

The Influence of Green Entrepreneurship Orientation, Green Market Orientation, and Organizational Support on the Adoption of Green Innovations

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Abstract

Environmental sustainability has become a critical concern for MSMEs, particularly in the natural dye batik industry in the Special Region of Yogyakarta. This study aims to examine the influence of green entrepreneurial orientation, green market orientation, and organizational support on the adoption of green innovations. A total of 100 MSME owners were surveyed using a non-probability sampling method through structured questionnaires. Instrument testing confirmed that all items were valid and reliable, while classical assumption tests indicated normally distributed data and a regression model free from multicollinearity and heteroscedasticity. The results reveal that green entrepreneurial orientation, green market orientation, and organizational support each have a significant positive effect on the adoption of green innovations. These findings suggest that fostering environmentally oriented entrepreneurial and market practices, supported by organizational backing, can enhance the adoption of sustainable innovations among batik MSMEs. This study contributes to both theory and practice by highlighting the key organizational and market factors that promote green innovation adoption in traditional craft industries.

Keywords

Green Entrepreneurship Orientation, Green Market Orientation, Green Innovation Adoption, Organizational Support.

1. Introduction

The quantitative development of Micro, Small, and Medium Enterprises (MSMEs) in the Special Region of Yogyakarta (*Daerah Istimewa Yogyakarta/DIY*) Province has shown an upward trend over the past three years, with business units totaling 342,924 in 2022, slightly decreasing to 342,586 in 2023, and rising again to 345,980 in 2024, according to the District of Cooperatives and MSMEs Office of Yogyakarta. Among the diverse MSME products, natural dye batik has emerged as a leading sector, reflecting growing consumer preference for environmentally friendly products and public awareness of environmental conservation issues.

Alshebami (2023) defines green innovation adoption as the process of implementing new ideas, practices, and technologies to minimize environmental impact while enhancing operational efficiency. Dangelico and Vocalelli (2017) emphasize that this concept integrates ecological considerations into business strategy, which can be operationalized through low-emission technologies, waste management, and sustainable supply chains, as noted by Saunila (2020). According to Baquero (2024), optimizing the adoption of green innovations can be achieved by strengthening both internal and external sustainability-oriented practices, while Muangmee et al. (2021) and Asad et al. (2023) highlight green entrepreneurial orientation, Ngo (2022) and Du and Wang (2022) emphasize green market orientation, and Saeed et al. (2019) and Li et al. (2020) point to organizational support as key determinants.

Green entrepreneurial orientation refers to an organization's tendency to recognize and exploit environmentally-based business opportunities through innovative activities and calculated risk-taking, including the adoption of natural dyes in the batik production process (Firlag et al., 2018; Baquero, 2024). This orientation contributes to increased resilience of MSMEs in the face of environmental pressures and global market dynamics. Various studies have shown that green entrepreneurial orientation has a positive and significant influence on the adoption of green innovations, both directly and through the mediating role of organizational dynamic capabilities (Jiang et al., 2018; Zhai et al., 2018; Aboelmaged & Hashem, 2019; Asad et al., 2023). However, Muangmee et al. (2021) indicate an insignificant effect, possibly due to resource constraints in small-scale MSMEs.

A green market orientation strategically focuses on understanding consumer needs and environmentally-oriented market dynamics, enhancing the competitiveness of sustainable products (Tjahjadi et al., 2020; Karmel et al., 2022; Wicaksana & Nuvriasari, 2025). It promotes both exploitative and exploratory innovations for environmentally conscious consumers (Kohli & Jaworski, 1990; Ngo, 2022). Empirical studies indicate a significant positive effect of green market orientation on green innovation adoption (Khan & Ghouri, 2018; Putri & Riyanto, 2023; Sulaiman, 2025). Although Afum et al. (2020) note that external factors, such as government regulations, can sometimes diminish this effect.

