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Green innovation on determinants of organizational performance with management commitment as a moderating variable

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Abstract

Purpose: The objective of this study is to analyze the effect of green innovation to business performance, the effect of management commitment to green innovation, effect of management commitment to organizational performance, and effect of green innovation to performance with management commitment as a moderating variable.

Design/methodology/approach: This research used a quantitative approach, using questionnaires as the primary data source. The study population consisted of the culinary sector in the city of Padang. The sample size was 100 managers from the culinary sector, selected using a purposive sampling technique. The data analysis technique applied was Structural Equation Modeling (SEM), with Analysis of Moment Structures (AMOS) software used for data processing.

Findings: There are 24 indicators whose values are valid because their standardized estimated value is ≥ 0.5, while 8 indicators are invalid. Goodness of fit test show that the model is an overall fit, all indicators meet the cut-off values. The result of the hypotheses show that green innovation significantly affects business performance, management commitment significantly affects green innovation, management commitment significantly affects business performance. However, management commitment does not moderate the relationship between green innovation and business performance.

Research limitations/implications: Many factors influence green innovation that has not been discussed in this research, such as knowledge and government roles. Future research should use this variable as an antecedent variable to the green innovation.

Practical implications: The findings of this research will contribute to development efforts, serving as an evaluation tool for the Padang City Government, particularly the Department of Environmental Affairs, about regulation no. 36 of 2018 about green innovation movement among Small and Medium Enterprises (SMEs).

Originality/value: most research on green innovation has been conducted in large companies, with very few studies focusing on small businesses. This research fills the gap in the literature on green innovation in SMEs.

Keywords: Green innovation, Management commitment, Organizational performance

Jel Codes: M14, M21

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1. Introduction

Green innovation is a critical global issue and is a significant research topic today. This is due to the increasingly concerning climate change and environmental degradation (Graessley, Horak, Kovacova & Poliak, 2019). Many corporate innovations have neglected environmental considerations, leading to a significant rise in pollution over time (El-Kassar & Singh, 2019). Innovation objectives often conflict between pursuing economic performance and prioritizing environmental sustainability. If a company focuses on economic performance, environmental concerns may be overlooked, and vice versa (Juan, 2011).

Although environmental issues began with the United Nations Economic and Social Council, since December 15, 1969 (Muhsin & Lucitasari, 2011), economic development has not been aligned with environmental concerns; it necessitates that companies be compelled to practice green innovation and economically valuable business operations (El-Kassar & Singh, 2019). In terms of innovation, companies must focus on green innovation. Green innovation involves using resources more efficiently, including energy, water, and raw materials, while reducing pollution(Ahmed, Akbar, Aijaz, Channar, Ahmed & Parmar, 2023; Rodrigues & Franco, 2023).

The success of green innovation hinges on the commitment management of organizational leaders to endorse environmentally friendly conduct via the policies and strategies formulated (Naruetharadhol, Srisathan, Suganya, Jantasombut, Prommeta & Ketkaew, 2021; Siagian, Tarigan & Basana, 2022). With solid management commitment, organizations can prioritize the development of green innovation and provide the necessary support to achieve these goals. Management commitment can influence the perceptions and attitudes of employees, roles, and other stakeholders. The goals of green innovation can be achieved through the adoption of teamwork within the organizational ecosystem, strong management commitment, and the proper utilization of human resources (Yen & Yen, 2012).

Companies are more likely to adopt green innovation practices when motivated by internal and external factors. Internal factors include employee engagement, where Green Human Resource Management (Green HRM) practices motivate employees to participate in green innovation, thereby increasing their caring attitudes and behaviors toward the environment. In addition, competitive advantage becomes an internal drive for companies that invest in green innovation to improve operational efficiency and reduce waste as part of a sustainable business strategy. Green HRM practices also shape a corporate culture that is more conscious of sustainability and aims to improve its environmental performance. On the other hand, external factors also play an important role in driving the adoption of green innovation. Environmental pressures and regulations from stakeholders, including the government and society, compel companies to develop more environmentally friendly policies to reduce negative impacts on the environment. Furthermore, companies are driven by social impacts and reputation, as the implementation of green innovation can enhance the company's image in the eyes of the public and attract more environmentally conscious consumers. With the increasing demand for environmentally friendly products and services, companies have a greater incentive to implement green innovation as part of their sustainable business strategy (Kuo, Khan, Islam, Abdullah, Pradana & Kaewsaeng-on, 2022).

Green innovation orchestrates the formulation of tactics that facilitate the minimal utilization of resources and the diminution of carbon consumption within enterprises, as elucidated by (El-Kassar & Singh, 2019). A reduction in resources utilized leads to a decrease in corporate expenditures, which, subsequently, favorably impacts the company's financial performance.

The perspective of the Resource-Based View (RBV) is employed in this investigation. RBV postulates that firms hold various stationary assets such as physical, human, and organizational capital. However, it is articulated that not all assets of a firm are capable of evolving into fountains of competitive superiority unless they are characterized by possessing four attributes: being of worth, rarity/uniqueness, challenging to replicate, and arduous to replace (Barney, 1991). This research focuses on human capital (management commitment) and organizational capital (green innovation) as sources of competitive advantage, which are expected to affect superior performance. The SCOR (Supply Chain Operations Reference) model is a tool for diagnosing Supply Chain Management (SCM) that allows users to understand all processes in a business organization (Rosyidah, Khoirunnisa, Rofiatin, Asnah, Andiyan & Sari, 2022).

