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Enhancing sustainability performance: Integrating green transformational leadership, green organizational culture, and total quality management

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ABSTRACT

Modern organizations need to understand the drivers of sustainability to remain competitive. This study examines sustainable performance by considering the roles of green transformational leadership and green organizational culture, with total quality management acting as an intervening variable. This study involved 161 respondents from micro, small, and medium enterprises in the batik sector in Yogyakarta, Indonesia, as the unit of analysis. Statistical analysis was conducted using Smart PLS 4.0. The results indicate that green organizational culture plays a significant role in strengthening both sustainable performance and total quality management. While no direct relationship is found between green transformational leadership and sustainable performance, this leadership style has been shown to support improvements in total quality management practices. The results show that total quality management enhances sustainable performance and serves as a mediating mechanism linking green transformational leadership and green organizational culture to sustainable outcomes. This suggests that sustainable performance is shaped not only by environmentally oriented values and leadership but also by the effectiveness of integrated quality practices. The results lend support to both the resource-based view and the natural resource-based view, emphasizing that organizational factors can be leveraged as strategic resources to enhance and sustain competitive advantage over time. In practice, this study recommends strengthening green culture and leadership by improving the implementation of total quality management, which supports sustainability.

1. Introduction

Global challenges such as climate change and rising pollution are prompting companies to adopt more environmentally friendly business practices (Khan & Badulescu, 2025). Modern production and consumption activities account for approximately 69% of

total global ecological pressure, contributing to the greenhouse effect and carbon dioxide emissions (Dallalia & Jeblia, 2025). This situation positions companies as both part of the solution and contributors to the increasingly complex problem of environmental degradation (Valentinov et al., 2026). Consequently, pressure from investors, governments, and the public is increasing to demand environmental accountability in corporate operations (Sulemana et al., 2025). Nevertheless, while many companies have declared sustainability commitments, their implementation is often suboptimal (Zhang et al., 2025). These sustainability claims are often not backed by substantive activities or tangible environmental outcomes, thereby fueling public skepticism (Kudłak, 2025). The discrepancy between stated commitments and their practical implementation suggests that sustainability principles have not been embedded in everyday decision-making and operational activities (Bianchi et al., 2022). Thus, further evaluation is needed to assess the implementation of sustainability practices in companies, with sustainable performance as the primary indicator of corporate success (Barbosa et al., 2023).

Sustainability highlights the importance of meeting current demands without limiting future generations' ability to maintain their well-being (Bergquist, 2017). Long-term sustainability requires effective integration of financial performance, social responsibility, and environmental management (Azapagic et al., 2016). Social sustainability focuses on improving community well-being and ensuring equitable access to education and healthcare services (Eizenberg & Jabareen, 2017). Economic sustainability emphasizes fair wages, economic growth, and stable resource allocation (van Niekerk, 2020). Meanwhile, environmental sustainability focuses on minimizing pollution, improving energy efficiency, and conserving biological resources (Shaheen et al., 2022). This research highlights how sustainable performance is influenced by internal organizational dynamics, particularly through green transformational leadership, green organizational culture, and the application of total quality management.

Evidence suggests that green transformational leadership contributes positively to pro-environmental behavior, employee engagement, and sustainability commitment (Perez et al., 2023; Priyadarshini et al., 2023; Suliman et al., 2023; Younis & Hussain, 2023; Srivastava et al., 2024). Moreover, this leadership approach acts as a catalyst for fostering creative, productive, and environmentally friendly behavior (Ng, 2017; Singh et al., 2020). These leaders enhance their organizations' sustainability performance by clearly communicating environmental goals, effectively managing knowledge, and fostering eco-friendly innovation (Singh et al., 2020). Studies report that leadership practices that emphasize environmental responsibility can reduce negative environmental impacts and improve sustainability outcomes across various industries (Li et al., 2020; Al Doghan et al., 2022; Begum et al., 2022; Cui et al., 2023). The existing literature suggests that green transformational leadership is a key strategic mechanism for enhancing organizational sustainability (Kim et al., 2019; Paillé & Halilem, 2019; Çop et al., 2021; Peng et al., 2021; Sun et al., 2022). Current literature has not fully clarified how green transformational leadership contributes to sustainable performance, particularly regarding the contextual conditions that may enhance its effectiveness. Existing studies suggest that this leadership approach is linked to various positive outcomes, including pro-environmental behavior, organizational commitment, and environmental performance (Singh et al., 2020; Cui et al., 2023; Hanif et al., 2023; Khan et al., 2023; Niazi et al., 2023; Perez et al., 2023; Younis & Hussain, 2023).

Green organizational culture helps shape organizational values and pro-environmental behavior at various levels. This cultural perspective supports innovation and environmental performance and strengthens the role of knowledge management in enhancing sustainability outcomes (Wang, 2019; Azeem et al., 2021; Wang et al., 2022). However, the findings are inconsistent: as this cultural concept is significant in micro, small,

and medium enterprises (MSMEs) (Rehman & Alsolamy, 2023), but insignificant in large organizations (Shoaib et al., 2022). This indicates the need for mediating variables that explain this relationship. A green organizational culture reflects shared organizational principles that encourage employees' environmental responsibility (Shahzad et al., 2020). These values are reflected in everyday practices, which in turn support improved green performance. This cultural approach supports sustainability values by promoting waste reduction, environmentally responsible actions, and long-term environmental management (Wahyuni & Sara, 2020). Shahriari et al. (2023) suggest that embedding environmental values within organizational culture encourages greater employee participation in sustainability initiatives and reinforces long-term organizational goals. Green organizational culture promotes environmental sustainability by encouraging eco-friendly behaviors, reducing waste, improving resource efficiency, and maintaining environmental certifications (Zafar et al., 2022).