Jun et al. (2019) argue that organizational support is a crucial factor bridging strategic orientation with the implementation of green innovations. Ahmed et al. (2023) and Bhatti et al. (2025) explain that such support includes management commitment, training, incentives, and internal policies that promote sustainability. Zhao and Huang (2022) and Alhazami and Tobing (2023) highlight that organizational support strengthens employee engagement, while Wasiq et al. (2023) and Bataineh et al. (2024) note its role in overcoming resource and technology limitations faced by MSMEs. Studies by Shamsuzzoha et al. (2023) confirm the positive and significant effect of organizational support on green innovation adoption, although Nawangsari et al. (2024) report that this effect can be insignificant when MSMEs depend heavily on external support, such as government subsidies.

The adoption of green innovation is a key strategy for developing green MSMEs, particularly in the natural dye batik subsector, which has strong potential for sustainable practices. Growing consumer awareness of environmentally friendly products highlights the need for empirical studies on green innovation in MSMEs, while mixed findings in previous research reveal an empirical gap that warrants further investigation. This study aims to examine the influence of green entrepreneurial orientation, green market orientation, and organizational support on the adoption of green innovations.

2. Literature Review and Hypothesis Development

2.1. Green Entrepreneurship Orientation and Adoption of Green Innovation

The adoption of green innovation reflects an organization's ability to implement new ideas, products, or processes that prioritize environmental sustainability, aiming to improve resource efficiency and minimize negative ecological impacts, as described by Najib et al. (2022). In the context of MSMEs, particularly in traditional sectors such as natural dye batik, green innovation adoption is not merely a technical adjustment but a strategic orientation that integrates environmental values into daily business operations. Muangmee et al. (2021) emphasize that a strong green entrepreneurial orientation encourages MSMEs to adopt eco-friendly technologies and design products with minimal environmental footprints, fostering long-term competitiveness while addressing the growing consumer demand for sustainable products. By embedding environmental considerations into entrepreneurial decision-making, MSMEs can simultaneously enhance operational efficiency and contribute to broader sustainability goals.

Previous studies consistently highlight the significant relationship between green entrepreneurial orientation and green innovation adoption. Green entrepreneurial orientation reflects a firm's proactive and risk-taking behavior in identifying and exploiting environmentally based business opportunities. Empirical evidence shows that this orientation positively influences the adoption of green

innovation, either directly or indirectly through organizational capabilities. Studies by Jiang et al. (2018) and Zhai et al. (2018) confirm its significant positive effect on sustainable innovation practices. Similarly, Aboelmaged and Hashem (2019) emphasize the mediating role of organizational capabilities. However, Muangmee et al. (2021) report an insignificant effect in MSMEs facing resource limitations, indicating contextual variability in this relationship.

H1: Green entrepreneurship orientation has a positive and significant effect on the adoption of green innovation.

2.2. Green Market Orientation and Adoption of Green Innovation

Marketing orientation is a strategic business philosophy that emphasizes identifying, understanding, and satisfying customer needs and preferences as the central focus of organizational activities (Widayati et al., 2023). Green market orientation is a strategic approach in which organizations prioritize understanding customer needs and market dynamics with an emphasis on environmental considerations, as highlighted by Tjahjadi et al. (2020). This orientation allows businesses, particularly MSMEs, to align their products and processes with sustainable practices, ensuring that environmental concerns are embedded in decision-making. Putri and Riyanto (2023) emphasize that by adopting a green market perspective, companies can anticipate market demands for eco-friendly products and respond proactively, which in turn accelerates the adoption of green innovations. Najib et al. (2022) further note that MSMEs with a strong green market orientation are quicker to implement environmentally conscious innovations, reflecting their ability to respond to shifts in consumer preferences and societal expectations.

Prior research demonstrates that green market orientation plays a crucial role in driving green innovation adoption by aligning organizational strategies with environmentally conscious market demands. Green market orientation emphasizes the systematic generation, dissemination, and responsiveness to environmental market intelligence, enabling firms to anticipate and respond to sustainability trends. Empirical studies by Khan and Ghouri (2018) reveal a positive and significant effect of green market orientation on sustainable innovation performance. Likewise, Du and Wang (2022) confirm that market responsiveness enhances green innovation implementation. However, Afum et al. (2020) note that regulatory pressures and external environmental factors may moderate this relationship, suggesting contextual influences on its effectiveness.

H2: Green market orientation has a positive and significant effect on the adoption of green innovation.