Green innovation improves the innovation system by considering ecological and economic aspects, creating a sustainable economic process. The green innovation process is driven by regulations, market inspiration, and health, environmental, and ethical issues (Xavier, Naveiro, Aoussat & Reyes, 2017). Numerous studies have been conducted on green innovation, such as the one by Chen and Zhang (2018), which examined the significant relationship between knowledge management and green innovation with a sample of manufacturing technology SMEs in Thailand. Another relevant study was conducted by (Kuo et al., 2022), which analyzed data from permanent employees of 3, 4, and 5-star hotels in Turkey. The findings are implementing green innovation practices to enhance organizational performance.

The investigation undertaken by Weng, Chen and Chen (2015) scrutinized the influence of various elements on green innovation and their repercussions on the organizational performance of 202 service and manufacturing firms in Taiwan. The analysis disclosed that inducements from competitors, governmental bodies, and staff actions were all found to have markedly and beneficially influenced the implementation of green innovation protocols. The inquiry by (Weng et al., 2015) into the chemical sector in Pakistan revealed a considerable affirmative influence of human resource management practices concerning green innovation on green innovation, along with the performance of employees and the environmental outcomes. The investigation by (Siagian et al., 2022) was examined, revealing that supplier integration, green innovation, and customer integration are directly impacted by commitment management.

It is implied by these outcomes that a pivotal and multifaceted impact is exerted by commitment management in augmenting competitive advantage via the formulation of strategies and policies. El-Kassar and Singh (2019) constructed and assessed an encompassing framework that scrutinizes the linkage among green innovation, its precursors, and the elements that facilitate surmounting technological impediments while concurrently enhancing organizational performance and competitive edge.

The focus of this research is to examine how green innovation-based performance and management commitment are manifested in the culinary sector of SMEs in Padang City, Indonesia. This research is important because, even though concern for environmental issues is increasing, studies on green innovation in the context of SMEs, especially in the culinary sector, are still very limited. Most studies focus on large companies or manufacturing industries, paying less attention to how SMEs implement green innovation and the challenges they face (Sánchez-Medina, Corbett & Toledo-López, 2011). SMEs, particularly in developing countries like Indonesia, often experience obstacles such as a lack of knowledge, weak managerial capabilities, technical limitations, and difficulty in accessing green financing, which hinder the implementation of sustainable business practices (I Dewa Made Endiana, 2019). However, there are not many empirical studies examining how these barriers affect the adoption of green innovation among SMEs, indicating a research gap that needs to be filled. Marketing is the spearhead of a firm, since it is well recognized that brand names already have value in the community, in addition to an influencer's ability to shape people's lives (Yuswardi, Andiyan, Sutrisno, Zulkifli & Juandi, 2024).

In addition, although several studies have highlighted the role of management commitment in driving business sustainability, there is still limited empirical evidence explaining whether management commitment has a significant effect on the adoption of green innovation and its impact on business performance (Naruetharadhol et al., 2021; Siagian et al., 2022). Most studies analyze management commitment in the context of organizational behavior or leadership, but not many have examined its role as a determinant or moderator in the adoption of

green innovation in SMEs. Therefore, this study aims to fill this gap by investigating whether management commitment accelerates the adoption of green innovation or whether other factors are more dominant in driving green innovation in SMEs. To meet the needs of the public, the government has provided an official financial institution, which is subject to a certain series of administrations with all the calculations (Sungkawaningrum, Hartono, Holle, Gustiawan, Siskawati, Hasanah et al., 2022).

In addition to internal organizational aspects, government regulations such as Mayor Regulation Perwako No. 36 of 2018 concerning the reduction of plastic waste in Padang City have been implemented to encourage more environmentally friendly business practices. However, there has been no empirical study evaluating whether this policy has been effective in influencing SMEs to adopt green innovation strategies. Therefore, this study will examine the extent to which the regulation has been implemented by SMEs and whether government policies correlate with increased adoption of green innovation in the SME sector.

Thus, this study contributes to the academic literature by addressing three major gaps: (1) the lack of research on green innovation adoption in the SME sector, particularly in the culinary industry; (2) the limited understanding of the role of management commitment in enhancing green innovation and its impact on business performance; and (3) the lack of empirical evaluation of environmental policies, such as Perwako No. 36 of 2018, in influencing SME behavior. By filling these gaps, this study will provide theoretical and practical insights into how SMEs can integrate green innovation into their business models while ensuring long-term sustainability and compliance with government regulations.

2. Literature Review and Hypothesis Development

2.1. Green Innovation, Management Commitment, and Organizational Performance

Green innovation is processes, products, and services that neither harm nor diminish environmental degradation. The bifurcation of green innovation encompasses green processes and products as its two dimensions. Both are designed to reduce energy consumption and emissions and promote recycling, which ultimately impacts company performance (Rajesh, 2017). In manufacturing, reuse and recycling should be integrated, and activities that utilize fewer resources, including energy, must accompany the product development process (Shafique, Asghar & Rahman, 2017).