To address these inconsistencies, total quality management is proposed as an underlying mechanism that links green transformational leadership, green organizational culture, and sustainable performance. This approach emphasizes continuous improvement by enhancing process efficiency, achieving operational excellence, and meeting customer expectations (Jimoh et al., 2019). This approach also reduces waste, optimizes resources, and enhances long-term competitiveness (Ansah, 2018). Previous research shows that total quality management strengthens transformational leadership on sustainability through efficiency, innovation, and quality orientation (Fok et al., 2023; Alkhawaldeh et al., 2025). In general, service and product quality management is reflected in total quality management (Permana et al., 2021). This system focuses on the continuous improvement of services, products, and processes to meet customer expectations (Muchlish & Tjahyono, 2021). This concept also aims to improve process performance and adaptability in achieving organizational excellence (Ramlawati & Kusuma, 2018).

Total quality management offers various benefits to both customers and organizations, reflected in increased customer satisfaction, improved service quality, and enhanced product quality (Permana et al., 2021). This concept emphasizes customer interactions, continuous improvement efforts, and customer involvement in the quality improvement process (Damayanti, 2024). First, customer orientation means prioritizing customer expectations and delivering high-quality products and services (Ghodke, 2021). Second, refers to continuous efforts to improve services (Lizarelli et al., 2023). Third, customer engagement refers to customers' participation in the quality improvement process, including understanding their preferences and needs (Haroun et al., 2022). The identified roles suggest that total quality management can serve as a linking mechanism among variables.

Grounded in the resource-based view (RBV) by Barney (1991), this study emphasizes that the effectiveness of internal resource management shapes the development of strategic advantage. In this context, green transformational leadership, green organizational culture, and total quality management serve as organizational capabilities that enhance effectiveness through innovation and continuous improvement. These capabilities enable companies to integrate environmentally friendly practices into their operations, thereby improving sustainable performance (Wijaya et al., 2025).

This study also uses the natural resource-based view (NRBV), which builds on the RBV by asserting that competitive advantage increasingly depends on a company's capabilities focused on reducing environmental harm, ensuring sustainable product practices, and encouraging innovation with ecological considerations (Hart, 1995). Thus, organizations capable of systematically developing environmental capabilities will be better positioned to achieve superior sustainable performance. Therefore, RBV and NRBV describe

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total quality management as an intermediary mechanism that translates sustainability values and commitments into organizational practices.

Many batik artisans still rely on conventional production methods, which tend to generate high levels of waste and chemical residues, making the transition to environmentally friendly practices appear costly and difficult. The literature highlights that adopting environmentally focused strategies offers significant advantages for organizations. Such strategies not only promote environmental sustainability but also improve performance by strengthening brand reputation, optimizing resource use, minimizing waste, and supporting long-term competitiveness (Yang et al., 2017; Green et al., 2019; Whitelock, 2019; Ghadimi et al., 2021; Sahoo & Vijayvargy, 2021). These findings suggest that, despite initial constraints, integrating sustainability-oriented practices is a strategic pathway for batik MSMEs to enhance performance and sustain their competitiveness.

However, prior studies have yet to develop a comprehensive model integrating green transformational leadership and green organizational culture to explain their influence on sustainable performance, particularly when total quality management is considered a mediating variable. Most previous studies examined only direct relationships, without exploring the underlying quality mechanisms (Thanki & Thakkar, 2018; Khalil & Muneenam, 2021). The present study analyzes how the variables in this research are related to one another, incorporating total quality management as a mediating factor, particularly among batik MSMEs facing sustainability challenges. The purpose of this study is to analyze the role of green transformational leadership and green organizational culture in promoting the implementation of total quality management, with the expectation that this will improve sustainability performance.

2. Literature Review and Hypothesis Development

2.1. Literature Review

2.1.1. Resource-Based View

The resource-based view (RBV) posits that organizational performance is closely linked to how firms utilize their internal resources, especially those that offer distinct value and are not easily imitated (Barney, 1991). RBV argues that organizations capable of managing their internal capabilities effectively will achieve sustainable performance long term (Guerrero-Villegas et al., 2018). This study considers that green transformational leadership, green organizational culture, and total quality management are considered strategic internal capabilities that can enhance organizational value (Fernando et al., 2019).

However, recent scholarly developments highlight the RBV's limitations in addressing sustainability issues related to environmental impacts. Consequently, Hart (1995) introduced NRBV, which emphasizes organizational capabilities in managing environmental concerns. NRBV asserts that organizations' ability to reduce waste, optimize resource utilization, and adapt to environmental demands will increasingly serve as a critical source of competitive advantage (Hart & Dowell, 2011). The integration of various internal organizational factors can strengthen environmental capabilities, thereby strengthening long-term organizational outcomes (Shaheen et al., 2022; Wang et al., 2022).

2.1.2. Sustainable Performance

Sustainable performance reflects an organization’s ability to balance financial results with social responsibility and environmental considerations, serving as the foundation for long-term stability (Fernando et al., 2019). This concept is commonly understood to encompass three primary dimensions, each highlighting cost efficiency

(Ekins & Zenghelis, 2021), improved social quality of life (Obaideen et al., 2022), environmental conservation (Shaheen et al., 2022), and pollution reduction (Andersson et al., 2022). Achieving sustainable performance requires organizations to move beyond purely economic goals and consider the social and environmental consequences of their activities, including environmental damage and social inequality (Ali et al., 2021). Thus, emphasizing sustainability performance helps firms achieve long-term sustainability and strengthen their competitive position (Okay et al., 2026).

