performance (CSP) has emerged as a key indicator of a company's competitiveness and long-term development potential (de Paula and Melhado, 2021). As global environmental issues intensify and awareness of social responsibility grows, CSP has become an essential standard for evaluating a company's long-term success (Jha and Rangarajan, 2020; Venkatraman and Nayak, 2015). Green Innovation (GI) refers to innovations in products, processes, and management models aimed at reducing environmental impact and enhancing sustainability (Takalo and Tooranloo, 2021). These innovations encompass not only technological advancements but also changes in management models and operational strategies to achieve both ecological and economic benefits. Moreover, GI enhances economic performance by increasing efficiency and reducing costs, thereby strengthening market competitiveness (Wang *et al.*, 2021). In today's global business environment, Environmental Management Readiness (EMR) is widely recognised as a critical factor in corporate

sustainability (Zhang *et al.*, 2020). As environmental challenges intensify, companies increasingly need to establish robust internal environmental management systems to address these growing challenges (Bravi *et al.*, 2020). In the current context of heightened environmental awareness, Green Buying Behaviour (GBB) has become a key area of study in consumer behaviour research (Khan *et al.*, 2023b; Moser, 2015). GBB is crucial for companies in formulating effective marketing strategies as it helps them better meet consumer demands while promoting sustainable development (Dangelico and Vocalelli, 2017; White *et al.*, 2025). Therefore, exploring the drivers of GBB and its market impact is vital for advancing sustainable consumption (Quoquab and Mohammad, 2020).

While extensive research has explored the effects of GI on CSP and GBB, the moderating role of EMR remains underexplored. Existing studies often overlook how varying levels of environmental readiness influence the impact of green innovation on corporate performance and purchasing behaviour. This study introduces a novel framework integrating GI, CSP, GBB, and EMR, examining EMR's moderating role and GBB's mediating role. By analysing empirical data, the paper fills a theoretical gap and offers practical guidelines, providing both academic and practical value.

LITERATURE REVIEW

Green Supply Chain Management (GSCM)

GSCM is a way of managing all parts of making and selling products so that they are better for the environment. This includes using ideas such as green innovation, green buying, and taking care of the environment at every step of the process: this helps companies be more sustainable (Wiredu *et al.*, 2024). GSCM ensures that all parts of the supply chain work together to lessen harm to the environment and help sustainable growth (Karmaker *et al.*, 2023). This method makes products, materials, making things, moving goods, and managing waste greener; the goal is to make the whole supply chain perform better environmentally (De Souza *et al.*, 2022). It is a complete plan that brings together green innovation, green buying, and readiness to manage the environment. The aim is to make every step of the supply chain better, achieving both environmental and economic gains (Gawusu *et al.*, 2022). This strategy not only improves corporate environmental performance but also strengthens competitiveness and brand value in the global market.

Green Buying Behaviour (GBB)

GBB means that people buy products and services that are better for the environment or help protect it because they care about the environment (Ali, 2021a; Rasheed *et al.*, 2024). This behaviour comes from being aware of environmental issues; it shows that consumers are committed to protecting the environment and helps make the market more sustainable (Carrión-Bósquez *et al.*, 2024). When

both companies and consumers practice green buying, it greatly improves the environmental benefits throughout the supply chain. This helps the whole industry grow in a way that is good for the environment (Fontoura and Coelho, 2022).

Environmental Management Readiness (EMR)

EMR is how ready a company is internally before it starts using environmental management systems and plans. This includes how resources are shared, how much employees are involved, and how much support management gives (Demir *et al.*, 2023). EMR covers all the internal setups needed before a company acts to manage the environment. This means making sure resources are enough, getting employees involved, and having strong leadership support (Ahmed *et al.*, 2024). This readiness includes understanding and complying with legal regulations, efficiently allocating resources, and actively involving employees in environmental projects. These factors collectively form the company's ability to respond to environmental challenges, thereby enhancing its green competitiveness (Sutrisno *et al.*, 2024). Therefore, companies must continuously improve their EMR to adapt to the dynamic market and policy environment, ensuring long-term sustainable development (Ormazabal *et al.*, 2021).

Green Innovation (GI)

GI involves taking innovative actions in the areas of products, technologies, processes, or business models to reduce negative environmental impacts (Dangelico, 2016; Takalo and Tooranloo, 2021). GI plays a central role in GSCM, as it enables companies to effectively reduce resource consumption and pollution emissions by introducing innovations in product design, manufacturing processes, and business models, thereby enhancing the environmental performance of the entire supply chain (Le *et al.*, 2022). Therefore, GI is not only an effective tool for companies to address environmental challenges but also a crucial pathway for improving resource efficiency (Barforoush *et al.*, 2021; Sun *et al.*, 2023).