Within the sphere of corporate operations, green innovation is associated with the enhancement of energy efficacy, the regulation of carbon and fossil fuel discharges, the administration of waste, the fabrication of renewable products, and the safeguarding of the environment (Ahmed et al., 2023). It is understood that organizational performance encompasses the advancement and evolution of an organization in its pursuit of fulfilling its objectives (Koohang, Paliszkiewicz & Goluchowski, 2017). The notion of performance may be categorized into qualitative and quantitative types. Data that is gathered concerning the organization is linked to organizational performance when it is examined. If the data pertains to an individual, it relates to their performance. This study focuses on organizational performance. Commitment is understood as a state in which an employee identifies with a particular organization, its goals, and desires to be a part of that organization (Triguero-Sánchez, Peña-Vinces & Ferreira, 2022).

2.2. Hypothesis Development of Green Innovation on Organizational Performance

Green innovation is one of the efforts companies undertake to reduce environmental damage worldwide. Awareness of protecting the environment impacts not only the environment itself but also the companies involved. Environmental conservation programs have been implemented, such as re-usage/recycling, waste reduction, and using energy-efficient equipment (Kucukoglu & Pinar, 2015). These programs will lead to cost reductions, for example, through recycling initiatives, which will reduce raw material costs, and energy-efficient equipment programs, which can lower electricity/energy expenses. When costs decrease, the company's profits increase, meaning green innovation programs will enhance profitability, growth, and competitive advantage (Hojnik & Ruzzier, 2016).

In academic discourse, the implications of several investigations have been scrutinized to assess the interrelations between green innovation activities and various performance metrics within organizations. It has been revealed by the inquiry of (Kucukoglu, & Pinar, 2015) that a noteworthy association exists between the activities related

to green innovation and environmental performance. Moreover, enterprises are provided the ability to surpass rivals by facilitating green process innovation. It was discovered in the study conducted by (Weng et al., 2015) that the practices associated with green innovation influence organizational performance. According to the findings presented by (Haffar, Al-Karaghouli, Djebarni, Al-Hyari, Gbadamosi, Oster et al., 2023; Zhang, Rong & Ji, 2019), green innovation significantly influences business performance. It has been asserted by Wang and Song (2014) that green innovation constitutes a distinctive strategy that empowers organizations to develop innovative techniques and novel systems, which assist in enhancing their performance. Ar (2012) stated that while substantial green innovation benefits performance, strategic green innovation influences environmental performance without modifying company performance. A study on Chinese found that while substantive green innovation positively affects company performance, strategically, green innovation affects environmental performance but does not influence company performance (Lu, Liu & Min, 2021).

Hypothesis 1: Green innovation positively and significantly affects business performance.

2.3. Hypothesis Development of Management Commitment to Green Innovation

One of the main challenges in green innovation in SMEs is managerial commitment. Lack of commitment and resources and fear of green innovation practices' risks and high costs are obstacles to implementing sustainable strategies. Companies with solid managerial support for green innovation tend to perform better in implementing these practices, especially when accompanied by financial incentives, stakeholder involvement, and government support (Purwandani & Michaud, 2021). In a similarly structured exploration, it was documented by (Siagian et al., 2022) that within manufacturing firms in East Java, Indonesia, the dedication of top management is instrumental in influencing green environmental purchasing, green production practices, and operational performance. Moreover, the analysis by (Naruetharadhol et al., 2021) elucidated that the achievement of green innovation is impacted by stakeholder commitment.

Hypothesis 2: Management commitment affects green innovation.

2.4. Hypothesis Development of Management Commitment to Organizational Performance

Previous research has shown that employees at all organizational levels affect environmental performance. However, the critical role of top management is vital due to their broad discretion in affecting performance (Singh, Giudice, Chierici & Graziano, 2020). An investigation executed in Manila, utilizing a cohort of 800 hotel personnel, demonstrated that the environmental performance of hotels is directly influenced by top management's green commitment and intellectual capital (Haldorai, Kim & Garcia, 2022). The availability of essential resources for the organization's success is ensured when top management is committed to environmental issues. Additional studies substantiate that top management teams, preoccupied with environmental concerns, are regarded as intangible assets within the framework of sustainable environmental enhancements. The recognition by senior management of the advantages of green innovation leads to a commitment to its enactment, which, in turn, passively improves environmental performance (Haldorai et al., 2022).

Hypothesis 3: Management commitment affects organizational performance.

2.5. Hypothesis Development of Green Innovation on Performance with Management Commitment as a Moderating Variable

It was concluded in the study by (El-Kassar & Singh, 2019) that the interplay between green innovation and performance is moderated by commitment management. A conclusion was drawn by (Ahmed et al., 2023), suggesting that management's dedication to green innovation fosters an organizational transformation that embraces the adoption of green innovation practices. The interaction between green innovation and organizational performance is moderated by commitment management. Green innovation ideals and perspectives are embedded within the organization by human resource managers. Its green aspirations are supported by the organization's green commitment and attitudes toward green innovation. The practices of green innovation, facilitated by human resource managers, direct staff towards environmental objectives and embrace these methodologies (Roscoe, Subramanian, Jabbour & Chong, 2019).

