

Green Transformational Leadership on MSME Performance Mediated by Green Product Innovation: Study on Batik MSMEs

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ABSTRACT: Based on the Resource-Based View theory (RBV), this research aims to examine the influence of the relationship between green transformational leadership on the performance of Micro, Small, and Medium Enterprises (MSMEs) which is mediated by environmentally friendly product innovation. This research uses a survey. Research population of Batik MSME owners, Sragen Regency, Indonesia. Convenience sampling was used with a total of 100 sample. Data analysis using PLS-SEM. The research results show that green transformational leadership has a significant effect on the performance of MSMEs. Green transformational leadership has a significant effect on environmentally friendly product innovation. Environmentally friendly product innovation has a significant effect on the performance of MSMEs. The mediation results show that the relationship between green transformational leadership and MSME performance is mediated by green product innovation and has a significant effect. This study highlights green product innovation as a key mediator between green transformational leadership and MSME performance, supporting the RBV framework. The study offers practical insights to align cultural preservation with sustainable business practices. This study is limited as it focuses on batik MSMEs in Sragen and the research design is cross-sectional, limiting generalizability and long-term insights. This study offers important insights and a unique contribution to addressing research gaps, particularly in heritage-based industries.

KEYWORDS: Cultural Heritage, Green Product Innovation, Green Transformational Leadership, MSME Performance, Sustainable Development

I. INTRODUCTION

Environmental issues have gained significant attention in global discussions, due to their widespread risks of environmental degradation, economic problems, and disruption of social order (World Economic Forum, 2022). This is demonstrated by increasing global temperatures, extreme weather, resource depletion, and the attention and pressure of various parties who raise this issue, such as governments, non-governmental organizations (NGOs), investors, and the society (Li et al., 2024). In this case, human activities are considered to have the most impact on environmental problems, both physical ecosystems and social transformation (Cavicchioli et al., 2019), especially industries that use a larger number of resources and produce waste that can harm the environment.

Various business actors contribute to changes in environmental balance which results in businesses carrying out activities that support environmental practices. The government issued Presidential Regulation of the Republic of Indonesia Number 59 of 2017 which explains that Indonesia plays an active role in determining sustainable development targets in the document Transforming Our World: the 2030 agenda for sustainable development growth (SDGs). Micro, small and medium enterprises (MSMEs) contribute to realizing the SDGs so that they are diversified in social goals and environmentally friendly practices (Putra & Utama, 2022; Yanti & Nawangsari, 2019; Ye et al., 2022). According to Nawangsari & Yanti, (2019) revealed that companies or business

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actors such as MSMEs face challenges related to business sustainability. Business actors are required to play a role in protecting the environment and improving environmentally based human resource management strategies to maintain their existence in the business world (Perez et al., 2023). This is because over the last two decades environmental damage has occurred very quickly (Siyal et al., 2022). Environmental problems can become a serious threat to society. Ongoing environmental damage is caused by water and air pollution, forest fires, erratic climate change, and so on.

Companies and MSMEs in developing countries have started to pay attention to environmentally friendly issues (Elisabeth Christian & Lutfi Alhazami, 2023). However, the main responsibility lies with the company leadership (Siyal et al., 2022). Companies are forced to adopt environmentally friendly practices because people now demand environmentally friendly products (Ye et al., 2022). In particular, businesses focus on innovative environmentally friendly products, helping to gain competitive advantage and improve performance (Siyal et al., 2022; Ye et al., 2022). The business world, especially MSMEs, are trend followers by nature, implementing environmentally friendly practices to improve the image of sustainable innovation to gain a competitive advantage (Borah et al., 2022). Environmentally friendly innovation can help MSMEs gain a competitive advantage, as consumers today have become overly concerned about environmentally friendly products (Cabrita et al., 2016). In the current era, MSMEs can gain a competitive advantage by differentiating themselves from competitors by overcoming environmental problems. For MSMEs, implementing strategies alone is not enough to gain profits, but strategies that pay attention to environmental impacts can guarantee business sustainability in the future (Rehman & Alsolamy, 2023; Khan et al., 2024; Siyal et al., 2022; Ye et al., 2022).

