DRIVING GREEN INNOVATION FOR SUSTAINABLE PERFORMANCE: AN EMPIRICAL STUDY OF MICRO ENTERPRISES IN NORTH SUMATRA, INDONESIA

by Cek Turnitin

Submission date: 28-Jan-2026 11:07AM (UTC+0700)
Submission ID: 2865359860
File name: Jurnal_Sisca.pdf (347.76K)
Word count: 7039
Character count: 41634

JOURNAL OF MANAGEMENT AND ENTREPRENEURSHIP RESEARCH
P-ISSN 2723-1658, E-ISSN 2723-1666
Available at http://ejournal.unisnu.ac.id/jmer/
Volume 06, Issue 4, p. 315–327
DOI: https://doi.org/10.34001/jmer.2025.12.06.4-77

DRIVING GREEN INNOVATION FOR SUSTAINABLE PERFORMANCE: AN EMPIRICAL STUDY OF MICRO ENTERPRISES IN NORTH SUMATRA, INDONESIA

Sisca Sisca[1*], Andy Wijaya[2], Christina Yanita Setyawati[3], Acai Sudirman[4]
[1,2,4] *Sekolah Tinggi Ilmu Ekonomi Sultan Agung, Indonesia*
[3] *Universitas Ciputra Surabaya, Indonesia*
e-mails: [1]sisca@stiesultanagung.ac.id; [2]andywijaya@stiesultanagung.ac.id;
[3]csetyawati@ciputra.ac.id; [4]acaivenly@gmail.com

Received July 12, 2025; accepted October 23, 2025; published November 12, 2025.

ABSTRACT

Objective: This study aimed to investigate the key factors driving the adoption of green innovation and how the adoption relates to the enhancement of sustainable business performance in North Sumatra context. **Research Design & Methods:** A quantitative design was applied through structural equation modeling (SEM) with SmartPLS software, based on data previously collected from 371 Micro, Small, and Medium Enterprises (MSMEs) in food and beverage (F&B) sector. **Findings:** The results showed that organizational factors, human resources, and technology were significant drivers in implementing green innovation. The adoption of this innovation has been proven to contribute positively to the social and environmental aspects of sustainable performance, although it did not have a significant impact on the economic aspect. **Implications & Recommendations:** This study provided valuable insights on green innovation, a topic that has received limited scholarly focus in the context of North Sumatra MSMEs. It also offered more insights into previously unanswered questions regarding the determinants of green innovation adoption and their potential role in fostering sustainable performance among MSMEs. **Contribution & Value Added:** Theoretically, this study expanded the use of Resource-Based View (RBV) by emphasizing the importance of internal resource management directed toward environmentally sound innovation to achieve sustainable competitive advantage. Practically, the results provided strategic guidance for MSMEs and policymakers in designing resource-based policies to encourage transformation toward sustainability.

Keywords: green innovation; MSMEs; sustainable business performance; RBV theory.
JEL codes: M10, M21, M31
Article type: research paper

INTRODUCTION

In the contemporary era, the world is increasingly confronted with urgent environmental issues, particularly environmental degradation and climate change (Aboalhool et al., 2024; Song et al., 2021). In response, businesses are being compelled to transition toward more sustainable production practices, with the goal of offering products and services that correspond with environmental stewardship. According to Baeshen et al. (2021), the adoption of green practices is becoming an unavoidable necessity for organizations aiming to achieve long-term sustainable performance (Larbi-Siaw et al., 2022; Sinaga et al., 2022). This imperative also applies to Micro, Small, and Medium Enterprises (MSMEs), constituting an essential component of Indonesian economic structure (Prabowo et al., 2021). MSMEs dominate employment and contribute more significantly to the national Gross Domestic

Corresponding author:
Sisca, email: sisca@stiesultanagung.ac.id

Product (GDP) than large enterprises. Furthermore, their resilience during periods of economic instability shows their strategic importance. Accordingly, Indonesian government continues to prioritize the empowerment and development of MSMEs (Putro & Ilmaniati, 2020).

Green innovation has emerged as a key strategy in the manufacturing sector, promoting sustainability through the integration of environmentally responsible practices (Shahzad et al., 2021; Somjai et al., 2020). However, a preliminary survey involving several MSMEs has shown that the adoption of green innovation remains suboptimal. A significant number still focus predominantly on profit-oriented innovations, often disregarding the long-term environmental consequences of their business activities (Baeshen et al., 2021). These tendencies pose a risk to public trust, specifically in light of the growing presence of green consumers, specifically individuals who are increasingly attentive to the environmental and health impacts of business operations (Abdou et al., 2022; Wang & Juo, 2021). This concern has become particularly salient following the Covid-19 pandemic, consequently increasing societal awareness of health and environmental sustainability.

A significant challenge to the advancement of green innovation in MSMEs is the lack of qualified human resources and inadequate technological capabilities required to facilitate environmentally sustainable transformations. In the absence of sufficient technical expertise and managerial proficiency, these enterprises struggle to incorporate sustainable practices into their core operations, particularly in areas such as energy efficiency, process innovation, and waste reduction (Baeshen et al., 2021; Jun et al., 2021). These internal limitations are often exacerbated by limited institutional support, specifically the scarcity of structured awareness programs and the inadequate provision of enabling infrastructure, such as access to clean technologies, training facilities, and green financing mechanisms (Khan et al., 2021; Zulkiffli et al., 2022). As a result, MSMEs face difficulties in scaling up sustainable innovations, thereby creating a gap between national-level sustainability objectives and their realization at the enterprise level. To mitigate these challenges, scholars have advocated for the development of public–private partnerships aimed at improving knowledge exchange, fostering collaborative innovation ecosystems, and delivering customized capacity-building initiatives (Abbas & Sağsan, 2019; Shahzad et al., 2020). Furthermore, embedding sustainability education into vocational and entrepreneurial training programs is seen as a strategic long-term strategy to cultivating a skilled and environmentally conscious MSMEs workforce (Nasrollahi et al., 2020).