Corporate Sustainability Performance (CSP)

CSP concerns how well a company does in terms of money, environment, and society (Dzage *et al.*, 2024), and how we understand and measure CSP has changed as more research has been done. In general, improving CSP helps companies create a good image in the market, gain trust from investors and customers, and meet their long-term goals for being sustainable (Li *et al.*, 2024).

Research Hypotheses

This study proposes a new research framework to explore the relationships between GBB, CSP, GI, and EMR. The framework highlights the central role of GI in driving corporate sustainability and

emphasises the importance of EMR as a moderating variable. Through the design of this framework, we aim to gain a deeper understanding of how companies implement GSCM strategies and provide empirical evidence to support these perspectives, thereby addressing gaps in the existing literature. The proposed model is illustrated in Figure 1.

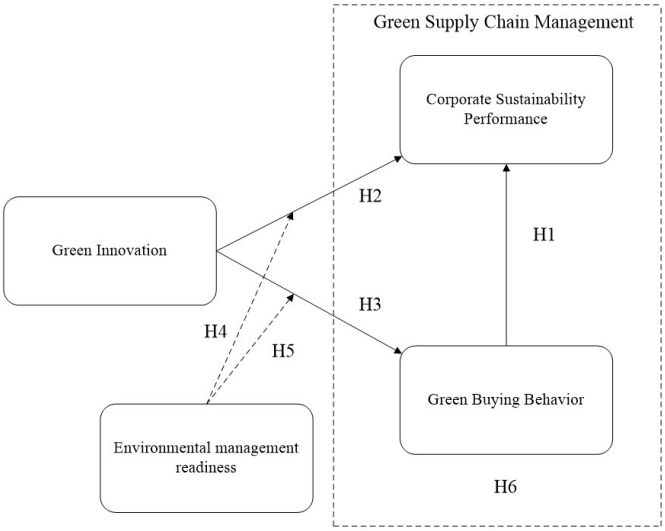

Figure 1: Proposed research model

Source: Constructed by authors

By supporting and choosing green products, companies can contribute to shaping their green image and enhancing brand value (Hameed *et al.*, 2021). Buying green products helps reduce bad effects on the environment and makes companies perform better socially. This happens because using fewer resources and creating less waste makes things more efficient (Hung and Chang, 2024). Therefore, GBB plays a critical role in achieving sustainability and environmental goals, contributing to the protection of our environment and the promotion of economic sustainability. Based on the literature discussed above, this study proposes Hypothesis H1: GBB positively affects CSP.

By integrating green customers and suppliers through green process innovation, companies can enhance their corporate social performance, including improving efficiency, reducing the use of chemicals, and increasing recycling rates (Wong *et al.*, 2020). GI plays a critical role in enhancing the green performance of the manufacturing industry. This study proposes Hypothesis H2: GI positively affects CSP.

By promoting environmental technologies and innovations, GI creates market demand that, in turn, exerts pressure on companies to engage in corresponding innovations. Additionally, the promotion

of GI can enhance internal environmental awareness and green values within companies, making those involved in GI more inclined to adopt green business practices and new technologies (Sharma *et al.*, 2022). This study proposes Hypothesis H3: GI positively affects GBB.

GI refers to the process by which companies innovate to reduce negative environmental impacts, thereby achieving a win-win situation of environmental and economic benefits (Tu and Wu, 2021). However, companies must also possess a high level of EMR to support and amplify the effects of green innovation (Li *et al.*, 2022). Companies with high EMR are better able to integrate green innovation, thereby gaining a long-term competitive advantage in the market (Zhang *et al.*, 2020). When companies invest substantial resources in environmental technologies and implement systematic management, their green innovations are more likely to translate into actual economic and social benefits, thereby improving CSP (Le, 2022). This study proposes Hypothesis H4: EMR acts as a moderator between GI and CSP.

Environmental management lets companies better use and organise green resources both inside and outside their operations. Additionally, how prepared a company is to put environmental strategies and actions into practice can strengthen this process even more (Faraz *et al.*, 2024). Companies with high EMR are better at turning GI into benefits in the market, which then affects how consumers engage in GBB (Aftab *et al.*, 2023). Therefore, companies should focus on enhancing their EMR to ensure that GI can truly promote consumer GBB and secure a competitive advantage in the market (Alam and Islam, 2021). This study proposes Hypothesis H5: EMR acts as a moderator between GI and GBB.