Developing environmentally friendly products and strategies is part of Corporate Social Responsibility (CSR) (Vuong & Bui, 2023). Although MSMEs are not as responsible as public companies in terms of social and environmental responsibility, they are in a social environment where people's attention is directly focused on their business activities. Therefore, environmental insights and practices still need to be implemented to gain legitimacy from society. Proposed by Resource-Based View Theory (RBV), a company's competitive advantage comes from internal resources, specifically human resources (Barney & Arian, 2001). In this case, business owners are believed to have full responsibility in creating MSMEs' competitive advantage through environmental and sustainability insights (Farida & Setiawan, 2022), thus improving MSME performance.

Previous studies have explored the factors that influence MSME performance through the lens of environment and sustainability. The study found that MSME performance is driven by environment orientation (Akomea et al., 2023; Laily et al., 2025; Oduro et al., 2022), sustainability practice and innovation (Akomea et al., 2023; Arshad et al., 2023; Deku et al., 2023; Do et al., 2024), entrepreneurial marketing practice (Sahu & Panda, 2024), networking (Uzkurt et al., 2024), business strategy (Sagita et al., 2024), technology adoption (Al-Mutawa & Saeed Al Mubarak, 2024; Samat et al., 2024), intellectual capital (Ali et al., 2024; Arshad et al., 2023), digital marketing (Borah et al., 2022; Mushi, 2024; Samat et al., 2024), CSR (Oduro et al., 2022; Thanh et al., 2021; Tjep Le et al., 2023), transformational leadership (Dahleez & Abdelmunim Abdelfattah, 2022), adaptability (Uzkurt et al., 2024) and corporate governance (Le & Behl, 2022). Innovation capabilities were also found to mediate some of these factors on MSME performance (Borah et al., 2022; Sahu & Panda, 2024). Although many studies have provided empirical evidence on several factors that drive MSME performance, in the sustainability framework. However, some domains still receive limited attention, particularly the role of leadership.

In recent years, global attention continues to increase on environmental issues. In response to this, many companies have made commitments and declared themselves as companies that care about the environment (Trouwloon et al., 2023). However, the limited evidence on their practices and initiatives has raised concerns about greenwashing, where companies make exaggerated and potentially misleading claims. Nonetheless, relevant regulations that encourage environmentally sound practices are still limited. Such regulations are further limited to MSMEs, as they do not have public accountability. MSMEs also have the potential to participate in encouraging sustainable practices, as they dominate in Indonesia. Innovative strategies and innovations are believed to be the company's competitive advantage that can drive overall performance (Almehairbi et al., 2024). Therefore, in this case the role of leadership is indispensable to drive sustainable practices and company performance.

Previous studies have provided empirical evidence on the role of transformational leadership in driving MSME performance (Dahleez & Abdelmunim Abdelfattah, 2022), but these studies are still limited, especially in the realm of green initiatives. Perez et al. (2023) revealed that there is a positive relationship indicating the relationship between green transformational leadership and performance. However, the green transformational leadership factor on performance still causes differences in previous empirical studies (Srimulyani et al., 2023). The relationship between green product innovation and performance (Ye et al., 2022) found a positive influence, but other studies found that the relationship between green product innovation showed a negative influence (Hugo & Nuringsih, 2020; Majali et al., 2022).

Green transformational leadership refers to the extension of the transformational leadership style to the environmental field, thereby motivating employees to achieve green environmental goals (Nguyen et al., 2023). Leadership style is very important for

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pro-environmental behavior (Rehman & Alsolamy, 2023). When leaders adopt democratic and open communication regarding environmental matters, employees are more willing to take action on the environment (Khan et al., 2024). Green transformational leadership creates an inspiring vision, moves employees to take the initiative to complete tasks and achieve goals (Liu & Yu, 2023), and drive MSME competitive advantage (Almehairbi et al., 2024). The transformational leadership style encourages employees to develop creative ideas in the company or business and take action to increase innovation.