Hypothesis 4: Green innovation affects performance with management commitment as a moderating variable.

Based on theory and research hypotheses, the research model can be seen in Figure 1.

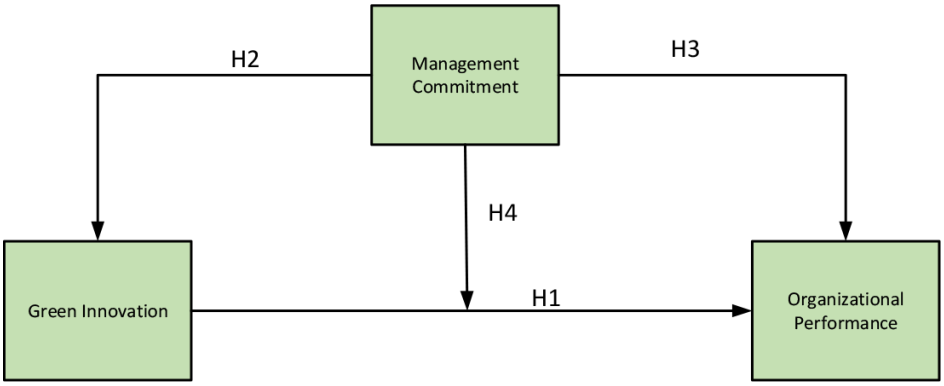

Figure 1. Research Model

3. Research Methodology

3.1. Research Approach, Sampling Technique, and Data Collection

This research employed a quantitative methodology, focusing on SMEs within Padang as the analytical subjects. The selection of this sector was motivated by the fact that the culinary industry accounts for 45% of Padang's tourism revenues and contributes 20% to the local income (Rais, 2021). Primary data were gathered passively from the managers of these enterprises through the administration of surveys employing a Likert scale. It was reported that the answers to each query were graded as follows: a score of 5 indicated strong agreement, 4 indicated agreement, 3 was neutral, 2 indicated disagreement, and 1 indicated strong disagreement.

The study targets small and medium culinary enterprises situated in Padang's municipality. The Central Bureau of Statistics Padang has noted that 338 culinary enterprises are dispersed through 12 districts (BPS, 2023). Investigations are centered on three districts: Padang Barat, Padang Utara, and Padang Timur, which collectively account for a populace of 216. These districts were chosen because, as reported, they encapsulate 67% of all Padang's eateries, totaling 216 establishments. The requisite statistical test guided the determination of the sample size, specifically SEM. (Hair, Anderson, Tatham & Black, 1998) that the sample size should range from five to ten times the number of indicators. Consequently, this investigation established the sample size as seven times the number of indicators. Given that there are 14 indicators, the calculation for the sample size amounts to 14 multiplied by 7, resulting in 98, which is subsequently approximated to 100.

The specimen allocation was then proportionately distributed among the three districts. The distributions were as follows: Padang Barat received 52 units, Padang Utara was allocated 28, and Padang Timur obtained 18. Purposive sampling, a technique for gathering data predicated on distinct criteria, was employed as the sampling methodology. The criteria stipulated that the enterprise must have been operational for a minimum of three years and must possess familiarity with, as well as implementation experience in, green innovation.

3.2. Data Analysis Method

SEM is employed in the examination of data utilizing the AMOS software. The evaluation phases consist of the normality assessment, anomaly scrutiny, and credibility assessment with a requisite threshold of 0.70; additionally, the adequacy-of-fit assessment includes these evaluative standards: Chi-square ought to be minimized, probability should not be less than 0.05, AGFI should not be less than 0.90, GFI should not be less than 0.90, TLI should not be less than 0.95, CFI should range between 0.9 and 1, RFI should be nearing 1, RMR should be nearing 0, and RMSEA should not exceed 0.08 (Hair et al., 1998). It is stated indirectly that the first order confirmatory factor analysis is utilized. Confirmatory Factor Analysis (CFA) aims to assess the multi-dimensional nature of theoretical constructs. Through CFA, it is investigated whether the indicators are appropriately measuring the latent constructs (Ghozali, 2004). An indicator is considered adequate when it possesses a standardized estimated value with a factor loading exceeding 0.5 and a CMIN value surpassing 0.5. It is determined by examining the Critical Ratio (CR) value whether the hypothesis will be accepted or rejected.

The hypothesis is upheld if the CR value derived from the analysis exceeds the threshold of 1.96 at a significance level of less than 0.05; if not, it is dismissed.

3.3. Research Variable and Indicator

Research variables can be seen in Table 1.

