“Translating environmental leadership into sustainable success in Vietnamese women-owned SMEs: A mixed-method approach”

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TRANSLATING ENVIRONMENTAL LEADERSHIP INTO SUSTAINABLE SUCCESS IN VIETNAMESE WOMEN-OWNED SMES: A MIXED-METHOD APPROACH

Abstract

As the global economy increasingly emphasizes sustainable development, small and medium-sized enterprises (SMEs) in emerging economies face growing pressure to integrate environmental responsibility with long-term business performance. This study aims to examine how environmental leadership and corporate social responsibility contribute to sustainable success in women-owned SMEs through the roles of green innovation and green competitive advantage. The paper analyzes survey data collected from 536 female business leaders in Vietnam using partial least squares structural equation modeling and fuzzy-set qualitative comparative analysis. The results reveal that environmental leadership and corporate social responsibility do not exert a direct influence on sustainable success ($p > 0.05$). Instead, their effects operate through a full serial mediation mechanism in which corporate social responsibility stimulates green innovation, which subsequently strengthens green competitive advantage and ultimately enhances sustainable success. The structural model explains 52.1% of the variance in sustainable success. In addition, market orientation significantly strengthens the relationship between green competitive advantage and sustainable success ($\beta = 0.176$, $p < 0.001$). Configurational analysis further identifies two alternative strategic pathways leading to high sustainable success, both highlighting the central role of green innovation and green competitive advantage. These findings demonstrate that ethical leadership values must be transformed into concrete green capabilities to generate sustainable competitive performance in resource-constrained environments.

Keywords women-owned SMEs, environmental leadership, green innovation, CSR, sustainable success, fsQCA, PLS-SEM, Vietnam

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INTRODUCTION

Sustainable development has evolved from a voluntary ethical choice into a strategic imperative for long-term corporate survival (Golicic & Smith, 2013). In emerging economies like Vietnam, small and medium-sized enterprises (SMEs) serve as the economic backbone but increasingly confront a "sustainability paradox": they face intense global pressure to adopt green practices while operating under severe financial and technological resource constraints (Laosirihongthong et al., 2013). Within this context, women-owned SMEs emerge as a compelling subject of study because female leaders often possess a heightened sensitivity to environmental and social issues – traits aligned with environmental leadership and corporate social responsibility (CSR) commitment (Robertson & Barling, 2013).

However, an important research gap remains in understanding how the internal values of female leaders are converted into sustainable success (Chen et al., 2006). Despite the growing body of research on

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green management, the mechanism by which these ethical "mindsets" translate into tangible "market performance" remains ambiguous (Chang, 2011). Previous studies have often focused on direct relationships between leadership and performance, yet empirical evidence remains inconsistent, frequently failing to account for the complex, multi-stage mediation processes required in resource-poor environments (Chang, 2011). Specifically, there is a critical lack of research exploring how green innovation and green competitive advantage act as essential conduits in this transformation (Chen, 2008).

This study addresses these shortcomings by investigating the serial mediation mechanism linking environmental leadership and CSR to sustainable success through the sequential roles of green innovation and green competitive advantage. By bridging Upper Echelons Theory (Hambrick & Mason, 1984) and the Natural Resource-Based View (Barney, 1991; Hart, 1995), this paper aims to explain the causal complexity of strategic pathways that lead to high performance. The findings provide a robust framework for understanding how female-led firms can overcome resource barriers to achieve a synergy between environmental integrity and economic prosperity.

1. LITERATURE REVIEW AND HYPOTHESES

Sustainable development has become a central strategic priority for firms operating in an increasingly competitive and environmentally sensitive global economy. In emerging markets, however, achieving sustainable success presents substantial challenges because firms must reconcile environmental responsibility with limited financial and technological resources. Small and medium-sized enterprises (SMEs) are particularly exposed to this dilemma, often described as the "sustainability paradox," in which organizations are expected to pursue environmentally responsible practices while simultaneously maintaining economic viability (Laosirihongthong et al., 2013). Understanding the mechanisms that enable SMEs to transform sustainability-oriented values into long-term competitive performance, therefore, remains an important research topic.