2.3. Organizational Support and Adoption of Green Innovation

Organizational support refers to employees' perceptions of the extent to which their contributions are valued and their well-being is considered within the workplace, as explained by Mujiasih (2015). The primary goal of such support is to foster a positive work environment, enhance loyalty, and strengthen employees' commitment to the organization through recognition, guidance, and appropriate rewards. In the context of green innovation, Kerse (2024) emphasizes that green organizational support encourages eco-friendly behaviors among employees, which form the foundation for implementing sustainable innovations. Awatara et al. (2024) further highlight that providing resources, training, and reward systems enhances employees' commitment to environmental initiatives, thereby driving the adoption of green practices in MSMEs

Internal organizational support, manifested through facilities, an innovation-oriented culture, and leadership engagement, has been shown to positively influence the implementation of green innovation (Weng & Lin, 2011; Zappalà et al., 2023; Indrawati et al., 2025). Organizational support encompasses leadership commitment, resource allocation, sustainability-oriented policies, training, and knowledge-sharing mechanisms that facilitate the implementation of environmentally friendly practices. Jun et al. (2019) argue that internal support bridges strategic orientation and green innovation outcomes. Empirical findings from Zhao and Huang (2022) demonstrate that supportive structures strengthen employee engagement in sustainability initiatives.

H3: Organizational support has a positive and significant effect on the adoption of green innovation.

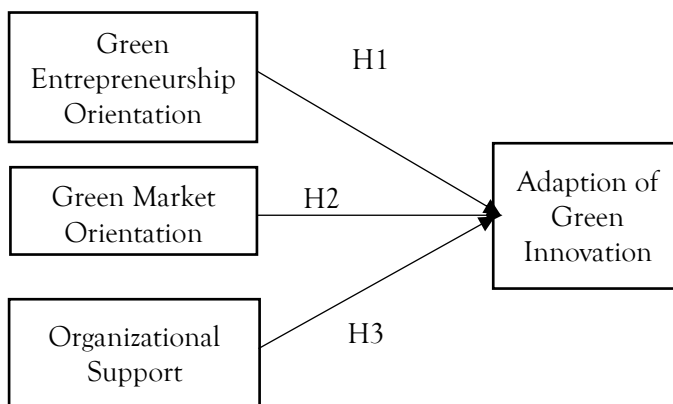


Figure 1. Conceptual Framework

Figure 1 illustrates the conceptual framework of this study, showing the relationships between the independent variables green entrepreneurship orientation, green market orientation, and organizational support, and the dependent variable, adoption of green innovation. Hypotheses H1, H2, and H3 represent the expected positive influences of each independent variable on green innovation adoption in natural dye batik MSMEs. The diagram emphasizes that the adoption of green innovation is jointly shaped by entrepreneurial, market-oriented, and organizational support factors, highlighting their combined role in driving sustainable practices.

3. Methods

This study employs a quantitative research design, which focuses on collecting numerical data and applying statistical techniques to test relationships between variables, allowing for precise measurement and analysis of patterns in the data (Waruwu et al., 2025). The study is categorized as explanatory research, aiming to explain cause-and-effect relationships and test hypotheses, thereby providing a structured framework to investigate the influence of multiple factors on outcomes (Barroga & Matanguihan, 2022). This approach provides empirical evidence on the factors influencing the adoption of green innovations in natural dye batik MSMEs, supporting both theoretical understanding and practical implications for sustainable business practices.

Using structured questionnaires intended to elicit thorough answers, primary data was gathered directly from MSMEs' owners, executives, or other responsible parties. To ensure that attitudes and behaviors were accurately reflected, the questionnaire employed a 5-point Likert scale, with 1 denoting "strongly disagree" and 5 denoting "strongly agree." This scale was used to measure respondents' perceptions of green market orientation, green entrepreneurial orientation, organizational support, and adoption of green innovations. The Cooperatives and MSMEs Office of the Special Region of Yogyakarta's official records for the years 2022–2024 were the source of secondary data, which gave the study's conclusions more context and confirmation.

The research population comprises all owners or managers of Yogyakarta's natural dye-based batik MSMEs, which are regarded as almost unlimited and undefinable because of their vast and fluctuating quantity. Using purposive non-probability sampling, 100 respondents were chosen based on predetermined standards: they had to be owners or managers of MSMEs that had been in operation for at least the previous three years. By using this sampling strategy, it is ensured that each participant has the necessary background, operational expertise, and comprehension of green innovation techniques to offer insightful and trustworthy analysis.

