

IMPLEMENTATION OF SUSTAINABLE PERFORMANCE THROUGH THE GREEN RELATIONAL CAPITAL AND GREEN INNOVATION MODELS

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ABSTRACT

The purpose of this study is to explore the influence of green relational capital and green innovation on sustainable performance, developed within a single model and explained through the Resource-Based Theory (RBT) as the main theoretical framework. The research sample consisted of 193 micro, small, and medium enterprises (MSMEs). Data were analyzed using the structural equation model with Partial Least Squares (PLS). The findings indicate that both green relational capital and green innovation significantly affect sustainable performance. This research contributes to the Resource-Based Theory by demonstrating that MSMEs are able to transform their resources into capabilities that foster green relational capital, such as two-way communication with customers, suppliers, networks, and partners regarding environmental management, as well as eco-friendly innovations. These practices enable businesses to generate profit and sustain a competitive advantage.

Keywords: Green Relational Capital, Green Innovation, Sustainable Performance

INTRODUCTION

East Java Province is one of the regions in Indonesia endowed with abundant natural resources and diverse tourist attractions that hold great potential for economic development. Examples include the Ijen Crater Nature Park located in Banyuwangi and Bondowoso, Mount Bromo spanning Probolinggo, Pasuruan, Lumajang, and Malang, Mount Kawi in Malang, Mount Kelud in Kediri, and Lake Sarangan in Magetan. The tourism sector serves as a major platform for micro, small, and medium enterprises (MSMEs) to showcase their products. With the right synergy, tourism and MSMEs can strengthen each other, positioning tourism not only as an economic driver but also as a strategic tool for human development (Mihalic, 2016). Tourism accelerates economic growth, creates jobs, increases income and living standards, and stimulates other productive sectors (Croes et al., 2021).

Recognizing the crucial role of entrepreneurship in supporting national economic growth, the government has implemented various policies to develop women-led MSMEs. Around 60 percent of MSMEs are managed by women, prompting targeted programs such as business incubation, budget allocation, and social assistance to empower women entrepreneurs (Maimuna et al., 2022). Women are often perceived as successful entrepreneurs due to their strong determination, quality, and capability in advancing economic development (Khan et al., 2021). Apart from their roles as homemakers, many women also engage in business activities to supplement household income (García-Aquino et al., 2024). However, they face challenges such as limited access to start-up capital, insufficient skills in designing effective marketing strategies, and lack of knowledge regarding product innovation and quality improvement—factors that undermine competitiveness (Jahanshahi et al., 2010).

These challenges can hinder women MSMEs' ability to achieve sustainable performance. Sustainable performance integrates social, economic, and environmental objectives of business activities, ultimately enhancing organizational value (Naciti, 2019). Attaining sustainable performance requires the implementation of green relational capital (Haddad

et al., 2024). Green relational capital reflects interactive relationships between businesses and customers, suppliers, networks, and partners concerning environmental management (Yong et al., 2019). Applying this concept is essential for balancing economic growth and environmental preservation, thus contributing to sustainable performance (Alkaf et al., 2023; Vale et al., 2022; Haddad et al., 2024; Zalfa & Novita, 2023). Nonetheless, other studies have found contrasting results, reporting that green relational capital does not always contribute to sustainable performance (Firmansyah et al., 2024; Hunafah & Rachmawati, 2023).

In addition to green relational capital, green innovation also contributes to enhancing sustainable performance. Green innovation is defined as hardware or software innovations related to green products or processes, including technologies that promote energy savings, pollution prevention, waste recycling, green product design, and environmental management (Chen et al., 2006). MSMEs in natural tourist destinations have strong opportunities to adopt green innovation, for example in producing eco-friendly souvenirs. Such innovations not only support environmental sustainability but also increase the attractiveness of products for environmentally conscious tourists. Prior research confirms that green innovation positively influences sustainable performance (Dangelico & Pontrandolfo, 2015; Huang & Li, 2017; Husnaini & Tjahjadi, 2021). However, some studies argue otherwise, suggesting that green innovation does not significantly impact sustainable performance (Candy et al., 2024).