A growing body of literature emphasizes the critical role of leadership in shaping organizational sustainability strategies. Environmental leadership refers to the extent to which organizational leaders promote environmental responsibility through their strategic vision, decision-making processes, and organizational culture (Egri & Herman, 2000; Robertson & Barling, 2013). According to Upper Echelons Theory, personal values and cognitive orientations of top managers significantly influence the strategic choices and outcomes of organizations (Hambrick & Mason, 1984). Leaders who demonstrate strong environmental commitment are more likely to integrate sustainability principles into corporate strategies and encourage environmentally responsible behaviors throughout the organization. Empirical studies have shown that environmentally oriented leadership can foster organizational practices related to sustainability, including the development of corporate social responsibility initiatives and the promotion of environmentally friendly innovations (Robertson & Barling, 2013; Singh et al., 2020).

Corporate social responsibility has also been widely recognized as a key mechanism through which firms respond to stakeholder expectations and enhance their legitimacy in society. Stakeholder Theory suggests that organizations achieve superior performance when they effectively address the interests of various stakeholders, including customers, employees, communities, and the natural environment (Freeman, 1984). CSR initiatives allow firms to build trust, strengthen reputational capital, and cultivate long-term relationships with stakeholders (Aguinis & Glavas, 2012). In addition, CSR engagement can facilitate access to knowledge, resources, and collaborative opportunities that support innovation activities within the firm (Bocquet et al., 2015). Several empirical studies indicate that organizations that actively implement CSR practices tend to exhibit stronger innovative capabilities and improved environmental performance, particularly in contexts where stakeholder expectations regarding sustainability are increasing (Jamali & Karam, 2016; Zhu et al., 2013).

Within the sustainability literature, green innovation has been identified as a crucial mechanism enabling firms to transform environmental commitment into operational and economic value. Green innovation refers to the development of environmentally friendly products, processes, and technologies that reduce environmental impact while improving organizational efficiency (Chen et al., 2006). From the perspective of the Natural Resource-Based View, environmental capabilities can serve as strategic resources that allow firms to achieve sustainable competitive advantages (Hart, 1995; Hart & Dowell, 2011). By adopting green innovation, firms can reduce production costs, improve resource efficiency, and differentiate their products in increasingly environmentally conscious markets (Chen et al., 2006; Kraus et al., 2020). Consequently, green innovation is frequently regarded as a key driver of superior organizational performance in sustainability-oriented markets.

Closely related to green innovation is the concept of green competitive advantage. Green competitive advantage refers to a firm's ability to outperform competitors by leveraging environmentally friendly resources, technologies, or reputational assets that are difficult for rivals to imitate (Chen et al., 2006). Firms that successfully integrate environmental considerations into their strategic capabilities may develop distinctive advantages in areas such as eco-friendly product quality, brand reputation, cost efficiency, and customer loyalty. These advantages enable organizations to achieve both environmental and economic benefits, thereby supporting long-term sustainable success (Chang, 2011). Previous research has consistently highlighted the important role of green competitive advantage as a mechanism through which environmental strategies translate into improved organizational outcomes.

Another factor that may influence the effectiveness of green strategies is market orientation. Market orientation reflects the extent to which firms systematically gather market intelligence, respond to customer needs, and monitor competitor actions (Narve & Slater, 1990). In sustainability-oriented markets, customer demand for environmentally responsible products continues to grow, making market orientation an important strategic capability. Firms that maintain a strong market orientation are better positioned to identify emerging opportunities for green products and effectively communicate the value of environmental initiatives to customers. As a result, market orientation may strengthen the relationship between environmentally driven competitive advantages and firm performance by ensuring that green innovations align with actual market demands.

Despite the substantial body of research on environmental leadership, corporate social responsibility, and green innovation, several important gaps remain in the existing literature. First, many studies have examined the direct relationships between sustainability-related practices and firm performance, often overlooking the complex mechanisms through which leadership values are translated into tangible competitive outcomes. Second, although previous research acknowledges the importance of innovation in sustainability strategies, limited attention has been given to the sequential processes through which leadership values stimulate CSR initiatives, which subsequently promote innovation and competitive advantage. Third, empirical studies focusing on women-owned SMEs remain relatively scarce, particularly in emerging economies such as Vietnam, where resource constraints may significantly influence the effectiveness of sustainability strategies.

