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From Sustainable Leadership to Green Performance: Exploring the Mediating Power of Green Innovation and Green Self-Efficacy in Tourism and Hospitality

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Abstract

This study investigates how sustainable leadership enhances green performance in the tourism and hospitality sector, specifically among managers and supervisors working in five-star hotels and travel agencies, by examining the mediating roles of green innovation and green self-efficacy through the lenses of the Resource-Based View (RBV) and Dynamic Capabilities Theory (DCT). A quantitative research approach was adopted, utilizing survey data collected from 788 managers and supervisors employed in Egyptian five-star hotels and travel agencies operating within a highly competitive tourism destination context. The findings indicate that sustainable leadership has a significant positive effect on green performance and positively influences both green innovation and green self-efficacy. Moreover, green innovation and green self-efficacy significantly contribute to green performance and partially mediate the relationship between sustainable leadership and environmental outcomes. This study contributes to the literature on sustainability, tourism, and organizational behavior by providing an integrated framework that links sustainable leadership with organizational innovation capabilities and employees' environmental competencies. In addition, the findings extend the explanatory power of RBV and DCT in explaining how sustainable leadership practices translate into enhanced environmental performance in tourism and hospitality organizations. From a practical perspective, the study highlights the importance of adopting leadership practices that foster green innovation, strengthen employees' environmental confidence, and promote proactive environmental behavior within organizations.



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1. Introduction

The tourism and hospitality industry is among the most environmentally sensitive sectors due to its intensive reliance on natural resources, high energy consumption, and continuous interaction with ecosystems and local communities (Baloch et al., 2023). As environmental pressures and stakeholder expectations continue to increase, sustainability

has become a strategic priority shaping organizational legitimacy, competitiveness, and long-term resilience (Rashid et al., 2025). In addition to its environmental significance, sustainability has increasingly emerged as an important strategic and economic imperative within the tourism and hospitality industry (Mahran et al., 2025). Contemporary hospitality research suggests that sustainability initiatives contribute not only to environmental protection but also to organizational competitiveness through enhanced brand positioning, stronger corporate reputation, increased customer loyalty, greater willingness to pay, and improved market differentiation (Qalati et al., 2026; Velaoras et al., 2025). Consequently, sustainability practices are increasingly viewed as strategic investments that generate both environmental and economic value, encouraging organizations to integrate sustainability considerations into their long-term strategic and leadership priorities (Ciuciuc et al., 2026). In highly competitive tourism destinations such as Egypt, sustainability practices are increasingly shaped not only by internal organizational priorities but also by external market dynamics. International tourists have become progressively more sensitive to environmental responsibility and sustainability performance when making travel and accommodation decisions. Similarly, multinational hotel chains, international tour operators, and global tourism markets increasingly encourage the adoption of sustainability standards and environmentally responsible practices through competitive pressures, reputation considerations, and market expectations. Consequently, organizations operating in the tourism and hospitality sector often adopt sustainability-oriented strategies and leadership approaches not only to fulfill environmental responsibilities but also to maintain competitiveness and strengthen their position in international markets (Qalati et al., 2026). Within this context, green performance, which refers to an organization's ability to achieve environmental objectives through reducing ecological impacts, improving resource efficiency, and integrating environmentally responsible practices into operational activities (Bani-Melhem et al., 2022; Zhao & Huang, 2022), has emerged as a critical indicator of organizational environmental effectiveness. In tourism and hospitality organizations, where service quality is closely connected to environmental conditions, environmental performance increasingly represents a source of competitive advantage and organizational sustainability (Al-Romeedy & El-Sisi, 2024).

In addition to internal organizational capabilities, sustainability practices in tourism and hospitality organizations are increasingly shaped by external institutional forces, including environmental regulations, ESG requirements, sustainability standards, certification schemes, and broader stakeholder expectations (Font, 2002). These institutional pressures not only influence organizational sustainability agendas but also affect leadership priorities and managerial commitment to environmental responsibility (Haldorai et al., 2025). While acknowledging the importance of such external influences, the present study focuses primarily on the internal organizational and behavioral mechanisms through which sustainable leadership contributes to environmental performance.

Environmental performance, however, does not emerge automatically. It is influenced by organizational, managerial, and behavioral factors that determine whether sustainability commitments are translated into meaningful operational outcomes (Aggarwal & Agarwala, 2023). Leadership orientation, organizational capabilities, and employee psychological resources collectively shape the effectiveness of sustainability initiatives (Kalkan, 2025). Consequently, understanding the internal mechanisms that drive environmental performance has become an important concern for both scholars and practitioners.

Among these mechanisms, sustainable leadership has received increasing scholarly attention as a key driver of sustainability-oriented transformation. Sustainable leadership refers to a leadership approach that integrates economic, social, and environmental considerations into organizational strategy, decision-making processes, and long-term

value creation while promoting sustainable organizational development and stakeholder well-being (Hargreaves & Fink, 2004; Avery & Bergsteiner, 2011). In contrast to leadership approaches that do not explicitly prioritize sustainability considerations, sustainable leadership integrates environmental responsibility into organizational strategy, organizational culture, and managerial decision-making processes (Rosário & Boechat, 2025). In tourism and hospitality organizations, where operations are often resource-intensive, sustainable leaders play an important role in shaping environmental priorities and encouraging environmentally responsible practices across organizational levels (Zada et al., 2025). Through strategic support, resource allocation, and the promotion of environmental values, such leaders foster organizational environments that encourage sustainability-oriented thinking and action (Boeske, 2023). The adoption of sustainable leadership practices is not solely determined by organizational strategy but may also reflect a combination of individual, social, and contextual influences (Gerard et al., 2017; Galpin & Lee, 2012). Previous studies suggest that leaders' environmental values, ecological awareness, cultural and societal norms, stakeholder expectations, and reputational considerations can shape their commitment to sustainability-oriented leadership practices (Mahran et al., 2025; Kareem & Kummitha, 2025). In tourism and hospitality organizations, where sustainability increasingly represents both a societal expectation and a strategic priority, these factors may contribute to the emergence of sustainable leadership orientations (López et al., 2025; Mahran et al., 2025).

The influence of sustainable leadership on environmental outcomes can occur through both direct and indirect pathways. In addition to its direct contribution to environmental performance, sustainable leadership exerts its influence through organizational and individual mechanisms that facilitate the translation of sustainability-oriented strategies into measurable environmental outcomes. At the organizational level, green innovation represents a critical pathway through which sustainability objectives are operationalized (L. Chen et al., 2023). Green innovation refers to the development of processes, services, and operational practices that reduce environmental harm while supporting long-term organizational sustainability and competitiveness (Le et al., 2024; Rennings, 2000). Although the implementation of green innovation may involve short-term costs, operational adjustments, or temporary reductions in organizational effectiveness, previous studies suggest that such investments often generate long-term benefits through improved resource efficiency, enhanced competitiveness, and superior environmental performance outcomes. In tourism and hospitality contexts, this may involve energy-efficient technologies, waste reduction systems, and environmentally friendly service practices (Al-Romeedy & El-Sisi, 2024). Sustainable leadership supports these initiatives by encouraging experimentation, legitimizing environmental change, and promoting innovation-oriented sustainability practices (Boeske, 2023).

At the individual level, green self-efficacy represents another important mechanism linking leadership to environmental performance (Y. Chen et al., 2014). Green self-efficacy refers to employees' confidence in their ability to contribute effectively to organizational environmental goals (Nisar et al., 2017). This mechanism is particularly relevant in tourism and hospitality organizations, where frontline employees play a central role in implementing sustainability practices (Al-Romeedy & El-Sisi, 2024). Sustainable leadership strengthens these beliefs by providing guidance, support, and reinforcement for environmentally responsible actions (Rosário & Boechat, 2025). Employees who perceive themselves as capable of contributing to environmental goals are more likely to engage in proactive green behaviors that enhance organizational environmental performance (Zafar et al., 2025).

The relationships among sustainable leadership, green innovation, green self-efficacy, and green performance can be explained through the integration of the Resource-Based View (RBV) and Dynamic Capabilities Theory (DCT). RBV suggests that intangible re-

sources and capabilities constitute important sources of sustained competitive advantage (Clulow et al., 2003; El Nemar et al., 2025). Within this perspective, sustainable leadership, green innovation capability, and green self-efficacy represent strategic resources that strengthen firms' environmental competitiveness (Saleem et al., 2024; Javed et al., 2021; Salama et al., 2025). DCT complements this perspective by explaining how organizations mobilize and reconfigure such resources in response to changing environmental demands (Gärtner, 2011; Strauss et al., 2017). Specifically, the theory highlights how leadership enables organizations to identify environmental opportunities, support innovation-oriented responses, and transform internal capabilities into measurable environmental outcomes (Al-Romeedy & El-Sisi, 2024). Together, these perspectives provide a coherent framework for understanding how sustainability-oriented capabilities contribute to green performance in tourism and hospitality organizations.

Despite the growing body of sustainability research in tourism and hospitality, existing studies remain limited in explaining how sustainability-oriented leadership translates into environmental outcomes. Much of the literature has examined leadership styles, environmental practices, or performance indicators separately, without adequately addressing the mechanisms connecting these elements (e.g., Salama et al., 2025; Javed et al., 2021). Consequently, the processes through which sustainable leadership influences green performance remain insufficiently explained. Specifically, previous studies have primarily examined either the direct effects of sustainability-oriented leadership on environmental outcomes (e.g., Rosário & Boechat, 2025; Boeske, 2023) or the role of organizational capabilities, such as green innovation, as independent organizational outcomes (e.g., Gürlek & Koseoglu, 2021; Park et al., 2023). Likewise, research on employee environmental behavior has paid limited attention to green self-efficacy as an explanatory psychological mechanism. Consequently, limited evidence exists regarding how organizational and individual mechanisms jointly explain the relationship between sustainable leadership and green performance, particularly in tourism and hospitality contexts. Green innovation has often been treated as an outcome of sustainability initiatives rather than as a mediating capability linking leadership and environmental performance. This limits understanding of how organizations convert sustainability-oriented leadership into operational environmental improvements, especially in service-based sectors where innovation frequently occurs through process adaptation and behavioral change. Similarly, although prior research has examined employee green behavior, limited attention has been given to green self-efficacy as a psychological mechanism explaining how employees contribute to organizational environmental goals. This gap is particularly important in tourism and hospitality organizations, where environmental performance depends heavily on employees' discretionary actions and confidence in implementing sustainability practices. Moreover, limited research has integrated organizational and individual mechanisms within a unified framework. The lack of multilevel perspectives restricts understanding of how leadership, innovation processes, and employee capabilities interact to shape environmental performance. This limitation is reinforced by the limited application of strategic management perspectives, particularly RBV and DCT, within sustainability research in tourism and hospitality contexts.