The impact of GI on CSP does not happen directly but instead works by affecting consumers' GBB (Khan *et al.*, 2023a). Consumers' decisions to buy green products depends on how they see and accept a company's efforts in environmental innovation, making GBB an important link between GI and CSP (Rehman *et al.*, 2023). Therefore, companies should use GI to influence and shape how consumers buy, thus improving their sustainability performance and boosting long-term competitiveness(Borah *et al.*, 2023). This study proposes Hypothesis H6: GBB acts as a mediator between GI and CSP.

METHOD

Vietnam displays the multifaceted characteristics of Southeast Asia's economy, with its economic structure encompassing agriculture, manufacturing, and services, similar to other countries in the region. The country is experiencing rapid economic growth, actively integrating into the global market, and has a vibrant young population, all of which are typical features of emerging markets. Vietnam also plays a key role in advancing regional economic integration and participating in free trade agreements. Facing common challenges in environmental, social, and infrastructure issues, Vietnam serves as an ideal case study for understanding the economic traits and challenges of Southeast Asia.

This study chose to employ a comprehensive interview method mainly because interviews provide an opportunity to deeply understand the perspectives and experiences of the respondents. By directly conversing with key personnel in manufacturing management, researchers were able to more accurately identify and understand their main concerns and their impacts on business operations. Additionally, interviews help uncover details and deep-seated issues that might be overlooked in a mere questionnaire survey (Ali, 2021b).

Another reason for choosing interviews as the research method is their flexibility. Researchers can adjust the questions based on how the interview progresses; it better facilitates the exploration and deeper investigation of key topics. This interactive method of data collection helps establish a trust relationship between researchers and respondents, thus obtaining more genuine and comprehensive feedback. In this study, interviews were conducted over the phone primarily to save time and resources, effectively achieving the goal of initially understanding the research objectives and the basic situations of the respondents. This method not only increased participation but also allowed respondents sufficient time and space to think about and answer the questions through subsequent email questionnaires; this is crucial for improving the quality and reliability of the data.

The selection of variables in this study was guided by comprehensive interviews with key personnel in manufacturing management, aiming to identify their primary concerns; this shaped the research's conceptual framework. The survey targeted corporate management in and around Ho Chi Minh City, Vietnam. Initially, preliminary inquiries and an overview of the research objectives were communicated via telephone. Subsequently, questionnaires were emailed to the identified respondents, allowing time for convenient completion and submission. This approach ensured targeted and efficient data collection from relevant business professionals. To assess the questionnaire's reliability, Cronbach's alpha coefficient was employed. The reliability coefficients for the constructs were as follows: GBB, 0.815, CSP, 0.894, EMR, 0.929, and GI, 0.922. All these values exceeded the commonly accepted threshold of 0.7, indicating high internal consistency and reliability of the measurement tools (see Table 1).

Table 1: Correlation analysis

		Green Buying Behaviour	*Environmental Management*	*Corporate Sustainability Performance*	*Green Innovation*
Green Buying Behaviour	Pearson correlation	1	0.697**	0.662**	0.594**
	Significance (Double tail)		0.000	0.000	0.000
	N	127	127	127	127
Environmental Management	Pearson correlation	0.697**	1	0.814**	0.835**
	Significance (Double tail)	0.000		0.000	0.000
	N	127	127	127	127

		Green Buying Behaviour	Environmental Management	Corporate Sustainability Performance	Green Innovation
Corporate Sustainability Performance	Pearson correlation	0.662**	0.814**	1	0.651**
	Significance (Double tail)	0.000	0.000		0.000
	N	127	127	127	127
Green Innovation	Pearson correlation	0.594**	0.835**	0.651**	1
	Significance (Double tail)	0.000	0.000	0.000	
	N	127	127	127	127

**The significance level of the correlation is at the 0.01 level (two-tailed).

Source: Constructed by authors

The study utilised a structured questionnaire (see Appendix) with all measurement scales based on a five-point Likert scale. Conducted across Vietnam, the study invited 217 members of the textile manufacturing industry to participate, distributing an equal number of questionnaires. After excluding 90 invalid responses due to improper patterns, such as overly concentrated or dispersed answers, the final sample size was 127, resulting in a response rate of 58% (Table 2).

The characteristics of the study sample are as follows (Table 2): male respondents accounted for 27.5%, while female respondents made up 72.5% of the total. In terms of age groups, the largest proportion of respondents, 43.3%, were aged between 20 and 30 years. Regarding work experience, 48.8% of the respondents had between 0 and 10 years of experience.

