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AN INTEGRATED GREEN SUPPLY CHAIN MODEL FOR INDONESIAN MSMEs: INTERNAL-EXTERNAL DRIVERS, PRACTICES, AND PERFORMANCE

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ABSTRACT

Background: The development of a green economy as one of the pillars in driving the national economic growth target of 6%-7% towards the Vision of Golden Indonesia 2045 continues to be encouraged. Several national green indicators still need to be improved, especially related to industrial sector activities. In Indonesia, most industrial actors (99%) are MSMEs, contributing 61% of GDP. Improving MSME green behavior and supply chain performance is crucial for enhancing Indonesia's green economy.
Purpose: The purpose of this study was to build an integrated green supply chain model in the MSME ecosystem to support the development of a green economy.
Design/methodology/approach: This study used a quantitative approach and CB-SEM analysis tools. The study processed questionnaire data from 459 MSME respondents collected during the period August - October 2024.
Findings/Result: The study produced an integrated green supply chain model in the MSME ecosystem in Indonesia, which shows that external forces have a greater influence on green management practices than internal forces. Green management practices then have a significant influence on green economic performance, green social performance, and green environmental performance.
Conclusion: Green management practices have the greatest influence on green environmental performance. The results of this study provide implications that managers should prioritize external collaborations, regulations, and stakeholder engagement to enhance green practices. Emphasizing green management will improve environmental performance, realization of green economy and aligning with 2045 Indonesia's Vision.
Originality/value (State of the art): Improving MSME green behavior and supply chain performance is crucial for enhancing Indonesia's green economy, yet research remains limited.

Keywords: green management practices, green performance, integrated green supply chain, internal-external drivers, MSMEs

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INTRODUCTION

Green economy is one of Indonesia's economic transformation strategies to achieve the vision of Advanced Indonesia 2045, namely sustainable development covering economic, social, and environmental aspects. Indonesia shown great effort in developing and implementing green supply chain management (GSCM) practices in the industry. One of them is by establishing mandatory laws to process and utilize natural resources efficiently, environmentally friendly, sustainable, and complying green industry standards (Law of the Republic of Indonesia No. 3/2014). In many developed countries in North America and Europe also mandated this (Mitra and Datta, 2014). But there are also developing nations that not sensitive enough regarding conserving the environment, such as India, China, and Brazil (Mitra and Datta, 2014; Soda et al. 2015; Scur and Barbosa, 2017).

Based on its definition, a green economy is a low-carbon economy, efficient in resource use, and socially inclusive (UNEP, 2024). Green economy has become a global issue because environmental issues have become a major concern for governments in all countries, every industry (Kong et al. 2020), and consumers (Du et al. 2016). Around the world, government laws are implemented and environmental policies are promoted to reduce emissions and control environmental pollution (Jum'a et al. 2021).

Several indicators used to measure the level of green economy in Indonesia are emission intensity, energy intensity, and managed waste volume, which are then translated into green behaviour in each business unit. The Indonesian government has a Roadmap for Indonesia's Sustainable Development Goals (SDGs) Towards 2030 which contains the development of a green economy through achieving clean and affordable energy goals, responsible consumption and production, and handling climate change (Ministry of PPN, 2018). However, national performance on several green economy indicators still needs to be improved, if we look at the green economy development targets versus current achievements. Gaps still occur, including those related to carbon emission reduction targets, more efficient waste management, and the use of New Renewable Energy (EBT).

In 2022, Indonesia is ranked 10th in the world as a contributor to GHG emissions (WRI, 2022). Indonesia's Greenhouse Gas (GHG) emissions volume in 2022 reached 1.24 gigatons of carbon dioxide equivalent (Gt CO2e), around 2,3% of total global GHG emissions. Based on the World Bank report (2023), Indonesia is the 5th largest waste producing country in the world, with a total waste production of around 65.2 million tons in 2022. According to data from the National Waste Management Information System (SIPSN), from 112 cities in Indonesia, waste accumulation reached more than 18 million tons in 2023. The results of the International Renewable Energy Agency (IRENA) analysis state that Indonesia's renewable energy potential is very large, estimated at 3.692 gigawatts (GW), including potential from solar, water, ocean currents, wind, biomass, and geothermal energy. However, the fact is that the utilization of renewable energy in Indonesia is still very minimal, namely around 10,5 GW or around 0,3% of the existing potential (IRENA Report, 2022).
Efforts to implement green economy programs are still limited to certain sectors in government institutions and Non-Governmental Organizations (NGOs). On the other hand, the number of business actors in the Micro, Small and Medium Enterprises (MSMEs) sector is 99% of the total business actors in Indonesia, and its contribution reaches 61% of the Republic of Indonesia's GDP (BPS, 2023). The role of MSMEs is very significant in increasing labour absorption and increasing national GDP, or in other words, the MSME sector is an important component of the Indonesian economy.