Addressing these gaps, the present study examines how sustainable leadership influences green performance through the mediating roles of green innovation and green self-efficacy in tourism and hospitality organizations. By integrating organizational and individual mechanisms within a unified framework, the study provides a more comprehensive explanation of how sustainability-oriented leadership promotes environmental performance. More specifically, unlike previous studies that have examined organizational and individual mechanisms separately, this study simultaneously examines green innovation and green self-efficacy as complementary mediating mechanisms and integrates the

RBV and DCT within a multilevel framework to explain environmental performance in tourism and hospitality organizations.

The study contributes to the literature in several ways. First, it extends sustainable leadership research by providing a deeper understanding of the mechanisms through which sustainable leadership influences green performance. Second, it integrates organizational and individual perspectives by simultaneously examining green innovation and green self-efficacy as complementary mediators. Third, it enriches the application of RBV and DCT within tourism and hospitality sustainability research by demonstrating how strategic resources and dynamic capabilities jointly contribute to environmental performance. Practically, the findings offer insights for managers and policymakers by demonstrating how leadership development, innovation support, and employee empowerment can be aligned to strengthen environmental performance in tourism and hospitality organizations.

2. Literature Review and Hypothesis Development

2.1. Resource-Based View (RBV) and Dynamic Capabilities Theory (DCT)

Environmental sustainability in tourism and hospitality organizations is increasingly understood as the result of how firms strategically organize and deploy internal resources in response to ecological pressures rather than merely implementing isolated environmental initiatives (Mahran et al., 2025). Accordingly, recent research has shifted from viewing green performance as a compliance-driven outcome toward understanding it as a strategic result shaped by leadership, organizational capabilities, and employee-related resources operating collectively (Ahsan & Khawaja, 2024). Within this context, sustainable leadership emerges as a central organizational capability that integrates environmental priorities into strategic decisions and operational practices (Avery & Bergsteiner, 2011). Although the RBV and DCT have traditionally been applied at the organizational and strategic levels of analysis, recent sustainability research suggests that the effects of strategic resources and dynamic capabilities ultimately materialize through organizational processes and employee-level mechanisms. Accordingly, the present study adopts a multilevel perspective in which sustainable leadership operates as a strategic organizational capability at the macro level, green innovation represents an organizational mechanism at the mezzo level, green self-efficacy reflects an employee-level psychological mechanism at the micro level, and green performance constitutes the resulting organizational outcome. This multilevel perspective provides a more comprehensive explanation of how sustainability-oriented leadership practices are translated into measurable environmental outcomes.

From the RBV, sustainable leadership can be regarded as a valuable intangible resource that enhances firms' ability to achieve environmentally responsible outcomes (Tate & Bals, 2018). By embedding sustainability into organizational strategy and managerial practices, sustainable leadership establishes the structural and cultural conditions necessary for developing other sustainability-oriented capabilities (Alzuman et al., 2025). This role is particularly important in tourism and hospitality organizations, where environmental pressures are substantial and operational flexibility is often constrained (Mahran et al., 2025). Within the RBV perspective, sustainable leadership, green innovation capability, and green self-efficacy can all be viewed as strategic intangible resources that contribute to environmental competitiveness and organizational sustainability. However, while RBV explains why such resources are valuable and capable of generating competitive advantage, it provides limited insight into the processes through which these resources are mobilized, transformed, and translated into organizational outcomes. Therefore, Dynamic Capabilities Theory complements RBV by explaining how organizations activate and reconfigure strategic resources through organizational and behavioral mechanisms to achieve superior environmental performance.

However, leadership commitment alone is insufficient to generate environmental performance. Achieving green outcomes depends on organizations' ability to adapt and reconfigure internal resources in response to evolving environmental demands (Abed Alhameed & Emeagwali, 2026). DCT provides an appropriate framework for explaining this process because it emphasizes how organizations develop the capacity to sense environmental opportunities and threats, seize them through strategic and operational responses, and continuously reconfigure internal resources and capabilities to maintain alignment with changing environmental conditions (Teece et al., 1997; Battleson et al., 2016; Teece, 2007). This perspective is particularly relevant in tourism and hospitality organizations, where environmental challenges require continuous adaptation of organizational processes, innovation activities, and employee practices (Tanveer et al., 2024). Unlike more static resource-based explanations, DCT explains how strategic resources are actively transformed into environmental performance outcomes through organizational learning, innovation, and capability reconfiguration (Dong & Son, 2026). More specifically, the present study draws on the sensing, seizing, and reconfiguring dimensions of DCT (Teece, 2007). Sustainable leadership facilitates the identification of environmental opportunities and challenges (sensing), supports the implementation of sustainability-oriented innovations and employee capabilities (seizing), and enables the continuous adaptation of organizational resources and practices to improve environmental performance (reconfiguring).

Within this perspective, green innovation represents an important organizational mechanism through which sustainable leadership is translated into operational environmental improvement (Ahmad et al., 2025). Through support for environmentally oriented process redesign and innovative solutions, sustainable leadership enables firms to improve efficiency, reduce waste, and minimize environmental impact (Fang et al., 2022; Singh et al., 2020). Consequently, green innovation can be viewed as a mediating capability linking sustainable leadership to green performance.

At the micro level, employee-related capabilities constitute the behavioral mechanisms through which strategic organizational capabilities are translated into environmental outcomes (Kaur, 2025). In labor-intensive industries such as tourism and hospitality, employees play a decisive role in implementing environmental initiatives (Hasanein et al., 2025). Green self-efficacy, defined as employees' confidence in their ability to perform environmentally responsible tasks, represents a critical psychological resource supporting organizational sustainability efforts (Saleem et al., 2024). Sustainable leadership contributes to strengthening this capability by reinforcing environmental values, clarifying sustainability expectations, and encouraging employee participation in green practices (Ahsan & Khawaja, 2024). Employees with high green self-efficacy are more likely to engage consistently in environmentally responsible behaviors that support organizational environmental performance (Paillé et al., 2020). Therefore, green self-efficacy can be conceptualized as the micro-level behavioral mechanism through which strategic organizational capabilities are translated into organizational environmental outcomes.

Although alternative theoretical perspectives, such as Institutional Theory, Stakeholder Theory, Social Cognitive Theory, and the Natural Resource-Based View, have been used to explain sustainability-related phenomena, the present study adopts the RBV and DCT because these perspectives provide a more comprehensive explanation of how strategic organizational resources and capabilities are mobilized, transformed, and translated into environmental performance outcomes. Specifically, RBV explains the strategic value of sustainability-oriented resources, whereas DCT explains the dynamic processes through which these resources are adapted and operationalized through organizational and behavioral mechanisms.

2.2. Sustainable Leadership and Green Performance

Growing evidence suggests that environmental outcomes in organizations are strongly shaped by leadership patterns, particularly in sectors exposed to sustained ecological and social scrutiny (Gerard et al., 2017). From a RBV perspective, sustainable leadership can be viewed as a strategic intangible resource that enables organizations to develop environmentally responsible practices and sustain competitive advantage through superior environmental performance (Lucas, 2010). By embedding sustainability values into organizational routines and strategic priorities, sustainable leadership contributes to the development of organizational capabilities that support long-term environmental effectiveness (Zhao & Huang, 2022; Boeske, 2023). Sustainable leadership extends beyond setting environmental aspirations at the strategic level and plays a decisive role in influencing how sustainability is enacted in routine managerial and operational choices within tourism and hospitality firms. Leaders who consistently prioritize sustainability redefine what is considered acceptable and desirable behavior, embedding environmental considerations into standard operating practices and performance expectations (Alzuman et al., 2025). Through this process, sustainability shifts from a peripheral concern to a core criterion against which organizational success is evaluated (Boeske, 2023). In addition, sustainable leadership shapes green performance by directing organizational focus and reinforcing accountability for environmental outcomes. By repeatedly signaling the importance of environmental responsibility, leaders influence how employees interpret their roles in achieving sustainability objectives, thereby encouraging the consistent enactment of environmentally responsible behaviors (Iqbal et al., 2020). This influence is particularly critical in tourism and hospitality settings, where environmental impacts often result from aggregated daily practices rather than isolated strategic decisions (Al-Romeedy & El-Sisi, 2024). Iqbal et al. (2020) justify the positive effect of sustainable leadership on green performance in tourism and hospitality businesses by explaining that sustainability-oriented leaders establish clear environmental values and align organizational practices with long-term ecological goals, which strengthens employees' commitment to green behaviors. Based on this reasoning, the following hypothesis is proposed:

H1. *Sustainable leadership has a positive effect on green performance.*

2.3. Sustainable Leadership and Green Innovation

In tourism and hospitality organizations, environmentally oriented innovation tends to be constrained by routine-driven operations, efficiency pressures, and a general reluctance to deviate from established service models (Gürlek & Koseoglu, 2021). According to DCT, organizations achieve sustainable adaptation by developing and reconfiguring internal capabilities that enable them to respond effectively to changing environmental conditions (Obeng et al., 2026). In this context, sustainable leadership facilitates green innovation by encouraging organizational learning, supporting experimentation, and legitimizing the reconfiguration of existing practices toward environmentally sustainable solutions (Hargreaves & Fink, 2004). Under such conditions, green innovation is unlikely to materialize unless existing assumptions about processes and performance are deliberately questioned. Sustainable leadership becomes crucial at this point, not as a driver of innovation output per se, but as a force that redefines how environmental change is understood and pursued within the organization. By reframing environmental challenges as strategic leverage points rather than operational disruptions, sustainability-oriented leaders alter the internal logic that governs innovation-related decisions (Redekop et al., 2018). Rather than focusing solely on introducing new technologies, sustainable leadership influences green innovation by reshaping organizational norms surrounding experimentation, learning,

and acceptable risk. Leaders who consistently endorse sustainability send clear signals that environmentally focused initiatives are legitimate and worth pursuing, even in the absence of immediate economic payoffs (Schein, 2017). This signaling function is particularly important in tourism and hospitality contexts, where green innovation often takes the form of subtle process adjustments, service redesign, or behavior-based improvements rather than large-scale technological transformation (Park et al., 2023). Shafait and Huang (2024) demonstrate that sustainable leadership modifies how environmental demands are cognitively framed within organizations, shifting them from compliance-driven obligations to innovation opportunities. Similarly, Gao and Tsai (2024) find that a strong sustainability vision at the leadership level reduces organizational resistance to green initiatives by lowering perceived risk associated with environmental experimentation. Based on these arguments, the following hypothesis is proposed:

H2. *Sustainable leadership has a positive effect on green innovation.*

2.4. Sustainable Leadership and Green Self-Efficacy

Employees' confidence in performing environmentally responsible behaviors is gradually constructed through experience rather than assumed as a given personal trait. In tourism and hospitality settings, where work is fast-paced and environmentally sensitive decisions are embedded in routine service encounters, employees constantly evaluate their own ability to respond appropriately to environmental demands (Kholijah, 2024). Sustainable leadership shapes green self-efficacy by stabilizing employees' understanding of environmental responsibility and reinforcing a shared sense of direction. When leaders consistently integrate sustainability into communication, decision-making, and personal conduct, environmental tasks become normalized as part of everyday work rather than perceived as additional or exceptional duties (ur Rehman et al., 2025; Alzuman et al., 2025). This process is consistent with the microfoundations perspective of DCT, which emphasizes that organizational adaptation depends not only on strategic and operational capabilities but also on employees' ability to internalize and enact organizational objectives (Zollo et al., 2016). Green self-efficacy represents an important employee-level capability that enables sustainability goals to be translated into environmentally responsible actions (Norton et al., 2015). This consistency helps employees reinterpret environmental requirements as manageable and within their control, particularly when leadership support is accompanied by learning opportunities and constructive feedback (Lane & Maznevski, 2019; Boeske, 2023). Empirical explanations offered by Javed et al. (2021) support this interpretation by showing that sustained leadership attention to environmental issues gradually enhances employees' understanding and confidence in executing green responsibilities. Similarly, ur Rehman et al. (2025) argue that when sustainability is consistently embedded in leadership routines, employees gain repeated exposure to environmental expectations, which transforms unfamiliar green tasks into perceived competencies. Accordingly, the following hypothesis is proposed:

H3. *Sustainable leadership has a positive effect on green self-efficacy.*

2.5. Green Innovation and Green Performance

Green performance in tourism and hospitality firms is ultimately shaped by how effectively sustainability aspirations are embedded into the operational fabric of the organization (Alkhozaim et al., 2024). Achieving high levels of green performance therefore requires more than strategic intent; it depends on the adoption of mechanisms that convert environmental priorities into practical, value-creating actions. Among these mechanisms, green innovation emerges as a critical driver, as it introduces environmentally oriented

changes that fundamentally alter how services are produced, organized, and delivered (Bani-Melhem et al., 2022; Al-Romeedy & El-Sisi, 2024). Beyond operational efficiency, green innovation also enhances organizational learning and adaptability in response to evolving environmental demands. The principles of DCT suggest that organizations enhance their competitiveness by cultivating capabilities that enable them to respond proactively to environmental challenges and opportunities (Teece, 2007). So, green innovation can be understood as a critical organizational mechanism through which sustainability-related strategies and resources are transformed into concrete environmental achievements and improved green performance outcomes (Pham et al., 2023; Wiredu & Konadu, 2026). Firms that continuously innovate environmentally are better positioned to adjust to changing regulations, stakeholder expectations, and sustainability benchmarks (Zhang & Zhu, 2019). This adaptive capability supports more stable and consistent green performance outcomes, positioning innovative organizations as forward-looking actors rather than reactive responders to environmental pressure (Al-Romeedy & El-Sisi, 2024). Earlier research highlights that environmentally driven innovation enables firms to translate sustainability goals into tangible performance gains by reshaping service and production systems toward greater resource efficiency (Singh et al., 2020). Consistent with this view, Fang et al. (2022) argue that organizations investing in green innovation are more capable of institutionalizing environmental improvements, thereby achieving higher and more enduring levels of green performance. Accordingly, the following hypothesis is proposed:

H4. *Green innovation has a positive effect on green performance.*

2.6. Green Self-Efficacy and Green Performance

Within tourism and hospitality organizations, green performance is often enacted in fast-paced service environments characterized by high workload, real-time decision-making, and limited managerial oversight. Under such operational conditions, the success of environmental efforts is less dependent on formal rules or standardized procedures and more reliant on employees' confidence in their own ability to act responsibly in environmentally sensitive situations (Alkhozaim et al., 2024). Employees who possess strong green self-efficacy are better equipped to convert environmental awareness into concrete behavior, particularly in situations where instructions are unclear or environmental decisions involve uncertainty (Saleem et al., 2024). This perspective aligns with the employee-level foundations of organizational adaptability emphasized by DCT (Salvato & Vassolo, 2018). In uncertain operational environments, employees' confidence in their ability to respond effectively to environmental challenges becomes a critical capability that supports adaptive and environmentally responsible action (Berkhout et al., 2006). Rather than disengaging or postponing action, these employees demonstrate initiative by confronting environmental challenges directly, modifying their conduct in response to situational demands, and maintaining environmentally responsible practices even when operational pressures are high (Gregory et al., 2012). Such sustained and adaptive behavior contributes to greater stability in environmental practices across daily service operations, thereby reinforcing overall organizational green performance (Alkhozaim et al., 2024). Recent empirical evidence further demonstrates that green self-efficacy supports long-term environmental performance by fostering persistence in green behaviors, minimizing inconsistencies in environmental execution, and enhancing the dependability of environmental initiatives within tourism and hospitality organizations (Saleem et al., 2024). Accordingly, the following hypothesis is proposed:

H5. *Green self-efficacy has a positive effect on green performance.*

2.7. The Mediating Role of Green Innovation

The influence of sustainable leadership on green performance often unfolds through indirect and cumulative processes rather than immediate outcomes. While leadership establishes direction and commitment, its environmental impact materializes only when organizational practices are reshaped in ways that alter how resources are used and services are delivered (Miao & Nduneseokwu, 2025). Green innovation represents this critical transformation stage, serving as the mechanism through which leadership-driven sustainability intentions are converted into operational reality (Al-Romeedy & El-Sisi, 2024). The integration of the RBV and DCT provides a theoretical explanation for this indirect relationship. While RBV suggests that sustainable leadership represents a strategic organizational resource (Clulow et al., 2003), DCT emphasizes that the value of such resources is realized only when they are transformed into adaptive organizational capabilities (Teece et al., 1997). In this vein, green innovation functions as the capability through which sustainability-oriented leadership is translated into operational practices and, ultimately, enhanced environmental performance (Aftab et al., 2026; Pham et al., 2023). Green innovation enables organizations to embed sustainability into processes, technologies, and service designs, ensuring that environmental priorities are not dependent on individual discretion alone but are systematically integrated into operations (Le et al., 2024). Through this integration, green innovation channels leadership influence into consistent and scalable environmental outcomes (Ahsan, 2025). In tourism and hospitality businesses, where environmental impacts are dispersed across numerous service interactions, the mediating role of green innovation becomes particularly salient. Innovation allows firms to standardize environmentally responsible practices while maintaining flexibility in service delivery (Alzuman et al., 2025; Alkhozaim et al., 2024). As a result, sustainable leadership enhances green performance primarily by fostering green innovation, which then translates strategic intent into tangible environmental results (Lane & Maznevski, 2019). Based on this reasoning, the following hypothesis is proposed:

H6. *Green innovation mediates the relationship between sustainable leadership and green performance.*

2.8. The Mediating Role of Green Self-Efficacy

Green performance in tourism and hospitality organizations frequently emerge from employees' moment-to-moment decisions rather than from formally prescribed managerial actions, as service delivery is often decentralized and highly situational (Alkhozaim et al., 2024). In such environments, leaders cannot continuously monitor or direct environmentally relevant behavior. Consequently, the effectiveness of sustainability-oriented leadership depends on whether employees are prepared to exercise independent judgment when facing environmental issues in their daily tasks (Iqbal et al., 2025). Green self-efficacy is critical in this regard, as it shapes the extent to which leadership intentions are internalized and enacted in practice (Saleem et al., 2024). DCT highlights that organizational competitiveness and adaptation emerge through the effective mobilization of employees' individual capabilities in response to strategic priorities (Strauss et al., 2017). In sustainability contexts, employees' beliefs about their own environmental competencies become particularly important. Green self-efficacy therefore acts as a driving force that motivates employees to engage proactively in environmental practices, enabling sustainability-focused leadership efforts to produce meaningful improvements in organizational environmental performance (Baydeniz et al., 2026). Although sustainable leaders may clearly communicate environmental priorities and outline long-term sustainability ambitions, these directives do not automatically materialize into improved environmental outcomes (Schein, 2017). Their impact is realized only when employees believe they

possess the competence and confidence to act independently in support of these goals. Individuals with high levels of green self-efficacy tend to proactively adjust their behaviors, respond flexibly to environmental requirements, and sustain eco-friendly practices even under intense operational pressure (Guo et al., 2019). Through this self-directed behavior, the influence of leadership extends beyond formal policies and becomes embedded in everyday service practices (Lane & Maznevski, 2019). From a psychological perspective, green self-efficacy functions as a key mechanism through which sustainable leadership shapes environmental behavior at the operational level (Saleem et al., 2024). While leaders can signal the strategic importance of sustainability, these signals remain ineffective unless employees cognitively reinterpret them as actions, they are personally capable of performing (Khan et al., 2023). Accordingly, the following hypothesis is proposed:

H7. *Green self-efficacy mediates the relationship between sustainable leadership and green performance.*

3. Method

3.1. Sample and Data Collection

The target population of this study comprised managers and supervisors working in five-star hotels and travel agencies operating across Egypt. This population was deliberately selected due to its direct involvement in leadership practices, operational supervision, and the implementation of sustainability-oriented initiatives within tourism and hospitality organizations. Managers and supervisors occupy a critical position between strategic direction and day-to-day execution, enabling them to provide informed assessments of sustainable leadership behaviors, organizational innovation practices, employee environmental capabilities, and overall green performance.

To ensure linguistic clarity and contextual appropriateness, the survey instrument was developed in both English and Arabic. A systematic back-translation procedure was employed to preserve conceptual equivalence across the two versions. The translation process was reviewed and validated by bilingual academics and industry practitioners with expertise in tourism and hospitality management and sustainability-related practices. This procedure ensured that all measurement items accurately reflected the intended constructs and were culturally suitable for respondents operating within the Egyptian tourism and hospitality context. Prior to the main data collection phase, a pilot study was conducted involving a group of managers and supervisors from five-star hotels and travel agencies in Egypt. The pilot aimed to evaluate item clarity, wording precision, and the relevance of the questionnaire to organizational practices within the tourism and hospitality sector. Feedback from the pilot participants indicated that the instrument was generally clear and contextually appropriate; however, minor linguistic refinements were introduced to improve readability and flow. These adjustments enhanced the content validity and reliability of the measurement instrument before full-scale administration.