Overall, prior research suggests that leadership values, corporate social responsibility, and green innovation play important roles in promoting sustainable organizational performance. However, the mechanisms by which these factors interact to generate sustainable success remain insufficiently understood, particularly in the context of women-owned SMEs in emerging markets. Addressing this gap requires a comprehensive analytical framework that examines the sequential relationships linking leadership values, social responsibility, innovation capabilities, and competitive advantage.

Based on the theoretical arguments and prior empirical findings discussed above, this study aims to investigate how environmental leadership and corporate social responsibility contribute to sustainable success in women-owned SMEs by examining the mediating roles of green innovation and green competitive advantage, as well as the moderating role of market orientation.

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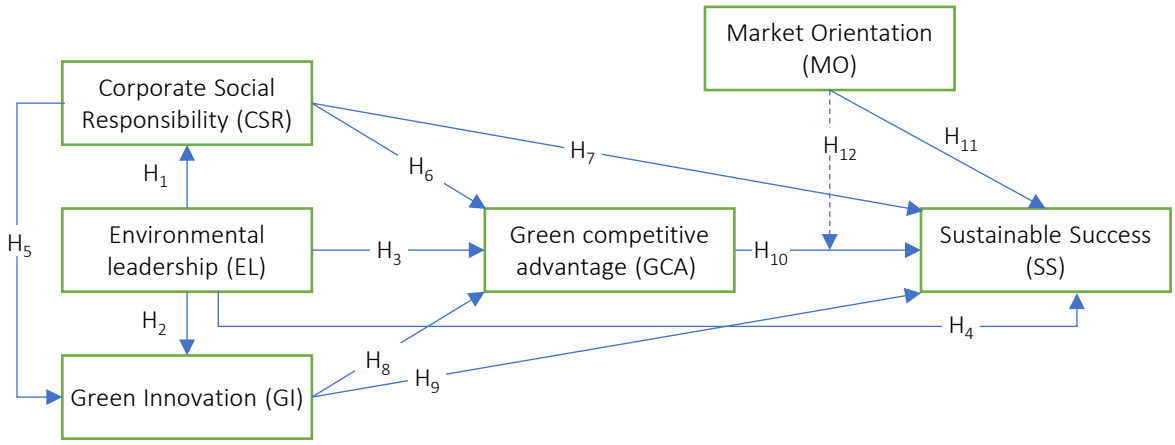

Figure 1. Conceptual framework

Accordingly, the following hypotheses are proposed:

H1: Environmental leadership has a positive impact on corporate social responsibility commitment.

H2: Environmental leadership has a positive impact on green innovation.

H3: Environmental leadership has a positive impact on green competitive advantage.

H4: Environmental leadership has a positive impact on the sustainable success of the enterprise.

H5: CSR has a positive impact on green innovation.

H6: CSR has a positive impact on green competitive advantage.

H7: CSR has a positive impact on the sustainable success of the enterprise.

H8: The adoption of green innovation has a positive impact on green competitive advantage.

H9: The adoption of green innovation has a positive impact on the sustainable success of the enterprise.

H10: Green competitive advantage has a positive impact on sustainable success.

H11: Market orientation has a positive impact on sustainable success.

H12: Market orientation moderates the relationship between green competitive advantage and sustainable success.

H13: Green competitive advantage mediates the relationship between environmental leadership and sustainable success.

H14: Green competitive advantage mediates the relationship between CSR and sustainable success.

H15: Green competitive advantage mediates the relationship between green innovation and sustainable success.

H16: CSR impacts sustainable success through a serial mediation chain: CSR → GI → GCA → SS.

H17: Environmental leadership impacts sustainable success through a multi-stage serial mediation chain: EL → CSR → GI → GCA → SS.

The proposed relationships and the overall structural model are illustrated in Figure 1.

2. METHOD

This study employs a quantitative research design to empirically examine the proposed relationships

among environmental leadership, corporate social responsibility, green innovation, green competitive advantage, market orientation, and sustainable success in women-owned small and medium-sized enterprises (SMEs). A cross-sectional survey approach was adopted because it enables the simultaneous analysis of complex direct, mediating, and moderating relationships among multiple constructs within organizational settings.