Previous studies have also given considerable attention to the role of innovation in mediating several business strategies to MSME performance (Borah et al., 2022; Sahu & Panda, 2024). However, its role in influencing transformational leadership on MSME performance has been explored to a limited extent, compared to its potential in bridging leadership and organizational performance. Green product innovation is one strategy as a company solution in developing business so as not to violate government regulations (Mariyamah & Handayani, 2020). Majali et al., (2022) explain that environmentally friendly innovation is an environmentally friendly product or process innovation through hardware and software innovation, including technological innovation involved in the process of managing the business environment. In practice, the application of environmentally friendly innovation consists of green product innovation and environmentally friendly process innovation (Shehzad et al., 2023). This research uses green product innovation to encourage efficient use of raw materials, produce lower raw material costs, and provide additional income by finding innovative ways to convert production waste into products that can be sold (Yu et al., 2022), by using environmental attributes, green product innovation will gain cost-effective benefits from consumers and business actors (Singh et al., 2020).

Based on the above discussion, this study is motivated to examine the effect of green transformational leadership on MSMEs performance, with green product innovation as a mediating variable. This study was conducted in the batik industry. Batik is one of the leading MSMEs prioritized by the Indonesian government. The government continues to develop batik centers in various regions by highlighting the uniqueness of each region. One of them is Sragen Regency, Central Java, which is a batik center area. This can be seen from the large number of batik MSMEs in the area. In order to improve the regional economy, the Sragen Regency Government has intensified entrepreneurship programs for its people. Community entrepreneurship in this region has developed rapidly and this can be seen, among other things, from the increase in the number of MSMEs over time (SoloPos-Bisnis, 2023). The batik industry in Sragen is a work of art that is made carefully and carefully to produce a special combination of patterns or motifs and colors. The patterns and colors of batik have symbolic and philosophical meanings. Batik is also an expression of creativity as well as the cultural and spiritual values of the Indonesian people. Therefore, all components of society together with the government should take steps on an ongoing basis to protect and preserve batik. Batik not only contains cultural heritage that needs to be preserved but also has economic and business value that must be developed (SoloPos-Bisnis, 2023). Meanwhile, most batik MSMEs do not support sustainable development. Awareness and responsibility of batik MSMEs for environmental sustainability is still low. This can be seen in the use of batik dyes by craftsmen, most of whom use synthetic dyes and are not equipped with a waste management system. Starting from this phenomenon, this research offers solutions and approaches to environmental sustainability problems in the batik industry.

By addressing the relevant gaps above, this study offers several major contributions. First, it provides empirical evidence of the influence of green transformational leadership on MSME performance, mediated by green product innovation. Second, by examining the batik industry, this study provides important insights that green leadership does not only exist in transforming the green environment, but also cultural heritage. Third, the results of this study highlight the importance of an environmentally oriented transformational leadership style in encouraging green product innovation and MSMEs performance. In the context of Indonesia's culturally based industries, this research offers an important starting point for future research that seeks to harmonize environmental sustainability with the preservation and advancement of traditional crafts.

II. LITERATURE REVIEW

A. Resource-Based View Theory

This research is built on the Resource-Based View (RBV) theory, and this research argues that the view is from the inside out or a specific perspective of the business world and companies regarding the reasons organizations succeed or fail (Barney & Arkan, 2001). According to the RBV, green transformational leadership, green product innovation, are strategic resources that combined with performance help companies recognize, utilize and maintain environmental initiatives (Tjahjadi et al., 2020). This research framework is based on the underlying support of the Resource-Based View (RBV) theory, namely green environmental innovation on the performance of MSMEs. Green transformational leadership as the main resources for companies are supported by RBV because green product innovation is a resource that can produce competitive advantages. However, adopting a green product innovation is currently the main factor in improving the performance of MSMEs (Majali et al., 2022). Meanwhile, the role of green

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transformational leadership provides motivation and courage for employees to experiment supported by motivational abilities. Leadership that provides motivation and empowers employees to engage in green environmentally friendly practices (Chaithanapat et al., 2022; Shehzad et al., 2023). Thus, green transformational leadership and green entrepreneurial orientation provide space for green product innovation and green knowledge management, which produce superior MSME performance, directly and indirectly (Majali et al., 2022; Shehzad et al., 2023). Therefore, the RBV framework conceptualizes the relationship between green transformational leadership, green product innovation, and MSME performance.