2.1.3. Green Transformational Leadership

Green transformational leadership encourages employees to implement environmentally oriented policies and practices (Younis & Hussain, 2023). The role can be seen in shaping an environmental vision and embedding sustainability values into organizational culture and daily operations (Honorata et al., 2024; Ren et al., 2024). Leaders instill environmental concern and awareness that drive the internalization of eco-friendly behaviors (Mukhtar et al., 2025). Employees tend to exhibit greater creativity in applying environmentally oriented practices when such values are deeply embedded, leading to improved sustainability outcomes (Luo et al., 2025). Moreover, green transformational leadership also supports total quality management by encouraging continuous efforts to enhance quality (Rahman et al., 2020).

2.1.4. Green Organizational Culture

A green organizational culture is one in which green behavior is highly valued and promotes environmentally friendly practices throughout the workplace (Al Doghan et al., 2022). This concept helps organizations adopt green practices that stem from collectively shared environmental values (Fok et al., 2023). This culture can integrate eco-friendly reforms into organizational operations while fostering employees' environmental awareness (Abbas & Khan, 2026). This awareness underpins the adoption of environmentally friendly practices, energy efficiency, and effective waste management, thereby contributing to improved sustainability performance. Sustainability-oriented work environments are more likely to emerge when organizations develop a green organizational culture (Wang, 2019). However, to ensure these values are consistently implemented, a structured managerial system is required. Total quality management plays a mediating role by incorporating green values into organizational practices, thereby contributing to higher levels of sustainability performance (Fang et al., 2022).

2.1.5. Total Quality Management

Total quality management emphasizes integrating technical processes and organizational behavior to enhance customer satisfaction and promote continuous improvement (Jiménez-Jiménez et al., 2015). Through this approach, organizations can strengthen their competitive position by ensuring that their offerings meet customer expectations (Aichouni et al., 2024). Total quality management is implemented through ongoing enhancement, employee engagement, and customer focus (Permana et al., 2021; Damayanti, 2024). Companies that implement total quality management effectively demonstrate higher operational efficiency and better environmental performance (Fok et al., 2023). Furthermore, this practice promotes the integration of green organizational values into standardized work processes (Irfan et al., 2025). Alkhawaldeh et al. (2025) note that the application of total quality

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management supports green transformational leadership by ensuring that the green vision is reflected in both management practices and operational procedures. This process ensures that the vision and mission are not only conceptual statements but are implemented in operational practices (Khalil & Muneenam, 2021). Therefore, total quality management links the positive influence of green transformational leadership and green organizational culture on sustainability performance.

2.2. Hypothesis development

2.2.1. Green Transformational Leadership and Sustainable Performance

The application of green transformational leadership contributes to achieving sustainable organizational performance across a wide range of sectors (Muralidharan & Pathak, 2018). Leaders inspire and motivate others, fostering a shared commitment to achieving long-term goals, including organizational sustainability. The literature consistently shows that this type of leadership contributes to improved organizational performance, fosters innovation, and strengthens the foundation for long-term sustainability. Nasir et al. (2022) demonstrate that leaders focused on environmental sustainability can foster an organizational culture more adaptable to continuous improvement efforts. Similarly, Ren et al. (2024) found that this leadership concept also fosters employees' ecological awareness, which motivates them to contribute to environmental conservation. Honorata et al. (2024) report that green transformational leaders significantly influence organizational commitment to sustainability goals.

Furthermore, when linked to the RBV, green transformational leadership views strategic resources as rare, valuable, and difficult to imitate because it creates environmentally oriented organizational capabilities through enhanced innovative capacity, green knowledge, and a sustainability-supportive work culture (Barney, 1991). Fernando et al. (2019) demonstrate that green leadership contributes to the development of employees' innovation capabilities, which in turn impact overall sustainability performance. Shaheen et al. (2022) also assert that environmentally oriented leaders strengthen organizational capacity to manage ecological issues, ultimately leading to positive sustainability performance. Consequently, the RBV framework positions green transformational leadership as a capability that enhances competitiveness by strategically managing sustainability issues. **H_1: Green Transformational Leadership Has a Positive Effect on Sustainable Performance.**

2.2.2. Green Organizational Culture and Sustainable Performance

Organizational culture consists of shared values and expectations that align member behavior with common goals (Schmiedel et al., 2013). High organizational commitment quality and sustainability are critical factors in strengthening firm performance (Hofmann & Oldehaver, 2016; Aboelmaged, 2018). Organizational culture highlights performance measurement and quality management as key factors that enhance organizational effectiveness (Ababneh, 2021).

An organizational culture that embeds sustainability into the company's core strategy can support the success of various sustainability initiatives. A culture that unites employees through environmental values can strengthen the implementation of sustainability programs and increase commitment to green practices (Thanki & Thakkar, 2019; Wang, 2019). Previous studies highlight knowledge management, organizational habits, and operational effectiveness as core elements of a quality and sustainability-oriented culture. Unique, difficult-to-replicate organizational knowledge can serve as a strategic asset and enhance organizational value.