Table 2: Demographic information (N=127)

Characteristics	Frequency	Percentage %
Gender		
Male	35	27.5
Female	92	72.5
Age		
20-30	55	43.3
31-40	37	29.1
41-50	21	16.5
51-60	10	7.9
61+	4	3.2
Seniority		
0-10	62	48.8
11-20	45	35.4
21-30	12	9.4
31+	8	6.4

Source: Constructed by authors

In this study, Pearson correlation analysis and multiple regression analysis were conducted using SPSS to explore the relationships between the variables.

RESULTS, DISCUSSION AND RESEARCH IMPLICATIONS

Hypotheses Test Result

Hypotheses H1, H2 and H3 are supported (Table 3). The findings reveal that GBB is significantly positively correlated with EMR, CSP, and GI, with Pearson correlation coefficients of 0.697, 0.662, and 0.594, respectively, all significant at the 0.01 level. Additionally, EMR shows a strong positive correlation with CSP and GI. Multiple regression analysis supports research Hypotheses H1, H2 and H3, showing that GBB significantly impacts CSP (Beta = 0.662), GI positively influences CSP (Beta = 0.506), and GI significantly affects GBB (Beta = 0.649). These results suggest that GBB enhances company performance and drives sustainable development, while GI fosters the adoption of eco-friendly innovations (Yang and Roh, 2019).

Table 3: Result of Testing the Mediation Model

Structural Relations	*Beta*	*SE*	*T Value*	*p-Value*	*Test*
H1: GBB -> CSP	0.662	0.048	9.875	<0.001	Support
H2: GI -> CSP	0.506	0.053	9.593	<0.001	Support
H3: GI -> GBB	0.649	0.079	8.245	<0.001	Support
H6: GI ->GBB	0.399	0.059	5.276	<0.001	Support
GI ->CSP	0.425	0.054	5.628	<0.001	

Source: Constructed by authors

Hypothesis H4 is supported (Table 4). In the regression analysis, EMR has a significant impact on CSP, with a regression coefficient of -0.135 and a T-value of -2.353. The corresponding significance level (p-value) is 0.020, i.e., below the commonly used significance threshold of 0.05. This indicates that for every one unit increase in EMR, CSP decreases by 0.135 units, reflecting a significant negative correlation between the two.

However, Hypothesis H5 is not supported. The significance level (p-value) is 0.172, indicating that EMR does not have a significant moderating effect on the relationship between GI and GBB.

Table 4: Result of Testing the Mediation Model

Structural Relations	*Beta*	*SE*	*T Value*	*p-Value*	*Test*
H4:GIxEMR->CSP	-0.135	0.057	-2.353	0.02	Support
H5:GIxEMR->GBB	-0.099	0.072	-1.374	0.17	Not Support

Source: Constructed by authors

Hypothesis H6 is supported. GI significantly impacts GP ($p<0.001$), and GBB also significantly affects GP ($p<0.001$). Controlling for GI, GBB's effect remains significant, indicating GBB mediates the relationship between GI and GP (Roh *et al.*, 2022).

Our study results show that GBB has a significant positive impact on CSP, and GI also positively affects the green performance of enterprises. These findings highlight the pivotal role of green innovation in promoting sustainable development within companies, as well as how EMR influences these relationships. The research supports Hypotheses H1, H2 and H3, indicating that GBB not only enhances corporate performance but also fosters the achievement of sustainable development. Additionally, these results reveal the mediating role of GBB between GI and corporate performance, confirming the positive influence of green innovation on green purchasing behaviours and overall sustainability performance. However, the moderating role of EMR between GI and GBB was not supported, suggesting that the role of management preparedness may be more complex than anticipated and requires further study to understand deeply. These conclusions provide practical guidance for the manufacturing industry in Southeast Asia, emphasising the importance of green innovation and management strategies in shaping the green competitiveness of enterprises.

Discussion

The research found that GI significantly contributes to reducing carbon emissions, lowering energy consumption, and decreasing waste production, which are central factors in enhancing corporate sustainability performance. Moreover, the implementation of GI not only meets the market demand for environmentally friendly products but also strengthens consumers' GBB, further encouraging enterprises to adopt more sustainable operational practices. However, EMR plays a complex moderating role in transforming GI outcomes into CSP. Excessive EMR may diminish the positive impact of GI on CSP, highlighting the challenges in the management process. Simultaneously, the study failed to prove significant moderation by EMR in the relationship between GI and GBB, suggesting that market or external factors might have a greater influence, indicating that the implementation of environmental management strategies requires greater flexibility and adaptability. In conclusion, GI has key strategic importance in driving the green transformation and sustainable development of the manufacturing industry in Southeast Asia, while GBB plays a crucial mediating role in translating these innovations into market benefits and enhancing overall corporate sustainability performance. These findings not only respond to the research questions but also provide practical guidelines for implementing green innovation and management in the region's manufacturing sector.