A purposive sampling approach was adopted to ensure that respondents possessed relevant managerial experience and direct exposure to sustainability-related leadership and practices. Data collection covered organizations operating across multiple regions within Egypt, enhancing geographical diversity and reducing location-specific concentration bias. A total of 1276 structured questionnaires were distributed with the assistance of four trained research assistants who followed a standardized protocol for distribution, follow-up, and respondent communication. Of the questionnaires distributed, 788 valid responses were collected, yielding a response rate of approximately 61.8 percent. This response rate is considered acceptable for survey-based organizational research and provides a sufficiently large sample for structural equation modeling, ensuring adequate statistical power for hypothesis testing.

To promote data accuracy and encourage candid participation, respondents were assured of strict confidentiality and anonymity. No identifying information was collected, and participation was entirely voluntary. Prior to completing the questionnaire, participants received a brief introduction outlining the study's objectives, the academic nature of the research, and their right to withdraw at any stage without consequence. Ethical considerations were carefully observed throughout the research process, and informed consent was obtained from all participants before data collection commenced.

3.2. Measures

All study constructs were measured using previously validated multi-item scales adapted from established studies in the sustainability and management literature. The questionnaire items were slightly contextualized to fit the tourism and hospitality environment while preserving their original conceptual meanings. Responses to all construct items were captured using a Likert-type scale, allowing respondents to indicate their level of agreement with each statement. Sustainable leadership was measured using a 15-item scale adapted from [Shafait and Huang \(2024\)](#). A sample item from this scale is: "My organizational leadership operates in a sustainably socially responsible manner." Green innovation was assessed using a five-item scale adapted from [Pham et al. \(2023\)](#). An example item is: "Choosing materials that consume the least energy and resources." Green self-efficacy was measured using six items adopted from [Y. Chen et al. \(2014\)](#). A sample item is: "We feel we can succeed in accomplishing environmental ideas." Green performance was measured using a five-item scale adapted from [Bani-Melhem et al. \(2022\)](#) and [Zhao and Huang \(2022\)](#). A sample item is: "The business activities significantly reduced the lead times". In addition to the main study variables, several demographic characteristics were collected to describe the sample profile and provide contextual information about the respondents.

3.3. Common Method Bias

Because the study relied on cross-sectional survey data collected from a single group of respondents, the possibility of common method variance was explicitly addressed to safeguard the credibility of the empirical results. Common method variance can arise when the measurement method, rather than the underlying constructs, systematically influences respondents' answers, potentially leading to biased parameter estimates ([Merkle, 2025](#)). Recognizing this risk, the study incorporated multiple preventative measures during both the design and data collection phases. At the design stage, several procedural precautions were applied in accordance with established methodological recommendations. Respondents were assured that their participation was anonymous and that all responses would remain strictly confidential, thereby reducing concerns related to self-presentation and social desirability ([Podsakoff et al., 2003](#)). The questionnaire explicitly communicated that there were no correct or incorrect responses, encouraging participants to reflect their genuine perceptions and experiences. In addition, all measurement items were derived from well-established scales and were carefully adapted to ensure neutral phrasing and conceptual clarity. A pilot study was conducted prior to full data collection to refine item wording, enhance clarity, and eliminate potential sources of ambiguity. Furthermore, a rigorous translation and back-translation process between English and Arabic was undertaken by bilingual experts to minimize language-related bias and ensure consistency in meaning across versions.

In addition to these procedural safeguards, statistical diagnostics were employed to evaluate the presence of common method variance. As an initial assessment, Harman's single-factor test was conducted, and the results showed that no single factor accounted for a majority of the variance, indicating that common method variance was unlikely to

dominate the data structure (Podsakoff et al., 2003). Although Harman's single-factor test has been criticized when used as a standalone diagnostic procedure, recent methodological literature recommends combining procedural and statistical remedies to provide a more comprehensive assessment of common method bias (Podsakoff et al., 2003). To provide a more stringent evaluation within the PLS-SEM context, a full collinearity assessment was performed using variance inflation factors, following the approach suggested by Kock (2025). All full collinearity VIF values were below the recommended threshold of 3.3, suggesting that common method bias does not pose a substantial threat to the validity of the estimated relationships. Furthermore, the full collinearity assessment approach has been recognized as an effective diagnostic tool for detecting potential common method bias in PLS-SEM research (Kock, 2025). Therefore, the convergence of procedural remedies and complementary statistical assessments provides robust evidence that common method variance is unlikely to meaningfully influence the findings of this study. Consequently, the observed relationships among the constructs can be interpreted as reflecting substantive theoretical associations rather than artifacts of the measurement approach.

4. Results

4.1. Demographic Profile

Table 1 presents the demographic characteristics of the study participants. The findings indicate that most respondents were between 40 and 49 years old (47.8%), followed by those aged 30 to 39 years (26.5%), while participants aged 50 years and above represented 23.7% of the sample. In terms of gender, males constituted the majority of the sample (73.7%), whereas females represented 26.3%. Regarding job position, supervisors accounted for 59.8% of respondents, while managers represented 40.2%. Concerning educational background, most respondents held bachelor's degrees (93.8%), while 6.2% possessed postgraduate qualifications. With respect to work experience, the largest proportion of respondents had 15 years of experience or more (35%), followed by those with 10 to 14 years of experience (33.4%) and 5 to 9 years of experience (29.3%).

Table 1. Demographic profile.

Participants' Profile		Freq.	%
Age	Less than 30 years	16	2%
	From 30 to 39 years	208	26.5%
	From 40 to 49 years	377	47.8%
	50 years and more	187	23.7%
Gender	Male	581	73.7%
	Female	207	26.3%
Job position	Manager	317	40.2%
	supervisor	471	59.8%
Education	Less Bachelor	-	-
	Bachelor	739	93.8%
	Postgraduate	49	6.2%
Work experience	Less than 5 years	18	2.3%
	From 5 to 9 years	231	29.3%
	From 10 to 14 years	263	33.4%
	15 years and more	276	35%

4.2. Measurement Model

Before examining the structural relationships, the measurement model was evaluated to ensure adequate reliability and validity of the study constructs. As reported in

Table 2, all indicator loadings exceed 0.82, ranging from 0.826 to 0.897, demonstrating strong item reliability across all constructs. Internal consistency is well supported, with Cronbach's alpha values ranging from 0.903 to 0.948 and composite reliability values ranging between 0.940 and 0.977, all exceeding recommended thresholds. Convergent validity is also confirmed, as the average variance extracted (AVE) values range from 0.745 to 0.765, indicating that each construct explains a substantial proportion of variance in its indicators. In addition, variance inflation factor (VIF) values range from 1.783 to 2.934, remaining below conservative cut-off levels and suggesting that multicollinearity is not a concern (Hair et al., 2021).

Table 2. Measurement model.

Construct	Loading	Cronbach Alpha	CR	AVE	VIF
Sustainable leadership		0.948	0.977	0.745	1.783
Sustainable leadership1	0.884				
Sustainable leadership2	0.879				
Sustainable leadership3	0.893				
Sustainable leadership4	0.839				
Sustainable leadership5	0.856				
Sustainable leadership6	0.871				
Sustainable leadership7	0.842				
Sustainable leadership8	0.855				
Sustainable leadership9	0.861				
Sustainable leadership10	0.859				
Sustainable leadership11	0.878				
Sustainable leadership12	0.873				
Sustainable leadership13	0.839				
Sustainable leadership14	0.852				
Sustainable leadership15	0.867				
Green innovation		0.914	0.942	0.765	2.334
Green innovation1	0.897				
Green innovation2	0.875				
Green innovation3	0.884				
Green innovation4	0.851				
Green innovation5	0.866				
Green self-efficacy		0.919	0.946	0.748	2.934
Green self-efficacy1	0.826				
Green self-efficacy2	0.876				
Green self-efficacy3	0.888				
Green self-efficacy4	0.879				
Green self-efficacy5	0.868				
Green self-efficacy6	0.851				
Green performance		0.903	0.940	0.759	2.019
Green performance1	0.856				
Green performance2	0.874				
Green performance3	0.881				
Green performance4	0.854				
Green performance5	0.891				

Discriminant validity was evaluated using the Fornell–Larcker criterion, and the results are reported in Table 3. The square root of the AVE for each construct exceeds its corresponding inter-construct correlations, providing evidence of adequate discriminant validity. Specifically, the diagonal values range from 0.863 for sustainable leadership to 0.871 for green performance, while the correlations among constructs vary between 0.511 and 0.608. The highest observed correlation, between sustainable leadership and green

innovation (0.608), remains lower than the square root of the AVE for both constructs. Similarly, the correlations involving green self-efficacy and green performance do not exceed their respective diagonal values. These findings indicate that each construct is empirically distinct and supports the discriminant validity of the measurement model.

Table 3. Discriminant validity results: Fornell–Larcker Criterion.

	Sustainable Leadership	Green Innovation	Green Self-Efficacy	Green Performance
Sustainable leadership	0.863			
Green innovation	0.608	0.874		
Green self-efficacy	0.562	0.511	0.864	
Green performance	0.549	0.578	0.590	0.871

The Heterotrait–Monotrait ratio (HTMT) was employed as an additional criterion to assess discriminant validity, and the results are reported in Table 4. All HTMT values fall below the recommended cut-off levels, supporting adequate discriminant validity among the constructs. The observed HTMT ratios range from 0.448 to 0.573, with the highest ratio occurring between sustainable leadership and green performance (0.573), which remains within acceptable bounds. Other construct pairings, including green innovation with green self-efficacy (0.487) and sustainable leadership with green self-efficacy (0.509), also exhibit satisfactory separation.

Table 4. HTMT for validity.