The target population consists of female business owners and senior managers currently operating SMEs in Vietnam. Women-led SMEs represent an important component of the Vietnamese economy, yet they often operate under significant resource constraints when implementing sustainability initiatives. Data collection was conducted from June to September 2025 using a structured questionnaire distributed through two channels. First, an online survey was administered through Google Forms to reach entrepreneurs participating in professional networks and business associations. Second, printed questionnaires were distributed during entrepreneurship training programs, seminars, and networking events organized for female entrepreneurs. Because a comprehensive sampling frame of women-owned SMEs is unavailable in Vietnam, a combination of convenience and snowball sampling techniques was employed to reach the target respondents. After the data screening process, which removed incomplete responses and cases showing straight-line answering patterns, a total of 536 valid questionnaires were retained for the final analysis. This sample size satisfies the recommended statistical requirements for partial least squares structural equation modeling and is also suitable for fuzzy-set qualitative comparative analysis.

To ensure research integrity and reduce potential biases, several procedural and statistical measures were implemented. Prior to completing the questionnaire, respondents were informed of the study's academic purpose and assured that their participation was voluntary and anonymous. All identifying information was removed from the dataset to ensure confidentiality. In addition, the order of survey items was randomized to reduce the risk of consistency motifs and response bias. To further assess the potential presence of common method bias, the study applied a full collinearity assessment using inner variance inflation factor (VIF) values. Following the recommendation of Kock (2015), all VIF values were below the critical threshold of 3.3, indicating that common method bias does not represent a serious concern in this study.

The measurement instruments used in this study were adapted from well-established scales in prior research to ensure content validity (Appendix A). Environmental leadership was measured using six items adapted from Robertson and Barling (2013) and Min et al. (2020). Corporate social responsibility was assessed using seven items based on the scale developed by Turker (2009) and further applied by Aguinis and Glavas (2012). Green innovation was measured using eight items derived from Chen et al. (2006) and Singh et al. (2020). Green competitive advantage was captured using eight items adapted from Chen et al. (2006), Chang (2011), and Hussein et al. (2024). Market orientation was measured with six items from the scale developed by Narver and Slater (1990). Finally, sustainable success was assessed using seven items adapted from Laosirihongthong et al. (2013) and Golicic and Smith (2013). All items were measured using a five-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree").

For data analysis, the study employed partial least squares structural equation modeling using SmartPLS version 4.1.0 to test the proposed hypotheses and evaluate the measurement and structural models. Bootstrapping with 5,000 resamples was applied to assess the statistical significance of the estimated path coefficients. In addition, fuzzy-set qualitative comparative analysis was conducted to complement the variance-based analysis by identifying configurational pathways leading to high levels of sustainable success. The combination of these two analytical approaches allows the study to capture both net effects among variables and complex combinations of conditions that contribute to sustainable performance.

The empirical analysis relies on data collected and validated from 536 female business owners and senior managers of small and medium-sized enterprises (SMEs) in Vietnam. Following data cleaning procedures, the demographic and organizational characteristics of the final sample are summarized in Table 1.

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Table 1. Profile of respondents and organizations (n = 536)

Criteria	Classification	Frequency	Percentage (%)
Industry Sector	Manufacturing	162	30.2
	Trade and Services	284	53.0
	High-tech Agriculture	90	16.8
Firm Size	Micro (Under 10 employees)	124	23.1
	Small (10–49 employees)	278	51.9
	Medium (50–200 employees)	134	25.0
Years in Operation	Under 5 years	156	29.1
	5–10 years	248	46.3
	Over 10 years	132	24.6
Education Level	Below Bachelor's Degree	54	10.1
	Bachelor's Degree	392	73.1
	Postgraduate Degree	90	16.8

The sample demonstrates adequate diversity to represent the SME landscape, with a predominance of small enterprises (51.9%) and firms in the trade and services sectors (53.0%). Overall, most respondents possess at least a bachelor's degree, with a substantial share holding postgraduate qualifications, suggesting a relatively high level of educational attainment among the female leaders surveyed.