In addition to serving as economic drivers, MSMEs also play an important role in supporting environmental sustainability through the implementation of green management practices, which include sustainable and environmentally friendly resource management, including emission reduction, more efficient waste management, and utilization of renewable energy. This implementation supports the green economy agenda, which is increasingly important to address the global climate crisis. Indonesia's green economy targets are still far from what is expected, so more efforts and support are needed, especially from MSMEs due to the large number of business actors and the environmental impacts they generate from their production activities..

On the other hand, MSMEs in developing countries, including Indonesia, tend to have limited resources, lack of understanding, and financial barriers in adopting environmentally friendly practices, so that the implementation of green supply chain management is often still limited. This is due to additional costs for environmentally friendly practices, lack of incentives from the government, and limited support from consumers and other stakeholders (Siregar and Pinagara, 2022; Kusrini and Primadasa, 2018; Pramudiawardani et al. 2019).

The MSME industry is in a supply chain consisting of suppliers, processors, and distributors or buyers, who have transactional relationships with each other in the supply chain network. Good green supply chain management has the potential to increase operational efficiency and competitiveness of MSMEs, as well as support economic, social, and environmental sustainability. The supply chain ecosystem must be built collaboratively so that all parties involved in the supply chain can work together to achieve green economy goals. This collaboration enables the creation of added value through the implementation of sustainable practices and green technology throughout the supply chain, from upstream to downstream. Acquah (2024) states that relational social capital among supply chain members shows a positive influence on green supply chain management practices

In recent years, Green Supply Chain Management (GSCM) has attracted the attention of SCM, operations, and logistics experts (Asif et al. 2020; Tseng et al. 2019). The urgency of GSCM has increased significantly as an important part of sustainable SCM (Fang and Zhang, 2018). More and more environmental issues, such as pollution, overflowing waste sites, increasing levels of pollution, government regulations, changing consumer demands, and the development of international certification standards, have driven the growing importance of GSCM (Dou et al. 2018).

Previous studies have shown that green organizational behaviour has been shown to affect company performance (Micheli et al. 2020). A study conducted in Ghana also showed that green supply chain management practices have a positive and significant effect on supply chain performance (Acquah, 2024). Agyabeng-Mensah et al. (2020) stated that green logistics management practices have a positive effect on social and environmental sustainability, but have a negative effect on business performance. Furthermore, Chatzoudes and Chatzoglou (2021) stated that internal environmental management, green innovative practices, and environmental proactivity which are part of GSCM practices show the most significant effect on company performance. This study also shows that GSCM practices mediate the relationship between GSCM drivers and company performance.

Previous studies have shown that relationships based on green management practices between buyers and suppliers in supply chain networks have a positive impact on an organization's green initiatives and performance (Liu et al. 2020). Public, supplier, and competitor pressures are the main drivers for green supply chain management practices, according to a study conducted in the pharmaceutical industry in India. Meanwhile, pressure from the government or regulators is the opposite (Sabat et al. 2023). Supply chain networks in developing countries are facing increasing pressure to use green processes and produce environmentally friendly products as a result of increasing public attention to environmental issues worldwide (Govindan et al. 2016).

Green supply chain research for MSMEs is very limited, one of which is a study on MSME green performance, which consists of green economic performance, green social performance, and green environmental performance (Muangmee, 2021). Furthermore, the development of comprehensive sustainable performance indicators for MSMEs, which include economic, social, and environmental aspects, can help in evaluating and improving the effectiveness of green supply chain management practices in this sector (Kusrini and Primadasa, 2018).

There is a gap in the literature on the adoption of green supply chain management practices in developing countries (Balasubramanian et al. 2020), including in Indonesia. The gap related to green supply chain management practices in medium-sized companies is also seen in developed countries compared to developing countries, especially in supporting the development of a green economy. Previous studies have highlighted that MSMEs, including medium-sized companies, face significant challenges in adopting green supply chain management practices, such as limited financial resources and knowledge required for the implementation of environmentally friendly technologies (Kot, 2018). Thus, there is an urgent need

for further research on the implementation and impact of green supply chain management on the sustainability performance of MSMEs in Indonesia, especially in the context of a sustainable green economy.

Based on the explanation above, the formulation of the problem in this study is how to improve green practices and performance of the MSME sector, seen from its relationship with internal and external driving factors that influence it? Internal factors here include natural resources owned, while external factors are the supply chain ecosystem that supports the green economy. The purpose of this study is to build an integrated green supply chain model in the MSME ecosystem that can support the development of a green economy, by analyzing:

1. To what extent do internal driving factors influence the green management practices of MSME actors;
2. To what extent do external driving factors influence the green management practices of MSME actors;
3. To what extent do green management practices affect the green performance of MSME actors from economic, social, and environmental aspects.

The results of this study will be very important for policy makers and business actors in designing policies that support the green transformation of MSMEs and their supply chain ecosystems and increase their competitiveness in the global market.