Linked RBV, green organizational culture considered, strong green culture encourages employees to remain engaged in environmentally friendly activities, strengthens organizational capabilities in managing sustainability issues, and enhances innovation capacity and operational efficiency (Barney, 1991; Aboelmaged, 2018; Ababneh, 2021). Due to its unique, embedded nature within the organization, a green organizational culture creates green capabilities essential to achieving sustainable performance. Within the RBV framework, green organizational culture is viewed as an internal asset that enhances organizational competitiveness through sustainability performance. **H_2: Green Organizational Culture Has a Positive Effect on Sustainable Performance.**

2.2.3. Green Transformational Leadership and Total Quality Management

An environmental leadership orientation encourages employees to adopt responsible practices while also promoting innovation and continuous quality improvement (Awan et al., 2023; Niazi et al., 2023; Perez et al., 2023). Such leadership also promotes the integration of sustainability into organizational culture and operational activities. Literature shows that green transformational leadership supports key total quality management principles, including employee involvement, continuous improvement, and quality orientation (Jiménez-Jiménez et al., 2015; Rahman et al., 2020; Fok et al., 2023).

From an RBV perspective, green transformational leadership sees strategic resources as creating organizational capabilities that enhance process quality, efficiency, and innovation (Barney, 1991; Fernando et al., 2019). Previous studies have shown that green transformational leadership can enhance employee engagement regarding quality and efficiency (Permana et al., 2021; Alkhawaldeh et al., 2025). This suggests that such leadership can strengthen total quality management within an organization. **H_3: Green Transformational Leadership Has a Positive Effect on Total Quality Management.**

2.2.4. Green Organizational Culture and Total Quality Management

Organizational values that emphasize environmental responsibility serve as a social foundation for facilitating the adoption of quality management (Wang, 2019; Fok et al., 2023). Another study found that Malaysian manufacturing companies have adopted an organizational culture that supports learning and innovation, thereby promoting the consistent implementation of quality practices (Long et al., 2023). Then, Lasrado and Kassem (2021) showed that employee participation and engagement within organizational culture improve the effectiveness of total quality management implementation. Similarly, Ababneh (2021) emphasized that organizational culture significantly impacts quality management, making it essential to foster a culture that prioritizes employee involvement, collaboration, and commitment to quality practices.

Choi et al. (2010) found that internalized cultural norms in daily work practices promote continuous improvement and product innovation, which are central to total quality management. Other studies also confirm that green organizational culture supports the management of environmental issues and operational efficiency, thereby strengthening sustainability-oriented total quality management practices (Aboelmaged, 2018; Ghadimi et al., 2021).

Within the RBV framework, the development of sustainable quality and innovation capabilities is closely linked to organizational values oriented toward environmental sustainability (Barney, 1991; Fernando et al., 2019). By reinforcing

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such values, organizations are better able to implement total quality management and achieve stronger effectiveness and long-term results. **H_4: Green Organizational Culture Has a Positive Effect on Total Quality Management.**

2.2.5. Total Quality Management and Sustainable Performance

RBV posits that firms that optimize their internal capabilities tend to achieve stronger strategic positioning and more consistent performance over time (Barney, 1991). Total quality management is a sustainable development effort that enables organizations to respond to change and implement best practices to maintain superior performance (Sahoo & Vijayvargy, 2021). Sustainable development indicates that shared management practices shape a firm's competitiveness. Therefore, organizational and global competitiveness should guide corporate planning, development policies, and the implementation of total quality management (Agyabeng-Mensah et al., 2020; Baah et al., 2020).

The literature has examined a range of organizational characteristics associated with sustainable performance. Studies investigate employee engagement, human resource management, leadership, commitment, and personality traits (Aquilani et al., 2017; Talapatra et al., 2019; Agyabeng-Mensah et al., 2020). The findings indicate that other contributing factors can influence managers' perceptions and behaviors. The study examines whether perceived effectiveness of total quality management tools influences managers' attitudes toward going green. Studies show that strategic and human resource support are key factors in implementing total quality management (Talapatra et al., 2019). **H_5: Total Quality Management Has a Positive Effect on Sustainable Performance.**

2.2.6. Green Transformational Leadership and Sustainable Performance through Total Quality Management

Green transformational leadership can increase employee engagement and foster continuous organizational improvement and innovation (Rahman et al., 2020). Total quality management strengthens this influence by enhancing efficiency and consistency in quality to achieve desired outcomes (Chen et al., 2020). Prior research also suggests that total quality management interacts with green transformational leadership in shaping ecological outcome (Chen et al., 2020; Rahman et al., 2020; Muchlish & Tjahyono, 2021). Then, this practice strengthens managerial capabilities and enhances the effectiveness of environmentally oriented leadership, thereby supporting long-term competitiveness (Chen et al., 2020). Consistent with this view, Muchlish and Tjahyono (2021) highlight total quality management as a mechanism linking green transformational leadership to sustainable performance. Rahman et al. (2020) further emphasize its role in strengthening leadership effectiveness and sustainability outcomes through improved managerial behavior.

From the RBV perspective, organizational capabilities can help explain how leadership influences performance outcomes, particularly when a mediating mechanism is involved (Barney, 1991). In this context, integrating environmental management principles into internal processes enables organizations to achieve more sustainable outcomes (Hart, 1995). Such a mechanism is reflected in the role of total quality management, which translates the influence of green transformational leadership into more effective improvements in sustainable performance. **H_6: Total Quality Management mediates the positive effect of Green Transformational Leadership on Sustainable Performance.**

2.2.7. Green Organizational Culture and Sustainable Performance through Total Quality Management

A strong green culture not only increases environmental awareness but also builds a collective commitment to quality, efficiency, and continuous improvement, which are core tenets of total quality management (Wang, 2019; Fok et al., 2023). Long et al. (2023) found that an organizational culture based on education and innovation can improve total quality management standards. Lasrado and Kassem (2021) demonstrated that organizational culture can encourage employee engagement in total quality management practices. Furthermore, Ababneh (2021) emphasizes that organizational culture can increase employees' awareness of quality standards, thereby influencing total quality management. Choi et al. (2010) highlighted that cultural norms embedded in daily work practices can stimulate the identification of opportunities for continuous process improvement.