Green entrepreneurship orientation is reflected in a firm's commitment to environmentally responsible innovation, including the use of eco-friendly raw

materials, packaging innovation, adoption of sustainable production processes, development of environmentally conscious products, implementation of energy-efficient practices, and continuous process improvement (Jun et al., 2019; Nurak & Nuvriasari, 2025). Complementing this, green market orientation emphasizes market-driven capabilities such as effective customer onboarding, strong service commitment, provision of relevant and transparent information, responsiveness to customer needs, systematic satisfaction measurement, and well-coordinated internal communication (Wicaksana & Nuvriasari, 2025). Meanwhile, organizational support strengthens both orientations through leadership support, adequate resource allocation, structured problem-solving mechanisms, continuous knowledge sharing, access to appropriate technology, and encouragement of idea generation (Jun et al., 2019).

Descriptive statistics were used to summarize the data, and inferential analysis was used to look at how organizational support, green market orientation, and green entrepreneurial orientation affected the uptake of green innovations. All statistical analyses were performed with SPSS software, which enables the identification of significant relationships among the variables under study and provides rigor, clarity, and confidence in the interpretation of the results. SPSS software also allows for the reliable computation of correlations, regressions, and other parametric tests.

4. Results

This section presents the results on how green entrepreneurship orientation, green market orientation, and organizational support influence the adoption of green innovation in natural dye batik MSMEs in Yogyakarta, including validity, reliability, normality, multicollinearity, heteroscedasticity, and regression analyses, providing a clear understanding of the key factors driving sustainable business practices.

Table 1. Validity & Reliability Test

Variable	Indicator	r-count	Cronbach's Alpha	Remarks
Green Entrepreneurship Orientation	X1.1	0.733	0.718	Valid & Reliable
	X1.2	0.472		
	X1.3	0.567		
	X1.4	0.728		
	X1.5	0.640		
	X1.6	0.710		
Green Market Orientation	X2.1	0.893	0.942	Valid & Reliable
	X2.2	0.891		
	X2.3	0.858		
	X2.4	0.870		
	X2.5	0.871		
	X2.6	0.905		

Variable	Indicator	r-count	Cronbach's Alpha	Remarks
Organizational Support	X3.1	0.891	0.937	Valid & Reliable
	X3.2	0.905		
	X3.3	0.847		
	X3.4	0.847		
	X3.5	0.855		
	X3.6	0.885		
Adoption of Green Innovation	Y.1	0.840	0.876	Valid & Reliable
	Y.2	0.755		
	Y.3	0.791		
	Y.4	0.774		
	Y.5	0.752		
	Y.6	0.805		

Based on Table 1, all statement items show an r-count higher than the r-table (0.196) with a p-value < 0.05, indicating that every questionnaire item is valid and suitable for further analysis. Furthermore, all research variables have a Cronbach's Alpha value exceeding 0.60, demonstrating that the questionnaire is reliable and can be confidently used as a data collection instrument in this study.

Table 2. Normality Test Results

Test	Unstandardized Residual
N	100
Normal Parameters	
Mean	0.0000000
Std. Deviation	0.6717
Most Extreme Differences	
Absolute	0.073
Positive	0.031
Negative	-0.073
Test Statistic	0.073
Asymp. Sig. (2-tailed)	0.200 (Lilliefors Significance Correction)

Table 2 shows the results of the normality test using the One-Sample Kolmogorov-Smirnov method. The Asymp. Sig. (2-tailed) value is 0.200. This value indicates that the data do not significantly deviate from a normal distribution. Therefore, the data in this study can be considered normally distributed. A significance value greater than 0.05 supports the assumption of normality for further statistical analysis.

Based on the results in Table 3, all independent variables have a Variance Inflation Factor (VIF) below 10 and a tolerance value above 0.10. This indicates that there is no multicollinearity among the independent variables in the regression model of this study. These results meet the multicollinearity test criteria, which

require a VIF value lower than 10 and a tolerance value greater than 0.10 to ensure that the independent variables are not highly correlated with one another.