B. Hypothesis Development

Green transformational leadership has a significant effect on the performance of MSMEs in several ways (Majali et al., 2022) and develops employee attitudes towards environmentally friendly practices (Chaithanapat et al., 2022), which leads to sustainability and improves the company's financial performance. Researchers state that green transformational leadership is beneficial because of its characteristics such as deviation from environmentally friendly and sustainable practices (Majali et al., 2022), providing experimental employees with the flexibility to make risky decisions, and the use of product and process innovations leading to business success (Hugo & Nuringsih, 2020). Due to sustainable practices, consumers become interested in companies and lead to financial success due to increased income (Mariyamah & Handayani, 2020), as in the current era, consumers really care about the environment and environmentally friendly practices (Yanti & Nawangsari, 2019). In this context, it is assumed that green transformational leadership is most suitable for improving the performance of MSMEs. Based on the discussion above, it is hypothesized as follows:

H1: Green Transformational Leadership has a positive influence on MSME Performance.

Green product innovation is the adoption of environmentally friendly production and product production processes (Ye et al., 2022). Green product innovation is the implementation of environmentally friendly practices by a business (Singh et al., 2020). These practices include reducing emission levels, reducing the use of environmentally unfriendly materials, using recycled materials, and consuming less energy in the production process of a business (Perez et al., 2023; Siyal et al., 2022; Ye et al., 2022). The motivational ability opportunity proposition is in line with the fact that company or business leaders who give employees freedom to encourage innovation, which is also supported by the RBV theory, functions as a resource and environmentally friendly transformational leadership will encourage green product innovation (Majali et al., 2022; Mariyamah & Handayani, 2020). Based on the discussion above, it is hypothesized as follows:

H2: Green Transformational Leadership has a positive influence on Green Product Innovation.

Green product innovation has a significant positive impact on performance (Majali et al., 2022), as identified by researchers, environmentally friendly practices are a burden for businesses (Perez et al., 2023). Similarly, companies that undertake eco-friendly practices follow cost-saving tactics to save resources, which leads to cost efficiency and improves the performance of MSMEs (Singh et al., 2020). Cost efficiency improves market position, as seen in improved feedback from consumers, suppliers, and governments (Khan et al., 2024). Energy savings, as part of green product innovation, reduce costs and result in reduced waste disposal, which has a positive impact on company performance (Majali et al., 2022). Based on the discussion above, this research hypothesizes that green product innovation improves performance. So, it is hypothesized as follows:

H3: Green Product Innovation has a positive influence on MSME Performance.

Green transformational leadership encourages employees to conduct experiments, which leads to green product innovation (Putra & Utama, 2022; Singh et al., 2020). The literature on green innovation and performance is abundant (Majali et al., 2022). However, what needs to be noted is that without support from transformational leadership, employees cannot be involved in green product innovation (Shehzad et al., 2023). Resource deployment results in superior MSME performance due to cost-effective and environmentally friendly practices (Khan et al., 2024). Green transformational leadership is useful because of its vision to promote environmentally friendly practices in recruiting employees who have the ability and confidence as well as environmental values to develop environmentally friendly products (Cabrita et al., 2016). Green transformational leadership provides training, development and considers compensation for involvement in environmentally friendly activities as a requirement to motivate employees on environmental benefits (Majali et al., 2022; Shehzad et al., 2023). Green product and process innovation significantly influences a company's positive impact on the environment and improves performance due to reduced costs, time and other resources (Khan et al., 2024; Majali et al., 2022; Shehzad et al., 2023). Based on the discussion above, it is hypothesized as follows:

H4: Green Product Innovation mediates the influence of Green Transformational Leadership on MSME Performance.