A substantial body of literature supported the positive relationship between green innovation and sustainable business performance (Abubakar et al., 2022; Almeida & Wasim, 2023; Asadi et al., 2020; Baeshen et al., 2021; Ch'ng et al., 2021). However, these studies differ significantly in terms of sectoral emphasis and geographic context. For example, Asadi et al. (2020) investigated green innovation in Malaysian hospitality industry, emphasizing environmental awareness as a key mediator, while Baeshen et al. (2021) explored the role of green absorptive capacity and human capital in MSMEs. Almeida & Wasim (2023) adopted a comparative approach between MSMEs in Portugal and the UK, and Zhao & Huang (2022) focused on leadership and HRM in large-scale enterprises in China. Despite the growing interest in this area, most of the studies centered on manufacturing, hospitality, service industries, as well as developed or upper-middle-income economies. Only a few specifically targeted food and beverage (F&B) sector, particularly in Indonesian MSMEs context. An exception was Natalie et al. (2024) and Siagian & Siagian (2025), which analyzed green market orientation among MSMEs in Indonesia, although the studies did not explore innovation drivers in depth. Due to F&B sector's reliance on traditional production systems, limited digitization, and informal operational structures (KemenKopUKM, 2023), the adoption of green innovation presents distinct challenges. These unique sectoral features, such as resource limitations, weak regulatory oversight, and high informality, remain underrepresented in current academic discussions. Although interest in green innovation continues to expand, empirical studies focusing on its drivers and impacts in Indonesian F&B MSMEs are still insufficient.

Building on the issues outlined, this study aimed to investigate the key determinants influencing the adoption of green innovation. These determinants include external partnership and cooperation, government support, rules and regulatory factors, market and customer factors, organizational and human resource factors, as well as technological factors. Accordingly, the objective was to address this

gap by examining the key drivers of green innovation adoption and their relationship with sustainability performance, specifically among MSMEs in Indonesian F&B industry. This not only enriches the empirical discourse on sector-specific innovation practices but also offers contextually grounded insights for policymakers aiming to foster inclusive and sustainable business ecosystems. By providing empirical insights into these dynamics, this study contributed to both academic discourse and practical policymaking concerning MSMEs development in Indonesia.

LITERATURE REVIEW

RBV Theory

Resource-Based View (RBV) offers a theoretical framework for understanding how a business's internal resources and capabilities contribute to product innovation, and how this innovation influences the organization's overall performance (Andersén, 2021). Over the last decade, RBV theory has been widely used to examine the internal determinants of organizational success (Shahzad et al., 2021). Several studies have explored various antecedents and driving factors that contribute to business performance enhancement, drawing on RBV as a foundational framework to analyze how internal resources and capabilities shape competitive advantage (Baeshen et al., 2021; Lorenzo et al., 2018; Shahzad et al., 2021). From RBV perspective, the adoption of green innovation can create a competitive advantage that improves business performance sustainably.

Sustainable Business Performance

Triple Bottom Line (TBL) framework delineates sustainability in business through a triadic lens, namely economic efficiency, social impact, and environmental protection, serving both as criteria for performance evaluation and as guiding principles for corporate innovation (Asadi et al., 2020). In tandem, RBV theory emphasizes that business ability to sustain competitive advantage is grounded in its capacity to exploit internal resources that are unique, valuable, and difficult for competitors to replicate (Barney, 1991; Shahzad et al., 2020). When synthesized, these frameworks offer a multidimensional method to analyzing how internal business resources contribute to sustainable outcomes across TBL. Strategic resources such as environmental competencies, sustainability-focused human capital, and green innovation capacity enable businesses to derive value not just financially but also socially and ecologically (Nasrollahi et al., 2020; Wang & Juo, 2021). For instance, green intellectual capital can simultaneously foster environmental gains, stakeholder trust, and financial sustainability. Therefore, this study integrated TBL as its main performance metric and applied RBV as the theoretical underpinning to evaluate how internal capabilities drove green innovation and influenced comprehensive sustainability performance (Abbas & Sağsan, 2019; Muangmee et al., 2021; Zhao & Huang, 2022).

Determinants of Green Innovation

In the process of adopting green innovation, several key factors influence its implementation. Baeshen et al. (2021) identified three key drivers in this process, namely green absorptive capacity, sustainable human capital, and organizational support. Complementing these factors, Jun et al. (2021); Rustiarini et al. (2022); Soewarno et al. (2019) expanded the perspective by outlining six critical determinants shaping the adoption of green innovation in organizations. These included external partnership and cooperation, government support, rules and regulatory factors, market and customer factors, organizational and human resource factors, and technological factors. To provide more comprehensive results regarding the determinants of green innovation, this study adopted the six determinants proposed by Jun et al. (2021).

H1: External partnership and cooperation (EPC) have a significant influence on green innovation (GI).
H2: Government support has a significant influence on green innovation (GI).
H3: Rules and regulatory factors have a significant influence on green innovation (GI).
H4: Market and customer factors have a significant influence on green innovation (GI).
H5: Organizational and human resource factors have a significant influence on green innovation (GI).
H6: Technological factors have a significant influence on green innovation (GI).

Green Innovation and Sustainable Business Performance

The concept of sustainable development is closely related to the modern, interdisciplinary perspective of green theory, which emphasizes the importance of implementing environmentally responsible management strategies and leveraging advanced technologies to produce eco-friendly goods and services (Abbas & Sağsan, 2019). In the current rapidly evolving global landscape, environmental management has become increasingly important for businesses, prompting many organizations to invest more actively in the development of green innovations (Tjahjadi et al., 2023). As a result, green innovation is widely recognized as a strategic solution that balances the often competing objectives of economic growth and environmental sustainability (Anik & Sulistyo, 2021; Novitasari & Agustia, 2022).

Green innovation is regarded as a key organizational capability that improves business performance (Muangmee et al., 2021; Tjahjadi et al., 2023). It plays a transformative role by fostering the development of new technologies and processes that support both ecological responsibility and economic viability (Abbas & Sağsan, 2019; Sudirman et al., 2024). A growing body of literature has explored the positive impact of innovation on business performance (Han et al., 1998; Putro & Ilmaniati, 2020; Rajapathirana & Hui, 2018; Siagian & Siagian, 2025; Soewarno et al., 2019), with several studies specifically emphasizing the integration of environmentally conscious practices into innovation efforts, commonly referred to as green innovation, as a significant contributor to achieving sustainable business performance (Abbas & Sağsan, 2019; Asadi et al., 2020; Muangmee et al., 2021; Tjahjadi et al., 2020).

H7: Green innovation (GI) has a significant influence on economic performance (ECP).
H8: Green innovation (GI) has a significant influence on social performance (SCP).
H9: Green innovation (GI) has a significant influence on environmental performance (EVP).