Table 3. Multicollinearity & Heteroscedasticity

Variable	Multicollinearity Test		Heteroscedasticity Test
	Tolerance	VIF	Sig
Green Entrepreneurial Orientation	0.190	5.270	0.078
Green Market Orientation	0.196	5.101	0.398
Organizational Support	0.912	1.083	0.915

As shown in Table 3, the heteroscedasticity test was conducted using the Glejser method. The significance values for green entrepreneurship orientation (X1), green market orientation (X2), and organizational support (X3) are 0.078, 0.393, and 0.915, respectively. Since all significance values are greater than 0.05, the regression model does not exhibit any signs of heteroscedasticity, indicating that the residuals are evenly distributed across the range of predicted values.

Table 4. Multiple Linear Regression Analysis Test

Variable	B	Std. Error	Beta	t-statistics	Sig.
Constant	0.982	0.579	-	1.696	0.093
Green Entrepreneurship Orientation	0.563	0.055	0.445	10.324	0.000
Green Market Orientation	0.413	0.051	0.340	8.034	0.000
Organizational Support	0.371	0.016	0.461	23.615	0.000

Based on Table 4, the following equations can be arranged:

$$Y = 0.982 + 0.563X_1 + 0.413X_2 + 0.371X_3 + e$$

Based on the regression results, the constant value of 0.982 indicates that if green entrepreneurship orientation, green market orientation, and organizational support are zero, the adoption of green innovation would still be 0.982. The regression coefficients for all independent variables are positive, showing a direct relationship with green innovation adoption. Specifically, an increase of one unit in green entrepreneurship orientation is associated with a 0.563-unit increase in green innovation adoption, while a one-unit increase in green market orientation corresponds to a 0.431-unit rise. Similarly, a one-unit increase in organizational support leads to a 0.371-unit increase in the adoption of green innovation,

highlighting that stronger organizational, entrepreneurial, and market orientations contribute positively to implementing green innovations in MSMEs.

Table 5. Partial Test Results (t-test)

Relationship	t-statistics	Sig. (p)	Remarks	Conclusion
Green Entrepreneurship Orientation → Adoption of Green Innovation	10.324	0.000	p < 0.05	Ha1 accepted
Green Market Orientation → Adoption of Green Innovation	8.034	0.000	p < 0.05	Ha2 accepted
Organizational Support → Adoption of Green Innovation	23.615	0.000	p < 0.05	Ha3 accepted

Based on the results of the t-test shown in Table 5, all three hypotheses are supported. Green entrepreneurship orientation has a positive and significant effect on the adoption of green innovation, with a t-statistic greater than the t-table and a significance level of 0.000 ($p < 0.05$), indicating that Ha1 is accepted. Similarly, green market orientation also positively and significantly influences the adoption of green innovation, as evidenced by a t-statistic of 8.034 exceeding the t-table and a significance value of 0.000, leading to the acceptance of Ha2. Organizational support further shows a significant positive effect on green innovation adoption, with a t-statistic higher than the t-table and $p < 0.05$, confirming Ha3. These findings collectively demonstrate that stronger entrepreneurial, market-oriented, and organizational support practices contribute meaningfully to the implementation of green innovations in natural dye batik MSMEs in the Special Region of Yogyakarta.

Table 6. Determination Coefficient (R²) Test Results

Parameter	Value
R	0.983
R Square	0.966
Adjusted R Square	0.965
Std. Error of the Estimate	0.682
Dependent Variable	Adoption of Green Innovation

According to Table 6's termination coefficient test results, 0.965 was the Adjusted R Square value. The variables of green market orientation, green entrepreneurship orientation, and organizational support account for 96.6% of the adoption of green innovation in Yogyakarta's natural dye batik MSMEs, according to this figure. The remaining 3.4% is impacted by additional variables not included in this research methodology.

5. Discussion

The results of Hypothesis 1 indicate that green entrepreneurship orientation positively and significantly affects the adoption of green innovation in natural dye batik MSMEs in Yogyakarta. MSME actors who embrace environmentally oriented entrepreneurial values are more likely to implement green innovations, particularly by developing products using local natural materials such as joho fruit, turmeric, jolawe peel, sappanwood, indigo fruit, and cinnamon. These materials reflect both innovation and environmental commitment. These findings are consistent with Guo (2020) and Rong et al. (2025), showing that green entrepreneurship orientation enhances organizational readiness and capability to adopt sustainable practices effectively.