3. RESULTS AND DISCUSSION

3.1. Measurement model assessment

The quality of the measurement scales was evaluated based on internal consistency reliability, convergent validity, and discriminant validity, adhering to the guidelines proposed by Hair et al. (2022).

As presented in Table 2, all constructs exhibit high internal consistency. Specifically, Cronbach's Alpha values range from 0.891 to 0.935, and composite reliability (CR) scores fall between 0.912 and 0.947, both well exceeding the recommended threshold of 0.70 (Hair et al., 2022). Regarding convergent validity, the outer loadings for all items surpass 0.70, and the average variance extracted (AVE) for each construct exceeds the 0.50 benchmark, confirming robust convergent validity.

Discriminant validity was assessed using the heterotrait-monotrait (HTMT) ratio of correlations. According to Henseler et al. (2015), HTMT values between any two constructs should be lower than 0.85 (or 0.90) to establish distinction. The results in Table 2 show that the highest HTMT value is 0.758 (between green innovation and green competitive advantage), thereby confirming that the constructs in the structural model are empirically distinct.

3.2. Structural model assessment

3.2.1. Common method bias (CMB) and explanatory power

Given that the data were collected via a cross-sectional, self-reported survey, common method bias (CMB) poses a potential validity threat. To address this, the study employed a full collinearity assessment approach using inner VIF values, as recommended by Kock (2015). The analysis reveals that all Inner VIF values range from 1.016 to

Table 2. Reliability and convergent validity results

Construct	Cronbach's Alpha	CR (rho_a)	CR (rho_c)	AVE	Outer Loadings (Range)	HTMT (Max)
CSR	0.899	0.901	0.921	0.624	0.726–0.822	–
EL	0.896	0.898	0.920	0.657	0.787–0.825	0.413
GCA	0.933	0.934	0.945	0.682	0.809–0.848	0.514
GI	0.935	0.936	0.947	0.689	0.811–0.847	0.758
MO	0.891	0.914	0.912	0.634	0.698–0.841	0.090
SS	0.919	0.920	0.935	0.673	0.795–0.865	0.715

Note: CSR = corporate social responsibility; EL = environmental leadership; GCA = green competitive advantage; GI = green innovation; MO = market orientation; SS = sustainable success.

2.524, falling significantly below the 3.3 threshold. This confirms that the model is free from multicollinearity issues and that CMB is not a pervasive concern in this study.

The structural model's explanatory power was evaluated using the coefficient of determination (R^2). As shown in Table 3, the model explains 55.2% of the variance in green competitive advantage (GCA) and 52.1% of the variance in sustainable success (SS). According to Hair et al. (2022), these R^2 values indicate a moderate-to-high predictive accuracy. Furthermore, the Stone-Geisser Q^2 values for all endogenous constructs are greater than zero, confirming the model's predictive relevance (Geisser, 1974; Stone, 1974).

Table 3. Explanatory power (R2) and predictive relevance (Q2)

Endogenous Construct	R^2	R^2 adjusted	Q^2 predict
GCA	0.552	0.549	0.148
GI	0.307	0.304	0.264
SS	0.521	0.516	0.139

Note: GCA = green competitive advantage; GI = green innovation; SS = sustainable success.

3.2.2. *Hypothesis testing and effect sizes (f2)*

A bootstrapping procedure with 5,000 resamples was conducted to test the statistical significance of the path coefficients (Hair et al., 2022). The results of the direct hypothesis testing are detailed in Table 4. In addition to significance levels (p-values), Cohen's f^2 effect sizes are reported to evaluate the substantive impact of independent variables (Cohen, 1988).

The analysis identifies green innovation and green competitive advantage as the most critical drivers of sustainable success. Notably, the effect size analysis reveals a substantial impact of green innovation on green competitive advantage ($f^2 = 0.617$). Conversely, the direct paths from environmental leadership (H4) and CSR (H7) to sustainable success yielded statistically insignificant results ($p > 0.05$) with negligible effect sizes ($f^2 < 0.02$), suggesting that their influence is fully mediated by other constructs.