Given these findings and ongoing debates, this study investigates the influence of green relational capital and green innovation on sustainable performance within a unified model explained through the Resource-Based Theory.

LITERATURE REVIEW

Resource-Based Theory (RBT)

The Resource-Based Theory (RBT) provides the foundational framework for modeling the relationship between green relational capital and sustainable performance through green innovation and entrepreneurial orientation. RBT highlights organizational resources and capabilities as tangible and intangible assets that help firms develop and implement strategies (J. Barney, 1991). Both internal and external factors influence firm performance depending on industry and competitive context (Makhija, 2003). In this context, green relational capital refers to two-way communication between businesses and their stakeholders—including consumers, suppliers, networks, and partners—concerning environmental management, which in turn fosters eco-friendly innovations that help create profit and competitive advantage (Chen, 2008). Green innovation, as an outcome of leveraging relational capital, represents a valuable organizational capability (Bhatti et al., 2024). The ability to develop greener products, processes, or services is a crucial internal resource that strengthens business sustainability (Ahmed et al., 2023).

According to RBT, firms with valuable, rare, and hard-to-imitate resources can achieve superior competitive advantages compared to others (Barney et al., 2011). Extensions of RBT have introduced the concept of “dynamic capabilities,” reflecting the firm’s ability to reconfigure and invest resources to adapt to changing and disruptive environments (Eisenhardt & Martin, 2000). This means firms must channel resources into capabilities that foster innovation, create value, and secure sustainable competitive advantage (Rauch et al., 2009).

Green Relational Capital and Sustainable Performance

Empirical studies have emphasized the role of green relational capital in enhancing sustainable performance by balancing economic growth and environmental conservation (Alkaf et al., 2023; Vale et al., 2022; Haddad et al., 2024; Zalfa & Novita, 2023). However, some research has revealed no significant relationship (Firmansyah et al., 2024; Hunafah & Rachmawati, 2023).

Green Innovation and Sustainable Performance

Growing concerns about climate change have driven firms to adopt green strategies, with green innovation emerging as a dominant approach (Singh et al., 2020). By redesigning innovation strategies, firms strengthen their ability to improve sustainability (Yusliza et al., 2020). Green innovation encompasses product, process, and business model innovations that reduce energy consumption, cut pollution, recycle waste, and optimize resource use (Chiou et al., 2011; Triguero et al., 2013).

HYPOTHESIS

Sustainable performance refers to the firm’s ability to achieve long-term success while minimizing environmental and social harm (Haddad et al., 2024). Green relational capital, rooted in trust, communication, and collaboration with external stakeholders, serves as an intangible asset that enhances environmental performance and creates lasting competitive advantage (Chen, 2008; Fitri et al., 2022). Particularly in emerging markets, strong stakeholder relationships improve environmental practices by facilitating knowledge exchange (Zahoor & Gerged, 2021). However, overreliance on these relationships may reduce overall performance efficiency (Wu et al., 2023).

Hypothesis 1: Green relational capital has a positive effect on sustainable performance.

Green innovation has been recognized as a mechanism to reduce environmental costs, enhance competitiveness, and improve firm sustainability (Eisenhardt & Martin, 2000; Przychodzen & Przychodzen, 2015). Empirical evidence confirms its positive impact on sustainable performance (Dangelico & Pontrandolfo, 2015; Huang & Li, 2017; Husnaini & Tjahjadi, 2021).

Hypothesis 2: Green innovation has a positive effect on sustainable performance.

All the above-mentioned hypotheses and the main supporting literature are combined in the table below (Table 1), as a basis for advancing the following conceptual model (Figure 1).