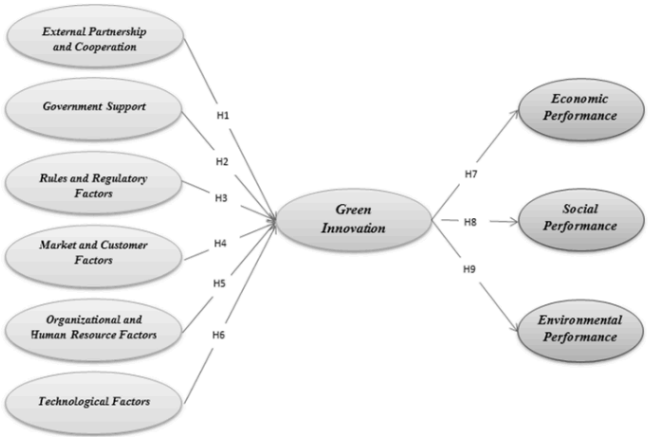

Figure 1. Conceptual Model
Source: Created by Authors (2025)

Figure 1 presents the proposed conceptual framework underpinning this study. The model was structured around two primary constructs, namely the antecedents or key determinants of green innovation, and the multidimensional outcomes of green innovation implementation. According to the integrative perspectives of RBV and TBL framework, the model showed that six determinant factors, namely external partnership and cooperation, government support, rules and regulatory factors, market and customer factors, organizational and human resource factors, and technological factors, were

hypothesized to significantly influence the adoption of green innovation (H1–H6) (Baeshen et al., 2021; Jun et al., 2021). In line with TBL framework (Asadi et al., 2020), the model further hypothesized that green innovation contributed to sustainable business performance across three performance dimensions, namely economic (H7), social (H8), and environmental outcomes (H9). The conceptual linkages assumed that the strategic deployment of internal and external resources could foster environmentally oriented innovation, consequently generating positive impacts on profitability, social contribution, and ecological responsibility (Abbas & Sağsan, 2019; Shahzad et al., 2020; Wang & Juo, 2021).

METHODS

This study used a quantitative cross-sectional survey method to examine the primary determinants influencing green innovation and to assess the impact on sustainable business performance. This study was conducted in Pematangsiantar City, North Sumatra, targeting MSMEs operating in F&B sector. The selection of this sector and location was based on the strategic relevance in Indonesian urban economic structure, where environmental sustainability was an emerging concern but remained underexplored in academic research. A total of 371 MSMEs were recruited through purposive sampling, with inclusion criteria comprising (1) active operation in F&B sector, (2) legal registration with the Ministry of Cooperatives and MSMEs (KemenKopUKM, 2023), and (3) a minimum operational duration of one year, ensuring that businesses had sufficient exposure to green innovation challenges.

Table 1. Demographic Characteristics of Respondents

Category	Items	Frequency	Percentage (%)
Gender	Male	130	35.04
	Female	241	64.96
Age (years)	17-30	111	29.92
	31-40	103	27.76
	41-50	91	24.53
	51-60	42	11.32
	>60	24	6.47
Education Stage	Primary School	41	11.05
	Junior High School	40	10.78
	Senior High School	231	62.26
	Diploma	19	5.12
	Bachelor's Degree	37	9.97
	Master's Degree	2	0.54
	Doctorate	0	0.00
	No Formal Education	1	0.27
Long Time in Business (years)	<1	15	4.04
	1-5	128	34.50
	6-10	97	26.15
	11-15	57	15.36
	16-20	32	8.63
	>20	42	11.32
Net Worth	≤ IDR 50,000,000	235	63.34
	IDR 50,000,000 – IDR 500,000,000	107	28.84
	IDR 500,000,000 – IDR 10,000,000,000	29	7.82
Annual Sales	≤ IDR 300,000,000	241	64.96
	IDR 300,000,000 – IDR 2,500,000,000	107	29.11
	IDR 2,500,000,000 – IDR 500,000,000,000	22	5.93

Source: Data processing results

Data were collected using a structured questionnaire, adapted from validated instruments in previous studies (Baeshen et al., 2021; Jun et al., 2021; Shahzad et al., 2020). The questionnaire comprised measurement items for six antecedents of green innovation, namely external partnerships and cooperation (4 items); government support (5 items); regulatory factors (4 items); market and customer orientation (4 items); organizational and human resource factors (5 items); and technological capabilities (4 items). It also included items for green innovation (5 items) and sustainable business performance, measured across three dimensions, namely economic (3 items), social (3 items), and environmental (5

items). Responses were rated using a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

Table 2. Validity and Reliability Test

Variables	Item	Loading Factor	Average Variance Extracted (AVE)	Composite Reliability	Cronbach's Alpha
External Partnership and Cooperation (EPC)			0.676	0.893	0.839
	EPC1	0.817			
	EPC2	0.881			
	EPC3	0.845			
	EPC4	0.740			
Government Support (GS)			0.609	0.886	0.840
	GS1	0.762			
	GS2	0.802			
	GS3	0.802			
	GS4	0.791			
	GS5	0.744			
Rules and Regulatory Factors (RR)			0.591	0.852	0.774
	RR1	0.740			
	RR2	0.751			
	RR3	0.799			
	RR4	0.782			
Market and Customer Factors (MC)			0.594	0.854	0.772
	MC1	0.737			
	MC2	0.759			
	MC3	0.781			
	MC4	0.804			
Organizational and Human Resource Factors (OH)			0.627	0.834	0.702
	OH2	0.821			
	OH3	0.749			
	OH4	0.803			
Technological Factors (TF)			0.615	0.864	0.792
	TF1	0.733			
	TF2	0.803			
	TF3	0.791			
	TF4	0.769			
Green Innovation (GI)			0.569	0.868	0.810
	GI1	0.705			
	GI2	0.789			
	GI3	0.738			
	GI4	0.802			
	GI5	0.734			
Economic Performance (ECP)			0.866	0.928	0.848
	ECP1	0.950			
	ECP3	0.911			
Social Performance (SCP)			0.721	0.886	0.807
	SCP1	0.866			
	SCP2	0.813			
	SCP3	0.868			
Environmental Performance (EVP)			0.634	0.874	0.807
	EVP2	0.809			
	EVP3	0.751			
	EVP4	0.830			
	EVP5	0.791			

Source: Smart-PLS data processing results

Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 3.0 software. According to Hair et al. (2023), the analysis included two primary stages, namely evaluation of the measurement model (outer model) and the structural model (inner model).

Convergent validity was confirmed through factor loadings above 0.70 and Average Variance Extracted (AVE) values exceeding 0.50. Meanwhile, discriminant validity was evaluated using the Fornell-Larcker criterion and cross-loading assessments. Internal consistency was established through composite reliability and Cronbach's alpha, both surpassing the threshold of 0.70. Hypothesis testing was conducted through bootstrapping with 5,000 resamples, and significance was determined at the $p < 0.05$ level.