METHODS

The study was conducted using a quantitative approach. Quantitative data collection was conducted by distributing survey questionnaires to target respondents, namely MSME actors operating in the Jabodetabek area, who are owners or people who can be sources of information related to business practices in the organization. Target respondents were selected based on the integrated MSME database at the Ministry of Industry and the Ministry of Cooperatives and MSMEs using random sampling techniques, based on accessibility, with the scope of the Jabodetabek operating area, in the period August to October 2024, and the willingness of prospective respondents to fill out the questionnaire. The number of samples for this study was 459 respondents, which was determined using the Cohran formula (1963) as follows :

$$n_0 = (Z^2) * p * q / (e^2)$$

note:

n_0 = number of samples; e = tolerance, used 5%; z = 1.96 (95% confidence level); p = the probability of finding an attribute in the population is assumed to be 50%; q = 1-p

Reliability and validity testing of the questionnaire was conducted before distributing the questionnaire to the target respondents using Jeffrey's Amazing Statistics Program (JASP) software version 0.16.4. Reliability is the ability of an instrument to show stability and consistency in measuring a concept. The reliability of an instrument can be indicated by a minimum value of Cronbach's Alpha (α) of 0.6, which describes good instrument reliability (Hair et al. 2010). Validity testing is used to show how well an instrument is used in measuring a particular concept. Validity testing is carried out using the Exploratory Factor Analysis (EFA) approach with a minimum loading value requirement of 0.4 (Hair et al. 2010). After obtaining parameters that meet the standards, meaning the instrument is reliable and can be used, the survey is conducted for all target respondents.

The Covariance Based Structural Equation Model (CB-SEM) is used as an analysis tool in this study. This method helps to test or confirm a theory. It is a statistical technique that analyses the relationships between unobservable variables (latent constructs) and their indicators, the connections between different latent constructs, and measurement errors within a structural model. The proposed conceptual framework of the study can be seen in Figure 1.

The hypotheses tested in this study are as follows:

H1: Internal Driver: Green Entrepreneurship Orientation has a positive effect on Green Management Practices.

H2: External Driver has a positive effect on Green Management Practices

H3: Green Management Practices has a positive effect on Green Economic Performance

H4: Green Management Practices has a positive effect on Green Social Performance

H5: Green Management Practices has a positive effect on Green Environmental Performance

This study is empirical (based on primary data), explanatory (examines cause and effect relationships), deductive (tests research hypotheses), and quantitative (includes the analysis of quantitative data collected with the use of a structured questionnaire). There are 12 variables and 72 indicators used in the study, which are grouped into 4 dimensions, namely (1) internal driving factors; (2) external driving factors; (3) green management practices; and (4) green performance. The complete variables and indicators can be seen in Table 1.

RESULTS

Based on the results of data processing from 459 valid questionnaires, the respondent characteristics were reported in Table 2. In terms of industry coverage, 37.04% are engaged in the food and beverage industry, 44.44% of MSMEs have employees in the range of 20-99 people, and also 39.87% of MSMEs have sales in the range of 209 Million Rupiah -4.2 Billion Rupiah.

As seen in Figure 2, as many as 57% of MSME respondents are domiciled in the Jabodetabek area and 42.92% are domiciled outside Jabodetabek but have operational areas in Jabodetabek. Wildnerova et al. (2024) stated that 50% of SMEs in Belgium, Germany, Estonia, Spain, Estonia, Finland, France, the United Kingdom, Greece, and some other countries implemented GSCM even though they were located in metropolitan areas. Nearly 30% of SMEs implementing GSCM in Finland, Greece, Estonia, Germany, Poland, and Hungary were located outside metropolitan areas.

If we look at the length of their business, 67% have been operating for >3 years, even 19.83% have been operating for >10 years. Data in 2019 showed that MSMEs implementing GSCM in Belgium, Germany, Spain, Estonia, Finland, France, and some other countries, have been operating for 0-5 years show figures of 33% (micro), 38% (small), and 49% (medium). For those operating for 6-10 years show figures of 30% (micro), 37% (small), and 46% (medium) and those operating for 11-20 years show figures of 31% (micro), 39% (small), and 50% (medium). Older SMEs are more likely to be greening, but the opposite holds for micro firms (Wildnerova et al. 2024).

Looking at the legal and/or certification ownership, 96.08% of MSMEs have business legality and related industry certification. This result shows that MSME actors have compliance with regulations and are serious about running their businesses. Meanwhile, related to environmental certification, 50.98% of MSMEs have environmental certification but conversely 49.02% do not have it. This result shows that there are still quite a lot of MSME actors who have not standardized their business activities to meet environmental regulations. There is a range in the percentage of MSME's implementing GSCM from 20% in Estonia to 50% in Belgium. About 4-5 in 10 enterprises in Belgium, the United Kingdom, France and Greece are environmentally engaged. Hungary, Latvia, and Finland are on the opposite side of the distribution, with about 20-25% of their enterprises declaring at least some environmental engagement (Wildnerova et al. 2024).