3.2.3. *Mediation and moderation analysis*

To elucidate the "black box" mechanism, mediation and moderation effects were examined (Table 5). The results confirm the full mediating

Table 4. Direct hypothesis testing results and effect sizes

Hyp.	Path	Beta (β)	T–stats	P–values	f^2	Result
H1	EL → CSR	0.374	10.534	0.000	0.163	Supported
H2	EL → GI	0.437	12.307	0.000	0.237	Supported
H3	EL → GCA	–0.028	0.837	0.403	0.001	Rejected
H4	EL → SS	0.010	0.274	0.784	0.001	Rejected
H5	CSR → GI	0.214	5.818	0.000	0.057	Supported
H6	CSR → GCA	0.243	8.283	0.000	0.108	Supported
H7	CSR → SS	0.025	0.736	0.462	0.001	Rejected
H8	GI → GCA	0.632	22.015	0.000	0.617	Supported
H9	GI → SS	0.301	6.378	0.000	0.096	Supported
H10	GCA → SS	0.424	9.716	0.000	0.167	Supported
H11	MO → SS	0.057	1.746	0.081	0.007	Rejected

Note: CSR = corporate social responsibility; EL = environmental leadership; GCA = green competitive advantage; GI = green innovation; MO = market orientation; SS = sustainable success.

Table 5. Indirect and interaction effects

Hyp.	Relationship	Beta (β)	T-stats	P-values	Result
H12	MO x GCA → SS	0.176	4.662	0.000	Supported
H13	EL → GCA → SS	–0.012	0.837	0.402	Rejected
H14	CSR → GCA → SS	0.103	6.529	0.000	Supported
H15	GI → GCA → SS	0.268	8.800	0.000	Supported
H16	CSR → GI → GCA → SS	0.057	4.815	0.000	Supported
H17	EL → CSR → GI → GCA → SS	0.021	4.333	0.000	Supported

Note: CSR = corporate social responsibility; EL = environmental leadership; GCA = green competitive advantage; GI = green innovation; MO = market orientation; SS = sustainable success.

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roles of green innovation and green competitive advantage. Crucially, the study provides robust empirical evidence for serial mediation pathways (H16, H17), validating the strategic sequence: Leadership → CSR → Innovation → Advantage → Success. Additionally, market orientation demonstrates a significant positive moderating effect (H12), strengthening the relationship between green competitive advantage and sustainable success ($\beta = 0.176$, $p < 0.001$).

3.3. Fuzzy-set qualitative comparative analysis (fsQCA)

Complementing the linear PLS-SEM analysis, fsQCA was utilized to identify complex configurations leading to "High Sustainable Success" (Ragin, 2008). Initially, the analysis of necessary conditions was performed to ascertain if any specific factor is mandatory for the outcome. The results, presented in Appendix B, indicate that no single condition exceeds the consistency threshold of 0.90 to be deemed strictly "necessary" (Ragin, 2008). Consequently, the analysis proceeded to examine sufficient conditions (configurations) that lead to the outcome.

The analysis of sufficient conditions (Table 6) reveals two distinct pathways (configurations) with high solution consistency (> 0.80).

The robustness of the configurations presented in Table 6 is substantiated by two critical parameters: consistency and raw coverage. Consistency values for all identified pathways exceed the recommended threshold of 0.80, with the highest reaching 0.940, thereby confirming a stable and reliable relationship between the strategic combinations of environmental leadership, corporate social responsibility, green innovation, green competitive advantage, and the outcome of high sustainable success. Furthermore, the raw coverage indicates the empirical relevance of each configuration; for instance, Configuration 1 has a coverage of 0.728, indicating that it explains a substantial proportion of the empirical instances associated with high sustainable success. Collectively, these metrics validate the high explanatory power of the configurational models and underscore the equifinality of strategies leading to sustainable success in the Vietnamese context.

The fsQCA results underscore that green innovation and green competitive advantage are core conditions present in all successful pathways. Configuration 1 highlights a synergy between CSR and green capabilities, while Configuration 2 emphasizes the role of environmental leadership combined with green capabilities. These findings strongly corroborate the central role of green strategies identified in the SEM analysis.