Hypothesis 2 testing demonstrates that green market orientation also has a positive and significant influence on the adoption of green innovation. This implies that businesses that actively monitor and respond to market trends with an environmental focus tend to adopt green innovations more effectively. Descriptive analysis highlights that MSMEs exhibiting high responsiveness to eco-conscious market trends develop sustainable marketing strategies and adapt their product characteristics to match consumer preferences for environmentally friendly products, thereby strengthening brand reputation. Among the indicators, providing adequate information to consumers about environmentally friendly products emerges as the primary driver for adopting green innovations. These results are in line with Du and Wang (2022) and Sulaiman (2025), who emphasized that green market orientation is a critical determinant for the adoption of sustainable innovations, enabling firms to anticipate market demand and adjust their processes accordingly.

For Hypothesis 3, the results reveal that organizational support has a positive and significant effect on green innovation adoption. This finding confirms that supportive internal structures manifested through organizational policies, resource availability, and a culture prioritizing sustainability facilitate the implementation of green innovation practices. MSMEs with high organizational support demonstrate greater capacity to conduct employee training on eco-friendly practices and provide sustainability-oriented production facilities. Organizational support functions as a catalyst for behavioral and operational changes toward a green business model, encompassing leadership guidance, resource allocation, removal of operational barriers, knowledge sharing, technology access, and collaborative idea generation. These findings are consistent with Weng and Jun et al. (2019) and Lin et al. (2020), indicating that leadership support and resource allocation are crucial in promoting the adoption of green innovations. Descriptive analysis further shows that leadership support in employee learning and the practical application of environmentally friendly business processes are the most dominant factors. These results align with Aboelmaged and Hashem (2019) and Baeshen et al. (2021), reinforcing the critical role of organizational support in facilitating sustainable innovation.

The findings indicate that green innovation adoption in natural dye batik MSMEs is driven by the combined influence of internal and external orientations and organizational support. Green entrepreneurial and market orientations enhance strategic and market responsiveness toward sustainability, while organizational support provides the structural and resource capacity to implement these initiatives effectively. MSMEs seeking to strengthen green innovation should simultaneously develop entrepreneurial and market-oriented practices and invest in organizational support (Alshebami, 2023). Policymakers, business associations, and support programs can use these insights to design training, allocate resources, and create incentives that promote eco-friendly innovation, ultimately fostering sustainable business practices and competitive advantage in the natural dye batik sector.

6. Conclusion

This study analyzed the influence of green entrepreneurship orientation, green market orientation, and organizational support on the adoption of green innovation in natural dye batik MSMEs in the Special Region of Yogyakarta. The results indicate that all three factors have a positive and significant effect on green innovation adoption. Specifically, green entrepreneurship orientation serves as a key driver in encouraging MSMEs to implement environmentally friendly innovations. Similarly, green market orientation and organizational support play crucial roles in promoting sustainable practices, demonstrating that both external market awareness and internal organizational backing are essential for successful green innovation adoption.

These findings have practical implications for MSME development and sustainability. Encouraging entrepreneurial initiatives that prioritize environmental considerations, fostering market strategies aligned with eco-conscious consumer demands, and strengthening organizational support through training, resources, and policy incentives can collectively enhance the adoption of green innovations. Policymakers, business associations, and MSME support programs can utilize these insights to design targeted interventions that facilitate environmentally responsible business practices.

Despite these contributions, the study has several limitations. The sample is limited to 100 natural dye batik MSMEs in Yogyakarta, with uneven regional representation, for example, Gunung Kidul is represented by only 4 MSMEs (4% of the sample). Additionally, micro-scale businesses dominate the sample (75%), which may not fully capture adoption patterns in small and medium enterprises. Future research is recommended to expand the sample size and ensure proportional representation across regions and business scales. By including a more diverse range of MSMEs, subsequent studies can provide a more comprehensive understanding of factors influencing green innovation adoption and offer more generalizable recommendations for promoting sustainable practices in the batik industry.

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