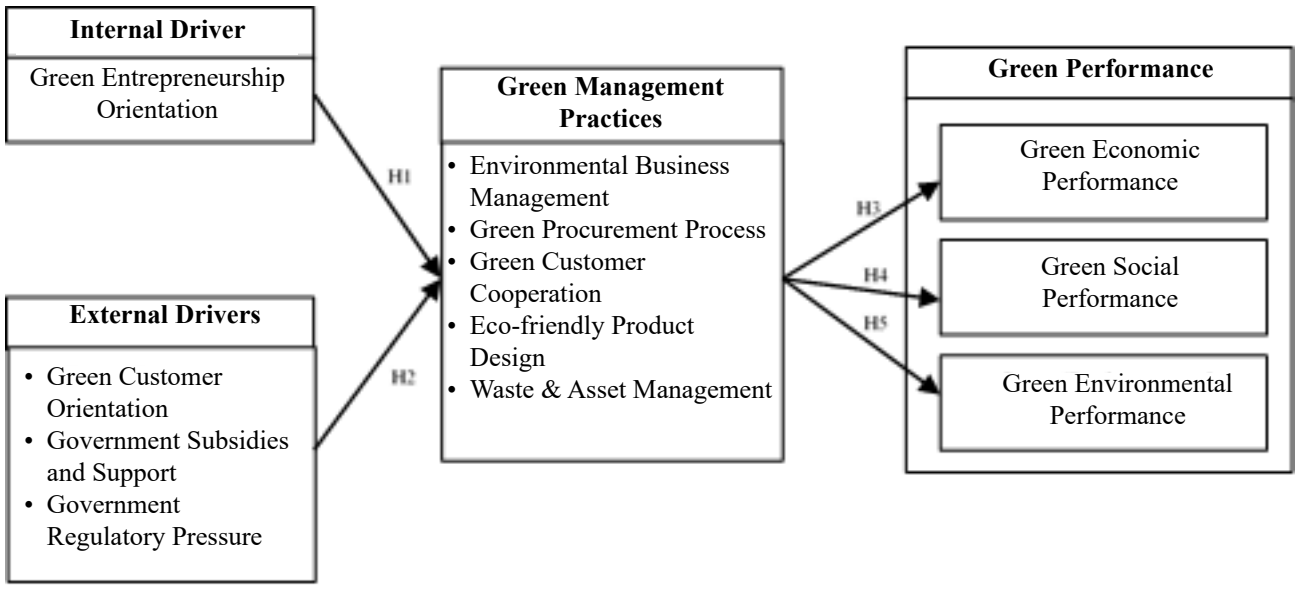

Figure 1. The proposed conceptual framework of the study

Table 1. Research Variables and Indicators

Variable	Code	Indicator
Internal Driver		
Green Entrepreneurship Orientation	GEO	Environmentally Friendly Policies (GEO1), Environmentally Friendly Product Development (GEO2), Eco-friendly Program Plan (GEO3), Green Technology Plan (GEO4), Allocation of Resources for Environmentally Friendly Activities (GEO5)
External Drivers (EXT)		
Green Customer Orientation	GCO	Green Supplier Cooperation (GCO1), Support for Green Suppliers (GCO2), Customer Expectations of Environmentally Friendly Activities (GCO3), Cooperation with Green Customers (GCO4), Eco-friendly Certification for Suppliers (GCO5), Eco-friendly Certification (GCO6), Implementation of Environmentally Friendly Activities (GCO7)
Government Subsidies and Support	GSS	Government Grants (GSS1), Government Incentives (GSS2), Technical Guidance (GSS3), Certification Assistance (GSS4), Market Access (GSS5), Government Facilitation in Investor Meeting (GSS6), Green Award (GSS7), Green Community (GSS8)
Government Regulatory Pressure	GRP	Green Regulatory (GRP1), Business Process Implementation (GRP2), Green Regulation Socialization (GRP3), Green Practice Guide (GRP4), Green Punishment (GRP5)
Green Management Practices (GMP)		
Environmental Business Management	EBM	Top Management Support in Green Practices (EBM1), Middle Management Support (EBM2), Inter-functional Cooperation in The Company (EBM3), Green Process Quality Management Mechanism (EBM4), Implementing Environmentally Friendly Programs (EBM5), Green Performance Indicators (EBM6), Green Audit (EBM7), Green Reward and Punishment (EBM8)
Green Procurement Process	GPP	Green Material (GPP1), Material of Green Supplier (GPP2), Green Cooperation with Partners (GPP3), Green Audit to Suppliers (GPP4), Green Certification of Suppliers (GPP5), Green Supply to Suppliers (GPP6), Supplier Reward and Punishment (GPP7)
Green Customer Cooperation	GCC	Green Product Design with Customer (GCC1), Green Production Process with Customer (GCC2), Voice of Customer to Green Packaging (GCC3), Waste Management with Customer (GCC4), Green Education to Customer (GCC5)
Eco-friendly Product Design	EPD	Energy Efficient Product Design (EPD1), Material saving Product Design (EPD2), Recycled Product Design (EPD3), Green Packaging (EPD4), Hazardous Materials (EPD5), Green Product Development (EPD6), By-product Development (EPD7)
Waste and Asset Management	WAM	Waste Management Procedures (WAM1), Waste Management Process (WAM2), Waste Sales (WAM3), Waste Management with Partners (WAM4)
Green Performance		
Green Economic Performance	GEP	Energy Costs (GEP1), Productivity (GEP2), Reject Level (GEP3), Waste Management Costs (GEP4), Phenalty Cost (GEP5)
Green Social Performance	GSP	Customer Satisfaction (GSP1), Repeat Buying (GSP2), Social Activities to Environmental Concern (GSP3), Customer Awareness to Company (GSP4), Resources Utilization (GSP5)
Green Environmental Performance	GEnP	Green Certification to Company (GEnP1), Environmental Awareness (GEnP2), Use of Natural Resources (GEnP3), Regulation Implementation (GEnP4), Green Award to Company (GEnP5), Customer Complains (GEnP6)