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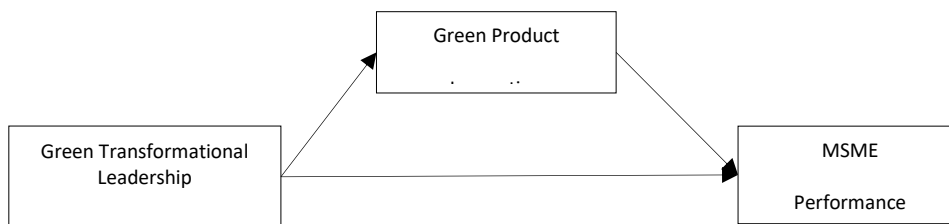


Figure 1. Research Model

III. METHODOLOGY

A. Research Design

This study uses a quantitative approach with a survey method to collect primary data directly in the field. The population of this study consists of MSMEs owners in the Batik industry in Sragen Regency, Central Java, which is one of the batik production centers in Indonesia. Given the scope and practical considerations of this study, the sample collection method used non-probability sampling with convenience sampling technique. This method was chosen to allow the researcher to access respondents more efficiently, particularly those who were willing to participate during the data collection period. To facilitate wide and accessible distribution, the questionnaire was administered online via Google Forms. A total of 100 valid responses were collected and used for further analysis. Although convenience sampling may limit generalizability, it is considered appropriate for exploratory research in specific geographical and cultural contexts such as this study (Andrade, 2021).

B. Measurement

The questionnaire is divided into two parts. The first section includes the user's personal information about socio-demographics such as age, gender, education and income. The second part consists of data about the main variables in this research such as green transformational leadership, green product innovation, performance SMEs. Green transformational leadership was measured using 5 question items adapted from (Majali et al., 2022). Green product innovation was measured using 5 question items adapted from (Majali et al., 2022). Performance SMEs was measured using 5 question items adapted from (Majali et al., 2022). Responses to each question item were obtained using a 5-point Likert scale from 1 (Strongly Disagree) to 5 (Strongly Agree).

C. Data Analysis

The collected data were analyzed using descriptive statistical analysis to summarize the characteristics of the respondents. For hypothesis testing, this study uses Structural Equation Modeling - Partial Least Squares (SEM-PLS) using SmartPLS 3.0 software, which is very suitable for predictive and exploratory research involving fairly complex models and small to medium sample sizes (Hair et al., 2014). Through this method, this study tested four hypotheses, generated path coefficients, and significance values to determine the strength and direction of the relationship between variables. This analysis provides a comprehensive understanding of the mediating effect of green product innovation in the influence of green transformational leadership on MSMEs performance.

IV. RESULTS AND DISCUSSION

A. Respondent Profile

The research was conducted using a survey distributed to a target of 100 respondents. Table 1 presents the profile of the respondents in this study. Based on gender, it can be seen that the number of respondents with male gender was 68 and the number of respondents with female gender was 32 or 32%. Based on educational level, it can be seen that respondents with a junior high school education level numbered 36 or respondents with a high school education level numbered 46, and respondents with a Bachelor's and D3 education level numbered 15 and 3. Based on age, it can be seen that respondents aged 17-25 years totaled 16, respondents aged 26 -35 years numbered 28, respondents aged over 36 years numbered 56, respondents with income below 50 million numbered 84, respondents with income 50-200 million numbered 10, respondents with income above 350 million numbered 6.