The empirical findings of this study provide a nuanced understanding of how women-owned SMEs in Vietnam navigate the "sustainability paradox" by converting ethical orientations into long-term performance. A pivotal discovery is the lack of a direct significant relationship between environmental leadership, corporate social responsibility, and sustainable success. While traditional global literature often suggests that leadership values can directly bolster organizational outcomes (Robertson & Barling, 2013), this result aligns with the specific findings of Laosirihongthong et al. (2013) in the Vietnamese context, which indicated that green supply chain practices do not always yield immediate economic gains without mediating factors. This suggests that in Vietnam's emerging market, "goodwill" alone is insufficient to overcome severe financial and techno-

Table 6. Configurations for achieving high sustainable success

Condition	Configuration 1	Configuration 2
Environmental Leadership (EL)		●
Corporate Social Responsibility (CSR)	●	
Green Innovation (GI)	●	●
Green Competitive Advantage (GCA)	●	●
Consistency	0.940	0.935
Raw Coverage	0.728	0.731
Overall Solution Consistency	0.849	

Note: ● indicates the presence of a condition.

logical constraints. For female leaders, ethical aspirations frequently collide with survival unless they are operationalized through tangible, market-ready capabilities. This empirical evidence clarifies why the direct paths (H4 and H7) were rejected. In the resource-constrained context of Vietnamese SMEs, environmental leadership and CSR do not automatically translate into commercial performance to drive success independently. Instead, they function as foundational 'mindsets' that require green innovation as a functional bridge to translate ethical value into economic performance. This aligns with the 'sustainability paradox' where goodwill without operational capability becomes a financial burden rather than a driver of success.

Conversely, the validation of the full serial mediation chain (EL → CSR → GI → GCA → SS) reinforces Upper Echelons Theory by demonstrating that the cognitive values of female leaders serve as the primary catalyst for a systematic strategic trajectory. Aligning with domestic observations that Vietnamese female entrepreneurs often prioritize long-term social integrity, the results show that CSR is not a peripheral philanthropic activity but a strategic tool to acquire the green knowledge necessary to fuel green innovation. This finding extends the evidence of Chen et al. (2006) and Chang (2011) by proving that for women-led firms in Vietnam, sustainability is a deliberate, multi-stage evolution from personal ethics to organizational innovation. While Western studies might find direct links between CSR and performance, the Vietnamese landscape, characterized by resource scarcity, requires this "innovation bridge" to achieve competitive differentiation.

Furthermore, the significant moderating effect of market orientation ($\beta = 0.176$, $p < 0.001$) provides a crucial pragmatic dimension. While green competitive advantage is inherently valuable, its conversion into sustainable success in Vietnam is not automatic; it requires deep alignment with customer demands. This explains the "commercial gap" frequently seen in Vietnamese SMEs, where high-quality, eco-friendly products fail financially because they lack market insight. These results corroborate the market-based view that technical green superiority must be paired with customer-centric strategies to justify premium pricing in Vietnam's increasingly discerning market.

Finally, the fsQCA results complement the SEM findings by identifying green innovation and green competitive advantage as "core conditions" present in every successful pathway. Whether through a leadership-driven or stakeholder-driven approach, the study confirms that for Vietnamese female business owners, there is no single formula for success, but rather a set of equifinal configurations. This flexibility allows them to choose a strategy focused on personal vision (environmental leadership) or social expectations (CSR), depending on their firm's development stage, provided they maintain the synergy between innovation and competitive positioning to reach the ultimate goal of sustainability.

CONCLUSION

This study was conducted to explore the mechanisms through which environmental leadership and corporate social responsibility influence sustainable success in women-owned small and medium-sized enterprises, with particular attention to the roles of green innovation, green competitive advantage, and market orientation. By analyzing survey data from female entrepreneurs in Vietnam using a combination of variance-based structural modeling and configurational analysis, the study provides empirical evidence on how sustainability-oriented leadership values are translated into long-term organizational outcomes.

The findings indicate that leadership commitment to environmental responsibility and CSR initiatives does not automatically lead to superior performance. Instead, their impact becomes meaningful when these orientations stimulate environmentally oriented innovation and strengthen firms' competitive positions in green markets. The empirical model also shows that market-oriented firms are better able to

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convert these advantages into sustainable success, while configurational analysis reveals that multiple strategic pathways may lead to high levels of performance among women-led SMEs.