	Sustainable Leadership	Green Innovation	Green Self-Efficacy	Green Performance
Sustainable leadership				
Green innovation	0.521			
Green self-efficacy	0.509	0.487		
Green performance	0.573	0.448	0.521	

Table 5 reports the explanatory power, predictive relevance, and overall model fit of the proposed structural model. According to Hair et al. (2021), R^2 values of 0.25, 0.50, and 0.75 indicate weak, moderate, and substantial explanatory power, respectively. The coefficient of determination (R^2) values indicates weak to substantial explanatory power across the endogenous latent variables. Specifically, sustainable leadership explains 21.7% of the variance in green innovation ($R^2 = 0.217$) and 23.7% of the variance in green self-efficacy ($R^2 = 0.237$), indicating weak explanatory power. Furthermore, sustainable leadership, green innovation, and green self-efficacy jointly explain 65.6% of the variance in green performance ($R^2 = 0.656$), indicating moderate to substantial explanatory power for the primary outcome variable. Regarding predictive relevance, Q^2 values of 0.02, 0.15, and 0.35 indicate small, medium, and large predictive relevance, respectively (Hair et al., 2021). In terms of predictive relevance, the Q^2 values for green innovation (0.181) and green self-efficacy (0.193) indicate moderate predictive relevance, whereas the Q^2 value for green performance (0.446) indicates strong predictive relevance, confirming the model's capability to predict endogenous constructs beyond in-sample estimation. Furthermore, the assessment of global model fit supports the adequacy of the proposed framework. The standardized root mean square residual (SRMR) value of 0.017 falls well below the recommended threshold, indicating a very close correspondence between the observed and predicted correlations. In addition, the normed fit index (NFI) value of 0.968 exceeds the minimum acceptable level, providing further evidence of good model fit.

Table 5. Coefficient of determination (R^2) and (Q^2), RMSE and Model Fit (SRMR-NFI).

Endogenous Latent Factors	(R^2)	(Q^2)
Green innovation	0.217	0.181
Green self-efficacy	0.237	0.193
Green performance	0.656	0.446
Model Fit Indices	SRMR	NFI
	0.017	0.968

4.3. Structure Model

The structural model results presented in Table 6 provide strong empirical support for the proposed relationships among sustainable leadership, green innovation, green self-efficacy, and green performance. All hypothesized direct and indirect paths are statistically significant, as indicated by high t-values, p -values below 0.001, and bias-corrected 95% confidence intervals that do not include zero, confirming the robustness of the estimated effects. The findings show that sustainable leadership has a substantial and positive direct effect on green performance (H1: $\beta = 0.521$), with a large effect size ($f^2 = 0.343$), underscoring the critical role of sustainability-oriented leadership in driving environmental performance outcomes in tourism and hospitality organizations. In addition to this direct influence, sustainable leadership significantly enhances green innovation (H2: $\beta = 0.466$, $f^2 = 0.287$) and green self-efficacy (H3: $\beta = 0.487$, $f^2 = 0.296$), indicating that leadership practices contribute meaningfully to both organizational-level environmental innovation and employee-level environmental capability.

Table 6. Structural model.

	Path Coefficients	t Values	p Values	95% Confidence Interval		Effect Size (f^2)	VAF (%)
				LB	UB		
H1: Sustainable leadership → Green performance	0.521	8.889	$p < 0.001$	0.376	0.678	0.343	-
H2: Sustainable leadership → Green innovation	0.466	6.776	$p < 0.001$	0.398	0.689	0.287	-
H3: Sustainable leadership → Green self-efficacy	0.487	6.546	$p < 0.001$	0.401	0.703	0.296	-
H4: Green innovation → Green performance	0.498	6.989	$p < 0.001$	0.418	0.715	0.331	-
H5: Green self-efficacy → Green performance	0.537	9.767	$p < 0.001$	0.389	0.631	0.268	-
H6: Sustainable leadership → Green innovation → Green performance	0.232	4.809	$p < 0.001$	0.146	0.335	0.176	30.8%
H7: Sustainable leadership → Green self-efficacy → Green performance	0.261	5.513	$p < 0.001$	0.173	0.369	0.182	33.4%

Both mediating variables also demonstrate significant direct effects on green performance. Green innovation positively affects green performance (H4: $\beta = 0.498$), with a relatively large effect size ($f^2 = 0.331$), highlighting the importance of environmentally oriented innovations in translating sustainability intentions into tangible performance outcomes. Similarly, green self-efficacy exhibits a strong positive effect on green performance (H5: $\beta = 0.537$), with a medium-to-large effect size ($f^2 = 0.268$), suggesting that employees' confidence in their ability to perform environmentally responsible actions plays a decisive role in improving organizational environmental outcomes.

The mediation analysis further clarifies the mechanisms through which sustainable leadership influences green performance. The indirect effect of sustainable leadership on green performance through green innovation is positive and statistically significant (H6: $\beta = 0.232$, $f^2 = 0.176$), indicating that green innovation partially transmits the effect of leadership to performance. Likewise, green self-efficacy significantly mediates

the relationship between sustainable leadership and green performance (H7: $\beta = 0.261$, $f^2 = 0.182$), confirming its role as an additional transmission mechanism. Importantly, the direct effect of sustainable leadership on green performance remains significant alongside both indirect paths, demonstrating that the mediation structure is partial rather than full. This indicates that sustainable leadership affects green performance both directly and indirectly, through the simultaneous development of organizational innovation capabilities and employee-level environmental confidence.

To further evaluate the magnitude of the mediation effects, the variance accounted for (VAF) values were calculated. The results indicate that green innovation accounts for 30.8% of the total effect of sustainable leadership on green performance, whereas green self-efficacy accounts for 33.4% of the total effect. According to the guidelines proposed by Hair et al. (2021), VAF values ranging between 20% and 80% indicate partial mediation. These findings provide additional evidence that both green innovation and green self-efficacy partially mediate the relationship between sustainable leadership and green performance. Moreover, the slightly higher VAF value observed for green self-efficacy suggests that employee-level psychological capability represents a relatively stronger transmission mechanism than organizational innovation capability in translating sustainable leadership into environmental performance outcomes.

4.4. Multi-Group Analysis

Before conducting the multi-group analysis, the Measurement Invariance of Composite Models (MICOM) procedure was performed to assess measurement invariance across five-star hotels and travel agencies. As shown in Table 7, configural invariance was established for all constructs. In addition, the compositional invariance assessment confirmed that all correlation values (c) exceeded the corresponding 5% quantiles, and the permutation p -values exceeded the recommended significance threshold of 0.05. Furthermore, the equality of composite means and variances was supported for all constructs. These results confirm full measurement invariance, thereby supporting the validity of subsequent multi-group comparisons.

Table 7. Measurement Invariance of Composite Models (MICOM) Results.

Construct	Configural Invariance	c Value	5% Quantile	Permutation p -Value	Compositional Invariance	Mean Difference p -Value	Variance Difference p -Value	Invariance Established
Sustainable leadership	Yes	0.997	0.991	0.619	Yes	0.281	0.336	Full
Green innovation	Yes	0.992	0.979	0.547	Yes	0.358	0.425	Full
Green self-efficacy	Yes	0.995	0.984	0.515	Yes	0.316	0.402	Full
Green performance	Yes	0.996	0.986	0.577	Yes	0.388	0.348	Full

Following the establishment of measurement invariance, the multi-group analysis (MGA) results reported in Table 8 indicate a high degree of consistency in the structural relationships across the two organizational contexts examined, namely five-star hotels and travel agencies. As shown in the table, none of the hypothesized paths exhibit statistically significant differences between the two groups. The absolute differences in path coefficients are minimal, ranging from 0.03 to 0.04, and all corresponding p -values exceed conventional significance thresholds, confirming the absence of meaningful group-based variations. Overall, these findings, together with the established measurement invariance, support the robustness and generalizability of the proposed model across five-star hotels and travel agencies. The absence of significant group differences further indicates that the underlying relationships are stable across different segments of the tourism and hospitality sector.

Table 8. Multi-group analysis.

Constructs/Hypotheses	Path Coeff. (Five-Star Hotel)	Path Coef. (Travel Agency)	Absolute Path Coeff. Diff.	<i>p</i> -Values	<i>t</i> Statistic	Result
Sustainable leadership → Green performance	0.54	0.50	0.04	0.32	0.98	No differences
Sustainable leadership → Green innovation	0.48	0.45	0.03	0.41	0.83	No differences
Sustainable leadership → Green self-efficacy	0.50	0.47	0.03	0.39	0.88	No differences
Green innovation → Green performance	0.51	0.48	0.03	0.36	0.91	No differences
Green self-efficacy → Green performance	0.55	0.52	0.03	0.34	0.95	No differences

5. Discussion

In light of the multifaceted relationships examined in this study, this discussion section interprets the empirical findings by situating them within the broader body of sustainability and organizational behavior literature. The discussion focuses on explaining how sustainable leadership contributes to green performance both directly and indirectly, by shaping green innovation and green self-efficacy, and clarifies the underlying mechanisms through which leadership values are translated into tangible environmental outcomes at the organizational level.

The results showed that sustainable leadership has a positive effect on green performance. This result can be explained by the ability of sustainable leadership to embed environmental priorities into organizational routines, managerial decision-making processes, and employee behaviors. By continuously reinforcing sustainability values and environmental expectations, sustainable leaders create organizational conditions that facilitate the implementation of environmental initiatives and improve environmental outcomes. This mechanism is particularly important in tourism and hospitality organizations, where environmental performance depends heavily on operational practices and employee engagement. This result is consistent with earlier empirical evidence reported by [Iqbal et al. \(2020\)](#), who demonstrated that sustainable leadership strengthens organizational capabilities and employee engagement toward sustainability objectives, ultimately enhancing environmentally oriented performance indicators. Their work highlights that sustainable leadership creates an enabling internal environment where pro-environmental behaviors and green initiatives are more likely to be adopted and sustained. Moreover, the results align with [Hashim et al. \(2025\)](#), who argue that the influence of sustainable leadership on green performance is rooted in its capacity to shape organizational systems and norms that support continuous environmental improvement.

The results also indicated the positive effect of sustainable leadership on green innovation. This result reflects the capacity of sustainability-oriented leaders to encourage experimentation, organizational learning, and adaptation in response to environmental challenges. By legitimizing environmental initiatives and supporting long-term sustainability investments, leaders create favorable conditions for the development and implementation of innovative environmental solutions. This influence is particularly relevant in tourism and hospitality organizations, where innovation frequently occurs through process improvement and service redesign rather than through radical technological transformation. This interpretation resonates with the arguments advanced by [Gao and Tsai \(2024\)](#), who highlight that sustainable leadership reshapes innovation priorities by embedding environmental considerations into strategic planning and innovation decision-making. Their findings suggest that green innovation emerges not simply from technical capability, but from leadership-driven signals that legitimize sustainability-oriented experimentation and

long-term investment. In this sense, sustainable leadership functions as a cognitive and strategic filter through which innovative ideas are evaluated and supported. A complementary perspective is offered by [Shafait and Huang \(2024\)](#), who demonstrate that sustainable leadership strengthens green innovation by altering the social and motivational conditions of the workplace. When leaders consistently model sustainability values and empower employees, innovation becomes a collective process rooted in shared responsibility for environmental outcomes.