Positive effect

Hypotheses H1, H2, and H3 are supported, indicating that GI contributes to reducing carbon emissions, lowering energy consumption, and minimising waste generation. These factors are

crucial for enhancing a company's sustainability performance (Habiba *et al.*, 2022). Companies that develop eco-friendly products through GI not only meet market demand but also enhance consumers' GBB (Dangelico and Pujari, 2010; Sarfraz *et al.*, 2022). Consumer demand for green products and services can drive companies to adopt more sustainable practices, thereby improving their environmental and social performance (Yildiz Çankaya and Sezen, 2019). In summary, GI plays a crucial role in GSCM, with its direct impact on CSP and GBB underscoring its strategic value for companies in achieving sustainable development goals (Gong, 2023).

Moderate effect

Hypothesis H4 is supported, indicating that EMR plays a critical moderating role in converting GI outcomes into CSP (Fosu *et al.*, 2024). However, this moderating effect is negative, meaning that an excessive increase in EMR can weaken the impact of GI on CSP. This negative correlation may suggest that while EMR enhances a company's capabilities in GI, overly stringent regulations or management requirements could lead to resource allocation being spread too thin, thereby diminishing the positive effects of GI on CSP.

Hypothesis H5 is unsupported, suggesting that internal EMR does not significantly moderate the GI-GBB relationship. Other external or market factors may dominate, indicating that EMR's moderating role is more context-dependent and complex than initially thought.

Mediate effect

Hypothesis H6 is supported (Table 3), indicating that when companies implement GI and successfully stimulate consumers' environmental awareness and purchasing behaviour, the contribution of innovation to the overall sustainability of the company is significantly enhanced (Li *et al.*, 2019). As a consumer behaviour, GBB not only promotes the market acceptance of GI products but also further improves a company's sustainability performance (Ali, 2021a). GI can indirectly enhance CSP by influencing consumers' GBB. When companies introduce products that meet environmental demands through GI, GBB amplifies the market effects of these innovations, further boosting the company's performance in both environmental and economic aspects (Zameer and Yasmeen, 2022).

Research Implications

This study conducted a thorough analysis on the topic and discovered that GI plays a significant role in reducing carbon emissions, energy consumption, and waste production. These factors are crucial for enhancing a company's sustainability performance. Implementing GI not only meets the market demand for eco-friendly products but also boosts consumers' GBB, further encouraging companies to adopt more sustainable operational strategies. However, an excessive emphasis on EMR may weaken the positive impact of GI on CSP, highlighting the need to avoid the over-distribution of

resources in management processes. The study did not confirm the significant moderating role of EMR between GI and GBB, suggesting that market or other external factors might play a more significant role in this process. Moreover, when companies implement GI and successfully stimulate consumers' environmental awareness and purchasing behaviour, the contribution of innovation to the company's overall sustainability is significantly enhanced. Therefore, GI plays a crucial role in driving the green transformation and sustainable development of the manufacturing industry in Southeast Asia. Overall, the findings not only address the research question but also provide practical guidance for the implementation of GI and EMR in the Southeast Asian manufacturing sector, emphasising the need for companies to balance innovation and management resources to fully leverage GI's potential in enhancing competitive and environmental performance.

CONCLUSIONS

GI significantly influences both CSP and GBB, although EMR did not perform as expected; this was potentially due to an over-emphasis on administrative processes. This indicates that companies need to strike a balance when integrating GI and environmental management, ensuring that management resources and innovation efforts work in harmony rather than in conflict. These findings underscore the importance of promoting GI within GSCM to boost CSP and drive GBB. Companies should prioritise GI to enhance sustainability performance while reassessing the role of EMR. However, this study's focus on Vietnamese manufacturers limits the generalisability of the findings.

Future research should include a more diverse, multinational sample to better understand the global variations and commonalities in GSCM practices, thereby providing more universally applicable insights and recommendations.

REFERENCES

Aftab, J., Abid, N., Cucari, N. and Savastano, M. (2023): Green human resource management and environmental performance: The role of green innovation and environmental strategy in a developing country. *Business Strategy and the Environment*, Vol. 32, No. 4, pp.1782-1798.