These results suggest that the effectiveness of sustainability strategies depends less on the symbolic adoption of environmental values and more on the firm's ability to transform those values into concrete capabilities and market advantages. In resource-constrained SMEs, sustainable success emerges when leadership vision, responsible business practices, and innovation activities operate as an integrated strategic system that supports long-term competitiveness.

Although this study contributes to understanding sustainability strategies in women-owned SMEs, several directions for future research remain open. Longitudinal research designs could provide deeper insights into how sustainability-oriented capabilities evolve over time and influence firm performance. In addition, comparative studies involving male-led firms or enterprises from different national contexts may help clarify the role of gender and institutional environments in shaping sustainable business strategies.

AUTHOR CONTRIBUTIONS

Conceptualization: Tra Thu Dao, Nuong Thi Le.
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APPENDIX A

Table A1. Measurement scales

Construct	Items	Source
	Environmental Leadership (EL)	
EL1	Leaders clearly communicate a vision for eco-friendly development	Robertson and Barling (2013)
EL2	Leaders encourage employees to propose ideas for improving environmental performance	
EL3	Leaders lead by example in environmental protection behaviors	Min et al. (2020)
EL4	Environmental goals are integrated into the firm's long-term strategy	
EL5	Leaders prioritize investment in eco-friendly initiatives	
EL6	Leaders view environmental protection as a core corporate responsibility	Robertson and Barling (2013)
	Corporate Social Responsibility (CSR)	
CSR1	The firm actively participates in environmental protection activities	Turker (2009)
CSR2	The firm ensures safe and fair working conditions for employees	
CSR3	The firm cares about employee welfare and development	
CSR4	The firm complies with legal regulations and business ethics	Aguinis and Glavas (2012)
CSR5	The firm contributes actively to the local community	Turker (2009)
CSR6	The firm considers stakeholder opinions in strategic decisions	Aguinis and Glavas (2012)
CSR7	CSR is an integral part of the firm's long-term strategy	
	Green Innovation (GI)	
GI1	The firm develops eco-friendly products	Chen et al. (2006); Singh et al. (2020)
GI2	The firm's products use less polluting materials	
GI3	The firm improves processes to minimize waste	
GI4	The firm adopts energy-saving technologies	
GI5	The firm reuses or recycles by-products in production	
GI6	The firm reduces consumption of non-renewable resources	
GI7	The firm invests in environment-related R&D	
GI8	Green innovations improve the firm's operational efficiency	
	Green Competitive Advantage (GCA)	
GCA1	The firm has a stronger green brand image than competitors	Hussein et al. (2024)
GCA2	The firm's green products are of superior quality compared to competitors	
GCA3	The firm achieves cost savings through green initiatives	Chang (2011)
GCA4	Competitors find it difficult to replicate the firm's green innovations	
GCA5	The firm holds a unique market position due to environmental factors	
GCA6	Customers are willing to pay a premium for the firm's green products	Chen et al. (2006)
GCA7	Environmental advantages help the firm maintain long-term competitiveness	Chang (2011)
GCA8	Green capabilities create superior value for the firm	Hussein et al. (2024)
	Market Orientation (MO)	
MO1	The firm regularly researches customer needs	Narver and Slater (1990)
MO2	The firm responds quickly to market changes	
MO3	The firm closely monitors competitor strategies	
MO4	Departments coordinate effectively to create value for customers	
MO5	Customers are central to strategic decisions	
MO6	The firm prioritizes delivering superior value to customers	
	Sustainable Success (SS)	
SS1	The firm's revenue has grown steadily	Laosirihongthong et al. (2013)
SS2	The firm's profit has improved in recent years	
SS3	The firm maintains a stable cash flow	
SS4	The firm has a good reputation for environmental responsibility	Golicic and Smith (2013)
SS5	The firm's brand is trusted by customers	
SS6	Customers are loyal to the firm's products	
SS7	The firm achieves sustainable long-term growth	

APPENDIX B

Table B1. Analysis of necessary conditions for sustainable success (SS)

Condition	Consistency	Coverage
CSR	0.828893	0.828893
EL	0.823133	0.823132
GI	0.864608	0.864608
GCA	0.873266	0.873265

Note: CSR = corporate social responsibility; EL = environmental leadership; GCA = green competitive advantage; GI = green innovation.

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