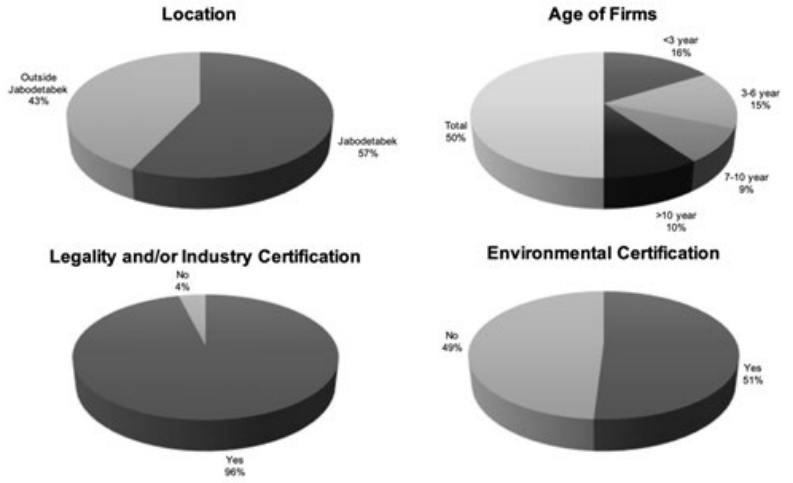

Figure 2. Demographic characteristics of samples

Table 2. Demographic characteristics of the respondents and samples

Demographic Statistic	Category	Respondents	
		n	(%)
Gender	Male	161	35.07
	Female	298	64.93
Industry Coverage	Trading (distributor, agent, retailer)	43	9.37
	Food and beverage	170	37.04
	Clothing (shoes, fashion, garment, etc)	88	19.17
	Basic chemical processing (drugs, cement, etc)	10	2.18
	Machinery and basic metal processing (spare parts, automotive, etc)	6	1.31
	Agriculture	0	0
	Plantation	1	0.22
	Farm	2	0.44
	Fishery	3	0.65
	Services	33	7.19
	Other	103	22.44
Size of Firms (Number of employees)	1-4	92	20.04
	5-19	121	26.36
	20-99	204	44.44
	>99	42	9.15
Average Sales (per month)	<25 Million Rupiah (micro)	87	18.95
	25 Million Rupiah - 208 Million Rupiah (small)	139	30.28
	209 Million Rupiah - 4.2 Billion Rupiah (medium)	183	39.87
	>4.2 Billion Rupiah (big)	50	10.89

A Confirmatory Factor Analysis (CFA) was done to assess the validity of the instrument. The validity test is measured by loading factor parameters and AVE (Average Variance Extracted) parameters. The factor loading should be greater than 0,5, indicates good validity (Hair et al. 1998). As shown in Table 3, all factor loadings of the scale items are greater than 0,5 (0,5044 – 1,0604), thus convergence validity was verified. According to Hair et al. (2019), the AVE estimates of the constructs have to be greater than 0,5. As seen in Table 3, all AVEs are greater than 0,5, therefore discriminant validity was established.

The results of the reliability and validity analysis are shown in Table 3. Reliability shows the level of consistency and stability of the measuring instrument or research instrument in measuring a concept or construct. Reliability testing in the SEM model uses the Cronbach Alpha parameter. Cronbach's α coefficient greater than 0.7 indicates good reliability (Hair et al. 1998). As seen in Table 3, the Cronbach's α coefficients are all higher than 0,7 (0,8686 – 0,9672), which shows that the scale is roughly in the high confidence range and has a certain degree of internal consistency.

Based on the structural equation model analysis, as shown in Table 4, the measurement model is valid. The research model has a good degree of fit between the data and the model. The model fit indices were assessed, 5 GOFI parameters showed good fit and 2 GOFI parameters showed marginal fit. Hair et al. (2009) stated that the assessment of model fit is assessed based on how many GOFI measurements can be met by the research model being built. The more GOFI measurements that can be met by the model, the better the research model that is built can be said.