Variable definition	Indicators	Measurement	Source
Green innovation is processes, products, and services that neither harm nor diminish environmental degradation (Rajesh, 2017)	**Green process innovation**	Ordinal	Doran & Ryan, 2012; Eryigit & Özcüre, 2015; Salem, 2020
	Lower consumption of e.g. water, electricity, gas and petrol during production/use/disposal		
	Use of cleaner or renewable technology to make savings (such as energy, water, waste)		
	Redesign of production and operation processes to improve environmental efficiency		
	Green product innovation		
	The company uses less or non-polluting/toxic materials that are environmentally friendly		
	The company uses materials that are easy to recycle, reuses, and decompose		
	The company recovers company's end-of-life products and recycling		
Management commitment is understood as a state in which an employee identifies with a particular organization, its goals, and desires to be a part of that organization (Triguero-Sánchez et al., 2022).	Establishing policies	Ordinal	Siagian et al., 2022
	Allocating resourcing and empowering the employee		
	Enables the organization to realize supplier integration in information sharing,		
	collaboration in decision-making,		
	system interconnection between the organization and the supplier.		
Performance is defined as the record of outcomes produced in a specified job function or activity during a specific period (Bernardin & Russell, 1998)	**Financial performance**	Ordinal	Chandler & Hanks, 1993; Ahmad, Halim & Zainal, 2010
	Profitability		
	Sales turn over		
	Sales growth		
	Return on investment		
	Market share		
	Non-Financial Performance		
	Work satisfaction		
	Karier development		
	Customer satisfaction		
	Customer retention		
	Employee satisfaction		
	Relation to supplier		
	Bisnis imagination		
	Industrial relationship		
	Worklife balance		

Table 1. Research Variables and Indicators

4. Results and Discussion

The research subjects are managers of culinary SMEs, including restaurants, cafeterias, and coffee shops. Data collection was carried out from July to August 2024. Table 2 shows the characteristics of respondents contributing to the research.

No	Description	Quantity	Percentage
Gender	Female	40	40
	Male	60	60
Age	Age		0
	20-25	28	28
	26-30	23	23
	31-35	11	11
	36-40	12	12
	>40	26	26
Experience	<1	4	4
	1 to 3	59	59
	4 to 6	20	20
	7 to 10	11	11
	>10	6	6
Education	Junior High School	5	5
	Senior High School	51	51
	Diploma	8	8
	Bachelor's Degree	34	34
	Master's Degree	2	2

Table 2. Characteristics of Respondent

The data presented in Table 2 reveal that the primary demographic of the respondents consists predominantly of men (60%), who are primarily between the ages of 20 and 25 years (28%), possess one to three years of work experience (59%), and have generally completed secondary education (51%).

4.1. First-Order Confirmatory Factor Analysis

The scrutinized standardized results are analyzed through a first-order confirmatory factor analysis, wherein an indicator is deemed valid when its factor loading surpasses 0.5. If an indicator's factor loading falls below 0.5, it is promptly excluded from the evaluation.

The results of the first stage of the first order CFA showed that several indicators values below 0.5. These values were excluded from the analysis. The discarded indicators included GD4, GD3, GP5, GP4, GP3, and GP2. After removing the indicators that did not meet the criteria, the analysis was conducted again. In the second stage, some indicators still had factor loadings below 0.5, namely GP2 and GP3. These indicators were discarded, and the data was processed again. The results of the third testing stage showed that all indicators had factor loadings above 0.5, making all indicators valid. The test results can be seen in Table 3.

The reliability test results for the three research variables fall into the high category, with the reliability value for organizational commitment being 0.948, management commitment 0.864, and business performance 0.965.

Code	Question	Estimate
Green Innovation (Green Product/GD and Green Process/GD)		
GD5	Using ecolabel equipment	.781
GD2	Using fewer raw materials that cause pollution	.728
GD1	Redesigning the production process to have minimal environmental impact	.798
GP5	Using energy-efficient cooking equipment	.574
Management Commitment (K)		
K1	Innovation policies consider environmental aspects	.517
K2	Allocating resources and empowering employees to ensure innovation considers the environment	.638
K3	Collaborating with suppliers and sharing information about friendly raw materials	.533
K4	Collaborating in decision-making with employees regarding green-conscious innovation	.758
K5	Making environmental protection a priority	.790
K6	Following up on suggestions for environmental protection improvements	.764
Organizational Performance (KU)		
KU1	Profitability	.796
KU2	Business sales turnover	.738
KU3	Return on investment	.710
KU4	Business sales growth	.819
KU5	Market share	.672
KU6	Personal satisfaction in managing this business	.762
KU7	My career advancement in managing this business	.863
KU8	Customer satisfaction	.681
KU9	The business successfully retains its customers	.713
KU10	Employee satisfaction	.763
KU11	Good relationships with suppliers	.670
KU12	My business imagination has developed while managing this business	.586
KU13	Working relationships with fellow culinary business owners	.527
KU14	Maintaining work-life balance	.647

Table 3. Standardized Estimates

4.2. Goodness of Fit Test

One requirement for testing with AMOS is that the model be well-fitting and in accordance with predetermined criteria. Table 4 summarizes the results of the model's goodness of fit.

The Goodness-of-Fit Indicators	Cut-off Value	Model Results	Description
Chi-square	min	387.179	Marginal
CMIN/DF	2.0-3.0	1.580	Very good
Probability	≥ 0.05	0.000	Marginal
GFI	≥ 0.90	0.809	Marginal
TLI	≥ 0.90	0.883	Good
IFI	≥ 0.90	0.898	Very good
NFI	≥ 0.90	0.764	Marginal
RMSEA	≤ 0.08	0.077	Good

Table 4. Goodness-of-fit Criteria

Table 4 presents that the model is an overall fit; all indicators meet the cut-off values. All the endogenous variables are valid and suitable for the following processing stage.