Furthermore, total quality management contributes to sustainable performance by promoting continuous improvement, customer orientation, and employee engagement (Aquilani et al., 2017; Thanki & Thakkar, 2019; Khalil & Muneenam, 2021). Total quality management implementation has been shown to improve sustainable performance, strengthening operational efficiency, reducing waste, improving quality, and encouraging continuous innovation (Green et al., 2019; Sahoo & Vijayvargy, 2021). Therefore, a green organizational culture creates psychological and structural conditions that enable total quality management to function optimally, making it a crucial mediating mechanism that translates green cultural values into improved sustainable performance.

Relationships are explained through the RBV, which posits that organizational culture and total quality management are internal capabilities (Barney, 1991). Green organizational culture serves as an intangible resource that fosters collective commitment to quality. In contrast, total quality management serves as an organizational capability that translates cultural values into sustainable performance outcomes (Fernando et al., 2019). Furthermore, according to the NRBV, integrating quality practices and environmental values within an organization forms the basis for creating environmental excellence and sustaining long-term performance (Hart, 1995). The presence of a green organizational culture enables organizations to strengthen total quality management practices and achieve better sustainability performance. **H_7: Total Quality Management mediates the positive effect of Green Organizational Culture on Sustainable Performance**

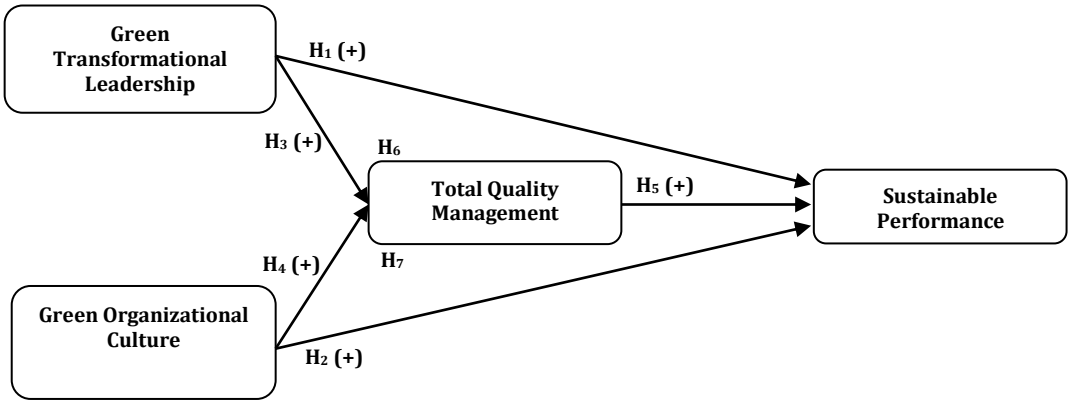

Figure 1. Research Framework

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Figure 1 presents a research model showing that total quality management mediates the relationships between green transformational leadership and green organizational culture, and between green organizational culture and sustainable performance. Green transformational leadership and green organizational culture have a positive effect on total quality management. Green transformational leadership, green organizational culture, and total quality management each have a positive effect on sustainable performance.

3. Research Methods

3.1. Research Population and Sampling

The empirical study focuses on batik MSMEs in Yogyakarta, Indonesia. The study involved 161 respondents, which falls within the recommended range of 100–300 respondents (Hair et al., 2021). This research adopted a non-probability sampling approach with purposive sampling technique was employed based on specific selection criteria as follows: 1) Owners of batik MSMEs in Yogyakarta, Indonesia; 2) Owners of batik MSMEs with at least 1 year of business experience; 3) Owners of batik SMEs who understand the variables under study; and 4) Owners of batik MSMEs who have attended training or seminars related to the variables under study.

3.2. Data Collecting Technique

Primary data were gathered using questionnaires. These were distributed to batik MSMEs in Yogyakarta through both online and offline channels within a predetermined period. All constructs in this study were assessed using a 5-point Likert scale. The research instrument consisted of statements developed to measure each construct, with indicators adopted from previous validated studies. The green transformational leadership (GTL) variable comprises four indicators adapted from Bass and Avolio (1994), while green organizational culture (GOC) comprises four indicators adapted from Hilton et al. (2023) and Lizarelli et al. (2023). Sustainability performance (SP) comprises 12 indicators adopted from Obaideen et al. (2022). Total quality management (TQM) comprises 7 indicators adopted from Jiménez-Jiménez et al. (2015) and Raoush (2023).

3.3. Data Analysis Techniques

This study adopts a quantitative approach and applies partial least squares structural equation modeling (PLS-SEM) to examine the relationships among latent constructs (Hair et al., 2019). The data analysis was conducted in a series of stages. First, validity was assessed using an outer loading threshold of ≥ 0.7 (Ghozali, 2021). Indicators that did not meet this criterion were excluded from the model. Next, reliability testing was performed using Cronbach's alpha and composite reliability, with a minimum threshold of 0.70, while AVE values exceeded 0.50 (Ghozali, 2021). Finally, hypothesis testing was conducted with significance determined by p-values below 0.05 and t-statistics above 1.96 (Ghozali, 2021).