FINDINGS

The questionnaire was distributed offline by surveyor, specifically college students supporting Kampus Merdeka program, resulting in 371 valid responses. The majority of respondents were female (64.96%), predominantly in the age ranges of 17–30 years (29.92%) and 31–40 years (27.76%). Most respondents had completed secondary education, with 62.26% holding a senior high school qualification. Regarding businesses, the majority had been operating for 1–5 years (34.50%) and 6–10 years (26.15%). The survey also showed most of these enterprises were categorized as micro-enterprises, with 63.34% reporting a net worth of ≤ IDR 50,000,000 and 64.96% reporting annual sales of ≤ IDR 300,000,000. See details in Table 1.

Table 3. Discriminant Validity and Heterotrait-Monotrait Ratio (HTMT) Test

	ECP	EVP	EPC	GS	GI	MC	OH	RR	SCP	TF
Discriminant Validity										
ECP	0.931									
EVP	0.059	0.796								
EPC	-0.106	0.457	0.822							
GS	-0.066	0.521	0.688	0.780						
GI	-0.048	0.660	0.573	0.641	0.754					
MC	0.071	0.580	0.438	0.589	0.625	0.771				
OH	0.046	0.538	0.509	0.610	0.676	0.624	0.792			
RR	0.099	0.447	0.221	0.515	0.410	0.582	0.495	0.769		
SCP	0.074	0.566	0.353	0.516	0.617	0.565	0.524	0.461	0.849	
TF	0.022	0.618	0.409	0.537	0.697	0.613	0.623	0.503	0.586	0.784
Heterotrait-Monotrait Ratio (HTMT)										
ECP										
EVP	0,080									
EPC	0,135	0,546								
GS	0,086	0,628	0,812							
GI	0,090	0,810	0,697	0,773						
MC	0,089	0,733	0,542	0,730	0,786					
OH	0,070	0,710	0,665	0,791	0,893	0,842				
RR	0,129	0,557	0,265	0,614	0,489	0,743	0,663			
SCP	0,091	0,700	0,429	0,625	0,757	0,714	0,689	0,580		
TF	0,057	0,770	0,497	0,651	0,864	0,782	0,828	0,634	0,735	

Source: Smart-PLS data processing results

Both convergent and discriminant validity tests were conducted to assess the validity and reliability of the measurement model (Table 2). Convergent validity was confirmed as most item loadings exceeded the recommended threshold of 0.70, and AVE values were above 0.50 for all constructs (Hair et al., 2023). However, several indicators, specifically OH1 (Organizational and Human Resource Factors), ECP2 (Economic Performance), and EVP1 (Environmental Performance), were removed from the final model. These items were excluded due to factor loadings below 0.70, confirming insufficient contribution to the respective latent constructs. The removal of low-loading indicators improved the internal validity of the model by ensuring that only statistically reliable and conceptually sound items contributed to construct measurement (Hair et al., 2023). Furthermore, the elimination of these items did not compromise the overall construct validity, as reflected in strong composite reliability values (all > 0.70) and acceptable Cronbach's alpha coefficients. This adjustment improved measurement precision without affecting the conceptual integrity of the constructs. Discriminant validity was also established, with all cross-loading values exceeding 0.70, confirming that each construct measured a distinct concept.

Heterotrait-Monotrait Ratio (HTMT) analysis showed that all inter-construct values were below the threshold of 0.90, confirming adequate discriminant validity (Table 3). The highest value was recorded between Green Innovation and Technological Factors (0.864), which remained in acceptable limits. Some pairs of constructs, such as Economic Performance and Technological Factors (0.057), showed low correlation, providing stronger evidence of conceptual differentiation between constructs. Generally, the results supported that each construct in the model measured an empirically distinct concept. In terms of explanatory power, R-square value for green innovation was 0.653, confirming that the six determinants accounted for approximately 65.3% of the variance in green innovation. R-square values for social and environmental performance were 0.380 and 0.435, respectively, confirming moderate explanatory strength (Table 4). However, the model's predictive power for economic performance was negligible (R^2 = 0.002), potentially due to the short-term financial burdens of implementing green practices among MSMEs.

Table 4. R-Square Test

	R-square	R-square Adjusted
Green Innovation	0.653	0.647
Economic Performance	0.002	0.000
Social Performance	0.380	0.379
Environmental Performance	0.435	0.434

Source: Smart-PLS data processing results

Significance testing was conducted to examine the relationships between the exogenous and endogenous variables to evaluate proposed hypotheses. The analysis focused on the p-values as the key criterion for significance. At a 5% significance level, a p-value less than 0.05 confirmed a statistically significant influence of the exogenous variable on the endogenous variable, while a p-value greater than 0.05 showed no significant influence. The detailed results of the hypothesis testing are presented in Table 5.

Table 5. Hypothesis Result

Path	B	t-Statistics	P-Value	Result
EPC -> GI	0.154	2.980	0.003	Supported
GS -> GI	0.159	2.921	0.004	Supported
RR -> GI	-0.087	2.032	0.043	Supported
MC -> GI	0.155	2.828	0.005	Supported
OH -> GI	0.224	4.292	0.000	Supported
TF -> GI	0.358	6.443	0.000	Supported
GI -> ECP	-0.048	0.675	0.500	Not Supported
GI -> SCP	0.617	17.490	0.000	Supported
GI -> EVP	0.660	20.627	0.000	Supported

Source: Smart-PLS data processing results

The hypothesis testing (H1–H6), examining the influence of various determinant factors on green innovation, showed that all proposed relationships were statistically supported, as confirmed by p-values less than 0.05. These results reinforced the theoretical premise that internal and external drivers, such as external partnerships, government support, market pressure, organizational capabilities, and technology, played a significant role in fostering green innovation among MSMEs. Furthermore, hypotheses H8 and H9, which tested the impact of green innovation on social performance and environmental performance, were also supported, as evidenced by highly significant p-values (< 0.05). In contrast, hypothesis H7, postulating a positive relationship between green innovation and economic performance, was not supported (p = 0.500), showing that economic gains from green innovation might not be immediately realized in the context of MSMEs.