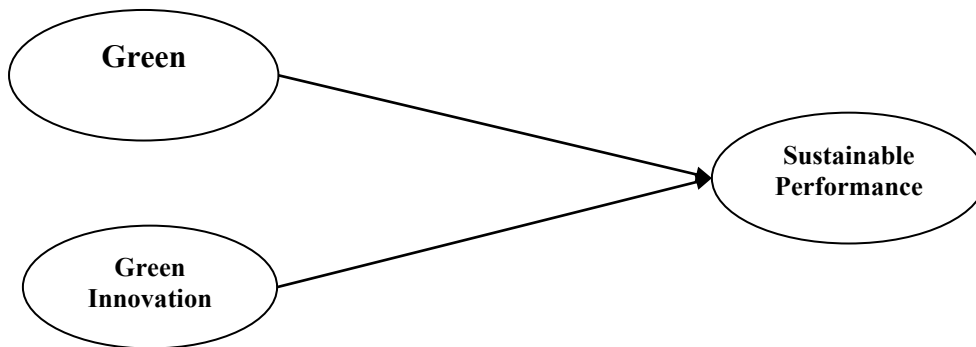


Figure 1. Structural Research Model and Hypotheses.
 Source: Processed Data (2025)

METHODS

This study aims to implement the concept of a green economy in women-led MSMEs operating in the tourism sector, focusing on how green innovation and entrepreneurial orientation mediate the relationship between green relational capital and sustainable performance. The framework is grounded in Resource-Based Theory (RBT) (see Figure 1).

A quantitative approach with explanatory research design was employed. The population consisted of 193 women-led MSMEs located around several natural tourism sites in East Java Province, Indonesia, namely Ijen Crater, Mount Bromo, Mount Kawi, Mount Kelud, and Lake Sarangan. A saturated sampling technique was applied, meaning the entire population was included as the research sample.

Survey items were measured using a five-point Likert scale. Green relational capital was measured through three indicators and six items adapted from (Mohd et al., 2019);(Delgado-Verde et al., 2014);(Cohen & Kaimenakis, 2007). Green innovation was assessed through three indicators and six items based on (Yusliza et al., 2020);(H. Liu & Lyu, 2022). Sustainable performance was measured with three indicators and six items from (Rauch et al., 2009);(Wiklund & Shepherd, 2003);(Guzman et al., 2017);(Ratnawati et al., 2024).

The data were analyzed using SmartPLS 4.0 to validate both the measurement and structural models. Analyses included convergent and discriminant validity, regression analysis (R-squared values), effect size (f-squared), predictive relevance (Q-square), and direct association testing using bootstrapping (Parmar et al., 2014). Convergent validity was tested through factor loadings, Cronbach’s alpha, and composite reliability.

RESULTS

Measurement Model (Outer Model)

The outer model assesses the validity and reliability of constructs. Convergent validity, discriminant validity, and composite reliability were applied as criteria.

Validity Model

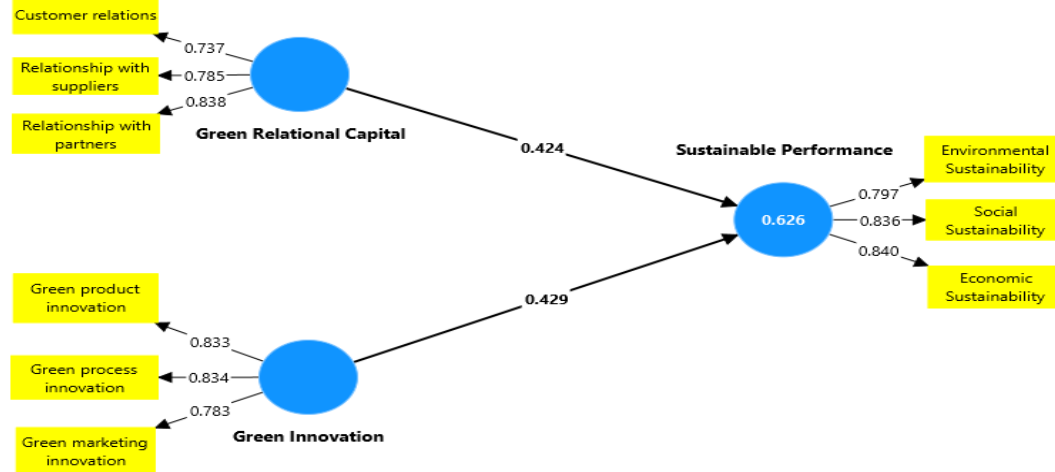


Figure 2. Outer Model Testing (Measurement Model)
Source: Processed Data (2025)