Table 1. Respondent Profile

Description	Description	Amount	Percentage
Gender	Man	68	68%
Gender	Woman	32	32%

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Education	Junior High School	36	36%
Education	Senior High School	46	46%
Education	D3	3	3%
Education	S1	15	15%
Age	17-25 Years	16	16%
Age	26-35 Years	28	28%
Age	>36 Years	56	56%
Income	<50 million	84	84%
Income	50>200 million	10	10%
Income	>350 million	6	6%

Source: Processed Data (2024)

B. Measurement Model

Data analysis was carried out using PLS-SEM via SMART PLS Version 3.0 software. The testing process was carried out in 3 stages including internal consistency reliability, convergent validity and discriminant validity. The re-sults of internal consistency reliability testing were carried out using Cronbach Alpha. From the data analysis carried out, the results obtained are as shown in Table 2.

Table 2. Internal Consistency Reliability Testing

Variable	Cronbach Alpha	Description
Green Product Innovation	0.865	Very good
Green Transformational Leadership	0.893	Very good
Performance MSMEs	0.861	Very good

Source: Processed Data (2024)

The test results in the table above show a reliability value above 0.7. Joe F Hair et al. (2019) stated that a Cronbach alpha score above 0.7 is in the very good category. Thus, overall, it can be concluded that all variables passed the internal consistency reliability test. Convergent validity testing is carried out by looking at the Reliability Indicator (Outer Loading) value and the AVE (Average Variance Extracted) value. The standard outer loading value is very good if it has a score above 0.7 and the standard AVE value above 0.5 has very good criteria (Hair et al., 2021). The results of convergent validity testing can be seen in Table 3.

Table 3. Convergent Validity Test

Variable	Indicator	Loading Factor	Composite Reliability	AVE
Green Product Innovation	GPI1	0.727	0.903	0.652
	GPI2	0.814		
	GPI3	0.843		
	GPI4	0.782		
	GPI5	0.863		
Green Transformational Leadership	GTL1	0.794	0.903	0.702
	GTL2	0.849		
	GTL3	0.803		
	GTL4	0.905		
	GTL5	0.833		
Performance MSMEs	PS1	0.761	0.903	0.640
	PS2	0.790		
	PS3	0.768		

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Variable	Indicator	Loading Factor	Composite Reliability	AVE
	PS4	0.816		
	PS5	0.860		

Source: Processed Data (2024)

The convergent validity test results in the table above show an outer load-ing value above 0.7 and an AVE value above 0.5. So, it can be concluded that each variable and indicator has very good convergent validity. Discriminant validity testing using the Fornell-Larcker criteria shows the highest cross-loading correlation value (Hair et al., 2019). Test results can be seen in Table 4.

Table 4. Discriminant Validity Test

Variable	Green Product Innovation	Green Transformational Leadership	Performance MSMEs
Green Product Innovation	0.807		
Green Transformational Leadership	0.738	0.838	
Performance MSMEs	0.620	0.556	0.800

Source: Processed Data (2024)

C. Structural Model Evaluation

The next step after evaluating the measurement model is evaluating the structural model to test the previously proposed hypothesis. This analysis was carried out by testing the direct and indirect influence between the hypothesized variables. Figure 2 are the results of the PLS-SEM analysis. The complete re-sults of hypothesis testing can be seen in Table 5. The results of hypothesis testing use a confidence level of 95%, so the standard used for the t value is 1.96. The t-test value is greater than 1.96 and the p-value is below 0.05, so it can be concluded that the hypothesis is accepted. All hypotheses proposed in the research have a t-test value greater than 1.96 and a p-value below 0.05, so it can be concluded that all hypotheses 1 to 4 are accepted.