DISCUSSION

This study found that among the various factors investigated, organizational and human resource aspects, along with technological readiness, emerged as the most influential in promoting green innovation in MSMEs in Indonesian F&B industry. This result was consistent with previous studies (Baeshen et al., 2021; Jun et al., 2021), identifying internal organizational capabilities and human capital as primary enablers of eco-innovation, specifically in small enterprise contexts. Drawing upon RBV,

elements such as organizational design, employee skills, leadership commitment, and access to appropriate technologies constituted strategic internal assets for improving business potential to innovate sustainably. These resources, being unique and difficult to replicate, offered a foundation for achieving long-term competitive advantage (Yang et al., 2023). Therefore, MSMEs that effectively utilized their human capital by fostering environmental awareness, technical competencies, and proactive leadership tended to be better equipped to adopt eco-innovative practices, even when faced with resource limitations (Asadi et al., 2020; Zulkiffli et al., 2022). This study also showed that regulatory and policy-related factors negatively affected the adoption of green innovation. This contradicted the original hypothesis, where regulations were assumed to function as facilitators of innovation. In the specific context of MSMEs in Indonesian F&B sector, regulations are frequently viewed as complex, vague, and challenging to implement, specifically by businesses with limited institutional and administrative capacity. This regulatory ambiguity tends to increase uncertainty and compliance burdens, typically discouraging businesses from initiating proactive environmental measures (Kania & Bukhori, 2025). Theoretically, while regulatory pressure is often expected to stimulate innovation, as suggested by Porter's Hypothesis, this relationship is contingent on the design and applicability of the regulations. In environments where regulatory systems are fragmented or not corresponding with MSMEs' operational realities, the systems may act as institutional lock-ins that restrict flexibility and impose high compliance costs (Miyamoto, 2015; Mohammad & Wasiuzzaman, 2021).

This study further confirmed that green innovation had a positive and significant influence on sustainable business performance, particularly in the environmental and social dimensions. These results were consistent with previous studies (Abbas & Sağsan, 2019; Asadi et al., 2020; Khan et al., 2021; Muangmee et al., 2021), emphasizing the important role of eco-innovation in advancing broader sustainability outcomes. According to RBV, green innovation is not merely a functional improvement but represents a strategic resource that is valuable, rare, inimitable, and non-substitutable (Yang et al., 2023). It enables businesses to integrate social and environmental values into core operations, thereby strengthening competitive positioning. For MSMEs, cultivating eco-innovative competencies supports organizational differentiation and resilience, particularly as markets shift toward sustainability-conscious consumer preferences (Siska et al., 2025; Zulkiffli et al., 2022).

The relationship between green innovation and economic performance was confirmed to be negative and statistically non-significant, diverging from Muangmee et al. (2021), which reported a positive impact. A plausible result lay in the substantial costs involved in implementing green innovation, which could temporarily reduce profitability, specifically for small enterprises. In the context of developing economies, MSMEs often operate with limited financial and structural resources, making it difficult to absorb these costs or to realize immediate financial returns. Therefore, the absence of a significant economic effect does not diminish the potential value of green innovation but emphasizes the pressing need for supportive mechanisms such as subsidies, green financing, and technical guidance to ensure sustainability efforts translate into long-term economic benefits.

This study provided meaningful implications for both MSMEs practitioners and policymakers in F&B industry. It emphasized the strategic value of green innovation in improving sustainable outcomes, particularly in response to increased consumer demand for ethical and environmentally responsible products. The pandemic has also reinforced consumers' digital orientation and raised expectations for social and environmental accountability (Baeshen et al., 2021). Therefore, businesses that embed sustainability into their core operations stand to benefit from stronger customer loyalty and market differentiation. In response, policy initiatives should prioritize the development of practical support systems such as simplified regulatory procedures, targeted funding schemes, and sustainability-driven training to foster an ecosystem that enables MSMEs to adopt green practices effectively.

CONCLUSION

In conclusion, from a theoretical standpoint, this study extended existing knowledge on MSMEs by explicitly applying RBV to examine how internal resources such as technological capabilities, green knowledge, and human capital contributed to the adoption of green innovation. It also advanced the

RBV discourse by showing eco-innovation could function as a strategic intangible asset that was valuable, rare, inimitable, and non-substitutable, thereby corresponding with the core tenets of Barney's RBV. Unlike previous studies that examined RBV in large-business contexts, this study adapted the framework to a small business environment, showing its relevance in resource-constrained settings such as Indonesian MSMEs in F&B sector.

On a practical level, the results provided actionable insights for both MSMEs owners and policymakers. For MSMEs practitioners, the results emphasized the need to invest in internal capabilities such as employee training, leadership in sustainability, and the adoption of green technologies, as these factors were central to driving eco-innovation. For policymakers, this study showed the importance of simplifying regulatory mechanisms and expanding access to green finance and technical support, particularly for small businesses often lacking the institutional capacity to navigate complex sustainability mandates. Tailored policy interventions, such as tax incentives for eco-friendly practices or green innovation incubators, could significantly lower entry barriers and improve innovation diffusion among MSMEs. Despite the significant contributions, this study was subject to certain limitations. Its exclusive focus on F&B sector in a single urban area (Pematangsiantar City) could limit the generalizability of the results to other sectors or geographic regions. Therefore, future studies were recommended to conduct comparative sectoral analyses, specifically between resource-intensive industries and service-based MSMEs, and examine whether the influence of internal drivers on green innovation varied across different industrial structures. Longitudinal designs could also be used to observe how green innovation evolved over time in response to internal capability development and external policy shifts.

ACKNOWLEDGEMENTS

The authors gratefully acknowledge the support of STIE Sultan Agung, whose academic environment and institutional encouragement have been instrumental in the completion of this research. We also extend our sincere thanks to all participating Indonesian MSMEs for their willingness to share valuable data and experiences. Appreciation is given to colleagues, research assistants, and all parties who provided input, motivation, and assistance throughout the research process. Their contributions have greatly enriched the study.

CONFLICT OF INTEREST STATEMENT

The authors declare that there is no conflict of interest regarding the publication of this research. All data collection, analysis, and interpretation were conducted independently and objectively, without any commercial, financial, or personal relationships that could be perceived to influence the findings of this study.

REFERENCES

Abbas, J., & Sağsan, M. (2019). Impact of Knowledge Management Practices on Green Innovation and Corporate Sustainable Development: A Structural Analysis. *Journal of Cleaner Production*, *229*, 611–620. https://doi.org/10.1016/j.jclepro.2019.05.024

Abdou, A. H., Hassan, T. H., Salem, A. E., Albakhit, A. I., Almakhayitah, M. Y., & Salama, W. (2022). The Nexus between Environmentally Sustainable Practices, Green Satisfaction, and Customer Citizenship Behavior in Eco-Friendly Hotels: Social Exchange Theory Perspective. *Sustainability*, *14*(19), 12791. https://doi.org/10.3390/su141912791

Aboalhool, T., Alzubi, A., & Iyiola, K. (2024). Humane Entrepreneurship in the Circular Economy: The Role of Green Market Orientation and Green Technology Turbulence for Sustainable Corporate. *Sustainability*, *16*(6), 2517. https://doi.org/10.3390/su16062517

Abubakar, A., Khalifa, M. M., Elbasset, F. H. A., & Alkharusi, B. (2022). Strategic Integration of Green Innovation, Green Behavior, and Information Systems for Sustainable Business Performance & Competitiveness. *International Journal of Management and Sustainability*, *11*(1), 31–45. https://doi.org/10.18488/11.v11i1.2951