4. Results and Discussion

4.1. Analysis Descriptive

The sample was predominantly female, accounting for 110 respondents (68.3%). Respondents were predominantly aged 36-45 years, comprising 77 respondents (47.8%). In addition to gender and age, respondent characteristics were examined based on last education, domicile, monthly income, and business age. The results show that respondents with a senior high school degree were the largest group, comprising 112

people (69.6%), followed by respondents domiciled in Yogyakarta City, comprising 69 people (42.9%). Most respondents had over 10 years of business experience (43.5%), and more than half earned a monthly income of IDR 6 – 10 million (52.8%).

Table 1. Demographic Profile of Respondents

Characteristics	Information	Number of respondents	Percentage (%)
Gender	Female	110	68.3
	Male	51	31.7
Age	26-35 Years Old	29	18
	36-45 Years Old	77	47.8
	46-55 Years Old	46	28.6
	>55 Years Old	9	5.6
Last Education	Junior High School	21	13
	Senior High School	112	69.6
	Bachelor	28	17.4
Domicile	Yogyakarta City	69	42.9
	Sleman Regency	51	31.7
	Bantul Regency	41	25.4
	Gunungkidul Regency	0	0
	Kulon Progo Regency	0	0
Monthly Income	IDR 3 – 5 million	55	34.2
	IDR 6 – 10 million	85	52.8
	IDR 11 – 15 million	20	12.4
	> IDR 15 million	1	0.6
Business Age	1-3 Years	1	0.6
	4-6 Years	61	37.9
	7-9 Years	29	18
	>10 Years	70	43.5

4.2. Validity and Reliability Test

Based on the results in Figure 2 and Table 2, all constructs meet the requirements for convergent validity, with outer loadings above 0.7. Reliability of all constructs is confirmed by Cronbach's alpha and composite reliability (>0.70), while AVE values exceed 0.50, indicating acceptable convergent validity. This provides a strong basis for ensuring that each construct consistently and accurately measures the concept it should measure.

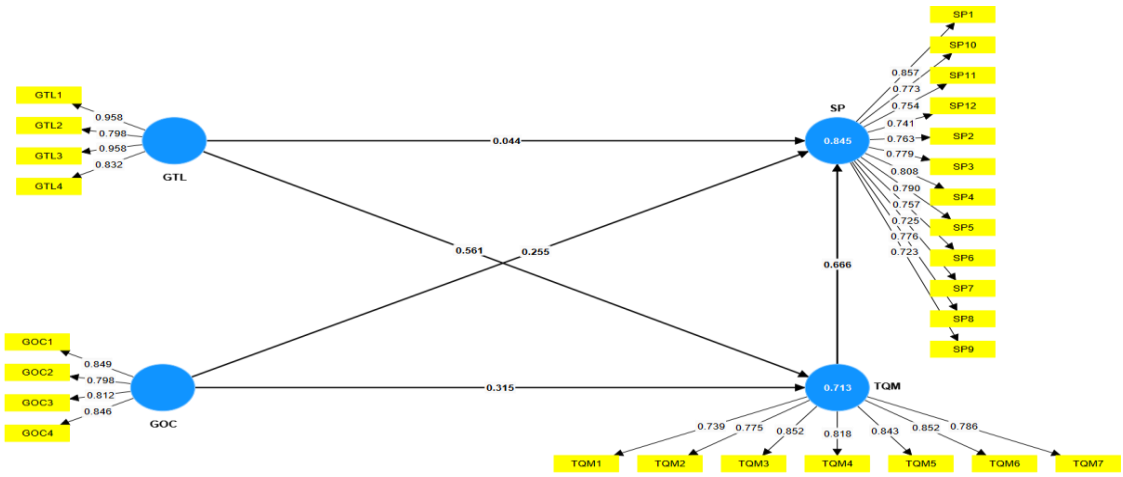

Figure 2. Measurement Model

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Table 2. Results of the Validity and Reliability Tests

Construct	Outer Loading	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Green Transformational Leadership		0.909	0.938	0.791
GTL1	0.958			
GTL2	0.798			
GTL3	0.958			
GTL4	0.832			
Green Organizational Culture		0.846	0.896	0.683
GOC1	0.849			
GOC2	0.798			
GOC3	0.812			
GOC4	0.846			
Total Quality Management		0.912	0.930	0.657
TQM1	0.739			
TQM2	0.775			
TQM3	0.852			
TQM4	0.818			
TQM5	0.843			
TQM6	0.853			
TQM7	0.786			
Sustainable Performance		0.938	0.946	0.595
SP1	0.857			
SP2	0.763			
SP3	0.779			
SP4	0.808			
SP5	0.790			
SP6	0.757			
SP7	0.725			
SP8	0.776			
SP9	0.723			
SP10	0.773			
SP11	0.754			
SP12	0.741			

4.3. Hypothesis Test

Table 3. Results of the Hypothesis Test

Hypothesis	Original Sample	Sample Mean	Standard Deviation	T Statistics	P Values
Green Transformational Leadership → Sustainable Performance	0.044	0.036	0.074	0.588	0.556
Green Organizational Culture → Sustainable Performance	0.255	0.255	0.093	2.745	0.006
Green Transformational Leadership → Total Quality Management	0.561	0.558	0.080	7.007	0.000
Green Organizational Culture → Total Quality Management	0.315	0.314	0.089	3.525	0.000
Total Quality Management → Sustainable Performance	0.666	0.670	0.076	8.782	0.000
Green Transformational Leadership → Total Quality Management → Sustainable Performance	0.374	0.374	0.069	5.437	0.000
Green Organizational Culture →Total Quality Management → Sustainable Performance	0.209	0.210	0.065	3.219	0.001

Table 3 indicates that six hypotheses are supported (the second through seventh hypotheses), while one is not (the first hypothesis). Following Ghozali (2021), a hypothesis is accepted when the p-value < 0.05.