Ahmed, F., Callaghan, D. and Arslan, A. (2024): A multilevel conceptual framework on green practices: Transforming policies into actionable leadership and employee behavior. *Scandinavian Journal of Psychology*, Vol. 65, No. 3, pp.381-393.

Alam, S.S. and Islam, K.Z. (2021): Examining the role of environmental corporate social responsibility in building green corporate image and green competitive advantage. *International Journal of Corporate Social Responsibility*, Vol. 6, Article 8, 16pp.

Ali, M. (2021a): A social practice theory perspective on green marketing initiatives and green purchase behavior. *Cross Cultural & Strategic Management*, Vol. 28, No. 4, pp.815-838.

Ali, M. (2021b): A systematic literature review of sustainable entrepreneurship with thematic analysis. *World Journal of Entrepreneurship, Management and Sustainable Development*, Vol. 17, No. 4, pp.742-764.

Barforoush, N., Etebarian, A., Naghsh, A. and Shahin, A. (2021): Green innovation a strategic resource to attain competitive advantage. *International Journal of Innovation Science*, Vol. 13, No. 5, pp.645-663.

Borah, P.S., Dogbe, C.S.K., Pomegbe, W.W.K., Bamfo, B.A. and Hornuvo, L.K. (2023): Green market orientation, green innovation capability, green knowledge acquisition and green brand positioning as determinants of new product success. *European Journal of Innovation Management*, Vol. 26, No. 2, pp.364-385.

Bravi, L., Santos, G., Pagano, A. and Murmura, F. (2020): Environmental management system according to ISO 14001: 2015 as a driver to sustainable development. *Corporate Social Responsibility and Environmental Management*, Vol. 27, No. 6, pp.2599-2614.

Carrión-Bósquez, N.G., Ortiz-Regalado, O., Veas-González, I., Naranjo-Armijo, F.G. and Guerra-Regalado, W.F. (2024): The mediating role of attitude and environmental awareness in the influence of green advertising and eco-labels on green purchasing behaviors. *Spanish Journal of Marketing-ESIC*, in press.

Dangelico, R.M. (2016): Green product innovation: Where we are and where we are going. *Business Strategy and the Environment*, Vol. 25, No. 8, pp.560-576.

Dangelico, R.M. and Pujari, D. (2010): Mainstreaming green product innovation: Why and how companies integrate environmental sustainability. *Journal of Business Ethics*, Vol. 95, pp.471-486.

Dangelico, R.M. and Vocalelli, D. (2017): "Green Marketing": An analysis of definitions, strategy steps, and tools through a systematic review of the literature. *Journal of Cleaner Production*, Vol. 165, pp.1263-1279.

de Paula, N. and Melhado, S. (2021): Management and environmental sustainability–guidelines for architectural and engineering design firms. *World Journal of Entrepreneurship, Management and Sustainable Development*, Vol. 17, No. 4, pp.662-689.

de Souza, E.D., Kerber, J.C., Bouzon, M. and Rodriguez, C.M.T. (2022): Performance evaluation of green logistics: Paving the way towards circular economy. *Cleaner Logistics and Supply Chain*, Vol. 3, p.100019.

Demir, S., Gunduz, M.A., Kayikci, Y. and Paksoy, T. (2023): Readiness and maturity of smart and sustainable supply chains: a model proposal. *Engineering Management Journal*, Vol. 35, No. 2, pp.181-206.

Dzage, E.J., Hussain, M.R., Dapaah, P.O. and Mustapha, Y. (2024): Corporate social responsibility, sustainable environmental practices and green innovation; perspectives from the Ghanaian manufacturing industry. *International Journal of Corporate Social Responsibility*, Vol. 9, No. 1, p.4.

Faraz, N.A., Ahmed, F. and Xiong, Z. (2024): How firms leverage corporate environmental strategy to nurture green behavior: Role of multi-level environmentally responsible leadership. *Corporate Social Responsibility and Environmental Management*, Vol. 31, No. 1, pp.243-259.

Fontoura, P. and Coelho, A. (2022): How to boost green innovation and performance through collaboration in the supply chain: Insights into a more sustainable economy. *Journal of Cleaner Production*, Vol. 359, p.132005.

Fosu, E., Yi, K. and Asiedu, D. (2024): The effect of CSR on corporate social performance: Mediating role of corporate image, green innovation and moderating role of corporate identity. *Corporate Social Responsibility and Environmental Management*, Vol. 31, No. 1, pp.69-88.