Table 3. Analysis of reliability and validity

Variable	Indicator	Coef. α	AVE	Loading
GEO	GEO1	0.9198	0.7030	0.6793
	GEO2			0.7828
	GEO3			0.7947
	GEO4			0.7908
	GEO5			0.7903
GCO	GCO1	0.9599	0.7746	0.8135
	GCO2			0.8683
	GCO3			0.8562
	GCO4			0.8703
	GCO5			0.8593
	GCO6			0.8349
	GCO7			0.8889
GSS	GSS1	0.9672	0.7865	1.0278
	GSS2			1.0604
	GSS3			0.9929
	GSS4			1.0469
	GSS5			1.0160
	GSS6			0.9991
	GSS7			1.0070
	GSS8			0.9741
GRP	GRP1	0.9419	0.7654	0.8577
	GRP2			0.8625
	GRP3			0.8539
	GRP4			0.9234
	GRP5			0.9215
EXT	GCO			0.9348
	GSS			0.8499
	GRP			0.9085
EBM	EBM1	0.9500	0.7170	0.5661
	EBM2			0.7623
	EBM3			0.7571
	EBM4			0.7847
	EBM5			0.6960
	EBM6			0.8722
	EBM7			0.9359
	EBM8			0.9310
GPP	GPP1	0.9269	0.6642	0.5044
	GPP2			0.6217
	GPP3			0.7197
	GPP4			0.8858
	GPP5			0.9194
	GPP6			0.8710
	GPP7			0.8913
GCC	GCC1	0.9466	0.7821	0.8724
	GCC2			0.8504
	GCC3			0.7733
	GCC4			0.8533
	GCC5			0.8674
EPD	EPD1	0.9191	0.6356	0.7781
	EPD2			0.7650
	EPD3			0.7896
	EPD4			0.7334
	EPD5			0.3527
	EPD6			0.6661
	EPD7			0.7485
WAM	WAM1	0.8968	0.6892	0.7634
	WAM2			0.7775
	WAM3			0.8223
	WAM4			0.9064
GMP	EBM			0.9395
	GPP			0.9753
	GCC			0.9690
	EPD			1.0112
	WAM			0.8972
GEP	GEP1	0.9281	0.7231	0.7383
	GEP2			0.7271
	GEP3			0.7370
	GEP4			0.7841
	GEP5			0.8189
GSP	GSP1	0.8686	0.5960	0.4045
	GSP2			0.4013
	GSP3			0.8191
	GSP4			0.7827
	GSP5			0.7678
GEnP	GEnP1	0.9235	0.6764	0.9477
	GEnP2			0.8614
	GEnP3			0.6560
	GEnP4			0.7072
	GEnP5			0.8778

Table 4. Overall model fit summary

Goodness of Fit Indices (GOFI)		Classification	Result	Summary
CFI	Comparative Fit Index	CFI > 0.90 : Good Fit	0.9098	Good Fit
NNFI	Non-normed Fit Index	NNFI > 0.90 : Good Fit	0.9048	Good Fit
PNFI	Parsimony Normed Fit Index	0.5 < PNFI < 1 : Good Fit	0.8125	Good Fit
IFI	Incremental Fit Index	IFI > 0.90 : Good Fit	0.9101	Good Fit
RFI	Relative Fit Index	RFI >0.90 : Good Fit ; 0.80 < RFI < 0.90 : Marginal Fit	0.8494	Marginal Fit
RMSEA	Root Mean Square Error of Approximation	RMSEA < 0.08 : Good Fit	0.0564	Good Fit
GFI	Goodness of Fit Index	GFI > 0.90 : Good Fit; 0.08 < GFI < 0.90: Marginal Fit	0.8955	Marginal Fit

The structural paths and the path estimate for all the constructs are shown in Figure 3. The GCO indicator has a loading factor of 0.9348 which is greater than the other two indicators, namely GRP and GSS in explaining the EXT construct. However, the three indicators show loading factors in the range of 0.8499–0.9348, which means that these three indicators are strongly correlated or have a large contribution in explaining the EXT construct. The EPD indicator has the largest loading factor of 1,0112 compared to the other four indicators, namely EBM, GPP, GCC, and WAM in explaining the GMP construct. The five indicators have a very large loading factor, namely the range of 0.8972 – 1.0112, which means that these five indicators are strongly correlated or have a large contribution in explaining the GMP construct.

The GCO and GRP indicators have loading factors > 0.9, while the GSS loading factor < 0.9 in explaining the EXT construct. These results can be interpreted that customer green orientation and government regulatory pressure contribute more strongly as external incentives for MSMEs to behave green, compared to government subsidies and assistance. MSMEs who have the necessary market information can organize their operations to produce specific products or services that suit customer needs and desires. They can also maintain a competitive position in the market by focusing on customer needs and desires (Acosta et al. 2018). Environmentally friendly actions are encouraged by regulation, particularly governmental regulation. In addition to underlying management methods, laws and regulations can increase environmental performance and demand environmental awareness (Kumar et al. 2020).