The study of green relational capital, green innovation, and sustainable performance variable indicators based on factor loading values is presented in Table 1. Factor loading analysis (Table 1) shows that all indicators exceeded the threshold value of 0.7, confirming their validity. Thus, customer relations, supplier relations, and partner relations effectively represent green relational capital; green product, process, and marketing innovation represent green innovation; and environmental, social, and economic sustainability represent sustainable performance.

Table 1. Factor Loading of Research Indicators

	Green Relational Capital	Green Innovation	Sustainable Performance
Customer relations	0.737		
Relationship with suppliers	0.785		
Relationship with partners	0.838		
Green product innovation		0.833	
Green process innovation		0.834	
Green marketing innovation		0.783	
Environmental Sustainability			0.797
Social Sustainability			0.836
Economic Sustainability			0.840

Source: Processed Data (2025)

Average Variance Extracted (AVE)

The Average Variance Extracted (AVE) is the value used in convergent validity testing because it is obtained from convergent validity results. AVE results can be seen in Table 2 below:

Table 2. Average Variance Extracted Results

Construct	Average Variance Extracted (AVE)
Green Relational Capital	0.621
Green Innovation	0.667
Sustainable Performance	0.680

Source: Processed Data (2025)

Table 2 shows that all constructs have an AVE value above 0.5, this result indicates that the convergent validity test is fulfilled.

Composite Reliability

To ensure there are no measurement-related issues, the final step in evaluating the outer model is to test the model's unidimensionality. This unidimensionality test is conducted using composite reliability and Cronbach's alpha. For both indicators, the cut-off value is 0.7. Table 3 shows that all constructs have composite reliability values above 0.7. Therefore, no unidimensionality problems were found.

Table 3. Composite Reliability Results

Construct	Composite reliability
Green Relational Capital	0.723
Green Innovation	0.761
Sustainable Performance	0.766

Source: Processed Data (2025)

Structural Model (Inner Model)

The structural model or inner model testing is evaluated by looking at the R² value of the latent variables using the Geisser Q-square test, then looking at the magnitude of the structural path coefficient. The stability of the estimates of the structural path coefficients is evaluated using a t-statistic test obtained from the bootstrapping procedure. The inner model testing can be seen from the R-square value of the equation between the latent variables. The results of the R-square calculation can be seen in Table 4.

Based on the calculation results in Table 4, the total coefficient of determination (Q²) was used to test the model's suitability. Q-square measures how well the observed values

generated by the model and its parameter estimates fit. To determine the Q-square value, the following formula is used:

$$Q^2 = 1 - (1 - R_1^2) \tag{i}$$

The Q-square calculation using the R-square data from the three models above can be done as follow that Q2 = 0.39. Based on the Q-square (Q2) calculation, the Q-square value obtained was 0.392, meaning that the research model can explain 39.2% of the contribution of Green Relational Capital and Green Innovation to Sustainable Performance of 39.2%.

Table 4 Results of R-Square Calculation

Construct	R-Square
Sustainable Performance	0.626

Source: Processed Data (2025)

Hypothesis Testing

Results from the regression analysis are shown in Table 5. Table 5 explains that green relational capital has an influence on sustainable performance with a coefficient value of 42.4%, meaning that an increase in green relational capital is followed by an increase in sustainable performance of 42.4%. The green innovation variable has an influence on sustainable performance with a coefficient value of 42.9%, meaning that an increase in green innovation is followed by an increase in sustainable performance of 42.9%.