Similarly, the results revealed that green self-efficacy is positively affected by sustainable leadership. This effect can be explained by the role of leadership in shaping employees' perceptions of their environmental capabilities and responsibilities. When sustainability values are consistently communicated, supported, and reinforced by leaders, employees become more confident in their ability to perform environmentally responsible tasks and contribute effectively to organizational environmental objectives. Such confidence develops through repeated exposure to environmental expectations, guidance, and organizational support. This finding aligns with the arguments of [Javed et al. \(2021\)](#), who suggest that sustainable leadership strengthens employees' confidence in addressing environmental challenges by modeling responsible behavior and offering consistent support for green initiatives. When leaders visibly prioritize sustainability, employees are more likely to interpret environmental goals as legitimate and attainable, which enhances their sense of green self-efficacy. Building on this perspective, [ur Rehman et al. \(2025\)](#) demonstrate that sustainable leadership nurtures green self-efficacy by fostering a work climate characterized by trust, encouragement, and learning, where individuals feel empowered to experiment with and commit to environmentally friendly practices.

Further, the results clarified that green innovation positively affects green performance. This result occurs because green innovation enables organizations to transform environmental objectives into operational practices and measurable environmental outcomes. Through environmentally oriented process improvements, resource efficiency initiatives, and sustainable service innovations, organizations can reduce environmental impacts while improving operational effectiveness. In tourism and hospitality organizations, where environmental performance is closely linked to service delivery processes, green innovation serves as a critical mechanism for achieving sustainable environmental outcomes. This result is consistent with earlier empirical evidence reported by [Pham et al. \(2023\)](#) and [Tariq et al. \(2019\)](#), who argue that green innovation functions as a direct performance-enhancing mechanism by improving resource efficiency, reducing waste, and minimizing environmental footprints. Their studies suggest that organizations that actively invest in green innovation are better positioned to achieve measurable gains in environmental performance. Similarly, [Singh et al. \(2020\)](#) emphasize that green innovation strengthens green performance by enabling firms to redesign processes and adopt cleaner technologies, thereby embedding sustainability into core operational activities rather than treating it as an auxiliary function. More recent research further substantiates this relationship. [Fang et al. \(2022\)](#) and [Zhao and Huang \(2022\)](#) demonstrate that green innovation enhances green performance by supporting continuous environmental improvement and organizational adaptability in response to regulatory and market pressures.

Additionally, the results highlighted that green self-efficacy has a positive effect on green performance. This link reflects the importance of employees' confidence in translating environmental intentions into sustained environmentally responsible behaviors. Employees who believe they possess the capabilities necessary to address environmental challenges are more likely to engage proactively in environmental initiatives, persist when encountering difficulties, and maintain environmentally responsible practices in their daily activities. In service-intensive industries such as tourism and hospitality, where

environmental performance often depends on employees' discretionary behaviors, green self-efficacy becomes a critical determinant of organizational environmental outcomes. This interpretation is in line with the early conceptual and empirical work of Y. Chen et al. (2014), which positions green self-efficacy as a central cognitive driver of environmentally responsible behavior. From this perspective, employees who perceive themselves as capable of addressing environmental issues are more likely to internalize environmental objectives and translate them into effective actions. Supporting this view, Nisar et al. (2017) provide evidence that green self-efficacy enhances green performance by strengthening persistence and problem-solving in environmentally challenging situations, indicating that confidence in one's green capabilities directly affects performance quality. More recent studies deepen this understanding. Saleem et al. (2024) argue that green self-efficacy operates as an internal activation mechanism that encourages employees to move beyond compliance and engage proactively in environmental improvement efforts.

Finally, the results indicate that green innovation and green self-efficacy act as partial mediators in the relationship between sustainable leadership and green performance, suggesting that leadership does not improve environmental performance in a direct or isolated manner. This finding indicates that leadership values and sustainability priorities require organizational and behavioral mechanisms to be translated into tangible environmental outcomes. While green innovation enables organizations to institutionalize environmental improvements through operational changes and innovative practices, green self-efficacy strengthens employees' confidence and capability to implement these practices effectively. Consequently, sustainable leadership exerts its influence on environmental performance by simultaneously shaping organizational processes and employee behaviors. This partial mediation implies that while sustainable leadership retains a direct influence on green performance, a substantial portion of its impact is channeled through behavioral and innovation-based mechanisms that translate leadership values into concrete environmental outcomes.

6. Theoretical Implications

The findings of this study provide several important theoretical implications for sustainability and tourism research. By demonstrating that sustainable leadership positively influences green performance, green innovation, and green self-efficacy, the study reinforces the strategic importance of leadership in shaping environmental outcomes within tourism and hospitality organizations. Rather than viewing sustainable leadership as a symbolic orientation, the findings position it as a strategic capability that influences both organizational processes and employee-related resources.

From the RBV, the study contributes by validating sustainable leadership, green innovation, and green self-efficacy as complementary intangible resources that collectively support green performance. Previous RBV research has primarily emphasized organizational-level resources while giving limited attention to employee-level psychological capabilities. By demonstrating that green self-efficacy directly enhances green performance and partially mediates the relationship between sustainable leadership and green performance, the study extends RBV through the incorporation of employee psychological resources into the broader sustainability-oriented resource base. This perspective highlights that environmentally driven competitive advantage depends not only on organizational capabilities but also on employees' confidence in executing environmental responsibilities.

The study also contributes to DCT by clarifying how sustainability-oriented capabilities are translated into environmental outcomes. The positive relationship between sustainable leadership and green innovation indicates that leadership facilitates the development and reconfiguration of environmentally oriented organizational capabilities. In

addition, the mediating role of green innovation demonstrates that environmental performance is strengthened through organizations' ability to transform sustainability priorities into operational improvements and innovation-oriented practices. These findings provide empirical support for the argument that dynamic capabilities play an important role in enabling organizations to respond effectively to environmental demands.

Furthermore, the identification of green self-efficacy as a parallel mediating mechanism extends DCT by emphasizing the importance of employee-level microfoundations in sustainability-oriented capability development. Although DCT increasingly recognizes the role of individual actions in organizational adaptation, empirical evidence connecting leadership, employee cognition, and environmental performance remains limited. The findings address this gap by showing that employees' confidence in performing environmentally responsible tasks represents an important mechanism through which leadership influences environmental outcomes. This suggests that sustainability-oriented capabilities are strengthened not only through organizational innovation and structural adaptation but also through employees' willingness and confidence to engage in environmental practices. The findings additionally indicate that sustainable leadership influences green performance through multiple interconnected pathways rather than a single mechanism. The coexistence of direct and indirect effects highlights the complementary roles of organizational innovation and employee psychological capability in shaping environmental outcomes. This insight advances both RBV and DCT by supporting a more integrated and process-oriented understanding of sustainability-driven performance.

7. Practical Implications

The findings of this study offer actionable insights for tourism and hospitality organizations seeking to enhance green performance through internal transformation rather than external compliance. First, the confirmed impact of sustainable leadership on green performance, green innovation, and green self-efficacy highlights leadership development as a strategic intervention point. Organizations should move beyond symbolic sustainability training and instead embed sustainability competencies into leadership selection, evaluation, and development systems. This includes equipping leaders with the skills to integrate environmental considerations into operational decision-making, communicate sustainability priorities consistently, and legitimize experimentation with environmentally responsible practices.

Second, the demonstrated role of green innovation as a pathway to improved green performance suggests that environmental initiatives should be operationalized through structured innovation processes. Managers are encouraged to treat green innovation as an ongoing managerial process rather than a series of isolated projects. Practically, this involves allocating dedicated resources for environmentally oriented process redesign, encouraging cross-departmental collaboration on sustainability challenges, and integrating environmental criteria into innovation assessment frameworks. In tourism and hospitality settings, where innovation often emerges incrementally, managers should focus on enabling continuous improvement in service workflows, resource use, and operational routines.

The findings also underscore the importance of employee empowerment in achieving environmental outcomes. The positive effect of green self-efficacy on green performance indicates that sustainability strategies will fall short if employees lack confidence in their ability to act. Managers should therefore prioritize interventions that strengthen employees' perceived environmental capability. This may include targeted, task-specific training, real-time feedback on environmental practices, and recognition systems that reinforce employees' successful engagement in green behaviors. Importantly, these initiatives should be embedded into daily operations rather than delivered as standalone sustainability programs.

Furthermore, the partial mediating roles of green innovation and green self-efficacy suggest that organizations should adopt a dual-path implementation approach. Leadership-driven sustainability efforts should simultaneously focus on redesigning systems and empowering individuals. Overemphasizing formal environmental procedures without addressing employee confidence may lead to superficial compliance, while focusing solely on employee motivation without operational innovation may limit scalability. Managers are therefore advised to align leadership practices, innovation processes, and human resource systems to ensure that sustainability objectives are consistently translated into performance across organizational levels.

From a strategic perspective, the results imply that green performance can be strengthened without relying exclusively on external regulation or market pressure. By cultivating internal leadership capabilities, fostering innovation, and empowering employees, tourism and hospitality firms can proactively shape their environmental outcomes. Policymakers and industry associations may also draw on these insights when designing sustainability guidelines or certification schemes, shifting emphasis toward leadership capability development and organizational learning as foundations for long-term environmental improvement.

8. Limitations and Future Research

Despite the theoretical and empirical contributions of this study, several limitations should be acknowledged. First, the research adopted a cross-sectional design, which restricts the ability to draw definitive causal inferences regarding the relationships among sustainable leadership, green innovation, green self-efficacy, and green performance. While the hypothesized relationships are theoretically grounded and empirically supported, future studies employing longitudinal designs would enable a deeper understanding of how leadership-driven sustainability outcomes evolve over time. Second, the study relied on self-reported data collected from managers and supervisors, which may introduce perceptual or response bias despite the procedural and statistical measures implemented to mitigate common method bias. In addition, because respondents simultaneously evaluated multiple organizational and behavioral constructs, the possibility of self-enhancement bias cannot be entirely excluded. Future research could strengthen the robustness of findings by incorporating objective environmental performance indicators, such as energy consumption, waste reduction, water usage, carbon emissions, externally verified sustainability measures, archival data, or multi-source responses from different organizational levels.