The EPD, GPP, and GCC indicators have loading factors > 0.95, while the EBM and WAM loading factors < 0.95 in explaining the GMP construct. These results can be interpreted that environmentally friendly product design, green procurement processes, and green cooperation with customers contribute more strongly to explaining green management practices carried out by MSME actors. Environmentally friendly product design is the target output that MSME actors must be able to produce, one of which is by carrying out eco-innovations. Furthermore, eco-innovation includes the development of environmentally friendly products, the introduction of cleaner technologies, and more effective use of resources. Afshari et al. (2020) carried out a study that repeatedly showed that eco-innovation and improved overall eco-efficiency in manufacturing enterprises are positively correlated.

Green procurement process is one form of green management practice implemented by MSMEs to ensure the supply of raw materials and suppliers meets the required green demands. According to Hsu et al. (2013), green procurement involves practices such as material substitution, waste reduction, and hazardous material waste minimization. Green logistics management practices are crucial supply chain management techniques that enhance business performance by preventing environmental contamination, improving energy efficiency and conservation, and managing trash properly (Agyabeng-Mensah et al. 2020).

Green cooperation with stakeholders, one of which is with customers, is a management practice carried out by MSMEs, for example in product design, determination of raw materials and suppliers, processing and adoption of technology, as well as in managing waste or defective goods. According to Green et al. (2012), performance is enhanced when stakeholder opinions

are incorporated into green supply chain procedures. According to studies, cooperation with stakeholders is necessary for the successful implementation of reverse logistics and waste management (Agyabeng-Mensah et al. 2020), this includes actions to reduce trash and the carbon footprints of products.

Table 5 summarizes the result of the hypotheses testing, where all hypothesized relationships in this study are supported. This study investigated the relationships among GEO, EXT, GMP, and green performance (GEP, GSP, GEnP). First, our results exhibit that green entrepreneurship orientation (GEO) as an internal driver enhances green management practices (GMP). These findings also confirm the extant literature claiming that management support could lead to better green procurement and transportation as a part of green management practices (Jum'a et al. 2021; Bjorklund, 2011). In MSME, the owners are responsible for most of the operations of the company and, therefore, their support and dedication are vital (Ali et al. 2016).

Second, this research also found that the external drivers (GCO, GSS, GRP) increase GMP. These results support the findings of previous studies that green customer orientation have a significant positive impact on green supply chain management capability, environmental performance, and economic performance (Borazon et al. 2022), and also market orientation improves green supply chain management practices (Song and Choi, 2018; Habib et al. 2020).

Third, we also found that the higher the GMP, the higher the green economic (GEP), social (GSP), and environmental performance (GEnP). These finding also confirm that some researchers have stressed that green supply chain management practices increase the environmental and economic performance of enterprises (Borazon et al. 2021; Chowdhury and Quaddus, 2021; Daddi et al. 2021; Habib et al. 2021). Agyabeng-Mensah et al. (2021) stated that green logistics management strategies have a good impact on environmental and social sustainability. Customer collaboration positively affects environmental and economic performance (Ardakani and Soltanmohammadi, 2022).