Almeida, F., & Wasim, J. (2023). Eco-Innovation and Sustainable Business Performance: Perspectives of SMEs in Portugal and the UK. *Society and Business Review*, *18*(1), 28–50. https://doi.org/10.1108/SBR-12-2021-0233

Andersén, J. (2021). A Relational Natural-Resource-Based View on Product Innovation: The Influence of Green Product Innovation and Green Suppliers on Differentiation Advantage in Small Manufacturing Firms. *Technovation*, *104*, 102254. https://doi.org/10.1016/j.technovation.2021.102254

Anik, S., & Sulistyo, H. (2021). The Role of Green Intellectual Capital and Green Innovation on Competitive Advantage of SMEs. *International Journal of Learning and Intellectual Capital*, *18*(1), 28–44. https://doi.org/10.1504/IJLIC.2021.113662

Asadi, S., Pourhashemi, S. O., Nilashi, M., Abdullah, R., Samad, S., Yadegaridehkordi, E., Aljojo, N., & Razali, N. S. (2020). Investigating Influence of Green Innovation on Sustainability Performance: A Case on Malaysian Hotel Industry. *Journal of Cleaner Production*, *258*, 120860. https://doi.org/10.1016/j.jclepro.2020.120860

Baeshen, Y., Soomro, Y. A., & Bhutto, M. Y. (2021). Determinants of Green Innovation to Achieve Sustainable Business Performance: Evidence From SMEs. *Frontiers in Psychology*, *12*, 767968. https://doi.org/10.3389/fpsyg.2021.767968

Barney, J. B. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management*, *17*(1), 99–120. https://doi.org/10.1177/014920639101700108

Ch'ng, P.-C., Cheah, J., & Amran, A. (2021). Eco-Innovation Practices and Sustainable Business Performance: The Moderating Effect of Market Turbulence in the Malaysian Technology Industry. *Journal of Cleaner Production*, *283*, 124556. https://doi.org/10.1016/j.jclepro.2020.124556

Hair, J. F., Ringle, C., Sarstedt, M., & Gudergan, S. P. (2023). *Advanced Issues in Partial Least Square Structural Equation Modeling* (2nd ed.). Sage.

Han, J. K., Kim, N., & Srivastava, R. K. (1998). Market Orientation and Organizational Performance: Is Innovation A Missing Link? *Journal of Marketing*, *62*(4), 30–45. https://doi.org/10.1177/002224299806200403

Jun, W., Ali, W., Bhutto, M. Y., Hussain, H., & Khan, N. A. (2021). Examining the Determinants of Green Innovation Adoption in SMEs: A PLS-SEM Approach. *European Journal of Innovation Management*, *24*(1), 67–87. https://doi.org/10.1108/EJIM-05-2019-0113

Kania, D., & Bukhori, R. F. (2025). Green Innovation Management in Indonesian SMEs: Drivers, Barriers, and Performance Implications for Sustainable Business Development. *Proceeding International Conference On Sustainable Environment And Innovation (ICOSEI)*. https://doi.org/10.53675/icosei.v1i1.1568

KemenKopUKM. (2023). *Panduan Pengembangan UMKM Bidang Kuliner*. https://www.depkop.go.id/data-umkm/panduan-kuliner

Khan, N. U., Anwar, M., Li, S., & Khattak, M. S. (2021). Intellectual Capital, Financial Resources, and Green Supply Chain Management as Predictors of Financial and Environmental Performance. *Environmental Science and Pollution Research*, *28*(16), 19755–19767. https://doi.org/10.1007/s11356-020-12243-4

Larbi-Siaw, O., Xuhua, H., Owusu, E., Owusu-Agyeman, A., Fulgence, B. E., & Frimpong, S. A. (2022). Eco-Innovation, Sustainable Business Performance and Market Turbulence Moderation in Emerging Economies. *Technology in Society*, *68*, 101899. https://doi.org/10.1016/j.techsoc.2022.101899

Lorenzo, J. R. F., Rubio, M. T. M., & Garcés, S. A. (2018). The Competitive Advantage in Business, Capabilities and Strategy. What General Performance Factors are FOUND in the Spanish Wine Industry? *Wine Economics and Policy*, *7*(2), 94–108. https://doi.org/10.1016/j.wep.2018.04.001

Miyamoto, M. (2015). Application of Competitive Forces in the Business Intelligence of Japanese SMEs. *International Journal of Management Science and Engineering Management*, *10*(4), 273–287. https://doi.org/10.1080/17509653.2014.966794

Mohammad, W. M. W., & Wasiuzzaman, S. (2021). Environmental, Social and Governance (ESG) Disclosure, Competitive Advantage and Performance of Firms in Malaysia. *Cleaner Environmental Systems*, *2*, 100015. https://doi.org/10.1016/j.cesys.2021.100015

Muangmee, C., Dacko-Pikiewicz, Z., Meekaewkunchorn, N., Kassakorn, N., & Khalid, B. (2021).

Green Entrepreneurial Orientation and Green Innovation in Small and Medium-Sized Enterprises (SMEs). *Social Sciences*, *10*(4), 136. https://doi.org/10.3390/socsci10040136

Nasrollahi, M., Fathi, M. R., & Hassani, N. S. (2020). Eco-Innovation and Cleaner Production as Sustainable Competitive Advantage Antecedents: The Mediating Role of Green Performance. *International Journal of Business Innovation and Research*, *22*(3), 388–407. https://doi.org/10.1504/IJBIR.2020.107978

Natalie, H. C., Bangsawan, S., & Husna, N. (2024). Driving Sustainable Business Performance: The Impact of Green Innovation on Food & Beverage SMEs in Bandar Lampung City. *International Journal of Business and Applied Economics*, *3*(3), 371–384. https://doi.org/10.55927/ijbae.v3i3.9187

Novitasari, M., & Agustia, D. (2022). The Role of Green Supply Chain Management and Green Innovation in the Effect of Corporate Social Responsibility on Firm Performance. *Gestão & Produção*, *29*, e117. https://doi.org//10.1590/1806-9649-2022v29e117

Prabowo, H., Sriwidadi, T., & Ikhsan, R. B. (2021). The Influence of Dynamic Capability on Sustainable Competitive Advantage: An Empirical Study of Small Businesses in Indonesia. *The Journal of Asian Finance, Economics and Business*, *8*(6), 949–959. https://doi.org/10.13106/jafeb.2021.vol8.no6.0949