4.3. Full Model Testing

The results of the full model test can be seen in Figure 2.

4.4. Hypothesis Testing

The investigation of the hypothesis is performed through an examination of the CR value produced via AMOS 16. It is indicated that the hypothesis receives support when the CR value surpasses the threshold of 1.96 at a significance threshold ($p < 0.05$); conversely, support for the hypothesis is withheld if the CR value falls below the threshold in question with a significance level ($p > 0.05$). Evidence from the investigation is displayed in Table 5.

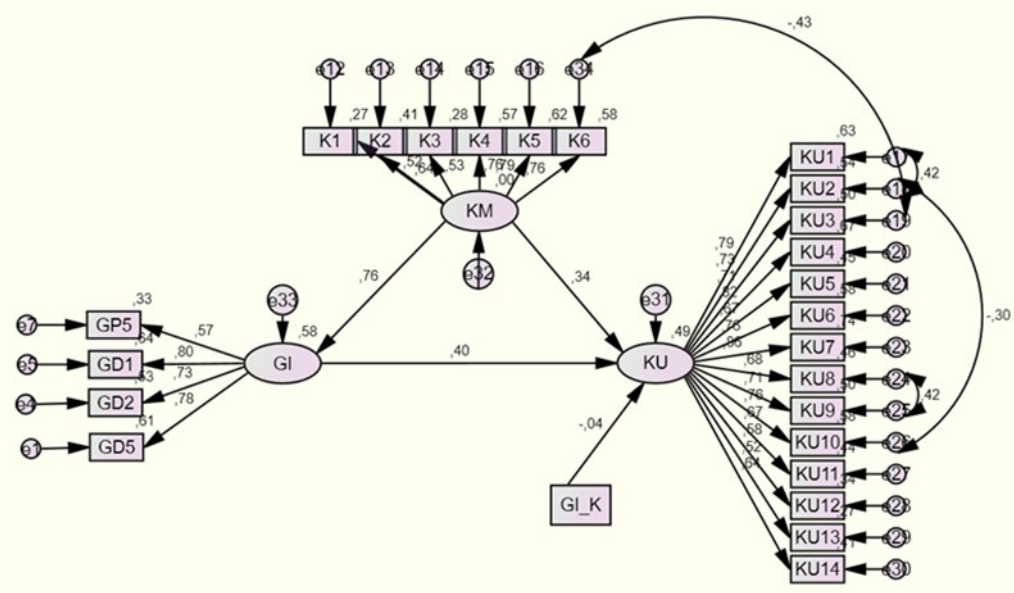

Figure 2. Full Model Testing

No	Hypothesis			CR	P	Decision
1	Green innovation	→	Business performance	2.353	0.019	Supported
2	Management commitment	→	Green innovation	4.391	0.000	Supported
3	Management commitment	→	Business performance	2.087	0.037	Supported
4	Green innovation	→	Business performance, with management commitment to moderating	-0.446	0.655	Not supported

Table 5. Hypothesis Testing

Hypothesis 1: Green innovation affects business performance. This hypothesis receives endorsement as the CR value, quantified at 2.353, accompanies a p-value of 0.019. The CR value is observed to surpass 1.96, and concurrently, the p-value is established to be inferior to 0.05. Hypothesis 2: Management commitment affects green innovation. The hypothesis finds affirmation as the CR value, registering at 4.391 and associated with a p-value of 0.000, exceeds the critical value of 1.96.

In contrast, the p-value remains below the threshold of 0.05. Hypothesis 3: Management commitment affects business performance. The hypothesis receives validation owing to the CR index registering at 2.087, alongside a significance level of 0.037. An interpretation that the CR index surpasses 1.96 is corroborated, while it is established that the significance level falls below 0.05. Hypothesis 4: Green innovation affects business performance with management commitment as a moderating variable. The postulation is supported by the finding that the CR value, registering at 0.446 and accompanied by a p-value of 0.655, does not meet the conventional significance levels. The critical ratio, recorded below 1.96, and the probability value, exceeding 0.05, indicate that the results do not achieve statistical significance.

The outcome of the initial hypothesis examination reveals that green innovation significantly influences business performance. This conclusion aligns with the findings presented in the study by Hojnik and Ruzzier (2016). Green innovation will impact cost reduction. For example, recycling initiatives can reduce raw material and production costs, and energy-efficient equipment programs can lower electricity and energy expenses. As costs decrease, company profits increase, improving profitability, growth, and competitive advantage. According to Kucukoglu et al. (2015), awareness of the importance of preserving and protecting the environment affects the environment and companies. Several environmental conservation programs contribute to this, such as reuse/recycling, waste reduction, and using energy-efficient equipment. These findings also support the empirical research by Ar (2012), Technology and innovation to develop new products and services should positively contribute to the environment. Thus, product innovation can be beneficial for the environment. Environmental conservation efforts can be achieved through energy and water savings, reducing CO_2 emissions, increasing recycling, enhancing biodiversity, and reducing environmental pollution. These innovations will positively affect growth, competitiveness, productivity, and economic well-being. This finding is also in line with the study by (Anvari, 2023) on Green Supply Chain Management, which can improve supply chain efficiency by optimizing production processes, reducing energy consumption, and minimizing waste. This efficiency not only increases productivity but also lowers production costs in the long term, thereby enhancing organizational performance.