Another limitation concerns the scope of the sample, which focused on five-star hotels and travel agencies operating in Egypt. Although this focus enhances contextual relevance and internal consistency, it may limit the generalizability of the findings to other segments of the tourism and hospitality industry, such as small and medium-sized enterprises or different service categories. Moreover, the focus on five-star hospitality organizations may introduce a contextual effect related to customer expectations and market positioning. Guests of upscale hospitality establishments are often characterized by relatively high levels of environmental awareness and sustainability expectations, which may encourage organizations to adopt sustainability-oriented strategies and leadership practices. Consequently, the observed relationships may partly reflect the influence of customer-driven market pressures in addition to internal organizational factors. Future research could examine whether these relationships differ across hospitality segments characterized by varying levels of customer environmental awareness and sustainability expectations.

Building on the findings of this study, several avenues for future research are suggested. Future studies may examine additional mediating or moderating mechanisms that could further explain how sustainable leadership translates into green performance, such as green organizational culture, environmental commitment, or regulatory pressures. In addi-

tion, future studies may incorporate external institutional factors, including environmental regulations, sustainability standards, ESG requirements, certification schemes, and broader stakeholder pressures. Integrating perspectives from Institutional Theory may provide a more comprehensive understanding of how external institutional environments interact with internal organizational capabilities to shape sustainable leadership practices and environmental performance outcomes. Comparative or cross-country research designs could also provide valuable insights into contextual differences in leadership-driven sustainability processes. Finally, adopting mixed-method approaches that combine quantitative modeling with qualitative inquiry may offer richer insights into the behavioral and organizational mechanisms through which sustainable leadership fosters green innovation and strengthens employee environmental capabilities in tourism and hospitality organizations.

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Data Availability Statement: Data are available upon request from researchers who meet the eligibility criteria. Kindly contact the first author privately through e-mail.

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References

- Abed Alhameed, A., & Emeagwali, O. (2026). Strategic digital leadership for sustainable transformation: The roles of organizational agility, digitalization, and culture in driving superior performance. *Sustainability*, 18(2), 837. [\[CrossRef\]](#)
- Aftab, J., Wei, F., Abid, N., Ishaq, M. I., & Veneziani, M. (2026). Green leadership and environmental sustainability: The roles of green absorptive capacity, environmental strategy, and government regulation. *Business Strategy and the Environment*. [\[CrossRef\]](#)
- Aggarwal, P., & Agarwala, T. (2023). Relationship of green human resource management with environmental performance: Mediating effect of green organizational culture. *Benchmarking: An International Journal*, 30(7), 2351–2376. [\[CrossRef\]](#)
- Ahmad, S., Xin, C., Mahmood, S., El-kenawy, E., & Alharbi, A. (2025). Testing the role of leadership competency and green dynamic capabilities in promoting sustainable development goals: Insights from the manufacturing sector. *Humanities and Social Sciences Communications*, 12(1), 1603. [\[CrossRef\]](#)
- Ahsan, M. (2025). Green leadership and innovation: Catalysts for environmental performance in Italian manufacturing. *International Journal of Organizational Analysis*, 33(7), 1646–1669.
- Ahsan, M., & Khawaja, S. (2024). Sustainable leadership impact on environmental performance: Exploring employee well-being, innovation, and organizational resilience. *Discover Sustainability*, 5(1), 317. [\[CrossRef\]](#)
- Alkhozaim, S., Alshiha, F., Alnasser, E., & Alshiha, A. (2024). How green performance is affected by green talent management in tourism and hospitality businesses: A mediation model. *Sustainability*, 16(16), 7093. [\[CrossRef\]](#)
- Al-Romeedy, B., & El-Sisi, S. (2024). Is green performance affected by green transformational leadership in travel agencies? The mediating roles of green organizational identity and green innovation. *Journal of Human Resources in Hospitality & Tourism*, 23(3), 508–530. [\[CrossRef\]](#)
- Alzuman, A., Alkhozaim, S., Alnasser, E., Al-Romeedy, B., Alhamdi, F., Alsetoohy, O., & Sheikhsouk, S. (2025). Strategic pathways to economic sustainability: The mediating role of green HRM between green leadership and advocacy in tourism and hospitality. *Sustainability*, 17(21), 9671. [\[CrossRef\]](#)

- Avery, G. C., & Bergsteiner, H. (2011). Sustainable leadership practices for enhancing business resilience and performance. *Strategy & Leadership*, 39(3), 5–15. [\[CrossRef\]](#)
- Baloch, Q., Shah, S., Iqbal, N., Sheeraz, M., Asadullah, M., Mahar, S., & Khan, A. (2023). Impact of tourism development upon environmental sustainability: A suggested framework for sustainable ecotourism. *Environmental Science and Pollution Research*, 30(3), 5917–5930. [\[PubMed\]](#)
- Bani-Melhem, S., Al-Hawari, M., & Mohd. Shamsudin, F. (2022). Green innovation performance: A multi-level analysis in the hotel sector. *Journal of Sustainable Tourism*, 30(8), 1878–1896.
- Battleson, D., West, B., Kim, J., Ramesh, B., & Robinson, P. (2016). Achieving dynamic capabilities with cloud computing: An empirical investigation. *European Journal of Information Systems*, 25(3), 209–230. [\[CrossRef\]](#)
- Baydeniz, E., Erer, B., & Iyem, C. (2026). The association between green HRM practices and employees' eco-friendly behavior. *Business Strategy and the Environment*, 35, 7275–7295. [\[CrossRef\]](#)
- Berkhout, F., Hertin, J., & Gann, D. M. (2006). Learning to adapt: Organisational adaptation to climate change impacts. *Climatic Change*, 78(1), 135–156. [\[CrossRef\]](#)
- Boeske, J. (2023). Leadership towards sustainability: A review of sustainable, sustainability, and environmental leadership. *Sustainability*, 15(16), 12626. [\[CrossRef\]](#)
- Chen, L., Yuan, M., Lin, H., Han, Y., Yu, Y., & Sun, C. (2023). Organizational improvisation and corporate green innovation: A dynamic capability perspective. *Business Strategy and the Environment*, 32(8), 5686–5701. [\[CrossRef\]](#)
- Chen, Y., Chang, C., & Lin, Y. (2014). Green transformational leadership and green performance: The mediation effects of green mindfulness and green self-efficacy. *Sustainability*, 6(10), 6604–6621. [\[CrossRef\]](#)
- Ciuciuc, V. E., Bunica, A., Biea, E. A., Treapat, L. M., & Edu, T. (2026). Managerial insights on sustainable practices in today's business: Mapping economic, social, cultural, and environmental dimensions and their organizational outcomes. *Kybernetes*, 55(3), 1407–1433.
- Clulow, V., Gerstman, J., & Barry, C. (2003). The resource-based view and sustainable competitive advantage: The case of a financial services firm. *Journal of European Industrial Training*, 27(5), 220–232. [\[CrossRef\]](#)
- Dong, X., & Son, S. (2026). Orchestrating green transformation: How AI adoption enables corporate carbon neutrality. *Corporate Social Responsibility and Environmental Management*. [\[CrossRef\]](#)
- El Nemar, S., El-Chaarani, H., Dandachi, I., & Castellano, S. (2025). Resource-based view and sustainable advantage: A framework for SMEs. *Journal of Strategic Marketing*, 33(6), 798–821.
- Fang, L., Shi, S., Gao, J., & Li, X. (2022). The mediating role of green innovation and green culture in the relationship between green human resource management and environmental performance. *PLoS ONE*, 17(9), e0274820. [\[CrossRef\]](#) [\[PubMed\]](#)
- Font, X. (2002). Environmental certification in tourism and hospitality: Progress, process and prospects. *Tourism Management*, 23(3), 197–205. [\[CrossRef\]](#)
- Galpin, T., & Lee, J. (2012). Sustainability leadership: From strategy to results. *Journal of Business Strategy*, 33(4), 40–48. [\[CrossRef\]](#)
- Gao, D., & Tsai, D. (2024). Charting sustainable paths: The influence of sustainable leadership and green innovation on sustainable performance in higher education institutions. *Educational Administration: Theory and Practice*, 30(4), 3171–3183. [\[CrossRef\]](#)
- Gärtner, C. (2011). Putting new wine into old bottles: Mindfulness as a micro-foundation of dynamic capabilities. *Management Decision*, 49(2), 253–269. [\[CrossRef\]](#)
- Gerard, L., McMillan, J., & D'Annunzio-Green, N. (2017). Conceptualising sustainable leadership. *Industrial and Commercial Training*, 49(3), 116–126. [\[CrossRef\]](#)
- Gregory, R., Failing, L., Harstone, M., Long, G., McDaniels, T., & Ohlson, D. (2012). *Structured decision making: A practical guide to environmental management choices*. John Wiley & Sons.
- Guo, L., Xu, Y., Liu, G., Wang, T., & Du, C. (2019). Understanding firm performance on green sustainable practices through managers' ascribed responsibility and waste management: Green self-efficacy as moderator. *Sustainability*, 11(18), 4976. [\[CrossRef\]](#)
- Gürlek, M., & Koseoglu, M. (2021). Green innovation research in the field of hospitality and tourism: The construct, antecedents, consequences, and future outlook. *The Service Industries Journal*, 41(11–12), 734–766. [\[CrossRef\]](#)
- Hair, J., Hult, G., Ringle, C., & Sarstedt, M. (2021). *A primer on partial least squares structural equation modeling (PLS-SEM)*. Sage Publications.
- Haldorai, K., Kim, W. G., & Phetvaroon, K. (2025). Top management commitment, institutional pressures and green supply chain practices: Pathways to sustainable performance. *Journal of Hospitality and Tourism Insights*, 8(8), 2860–2879. [\[CrossRef\]](#)
- Hargreaves, A., & Fink, D. (2004). The seven principles of sustainable leadership. *Educational Leadership*, 61(7), 8–13.
- Hasanein, A., Al-Romeedy, B., Khairy, H., & Aliane, N. (2025). Designing for sustainability: How ergonomics enhances green motivation and innovation in the hospitality sector. *Tourism and Hospitality*, 6(5), 280. [\[CrossRef\]](#)
- Hashim, M., Márquez, F., Baig, S., Asif, M., Nazim, M., & Sibtain, M. (2025). Sustainable leadership and green innovations: Catalysts for sustainable business performance in the textile sector of Pakistan. *Business Strategy and the Environment*, 35(2), 2675–2694. [\[CrossRef\]](#)