Table 5. Results of Regression Weight Analysis

	Koefisien	T statistics	P values
Green Relational Capital -> Sustainable Performance	0.424	5.480	0.000
Green Innovation -> Sustainable Performance	0.429	5.432	0.000

Source: Processed Data (2025)

Discussion

Green relational capital and sustainable performance.

Green relational capital represents an organization’s external relationships with stakeholders in environmental contexts, including eco-friendly suppliers, environmentally conscious customers, government agencies, and green communities (Chen, 2008). Strong external ties rooted in sustainability foster trust and collaboration, enabling firms to access resources and environmental innovations that enhance sustainable performance (D. Liu et al., 2022).

Based on the analysis results, it is proven that green relational capital has an influence on sustainable performance. This result can be explained that female MSMEs in tourist areas who are able to implement green relational capital which is manifested in Relationships with partners, such as business partners helping to improve skills in environmentally friendly production processes and providing easy access to marketing of environmentally friendly products contribute to sustainable performance which is manifested in Economic Sustainability, such as increased profitability in business activities and the ability to carry out sales promotions.

This study confirms that women-led MSMEs in tourism areas benefit from green relational capital through improved partnerships, enhanced marketing access, and eco-friendly production support. These practices strengthen economic sustainability by improving profitability and sales promotion capacity. The findings align with prior studies (Haddad et al., 2024; Yong et al., 2019; Alkaf et al., 2023;Vale et al., 2022;).

Green innovation and sustainable performance.

Green innovation emphasizes resource efficiency, environmental impact reduction, and eco-value creation (Chen et al., 2006). By adopting cleaner production processes, MSMEs reduce emissions and waste while improving environmental performance (Kraus et al., 2020). Green innovation also enhances economic performance by lowering production costs, expanding green market opportunities, and differentiating products (Xie et al., 2019). Socially, it improves legitimacy, customer satisfaction, and relationships with regulators (Zhang et al., 2018).

Based on the analysis results, it is proven that green innovation has an impact on sustainable performance. This result can be explained that female MSMEs in tourist areas who are able to implement green innovation manifested in green process innovation such as product manufacturing processes, MSMEs reducing the use of emissions and waste and MSMEs recycling waste before disposal contribute to sustainable performance manifested in Economic Sustainability, such as increased profitability in business activities and the ability to carry out sales promotions.

This study shows that green process innovation, such as waste reduction and recycling, significantly strengthens MSMEs' economic sustainability. The results support previous findings that green innovation is a vital mechanism for achieving competitive advantage and sustainable performance (Chiou et al., 2011; Triguero et al., 2013; Dangelico & Pontrandolfo, 2015; Huang & Li, 2017; Husnaini & Tjahjadi, 2021).

CONCLUSION

This study demonstrates that both green relational capital and green innovation significantly influence sustainable performance, offering empirical support for Resource-Based Theory. According to RBT, firms that possess valuable and rare resources can achieve superior competitive advantages (J. B. Barney et al., 2011). The extension of RBT into dynamic capabilities explains how MSMEs can leverage resources into capabilities that drive innovative, eco-friendly practices, ensuring long-term competitiveness (Eisenhardt & Martin, 2000). For practical implications, women-led MSMEs should actively strengthen green relational capital by building relationships with eco-friendly suppliers, environmental communities, and sustainability-conscious consumers. Strong networks will facilitate access to information, sustainable raw materials, and new market opportunities. MSMEs are also encouraged to integrate green innovation in their operations—such as producing eco-friendly goods, minimizing plastic use, sourcing sustainable local materials, and applying energy-efficient production processes. These practices not only boost competitiveness but also enhance business reputation among environmentally aware consumers.

Government agencies, particularly MSME support offices, should provide training and mentoring programs focused on green innovation and sustainable networking strategies. Business incubation initiatives should prioritize the development of eco-friendly products, access to green financing, and eco-label certification to reinforce sustainability in women-led MSMEs.

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