The outcomes of the hypothesis 2 examination indicate that commitment management exerts a substantial and favorable influence on green innovation, signifying that the intensification of commitment management enhances green innovation practices. Management's dedication to green innovation is vital for the generation and preservation of sustainability, which not only advantages the environment but also aids in the prolonged expansion and sustainability of the corporation. It was affirmed that these results align with the investigations by (Naruetharadhol et al., 2021; Siagian et al., 2022). Management commitment is reflected in the ability to integrate policies and strategies that support green innovation, set clear goals, and allocate the necessary resources to develop and implement green innovation. This commitment is also evident in the adequate allocation of resources, including funding, time, and skilled labor, to realize green innovation. Managers inspire and motivate employees to innovate and seek solutions related to green innovation. Management that supports green innovation tends to build partnerships with external parties, such as research institutions, universities, and non-governmental organizations. These partnerships can accelerate technology and knowledge transfer and expand green innovation networks. Management's commitment to green innovation in the culinary SMEs of Padang also represents adherence to environmental regulations. In Padang, environmental concerns in business operations are regulated under mayor's regulation no. 36 of 2018, specifically addressing the control of plastic bag usage. To reduce the volume of plastic waste, the department of environmental affairs has been actively promoting and encouraging the public to reduce the use of plastic bags. Some initiatives implemented include introducing paid plastic bags in stores, encouraging the use of environmentally friendly plastic bags, and placing stickers in restaurants indicating their support for the movement to reduce plastic bags, straws, and styrofoam.

The results of the hypothesis 3 test show that management commitment affects business performance. This finding is consistent with the research (Haldorai et al., 2022; Singh & Rao, 2016). Management commitment is reflected in regulations encouraging organizations to use resources more efficiently and reduce waste. For example, using energy-saving equipment and conserving water can reduce operational costs, thereby improving company performance. Management commitment is also evident in empowering employees through participation, creativity, and motivation in green innovation, generating fresh ideas that have the potential to enhance organizational performance. Management commitment is also reflected in collaboration in decision-making, which brings together various perspectives from different stakeholders, such as production, marketing, suppliers, and external partners. Through collaboration, decisions become more effective, resulting in innovations that are more relevant to market needs and reducing the risk of making poor decisions.

The findings from the hypothesis 4 test show that commitment management does not influence the connection between green innovation and organizational performance. Contrary to the outcomes reported by (Ahmed et al., 2023; El-Kassar & Singh, 2019; Roscoe et al., 2019), it has been established that commitment management does not affect the link between green innovation and organizational performance. This finding indicates that although management commitment has a direct effect on green innovation and business performance, it does

not have a significant effect when positioned as a moderating variable between green innovation and organizational performance. This may be because the direct influence of green innovation and organizational commitment on business performance is already quite strong. Green innovation plays a role in improving organizational performance through operational, financial, and environmental efficiency (Xue, Boadu & Xie, 2019), so management commitment no longer provides a significant additional effect on organizational performance when positioned as a moderating variable. The role of management commitment is more dominant as an antecedent in the adoption of green innovation, not as a moderator between green innovation and business performance. Management has an important role in ensuring that green innovation can be implemented through supportive policies and strategies (Basana, Siagian, Ubud & Tarigan, 2022). However, after green innovation is adopted, other factors such as government regulation, consumer demand, and financial resources tend to have more influence on its impact on business performance. In addition, there may be other more influential moderating factors, such as organizational culture, technology investment, or market pressure, which are more determinant. The context of the study that focuses on culinary sector SMEs in Padang, Indonesia, may also be a factor that explains this result. Many SMEs implement innovation due to external pressure, such as government policy (Perwako No. 36 of 2018 concerning plastic waste reduction). In this situation, external factors such as government regulation, financial incentives, or consumer preferences for environmentally friendly products may be mediators between green innovation and organizational performance. These factors have not been studied in this research, so further studies are needed to investigate other moderating variable factors that can explain the relationship between green innovation and business performance. Thus, although management commitment is important in driving the implementation of green innovation, its role in strengthening the impact of green innovation on business performance still needs to be studied further, especially by considering external factors and the dynamics of these factors in certain industries.

5. Conclusion

The two independent variables explored in this research, namely green innovation and organizational commitment, apparently have an influence on organizational performance, especially SMEs in the culinary sector in the city of Padang, West Sumatra. Management's commitment to green innovation has an impact on green innovation actions. The stronger the commitment, the better the green innovation practice will be because management commitment will guide managers to provide direction and ensure that green innovation practices run according to plan. Management commitment is expressed in the form of regulations as well as allocation of costs, energy and time in developing green innovation. Management commitment is also manifested in motivating employees to be involved in green innovation programs and practices so as to create an green culture. Managers integrate green innovation programs at all levels of the organization, providing employees with training that will improve skills, competencies and generate creative ideas related to green innovation, whether related to energy efficiency, waste management, or the use of environmentally friendly materials.