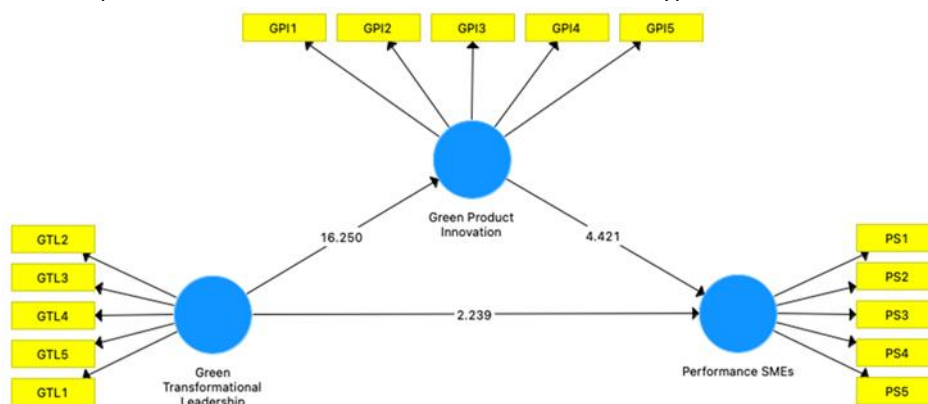


Figure 2. Structural Model Testing

Table 5. Hypothesis Testing Results

Hypothesis	Sample Mean	T Statistics	P-Values	Description
Green Transformational Leadership -> Performance MSMEs	0.202	2.239	0.026	Supported
Green Transformational Leadership -> Green Product Innovation	0.746	16.250	0.000	Supported
Green Product Innovation -> Performance MSMEs	0.488	4.421	0.000	Supported
Green Transformational Leadership -> Green Product Innovation -> Performance MSMEs	0.364	4.175	0.000	Supported

Source: Processed Data (2024)

D. Discussion

The results of this research show that Green Transformational Leadership is significantly related to SMEs Performance (H1). Likewise, according to RBV theory (Barney & Arikan, 2001), the role of the leader is crucial to inspire and encourage employees, increasing results and productivity (Majali et al., 2022; Perez et al., 2023) in the same way as Green Transformational Leadership

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im-proves the Performance of SMEs (Liu & Yu, 2023; Nguyen et al., 2023). The findings of this study are consistent with previous research (Liu & Yu, 2023; Majali et al., 2022; Perez et al., 2023), which shows a direct correlation between Green Transformational Leadership and Performance of SMEs. The findings of this research are very valuable, because Green Transformational Leadership focuses on efforts to attract and motivate personnel to understand environmentally friendly organizational goals, provide subordinates with clear goals, inspiration, vision and enthusiasm, and to fulfill SMEs Performance.

The results of this research indicate that Green Transformational Leadership is significantly related to Green Product Innovation (H2). Likewise according to the theoretical basis of RBV (Barney & Arian, 2001). Green Transformational Leadership influences Green Product Innovation as leaders play an important role in encouraging environmentally friendly employees to be enthusiastic about innovation (Elisabeth Christian & Lutfi Alhazami, 2023). Leaders make decisions about direction. Therefore, if you believe that Green Product Innovation is important for MSMEs to survive, then employees will support a more environmentally friendly business direction while maintaining the need to make a profit. Strong Green Transformational Leadership will do this to strive to increase innovation in an environmentally friendly way (Singh et al., 2020; Siyal et al., 2022). Leaders who focus on the environment will likely find employees who share the same focus on environmental values as the company. The findings of this research are consistent with previous research (Majali et al., 2022; Shehzad et al., 2023) which shows a direct correlation between Green Transformational Leadership and Green Product Innovation.

The results of this research show that Green Product Innovation is significantly related to SMEs Performance (H3). Likewise according to the theoretical basis of RBV (Barney & Arian, 2001). Green Product Innovation has environmental benefits. Products that have benefits, quality and are competitive will attract consumers so that consumer interest in the product increases. This will provide a competitive advantage for MSMEs (Hugo & Nuringsih, 2020; Siyal et al., 2022). In addition, consumer interest in environmentally friendly products is based on the level of trust in the product. Consumers will consider the product they want to buy, such as whether the product is safe and does not have an impact on the environment. The findings of this research are consistent with previous research (Liu & Yu, 2023; Majali et al., 2022; Shehzad et al., 2023) which shows a direct correlation between Green Product Innovation and Performance of SMEs.