Putro, B. E., & Ilmaniati, A. (2020). The Effectiveness Model of Knowledge Sharing in Business Innovation to Improve the Performance of Micro Small and Medium Enterprises. *Jurnal Ilmiah Teknik Industri*, *19*(1), 39–46. https://doi.org/10.23917/jiti.v19i1.10231

Rajapathirana, R. J., & Hui, Y. (2018). Relationship between Innovation Capability, Innovation Type, and Firm Performance. *Journal of Innovation & Knowledge*, *3*(1), 44–55. https://doi.org/10.1016/j.jik.2017.06.002

Rustiarini, N. W., Bhegawati, D. A. S., & Mendra, N. P. Y. (2022). Does Green Innovation Improve SME Performance? *Economies*, *10*(12), 316. https://doi.org/10.3390/economies10120316

Shahzad, M., Qu, Y., Rehman, S. U., Zafar, A. U., Ding, X., & Abbas, J. (2020). Impact of Knowledge Absorptive Capacity on Corporate Sustainability With Mediating Role of CSR: Analysis from the Asian Context. *Journal of Environmental Planning and Management*, *63*(2), 148–174. https://doi.org/10.1080/09640568.2019.1575799

Shahzad, M., Qu, Y., Zafar, A. U., & Appolloni, A. (2021). Does the Interaction Between the Knowledge Management Process and Sustainable Development Practices Boost Corporate Green Innovation? *Business Strategy and the Environment*, *30*(8), 4206–4222. https://doi.org/10.1002/bse.2865

Siagian, H., & Siagian, V. (2025). Green Innovation, Sustainability Growth Rate, and Firm Performance Evidence from Indonesia. *Jurnal Ilmiah Manajemen Kesatuan*, *13*(5), 3755–3764. https://doi.org/10.37641/jimkes.v13i5.3356

Sinaga, O. S., Candra, V., Inrawan, A., Abdurohim, & Sudirman, A. (2022). Analysis of the Mediation Effect of Innovation Culture on the Effect of Entrepreneurial Orientation on the Sustainable Competitive Advantage of SMEs in Indonesia. *International Journal of Economics, Business and Management Research*, *6*(11), 51–62. https://doi.org/10.51505/IJEBMR.2022.61104

Siska, E., Irawan, R. L., Lestari, T., & Yadewani, D. (2025). Impact of Green Economy and Innovation on Sustainable Development with Regulatory Quality Mediation: Indonesia Case. *Jurnal Aplikasi Bisnis Dan Manajemen*, *11*(3), 1087. https://doi.org/10.17358/jabm.11.3.1087

Soewarno, N., Tjahjadi, B., & Fithrianti, F. (2019). Green Innovation Strategy and Green Innovation: The Roles of Green Organizational Identity and Environmental Organizational Legitimacy. *Management Decision*, *57*(11), 3061–3078. https://doi.org/10.1108/MD-05-2018-0563

Somjai, S., Fongtanakit, R., & Laosillapacharoen, K. (2020). Impact of Environmental Commitment, Environmental Management Accounting and Green Innovation on Firm Performance: An Empirical Investigation. *International Journal of Energy Economics and Policy*, *10*(3), 204–210. https://doi.org/10.32479/ijeep.9174

Song, S., Hossin, M. A., Yin, X., & Hosain, M. S. (2021). Accelerating Green Innovation Performance from the Relations of Network Potential, Absorptive Capacity, and Environmental Turbulence. *Sustainability*, *13*(14), 7765. https://doi.org/10.3390/su13147765

Sudirman, A., Kusuma, C. S. D., Halim, F., & Sembiring, L. D. (2024). Analysis of the Mediation Effect

of Green Competitive Advantage: Reviewing the Influence of Green Innovation on SMEs' Business Performance. *International Journal of Business, Law, and Education*, *5*(2), 2617–2627. https://doi.org/10.56442/ijble.v5i2.917

Tjahjadi, B., Soewarno, N., Hariyati, H., Nafidah, L. N., Kustiningsih, N., & Nadyaningrum, V. (2020). The Role of Green Innovation between Green Market Orientation and Business Performance: Its Implication for Open Innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, *6*(4), 173. https://doi.org/10.3390/joitmc6040173

Tjahjadi, B., Soewarno, N., Kamarudin, K. A., Aldina, S., Karima, T. El, & Sutarsa, A. A. P. (2023). Effect of Top Management Team Characteristics and Green Innovation on Firm Performance in Indonesia: Role of Carbon Emission Disclosure. *International Journal of Energy Economics and Policy*, *13*(5), 44–53. https://doi.org/10.32479/ijeep.14222

Wang, C. H., & Juo, W. (2021). An Environmental Policy of Green Intellectual Capital: Green Innovation Strategy for Performance Sustainability. *Business Strategy and the Environment*, *30*(7), 3241–3254. https://doi.org/10.1002/bse.2800

Yang, J., Malik, S. Y., Mughal, Y. H., Azam, T., Khan, W., Chuadhry, M. A., Ilyas, M., & Cao, Y. (2023). Assessing the Impact of Corporate Social Responsibility, Green Shared Vision on Voluntary Green Work Behavior: Mediating Role of Green Human Resource Management. *Sustainability*, *15*(23), 16398. https://doi.org/10.3390/su152316398

Zhao, W., & Huang, L. (2022). The Impact of Green Transformational Leadership, Green HRM, Green Innovation and Organizational Support on the Sustainable Business Performance: Evidence from China. *Economic Research-Ekonomska Istraživanja*, *35*(1), 6121–6141. https://doi.org/10.1080/1331677X.2022.2047086

Zulkiffli, S. N. A., Zaidi, N. F. Z., Padlee, S. F., & Sukri, N. K. A. (2022). Eco-Innovation Capabilities and Sustainable Business Performance during the COVID-19 Pandemic. *Sustainability*, *14*(13), 7525. https://doi.org/10.3390/su14137525

DRIVING GREEN INNOVATION FOR SUSTAINABLE PERFORMANCE: AN EMPIRICAL STUDY OF MICRO ENTERPRISES IN NORTH SUMATRA, INDONESIA

ORIGINALITY REPORT

14%	9%	11%	3%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Ali Zaidi, Lassaad Lakhal. "The impact of lean manufacturing practices on green supply chain management and corporate sustainable performance: evidence from manufacturing firms operating in Tunisia", International Journal of Productivity and Performance Management, 2025 Publication	1%
2	Ana Komari. "Towards an Advanced Economy Through Batik SMEs: The Strategic Role of Green Innovation and Knowledge Management in Local Competitiveness", International Journal of Sustainable Development and Planning, 2025 Publication	1%
3	Marco Tavanti. "Sustainability in Business Management, Volume 2", Springer Science and Business Media LLC, 2025 Publication	<1%
4	Biao Luo, Muhammad Hasan Makhdomzada. ""The Role of Technology, Management Skills, and Policy Capacity in Enhancing Enterprise Catch-Up Performance: A Comparative Study."", Cleaner Waste Systems, 2025 Publication	<1%
5	staging-formative.jmir.org Internet Source	<1%