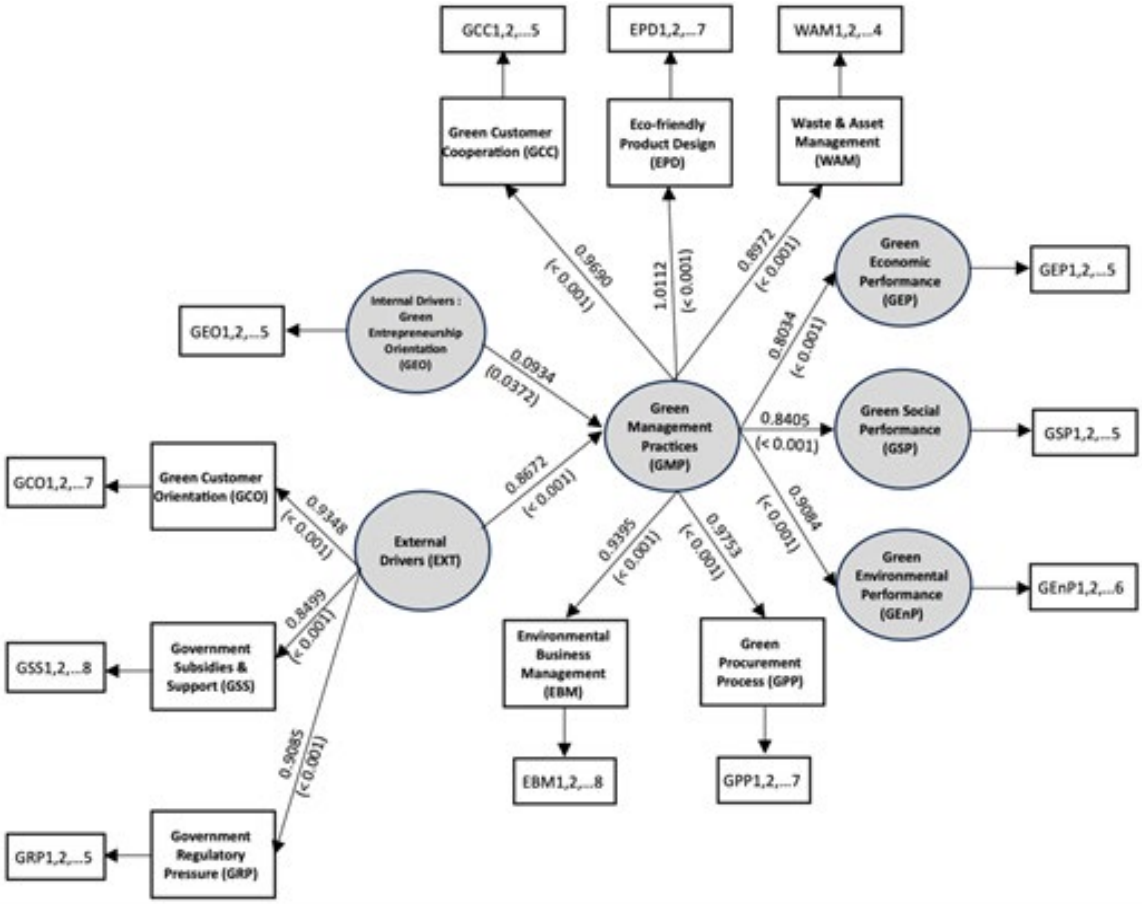

Figure 3. The Path Diagram

Table 5. Hypotheses testing results

Hypotheses	Predictor	Outcome	p	LV Standardized	Result
H1	INT: GEO	GMP	0.0372	0.0934	Supported
H2	EXT	GMP	<0.001	0.8672	Supported
H3	GMP	GEP	<0.001	0.8034	Supported
H4	GMP	GSP	<0.001	0.8465	Supported
H5	GMP	GEnP	<0.001	0.9084	Supported

This study produced a model that showed a positive influence of INT:GEO and EXT on GMP which then had a positive influence on green performance (GEP, GSP, GEnP). However, the results showed a greater influence of external forces on green management practices carried out by MSMEs, as indicated by the LV standardized EXT value against GMP of 0.8672, greater than the LV standardized INT: GEO of 0.0934. Furthermore, the results also showed that green management practices carried out by MSMEs had a greater influence on green environmental performance (LV standardized 0.9084) than green economic performance or green social performance.

These results are in accordance with previous studies, market orientation as an external driver has an indirect influence on environmental performance through green practices (Li et al. 2018; Lin et al. 2020; Borazon et al. 2022). Green procurement adoption had positive relationships with all selected parameters of firm performance, while internal environmental concern, customer pressure, competitive pressure and management support had a positive influence on green procurement (Ghosh, 2019). Economic performance is impacted by green practices because they can enhance competitiveness (by improving product quality, efficiency, productivity, and saving costs) and environmental performance (by reducing waste, emissions) (Wang et al. 2020).

Meanwhile, as previously explained, MSMEs in developing countries, including Indonesia, tend to have limited resources, lack of understanding, and financial barriers in adopting environmentally friendly practices, so that the implementation of green supply chain management is often still limited. These obstacles are related to the lack of incentives from the government, and limited support from consumers and other stakeholders (Siregar and Pinagara, 2022; Pramudiawardani et al. 2019).

Managerial Implication

The findings of this study provide MSME managers with a strategic framework to enhance their green performance through the adoption of green management practices. The managers should prioritize external collaborations, regulations, and stakeholder engagement to enhance green practices. This model will help managers align their operations with sustainable business standards. This can ultimately boost MSME competitiveness, strengthen their legitimacy as sustainable business, and contribute to Indonesia's green economy development.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

This paper tried to create a MSME green supply chain model with internal and external drivers, green management practices, and performance. This study showed that a positive influence of green entrepreneurship orientation as internal drivers and external drivers on green management practices which then had a positive influence on green performance (economic, social, and environmental). This study has added something special to green supply chain management literature by offering MSME actors guidelines for creating a green supply chain society and establishing their legitimacy as an sustainable business. This study highlights the need for a framework of pressure, support, practices, and performance to enhance the green supply chain of Indonesian MSMEs and improve their green performance, supporting the green economy. There are multiple limitations to this study. First, this study was limited to MSMEs in Indonesia, which may affect the generalizability of the findings to other countries or regions with different cultural, economic, and regulatory contexts. Second, measuring green performance in terms of economic, social, and environmental outcomes is complex and may not fully capture the multidimensional aspects of sustainability.

Recommendations

The government needs to actively assist MSMEs to improve their capabilities, prepare regulations, and socialize them to encourage green management practices. In relation to that matter, Choudhary and Sangwan (2018) discussed that green practices will reduce ecological impacts and increase economic performance in developing countries, including Indonesia. Thus, the top priority strategy to improve MSME's performance was to increase innovative and proactive through one-on-one mentoring (Octasylva, 2024).

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