Gawusu, S., Zhang, X., Jamatutu, S.A., Ahmed, A., Amadu, A.A. and Djam Miensah, E. (2022): The dynamics of green supply chain management within the framework of renewable energy. *International Journal of Energy Research*, Vol. 46, No. 2, pp.684-711.

Gong, Y. (2023): Creating a greener future: the crucial role of green innovation and supply chain management in corporate sustainability. *Environmental Science and Pollution Research*, Vol. 30, No. 56, pp.118523-118534.

Habiba, U., Xinbang, C. and Anwar, A. (2022): Do green technology innovations, financial development, and renewable energy use help to curb carbon emissions? *Renewable Energy*, Vol. 193, pp.1082-1093.

Hameed, I., Hyder, Z., Imran, M. and Shafiq, K. (2021): Greenwash and green purchase behavior: An environmentally sustainable perspective. *Environment, Development and Sustainability*, Vol. 23, pp.1-22.

Hung, C.Z. and Chang, T.W. (2024): Have I purchased the right product? Consumer behavior under corporate greenwash behavior. *Journal of Consumer Behaviour*, Vol. 23, No. 3, pp.1102-1113.

Jha, M.K. and Rangarajan, K. (2020): Analysis of corporate sustainability performance and corporate financial performance causal linkage in the Indian context. *Asian Journal of Sustainability and Social Responsibility*, Vol. 5, Article 10, 30pp.

Karmaker, C.L., Al Aziz, R., Ahmed, T., Misbauddin, S. and Moktadir, M.A. (2023): Impact of industry 4.0 technologies on sustainable supply chain performance: The mediating role of green supply chain management practices and circular economy. *Journal of Cleaner Production*, Vol. 419, p.138249.

Khan, S.A.R., Yu, Z. and Farooq, K. (2023a): Green capabilities, green purchasing, and triple bottom line performance: Leading toward environmental sustainability. *Business Strategy and the Environment*, Vol. 32, No. 4, pp.2022-2034.

Khan, S.J., Badghish, S., Kaur, P., Sharma, R. and Dhir, A. (2023b): What motivates the purchasing of green apparel products? A systematic review and future research agenda. *Business Strategy and the Environment*, Vol. 32, No. 7, pp.4183-4201.

Le, T.T. (2022): How do corporate social responsibility and green innovation transform corporate green strategy into sustainable firm performance? *Journal of Cleaner Production*, Vol. 362, p.132228.

Le, T.T., Vo, X.V. and Venkatesh, V. (2022): Role of green innovation and supply chain management in driving sustainable corporate performance. *Journal of Cleaner Production*, Vol. 374, p.133875.

Li, G., Wang, X. and Wu, J. (2019): How scientific researchers form green innovation behavior: an empirical analysis of China's enterprises. *Technology in Society*, Vol. 56, pp.134-146.

Li, L., Shan, S., Dai, J., Che, W. and Shou, Y. (2022): The impact of green supply chain management on green innovation: A meta-analysis from the inter-organizational learning perspective. *International Journal of Production Economics*, Vol. 250, p.108622.

Li, Y., Tsang, Y.P., Lee, C.K.M. and Wu, C.H. (2024): Multi-criteria group decision analytics for sustainable supplier relationship management in a focal manufacturing company. *Journal of Cleaner Production*, Vol. 476, p.143690.

Moser, A.K. (2015): Thinking green, buying green? Drivers of pro-environmental purchasing behavior. *Journal of Consumer Marketing*, Vol. 32, No. 3, pp.167-175.

Ormazabal, M., Sarriegi, J.M., Rich, E., Viles, E. and Gonzalez, J.J. (2021): Environmental management maturity: The role of dynamic validation. *Organization & Environment*, Vol. 34, No. 1, pp.145-170.

Quoquab, F. and Mohammad, J. (2020): A review of sustainable consumption (2000 to 2020): What we know and what we need to know. *Journal of Global Marketing*, Vol. 33, No. 5, pp.305-334.

Rasheed, N., Sabir, R.I., Mahmood, H., Rauf, A., Ibrahim, A.M. and Naseem, W. (2024): Impact of pro-environmental values on sustainable green apparel buying behavior in Pakistan. *Cleaner and Responsible Consumption*, Vol. 12, p.100180.

Rehman, S.U., Elrehail, H., Alshwayat, D., Ibrahim, B. and Alami, R. (2023): Linking hotel environmental management initiatives and sustainable hotel performance through employees' eco-friendly behaviour and environmental strategies: a moderated-mediated model. *European Business Review*, Vol. 35, No. 2, pp.184-201.