6	www.smartscitech.com Internet Source	<1 %
7	Han Phoumin, Farhad Taghizadeh-Hesary, Fukunari Kimura, Rabindra Nepal. "Green Finance and Decarbonization - Advancing Low-Carbon Technologies in East and Southeast Asia", Routledge, 2025 Publication	<1 %
8	Submitted to National School of Business Management NSBM, Sri Lanka Student Paper	<1 %
9	dokumen.pub Internet Source	<1 %
10	fbj.springeropen.com Internet Source	<1 %
11	journal.unismuh.ac.id Internet Source	<1 %
12	Submitted to Universidad de Chile Student Paper	<1 %
13	grassrootsjournals.org Internet Source	<1 %
14	www.philexport.ph Internet Source	<1 %
15	Submitted to University of Dammam Student Paper	<1 %
16	ijafibs.pelnus.ac.id Internet Source	<1 %
17	jurnalmanajemen.petra.ac.id Internet Source	<1 %
18	Submitted to National University of Singapore Student Paper	<1 %

19	ijstm.inarah.co.id Internet Source	<1 %
20	sj.wne.sggw.pl Internet Source	<1 %
21	Shengyu Gu. "Green innovation; a way to enhance economic performance of Chinese hotels", International Journal of Innovation Science, 2022 Publication	<1 %
22	Zafer Adiguzel, Fatma Sonmez Cakir. "Leveraging green information systems and big data analytics infrastructure flexibility for sustainable performance: the mediating role of green technological turbulence in energy companies", Industrial Management & Data Systems, 2025 Publication	<1 %
23	dinastipub.org Internet Source	<1 %
24	www.erudit.org Internet Source	<1 %
25	zbc.uz.zgora.pl Internet Source	<1 %
26	Islam, Mohedul, Mohitul Ameen Ahmed Mustafi, Rafiqul Islam, and Nazrul Islam. "A Multivariate Analysis of Job Satisfaction of Ready-made Garments (RMG) Workers in Bangladesh", International Business Research, 2016. Publication	<1 %
27	archive.conscientiabeam.com Internet Source	<1 %
	ijsrm.net	

28	Internet Source	<1%
29	prosiding.stie-aas.ac.id Internet Source	<1%
30	www.researchsquare.com Internet Source	<1%
31	wydawnictwo.pcz.pl Internet Source	<1%
32	Cassandra Yi Rong Chan, Suhaiza Zailani. "Capabilities to create new value forbusiness sustainability: aretailer case study from Malaysia", Benchmarking: An International Journal, 2024 Publication	<1%
33	Grisna Anggadwita, Erni Martini. "Digital Economy for Customer Benefit and Business Fairness", Routledge, 2020 Publication	<1%
34	Waheed Ali Umrani, Nisar Ahmed Channa, Amna Yousaf, Umair Ahmed, Munwar Hussain Pahi, Thurasamy Ramayah. "Greening the workforce to achieve environmental performance in hotel industry: A serial mediation model", Journal of Hospitality and Tourism Management, 2020 Publication	<1%
35	archive.aessweb.com Internet Source	<1%
36	bmcpsychology.biomedcentral.com Internet Source	<1%
37	dspace.uni.lodz.pl:8443 Internet Source	<1%
	jisem-journal.com	

38	Internet Source	<1%
39	journal.afebi.org Internet Source	<1%
40	malque.pub Internet Source	<1%
41	remittancesreview.com Internet Source	<1%
42	research.uca.ac.uk Internet Source	<1%
43	ris.utwente.nl Internet Source	<1%
44	www.international-review.com Internet Source	<1%
45	www.openjournals.ijaar.org Internet Source	<1%
46	Noorlailie Soewarno, Bambang Tjahjadi, Febrina Fithrianti. "Green innovation strategy and green innovation", Management Decision, 2019 Publication	<1%
47	Tsai-Chiao Wang, Ming-Lang Tseng, Huei-Wen Pan, Chiou-Chi Hsiau, Ta-Wei Tang, Chia-Liang Tsai. "The development of a sustainable wellness service marketing strategy in Taiwan based on consumer eye movements and preferences", Journal of Cleaner Production, 2020 Publication	<1%
48	azpdf.tips Internet Source	<1%
49	bit.fsv.cvut.cz Internet Source	

		<1 %
50	ejournal.ipdn.ac.id Internet Source	<1 %
51	hrcak.srce.hr Internet Source	<1 %
52	iieta.org Internet Source	<1 %
53	ijssmr.org Internet Source	<1 %
54	ir.knust.edu.gh Internet Source	<1 %
55	jptam.org Internet Source	<1 %
56	ucudir.ucu.ac.ug Internet Source	<1 %
57	Javier Martínez-Falcó, Eduardo Sánchez-García, Bartolomé Marco-Lajara, Gustav Visser. "The Influence of Green Intellectual Capital on Competitive Advantage: A Mediation Analysis in Spanish Wineries", Journal of the Knowledge Economy, 2025 Publication	<1 %
58	Onita Sari Sinaga, Vivi Candra. "Analysis of the Mediation Effect of Innovation Culture on the Effect of Entrepreneurial Orientation on the Sustainable Competitive Advantage of SMEs in Indonesia", International Journal of Economics, Business and Management Research, 2022 Publication	<1 %
59	Rūta Banelienė, Rolandas Strazdas. "Green Innovation for Competitiveness: Impact on	<1 %

GDP Growth in the European Union", Contemporary Economics, 2023
Publication

60 Ying Wang, Yun Yang. "Analyzing the green innovation practices based on sustainability performance indicators: a Chinese manufacturing industry case", Environmental Science and Pollution Research, 2020 <1%
Publication

61 Peter Madzík, Lukáš Falát, Neeraj Yadav, Fabiane Letícia Lizarelli, Karol Čarnogurský. "Exploring uncharted territories of sustainable manufacturing: A cutting-edge AI approach to uncover hidden research avenues in green innovations", Journal of Innovation & Knowledge, 2024 <1%
Publication

62 Rashed Al Karim, Mahmuda Mehzabeen. "Fostering customer citizenship behavior of upscale hotels: the role ofhotel atmosphere, customer experience, perceived value and staff-customer interaction", Journal of Hospitality and Tourism Insights, 2025 <1%
Publication

Exclude quotes	On	Exclude matches	Off
Exclude bibliography	On		