4.4. Discussion

4.4.1. Green Transformational Leadership and Sustainable Performance

Green transformational leadership is not significantly associated with sustainable performance in a direct relationship. Green leadership alone is insufficient to achieve sustainability outcomes, as its impact depends on organizational systems and managerial support, including system quality, green innovation, and effective management practices (Aboelmaged, 2018; Chen et al., 2020). The relationship between green transformational leadership and sustainable performance can also be explained through employee engagement and process improvement (Rahman et al., 2020).

When linked to grand theory, particularly the RBV, green transformational leadership is categorized as an intangible and strategic managerial capability, but it does not provide a sustainable competitive advantage unless supported by other processes and resources within the organization (Barney, 1991). RBV emphasizes that sustainable excellence can be achieved only when leadership capabilities are integrated with systemic practices, innovation, and quality management. Thus, this insignificant relationship is reinforced by the RBV, which holds that managerial competence must be aligned with the organizational system to achieve sustainable performance.

4.4.2. Green Organizational Culture and Sustainable Performance

A stronger green organizational culture can improve sustainability performance within an organization. Such a culture encourages environmental activities that can improve environmental efficiency, operational quality, and social responsibility (Wang, 2019; Fok et al., 2023). These findings are reinforced by Ababneh (2021), who asserts that an environmentally based organizational culture increases employee commitment to environmentally friendly practices, thus impacting overall sustainability performance. A well-established organizational culture promotes innovation and continuous learning practices as fundamental drivers of long-term sustainability (Long et al., 2023).

This finding aligns with the RBV perspective and creates sustainable competitive advantage (Barney, 1991). A green organizational culture fulfills these characteristics as an intangible resource that shapes pro-environmental behavior patterns within an organization, thus significantly contributing to firm sustainability. Fernando et al. (2019) highlight that environmental value–based organizational capabilities enhance operational effectiveness and long-term performance. Thus, a green organizational culture not only shapes pro-environmental behavior but also serves as a strategic capability that strengthens internal processes and sustainability-based decision-making.

4.4.3. Green Transformational Leadership and Total Quality Management

Organizations under green transformational leadership tend to adopt total quality management more strongly. This effect can be achieved by fostering a quality-oriented mindset and proactive behavior among employees (Chen et al., 2020). Muchlish and Tjahyono (2021) demonstrate that this type of leadership helps instill quality-focused values within the organization and reinforces practices that support

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continuous improvement. Rahman et al. (2020) highlight that transformational leadership drives employee commitment to quality goals, thereby reinforcing the integration of total quality management into work processes. Thus, leadership shapes shared vision, motivation, and alignment of employee behavior toward quality and sustainability objectives.

RBV views green transformational leadership as an intangible, inimitable capability that supports the effectiveness of quality systems (Barney, 1991). Green transformational leadership tends to shape how organizations operate daily, particularly by encouraging learning, innovation, and attention to quality in routine practices. Over time, this influence becomes embedded in organizational processes, making quality management more consistently practiced rather than treated as a separate initiative.

4.4.4. Green Organizational Culture and Total Quality Management

A stronger green organizational culture is reflected in better implementation of total quality management practices. Organizational culture supports a better understanding of total quality management through learning and experience (Long et al., 2023). It encourages employee participation, which can enhance the effectiveness of total quality management (Lasrado & Kassem, 2021). Ababneh (2021) noted that organizational culture fosters environmental responsibility, which enhances a company's adaptability in implementing quality standards. Furthermore, Aboelmaged (2018) and Ghadimi et al. (2021) state that green-oriented organizational culture can strengthen a company's ability to manage quality while integrating sustainability aspects into operational processes.

From the RBV perspective, green organizational culture functions as an internal capability that supports organizations in building relative competitiveness (Barney, 1991). Green organizational culture serves as a strategic foundation that strengthens an organization's capabilities to implement quality practices, drive operational innovation, and sustain continuous improvement processes. Thus, a green culture not only encourages pro-environmental behavior but also increases an organization's readiness to implement total quality management effectively, thereby contributing to sustainable competitive advantage.

4.4.5. Total Quality Management and Sustainable Performance

Organizations that implement total quality management effectively are more likely to achieve enhanced sustainable performance outcomes. The results of the analysis indicate that this hypothesis has the highest coefficient, confirming that total quality management is the most dominant variable in driving improvements in sustainability performance among the variables. Quality management plays a strategic role in developing industrial sustainability (Thanki & Thakkar, 2019). Furthermore, a study by Khalil and Muneenam (2021) shows that organizations with high levels of total quality management implementation tend to have better environmental performance because quality practices drive resource efficiency. Sahoo and Vijayvargy (2021) confirm that total quality management is the foundation for organizations to achieve sustainable excellence by integrating quality across all business processes. Al-Zwyalif (2017) emphasizes that total quality management contributes to achieving sustainability as part of a strategy that provides long-term benefits for companies. Thus, total quality management can be viewed as an organizational capability within the RBV, as it creates internal capabilities that are difficult to imitate and directly improve sustainable

performance.