The research results found that Green Product Innovation mediates the relationship between Green Transformational Leadership and SMEs Performance. It can be concluded that leaders who adopt Green Transformational Leadership and by implementing Green Product Innovation can control or reduce hazardous waste caused by the production process. According to Ye et al., (2022), companies maintain an environmentally friendly image by adopting Green Product Innovation, and Siyal et al., (2022) stated that to maintain competitive advantage, companies are moving towards environmentally friendly solutions and changing employee behavior to environmentally friendly behavior. The findings of this study are consistent with previous studies (Majali et al., 2022). This is a contribution to existing literature because of the mediating role of Green Product Innovation between the relationship between Green Transformational Leadership and SMEs Performance. According to RBV theory, leaders and followers are one of the company's main resources so they must be valued, so that competitors find it difficult to imitate (Barney & Arian, 2001). Therefore, the findings of this research show that Green Transformational Leadership strengthens the impact of Green Product Innovation on the Performance of SMEs.

CONCLUSIONS

This study examines the effect of green transformational leadership on MSMEs performance, with green product innovation as a mediating variable. The results show that green transformational leadership has a positive and significant effect on MSMEs performance. RBV supports this finding, that leaders adopting green transformational leadership are better at inspiring, guiding, and motivating employees towards shared environmental goals that result in increased productivity and performance. Other findings show that green transformational leadership also enhances green product innovation, as leaders play an important role in shaping the direction of innovation and fostering a pro-environmental culture. Green product innovation also shows an important contribution in improving MSME performance. This indicates that environmentally friendly and innovative products can increase competitiveness and attract environmentally conscious consumers. Finally, green product innovation shows a role in mediating the influence of green transformational leadership on MSMEs performance. This highlights that transformational leadership alone is not enough, but it needs innovation that can provide better MSMEs performance.

From a theoretical perspective, this study contributes to the growing literature on sustainability-oriented leadership and innovation in the MSME sector, particularly by confirming the mediating role of green product innovation in the influence of green transformational leadership on MSMEs performance. This study supports the RBV perspective by positioning leadership and innovation as strategic resources of companies that become competitive advantages. Practically, this study offers actionable insights for MSME leaders, specifically the batik industry, to support green transformational practices that not only support

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environmental sustainability but also drive performance. The findings emphasize the importance of aligning leadership behaviors with innovation strategies that meet environmental and market demands. Although the batik industry does not cause as much environmental damage as modern industries, they are a cultural heritage that is expected to not only preserve culture but also participate in environmentally sound practices that are aligned with sustainable development. In terms of policy engagement, the government is expected to encourage transformation to green transformational leadership and green product innovation by providing training, socialization, policy intervention, and monitoring of MSME activities. This is not only because it can improve the performance and sustainability of MSMEs, but also because it can support the sustainable development agenda.

This study, while offering important insights, has its limitations. First, this research adopted a previous research questionnaire administered to MSME owners. Therefore, these findings cannot be generalized to different contexts and countries. In addition, focusing on a single industry and geographical area of batik MSMEs in Sragen Regency may not capture the diversity of sustainability practices across different areas and industry sectors. Second, this study was cross-sectional, and data were collected at the same time. In addition, the concept of environmentally friendly practices is a new idea applied to Batik MSMEs, and it is hoped that results will be obtained in the long term so that longitudinal studies can be carried out. Third, this study did not consider gender, age, or experience as moderating variables. Although previous research established that the gender of leaders is likely to influence work and outcomes.

By acknowledging the limitations, this study opens up opportunities for future research. First, future studies can expand the scope of the sample and industry sector. As mentioned in the previous discussion, the batik industry is part of Indonesia's cultural heritage and thus has different pressures from other industries in terms of environmental responsibility and market demand. Studies in different industries and environments will provide new insights into this literature. Second, a longitudinal or mixed methods study could also provide deeper insights into the potential dynamic relationship between leadership, innovation and performance over time. Third, consideration of other mediating variables such as gender, experiences, and education would provide more comprehensive insights. Finally, future studies could explore the role of external factors such as government policies, environmental regulations, and government involvement in improving the quality of resources owned by MSMEs.

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