- Iqbal, Q., Ahmad, N., & Halim, H. (2020). How does sustainable leadership influence sustainable performance? Empirical evidence from selected ASEAN countries. *Sage Open*, 10(4), 2158244020969394. [\[CrossRef\]](#)
- Iqbal, Q., Piwowar-Sulej, K., Agarwal, R., & Yaqub, M. (2025). Sustainability-oriented leadership and business strategy: Examining the roles of procedural environmental justice and job embeddedness. *Business Strategy and the Environment*, 34(3), 2917–2933. [\[CrossRef\]](#)
- Javed, A., Iqbal, J., Iqbal, S., & Imran, M. (2021). Sustainable leadership and employee innovative behavior: Discussing the mediating role of creative self-efficacy. *Journal of Public Affairs*, 21(3), e2547.
- Kalkan, P. (2025). Green employee behavior: Antecedents, outcomes, and the road to sustainability. In *Green management approaches to organizational behavior* (pp. 121–144). IGI Global Scientific Publishing.
- Kareem, M. A., & Kummitha, H. R. (2025). Impact of sustainable leadership practices on green innovation: The mediating role of organisational culture. *Discover Sustainability*, 6(1), 1077. [\[CrossRef\]](#)
- Kaur, V. (2025). Managerial attention and knowledge-based dynamic capabilities: A meta-theoretical approach to competitive advantage. *Journal of General Management*, 50(3), 220–239.
- Khan, R., Saqib, A., Abbasi, M., Mikhaylov, A., & Pinter, G. (2023). Green leadership, environmental knowledge sharing, and sustainable performance in manufacturing industry: Application from upper echelon theory. *Sustainable Energy Technologies and Assessments*, 60, 103540. [\[CrossRef\]](#)
- Kholijah, S. (2024). Analysis of economic and environmental benefits of green business practices in the hospitality and tourism sector. *Involvement International Journal of Business*, 1(1), 60–74. [\[CrossRef\]](#)
- Kock, N. (2025). Methods showcase—Using PLSF-SEM in business communication research. *International Journal of Business Communication*, 62(1), 187–205.
- Lane, H., & Maznevski, M. (2019). *International management behavior: Global and sustainable leadership*. Cambridge University Press.
- Le, T., Tran, P., Lam, N., Tra, M., & Uyen, P. (2024). Corporate social responsibility, green innovation, environment strategy and corporate sustainable development. *Operations Management Research*, 17(1), 114–134.
- López, S. M. C., Guerra, I. R., & Pernas, J. B. (2025). Sustainable leadership as a governance mechanism in the ESG era: A systematic review of organizational transformation in the hospitality sector. *Merits*, 5(4), 22. [\[CrossRef\]](#)
- Lucas, M. T. (2010). Understanding environmental management practices: Integrating views from strategic management and ecological economics. *Business Strategy and the Environment*, 19(8), 543–556. [\[CrossRef\]](#)
- Mahrán, K., Albarrak, H., Ibrahim, B., & Elamer, A. (2025). Leadership and sustainability in tourism and hospitality: A systematic review and future research agenda. *International Journal of Contemporary Hospitality Management*, 37(7), 2219–2242. [\[CrossRef\]](#)
- Merkle, A. (2025). Item level correction: Detecting, removing, and reporting common methods variance. *Journal of Marketing Analytics*, 13, 405–423. [\[CrossRef\]](#)
- Miao, Q., & Nduneseokwu, C. (2025). Environmental leadership in private organizations. In *Environmental leadership in a VUCA Era: An interdisciplinary handbook* (pp. 317–398). Springer Nature.
- Nisar, Q., Zafar, A., Shoukat, M., & Ikram, M. (2017). Green transformational leadership and green performance: The mediating role of green mindfulness and green self-efficacy. *International Journal of Management Excellence*, 9(2), 1059–1066. [\[CrossRef\]](#)
- Norton, T. A., Parker, S. L., Zacher, H., & Ashkanasy, N. M. (2015). Employee green behavior: A theoretical framework, multilevel review, and future research agenda. *Organization & Environment*, 28(1), 103–125.
- Obeng, H. A., Mensah, L., Arhinful, R., & Sarwar, A. (2026). How corporate social responsibility drives sustainable competitive advantage: The mediating roles of green HRM and technological adaptability in SMEs. *Corporate Social Responsibility and Environmental Management*. [\[CrossRef\]](#)
- Paillé, P., Valéau, P., & Renwick, D. (2020). Leveraging green human resource practices to achieve environmental sustainability. *Journal of Cleaner Production*, 260, 121137. [\[CrossRef\]](#)
- Park, H., Lee, M., & Back, K. (2023). A critical review of technology-driven service innovation in hospitality and tourism: Current discussions and future research agendas. *International Journal of Contemporary Hospitality Management*, 35(12), 4502–4534. [\[CrossRef\]](#)
- Pham, H., Pham, T., Truong Quang, H., & Dang, C. (2023). Impact of transformational leadership on green learning and green innovation in construction supply chains. *Engineering, Construction and Architectural Management*, 30(5), 1883–1901. [\[CrossRef\]](#)
- Podsakoff, P., MacKenzie, S., Lee, J., & Podsakoff, N. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5), 879–903. [\[CrossRef\]](#) [\[PubMed\]](#)
- Qalati, S. A., Badwy, H. E., Al-Romeedy, B. S., & Hasanein, A. M. (2026). Leading sustainability in restaurants: How authentic leadership cultivates green commitment through innovation and trust. *Journal of Hospitality and Tourism Insights*, 9(3), 1105–1124.
- Rashid, A., Rasheed, R., & Altay, N. (2025). Greening manufacturing: The role of institutional pressure and collaboration in operational performance. *Journal of Manufacturing Technology Management*, 36(2), 455–478.
- Redekop, B., Gallagher, D., & Satterwhite, R. (2018). *Innovation in environmental leadership: Critical perspectives*. Routledge.
- Rennings, K. (2000). Redefining innovation—Eco-innovation research and the contribution from ecological economics. *Ecological Economics*, 32(2), 319–332. [\[CrossRef\]](#)

- Rosário, A., & Boechat, A. (2025). How sustainable leadership can leverage sustainable development. *Sustainability*, 17(8), 3499. [\[CrossRef\]](#)
- Salama, W., Khairy, H., Othman, I., Ibrahim, T., Farid, M., & Elbanna, S. (2025). Paradoxical leadership, green commitment, and green self-efficacy: The mediating and moderating pathways to green innovative work behavior in the tourism and hospitality businesses. *Geo Journal of Tourism and Geosites*, 62(4), 2376–2389. [\[CrossRef\]](#)
- Saleem, F., Mateou, S., & Malik, M. (2024). How green transformational leaders trigger environmental performance? Unleashing the missing links through green self-efficacy, green empowerment, and green training of employees. *Sustainability*, 16(22), 9982. [\[CrossRef\]](#)
- Salvato, C., & Vassolo, R. (2018). The sources of dynamism in dynamic capabilities. *Strategic Management Journal*, 39(6), 1728–1752.
- Schein, S. (2017). *A new psychology for sustainability leadership: The hidden power of ecological worldviews*. Routledge.
- Shafait, Z., & Huang, J. (2024). Examining the impact of sustainable leadership on green knowledge sharing and green learning: Understanding the roles of green innovation and green organisational performance. *Journal of Cleaner Production*, 457, 142402. [\[CrossRef\]](#)
- Singh, S., Del Giudice, M., Chierici, R., & Graziano, D. (2020). Green innovation and environmental performance: The role of green transformational leadership and green human resource management. *Technological Forecasting and Social Change*, 150, 119762. [\[CrossRef\]](#)
- Strauss, K., Lepoutre, J., & Wood, G. (2017). Fifty shades of green: How microfoundations of sustainability dynamic capabilities vary across organizational contexts. *Journal of Organizational Behavior*, 38(9), 1338–1355. [\[CrossRef\]](#)
- Tanveer, M. I., Yusliza, M. Y., & Fawehinmi, O. (2024). Green HRM and hospitality industry: Challenges and barriers in adopting environmentally friendly practices. *Journal of Hospitality and Tourism Insights*, 7(1), 121–141.
- Tariq, A., Badir, Y., & Chonglertham, S. (2019). Green innovation and performance: Moderation analyses from Thailand. *European Journal of Innovation Management*, 22(3), 446–467. [\[CrossRef\]](#)
- Tate, W., & Bals, L. (2018). Achieving shared triple bottom line (TBL) value creation: Toward a social resource-based view (SRBV) of the firm. *Journal of Business Ethics*, 152(3), 803–826.
- Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*, 28(13), 1319–1350. [\[CrossRef\]](#)
- Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509–533. [\[CrossRef\]](#)
- ur Rehman, G., Shah, N., Jehangir, M., Irfan, M., & Rafiq, M. (2025). Moderating role of green self efficacy between green transformational leadership and green creativity. *Journal of Business and Management Research*, 4(1), 81–106.
- Velaoras, K., Menegaki, A. N., Polyzos, S., & Gotzamani, K. (2025). The role of environmental certification in the hospitality industry: Assessing sustainability, consumer preferences, and the economic impact. *Sustainability*, 17(2), 650. [\[CrossRef\]](#)
- Wiredu, J., & Konadu, E. (2026). Does green supply chain management and green intellectual capital influence business environmental performance? The moderating and mediating role of governance quality and green innovation practices in an emerging economy. *Business Strategy and the Environment*. [\[CrossRef\]](#)
- Zada, M., Erkol Bayram, G., Contreras-Barraza, N., Kaptangil, K., & Aylan, S. (2025). Integrating social media-driven service innovation and sustainable leadership: Advancing sustainable practices in tourism and hospitality. *Sustainability*, 17(2), 399. [\[CrossRef\]](#)
- Zafar, H., Cheah, J., Ho, J., Suseno, Y., & Tian, F. (2025). How green servant leadership influences organizational green performance? The roles of employee green creativity, voluntary pro-environmental behavior and green psychological climate. *Personnel Review*, 54(4), 971–995. [\[CrossRef\]](#)
- Zhang, F., & Zhu, L. (2019). Enhancing corporate sustainable development: Stakeholder pressures, organizational learning, and green innovation. *Business Strategy and the Environment*, 28(6), 1012–1026. [\[CrossRef\]](#)
- Zhao, W., & Huang, L. (2022). The impact of green transformational leadership, green HRM, green innovation and organizational support on the sustainable business performance: Evidence from China. *Economic Research*, 35(1), 6121–6141. [\[CrossRef\]](#)
- Zollo, M., Bettinazzi, E. L., Neumann, K., & Snoeren, P. (2016). Toward a comprehensive model of organizational evolution: Dynamic capabilities for innovation and adaptation of the enterprise model. *Global Strategy Journal*, 6(3), 225–244. [\[CrossRef\]](#)

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