Regarding the function of commitment management as a moderating element, it is revealed that it does not alter the association between green innovation and business performance. It is indicated that when green innovation is executed proficiently, it influences efficiency directly, thus rendering additional enhancement through commitment management superfluous. Management commitment functions more as an antecedent variable that drives green innovation itself. In other words, without management commitment, innovation may not occur, but once innovation is implemented, its effect on performance is realized directly.

The results of this study also contribute to transformative innovation, which is an innovation that drives systemic and long-term change in industry, society, or environmental sustainability. Transformative innovation drives change through the integration of sustainability as a primary business strategy. In the culinary sector, green innovation can be a catalyst for transformational change through industry norms, supply chain dynamics, and consumer behavior. Green innovation not only reduces environmental impacts at the operational level but also plays a role in redefining business models and creating sustainable change. In the long term, green innovation has the potential to drive the adoption of zero-waste production models, the use of environmentally friendly raw materials, and recyclable packaging. Green innovation can also change consumer behavior and industry culture; increasing awareness of environmentally friendly food will affect market demand. Consumers

who are more concerned about the environment will tend to choose environmentally friendly products, thus encouraging more businesses to implement green innovation.

6. Theoretical Implications

The results of this research contribute significantly to the academic literature on green innovation, management commitment, and business performance. The finding that green innovation has a positive effect on business performance proves that the adoption of green innovation not only increases environmental sustainability but also provides economic benefits for companies. This research also confirms that management commitment is a key factor in encouraging green innovation, which is in line with resource-based view theory, where internal resources influence sustainable competitive advantage. This shows that active support from management is very important in creating a conducive environment for the implementation of green innovation. However, the results showing that management commitment does not moderate the relationship between green innovation and business performance provide new insights that enrich the literature on factors influencing the effectiveness of green innovation. These findings indicate that although management commitment plays a role in supporting green innovation and business performance directly, other factors such as government regulations, organizational culture, or financial support may serve as moderating factors. Therefore, this research opens up opportunities for further studies to explore more complex mechanisms in the relationship between green innovation, leadership, and company performance.

7. Practical Implications

From a managerial perspective, the findings of this research have several important implications for the implementation of green innovation. First, companies should make green innovation a business strategy that not only aims at environmental sustainability but also at increasing competitiveness and organizational performance. Thus, managers must be proactive in allocating resources and establishing policies that support environmentally friendly implementation. Management commitment has been proven to have a significant influence on green innovation; therefore, companies must ensure that organizational leaders have a strong sustainability vision and can communicate it to all organizational members, directing them to behave in an environmentally friendly manner. Understanding is needed through training for managers regarding sustainability and green innovation, which will be a strategic step in implementing this program. Even though internal management commitment is important, external factors must also be considered when implementing green innovation, such as government regulations, financial incentives, and pressure from consumers and stakeholders to support green innovation practices. This external support can accelerate the adoption of green innovation and realize long-term business sustainability. Collaboration with stakeholders is an important aspect of encouraging the implementation of green innovation. The government and related institutions are advised to provide more complete data on SMEs that have adopted green innovations and offer incentives for companies that want to switch to more environmentally friendly business practices. With synergy between internal policies and external factors, companies can optimize the benefits of green innovation, both in terms of environmental sustainability and in improving business performance.

8. Research Limitation

The main limitation of this research is the difficulty in identifying SMEs that implement green innovation practices due to the lack of available statistical data, especially in the city of Padang, West Sumatra Province, Indonesia. As a result, the sample size obtained in this research is limited. Additionally, because this research was only conducted in Padang City, the results cannot be fully generalized to a wider context, as green innovation practices in this city do not necessarily represent global conditions as a whole. To overcome this limitation, future research is recommended to expand the scope of the study area to include several cities or countries with different economic and environmental policies. This comparative approach will provide deeper insight into the determinants of green innovation adoption and increase the generalizability of the findings. Furthermore, systematic efforts are needed from government institutions to compile and provide more complete data regarding SMEs that have adopted green innovations.

The scholarly study presented centers green innovation around two key dimensions: product and process. These dimensions of organizational innovation have not yet been explored within the context of this study. Subsequent studies should incorporate a comprehensive framework for assessing green innovation, including product, process, and organizational innovation.

9. Future Line of Research

There are several factors that influence green innovation that have not been discussed in this research. One of the main limitations is the exclusion of knowledge and awareness about green innovation as factors that can influence the adoption of green innovation. Future research should consider environmental knowledge and insight as antecedent variables to green innovation because an adequate understanding of sustainability practices can significantly encourage business actors to adopt green innovation in their businesses. In addition, this research has not explored financial constraints as a potential barrier to implementing green innovation. Many SMEs face challenges in obtaining funding for sustainable business practices, and these financial aspects can impact their readiness and ability to implement green innovations. Therefore, future research could examine how financial incentives, subsidies, or access to green finance contribute to the adoption of sustainable business practices. Another limitation of this research is the focus on managerial commitment without considering other organizational factors, such as corporate culture, leadership style, or employee involvement, which can also play an important role in the implementation of green innovations. Future studies could explore these factors to provide a more holistic understanding of the internal drivers of business sustainability.

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