Roh, T., Noh, J., Oh, Y. and Park, K.-S. (2022): Structural relationships of a firm's green strategies for environmental performance: The roles of green supply chain management and green marketing innovation. *Journal of Cleaner Production*, Vol. 356, p.131877.

Sarfraz, M., Raza, M., Khalid, R., Liu, T., Li, Z. and Niyomdecha, L. (2022): Consumer purchasing behavior toward green environment in the healthcare industry: mediating role of entrepreneurial innovation and moderating effect of absorptive capacity. *Frontiers in Public Health*, Vol. 9, p.823307.

Sharma, N., Paço, A. and Kautish, P. (2022): The impact of eco-innovation on green buying behaviour: the moderating effect of emotional loyalty and generation. *Management of Environmental Quality: An International Journal*, Vol. 33, No. 4, pp.1026-1045.

Sun, Y., Gao, P., Tian, W. and Guan, W. (2023): Green innovation for resource efficiency and sustainability: Empirical analysis and policy. *Resources Policy*, Vol. 81, p.103369.

Sutrisno, A.D., Lee, C.-H., Suhardono, S. and Suryawan, I.W.K. (2024): Evaluating factors influencing community readiness for post-mining environmental development strategies. *Journal of Environmental Management*, Vol. 366, p.121823.

Takalo, S.K. and Tooranloo, H.S. (2021): Green innovation: A systematic literature review. *Journal of Cleaner Production*, Vol. 279, p.122474.

Tu, Y. and Wu, W. (2021): How does green innovation improve enterprises' competitive advantage? The role of organizational learning. *Sustainable Production and Consumption*, Vol. 26, pp.504-516.

Venkatraman, S. and Nayak, R.R. (2015): Corporate sustainability: An IS approach for integrating triple bottom line elements. *Social Responsibility Journal*, Vol. 11, No. 3, pp.482-501.

Wang, M., Li, Y., Li, J. and Wang, Z. (2021): Green process innovation, green product innovation and its economic performance improvement paths: A survey and structural model. *Journal of Environmental Management*, Vol. 297, p.113282.

White, K., Cakanlar, A., Sethi, S. and Trudel, R. (2025): The past, present, and future of sustainability marketing: How did we get here and where might we go? *Journal of Business Research*, Vol. 187, p.115056.

Wiredu, J., Yang, Q., Sampene, A.K., Gyamfi, B.A. and Asongu, S.A. (2024): The effect of green supply chain management practices on corporate environmental performance: Does supply chain competitive advantage matter? *Business Strategy and the Environment*, Vol. 33, No. 3, pp.2578-2599.

Wong, C.Y., Wong, C.W. and Boon-itt, S. (2020): Effects of green supply chain integration and green innovation on environmental and cost performance. *International Journal of Production Research*, Vol. 58, No. 15, pp.4589-4609.

Xu, J., Yu, Y., Wu, Y., Zhang, J.Z., Liu, Y., Cao, Y. and Eachempati, P. (2022): Green supply chain management for operational performance: anteceding impact of corporate social responsibility and moderating effects of relational capital. *Journal of Enterprise Information Management*, Vol. 35, No. 6, pp.1613-1638.

Yang, J.Y. and Roh, T. (2019): Open for green innovation: From the perspective of green process and green consumer innovation. *Sustainability*, Vol. 11, No. 12, p.3234.

Yildiz Çankaya, S. and Sezen, B. (2019): Effects of green supply chain management practices on sustainability performance. *Journal of Manufacturing Technology Management*, Vol. 30, No. 1, pp.98-121.

Younis, H., Sundarakani, B. and Vel, P. (2016): The impact of implementing green supply chain management practices on corporate performance. *Competitiveness Review*, Vol. 26, No. 3, pp.216-245.

Zahoor, N., Wu, J., Khan, H. and Khan, Z. (2023): De-globalization, international trade protectionism, and the reconfigurations of global value chains. *Management International Review*, Vol. 63, No. 5, pp.823-859.

Zameer, H. and Yasmeen, H. (2022): Green innovation and environmental awareness driven green purchase intentions. *Marketing Intelligence & Planning*, Vol. 40, No. 5, pp.624-638.

Zhang, Y., Sun, J., Yang, Z. and Wang, Y. (2020): Critical success factors of green innovation: Technology, organization and environment readiness. *Journal of Cleaner Production*, Vol. 264, p.121701.

Appendix. Questionnaire available on https://forms.gle/byk2u6Fqwo95RzbdA

BIOGRAPHY

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