4.4.6. Green Transformational Leadership and Sustainable Performance: Mediating by Total Quality Management

Organizations led by green transformational leaders tend to achieve better sustainability outcomes, especially when total quality management is consistently applied in daily operations. This condition enables leadership initiatives to be reflected in organizational outcomes, particularly in terms of performance and operational effectiveness (Chen et al., 2020; Rahman et al., 2020; Muchlish & Tjahyono, 2021).

RBV states that intangible resources alone are insufficient to create sustainable advantage without the support of operational capabilities (Barney, 1991; Dangelico, 2016). Total quality management in this case acts as an organizational capability that transforms leadership inspiration into a consistent, efficient, and sustainability-oriented process. In other words, leadership provides the vision, while total quality management ensures its realization through systematic improvements in sustainability performance.

Furthermore, in line with the NRBV, companies need environmentally based capabilities, such as pollution reduction, green product management, and environmentally friendly processes, to achieve a sustainable competitive advantage (Hart, 1995). Green transformational leadership fosters an orientation toward sustainability. However, NRBV capabilities can be realized only if the organization has a quality system that integrates green principles into work procedures, quality standards, and process innovation. Thus, total quality management serves as a bridge connecting the leader's vision with the achievement of environmental capabilities that form the basis for long-term sustainability.

4.4.7. Green Organizational Culture and Sustainable Performance: Mediating by Total Quality Management

The relationship between green organizational culture and sustainable performance is explained through the role of total quality management as a mediating mechanism. This means that green cultural values are only capable of producing sustainable performance when translated into systematic quality management practices. Green culture lays the foundation for behaviors and norms, while total quality management serves as an operational mechanism for translating quality improvement and sustainability.

RBV explains that the contribution of green organizational culture to performance is strengthened by internal capabilities such as total quality management (Barney, 1991). The RBV asserts that organizational sustainability emerges when unique resources, including green culture, are combined with managerial capabilities that transform cultural values into high-performance processes (Dangelico, 2016).

NRBV highlights environmental capabilities as key to sustainable competitive advantage (Hart, 1995). A green organizational culture provides a long-term orientation and commitment to environmental management. However, these capabilities will only yield performance if supported by a total quality management, which facilitates the creation of clean technologies, pollution prevention, and product stewardship. Therefore, the success of a green culture in improving sustainable performance depends heavily on the total quality management's ability to operationalize these values into quality standards and daily work practices.

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Lasrado and Kassem (2021) and Long et al. (2023) emphasized that a green organizational culture is only significant if translated into an integrated management system, such as total quality management. Meanwhile, Thanki and Thakkar (2019), Khalil and Muneenam (2021), and Sahoo and Vijayvargy (2021) demonstrated that total quality management is a core capability that drives sustainable performance. Thus, the combination of green organizational culture as an internal resource and total quality management as a dynamic capability contributes to superior sustainable performance.

5. Conclusion

Sustainable performance is largely determined by the presence of environmentally oriented leadership and organizational values, and by the effective use of total quality management. Research indicates that a green organizational culture can enhance total quality management and sustainable performance through sustainability-oriented behavior. Green transformational leadership does not significantly influence sustainable performance, yet it significantly contributes to total quality management. This suggests that the vision and inspiration of new, environmentally driven leaders can impact sustainability when internalized through quality management mechanisms. Total quality management functions as a mediating mechanism linking green transformational leadership and green organizational culture with sustainable performance, showing both full and partial mediation depending on the specific relationships. The results also show that total quality management has the strongest contribution to sustainable performance among the variables examined. The findings align with RBV and NRBV perspectives, demonstrating that green culture, green leadership, and total quality management serve as unique strategic capabilities and resources that support the development of long-lasting organizational competitiveness.

Practically, this study has implications for batik MSMEs in Yogyakarta to prioritize strengthening total quality management to enhance sustainable performance. This can be implemented by developing standard operating procedures at each stage of batik production. In addition, simple quality control practices, such as inspecting products before batik MSMEs are marketed and recording production defects to inform continuous improvement, should be implemented. These efforts are expected to help maintain the consistency and quality of batik production. Furthermore, developing a sustainability-oriented culture in batik MSMEs requires the consistent integration of environmentally responsible practices into everyday operations. This may involve using eco-friendly dyes, implementing simple wastewater-handling techniques, and optimizing water and energy consumption throughout the production process. Such an approach is important to ensure that sustainability practices remain feasible and aligned with the resource constraints of MSMEs. From a leadership perspective, the close relationship between owners and workers in batik MSMEs is an advantage that can be leveraged to accelerate the implementation of sustainability values. Business owners are encouraged not only to communicate an environmentally friendly vision but also to translate it into concrete, measurable work rules, such as setting standards for material use, waste management procedures, and product quality targets. In this way, environmental values are not merely rhetorical but are integrated into everyday operational practices.

The findings of this study should be interpreted with caution, as the results are derived from a limited number of respondents within batik MSMEs, which may not adequately represent broader populations. Therefore, future research is recommended to increase the sample size to obtain a more comprehensive understanding. Other, this study does not incorporate other variables that may influence sustainable performance, such as green human resource management, green marketing, and green supply chain. Future

studies are expected to integrate these variables into the research model to enrich the analysis. Furthermore, differences in regional context, research objects, and time may lead to varying results; therefore, future research should consider contextual variations to enhance the relevance of the findings.

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