

Exploring the Mediating Role of Green Transformational Leadership in the Relationship between Corporate Social Responsibility and Environmental Performance

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ABSTRACT

Objective: The present study aimed to investigate the mediating role of green transformational leadership in the relationship between corporate social responsibility (CSR) and environmental performance among companies listed on the Tehran Stock Exchange.

Methods and Materials: This applied research employed a descriptive–correlational survey design. The statistical population consisted of financial managers, heads of accounting departments, and senior accounting experts working in companies listed on the Tehran Stock Exchange in 2025. Using Cochran’s formula and a stratified random sampling approach, 395 valid questionnaires were collected and analyzed. Standardized instruments were used to measure corporate social responsibility, green transformational leadership, and environmental performance. Data analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) through SmartPLS 3 software. Reliability, convergent validity, discriminant validity, and overall model fit were assessed prior to hypothesis testing. The results confirmed satisfactory psychometric properties and a strong model fit (GOF = 0.672), indicating the adequacy of the measurement and structural models.

Findings: The structural model results demonstrated that corporate social responsibility had a significant positive effect on environmental performance ($\beta = 0.414$, $t = 9.370$, $p < 0.001$). Corporate social responsibility also exerted a significant positive effect on green transformational leadership ($\beta = 0.739$, $t = 29.310$, $p < 0.001$). Furthermore, green transformational leadership significantly enhanced environmental performance ($\beta = 0.584$, $t = 13.958$, $p < 0.001$). The findings additionally confirmed the mediating role of green transformational leadership in the relationship between corporate social responsibility and environmental performance, indicating that CSR contributes to superior environmental outcomes both directly and indirectly through the development of green transformational leadership practices.

Conclusion: The findings indicate that corporate social responsibility serves as a strategic driver of environmental performance and that green transformational leadership plays a pivotal intermediary role in translating social commitments into tangible environmental achievements.

Keywords: Corporate Social Responsibility; Green Transformational Leadership; Environmental Performance; Sustainability Performance; Sustainable Management.

1 Introduction

In recent years, environmental performance has become one of the central indicators through which the strategic maturity, social legitimacy, and long-term competitiveness of firms are evaluated. The intensification of climate change, resource depletion, pollution, and ecological degradation has moved environmental responsibility from the margins of corporate activity to the core of organizational strategy. Firms are no longer assessed only by financial profitability or market share, but also by their ability to reduce emissions, manage environmental costs, disclose ecological impacts, develop cleaner processes, and align operational decisions with the principles of sustainability. This shift is particularly important for firms operating in capital markets, where investors, regulators, customers, and civil society increasingly demand transparent evidence of environmental accountability and responsible governance. Earlier studies on environmental degradation and carbon emissions have shown that industrialization, globalization, energy consumption, and non-renewable development models impose substantial ecological burdens, thereby requiring firms to reconsider the environmental consequences of their activities (Ma et al., 2020; Ramzan et al., 2021; Yang & Usman, 2021). In this context, corporate environmental performance is not merely a technical outcome of pollution control systems; rather, it reflects the degree to which environmental values are internalized in organizational structures, reporting practices, leadership patterns, and resource allocation mechanisms.

Corporate social responsibility has emerged as a major strategic framework for responding to these pressures. CSR broadens the mission of the firm beyond short-term shareholder value and requires organizations to consider the expectations of a wider network of stakeholders, including employees, customers, investors, communities, regulators, and the natural environment. From this perspective, CSR is both a normative commitment and a managerial mechanism through which firms integrate ethical, social, and environmental considerations into strategic decisions. Studies on CSR, stakeholder value, and firm reputation have shown that socially responsible practices can strengthen organizational legitimacy and create a foundation for sustainable value creation (Faraji et al., 2020; Trotta et al., 2017). In environmentally sensitive industries, CSR becomes even more critical because corporate activities may generate direct ecological externalities, and stakeholders expect firms to disclose, manage, and reduce these impacts

(Amoako et al., 2021; Dhar et al., 2022; Ikechukwu et al., 2022). Therefore, CSR can be understood as an institutionalized commitment that pushes organizations toward stronger environmental governance, more transparent reporting, and proactive investment in ecological improvement.

A growing body of literature suggests that CSR can influence environmental performance by shaping organizational priorities and directing managerial attention toward sustainability-oriented actions. When firms adopt CSR as a genuine strategic orientation rather than a symbolic reporting exercise, they are more likely to invest in pollution reduction, environmental accountability, green innovation, and sustainable resource management. Empirical research has linked CSR and environmental performance in different national and industrial contexts, showing that firms with stronger social responsibility commitments are better positioned to improve ecological outcomes (M. Ahmad et al., 2022; Ahmad, 2021; Al-Ali & O'Mahony, 2025). However, the relationship between CSR and environmental performance is not always direct or automatic. CSR policies may remain formal statements unless they are translated into managerial behaviors, organizational capabilities, and operational practices. This explains why recent studies have increasingly examined mediating variables such as green capabilities, green innovation, green organizational culture, green strategy, and leadership as mechanisms through which CSR produces measurable environmental outcomes (Bhat et al., 2024; Bonsu et al., 2024; Xu et al., 2024).

Among these mechanisms, green transformational leadership has received increasing attention as a critical organizational force that can convert sustainability values into employee motivation, innovation, and environmental action. Transformational leadership traditionally emphasizes vision-building, intellectual stimulation, inspirational motivation, individualized consideration, and the mobilization of followers around higher-order goals. When this leadership style is directed toward environmental sustainability, it becomes green transformational leadership: a form of leadership that inspires employees to support ecological values, encourages creative environmental problem-solving, and embeds green objectives into everyday organizational routines. Research has shown that green transformational leadership is associated with green human resource management, green innovation, environmental performance, and sustainable competitive advantage (Awan et al., 2023; Demir et al., 2025; Singh et al., 2020). In this sense, green transformational leaders act as strategic

translators: they transform abstract sustainability commitments into shared organizational vision, motivate employees to participate in environmental initiatives, and create the psychological and cultural conditions required for environmental performance improvement.

The relevance of green transformational leadership becomes clearer when CSR is viewed as a source of values and expectations that must be enacted through leadership. CSR can signal organizational commitment to society and the environment, but without leaders who articulate these commitments, model green behavior, and align resources with environmental objectives, CSR may fail to generate meaningful ecological outcomes. Leadership provides the behavioral and interpretive infrastructure through which CSR becomes actionable. Studies on green leadership, green organizational culture, and sustainable performance indicate that leadership can strengthen the effects of environmental policies by encouraging employees to internalize sustainability goals and participate in green innovation processes (Dehghanizadeh & Tavakoli Elahabadi, 2024; Khalafi & Ashrafi, 2025; Khan et al., 2025). Similarly, research on organizational identity and citizenship behavior suggests that socially responsible organizational values can influence employees' engagement and extra-role behaviors when such values are embedded in organizational identity and managerial practice (Aghajani & Behboudi, 2023; Heydari, 2023). Thus, green transformational leadership may serve as a central mediating mechanism between CSR and environmental performance.

In addition to leadership, green innovation and green capabilities have been widely recognized as channels through which CSR affects environmental outcomes. Firms that integrate social responsibility into their strategic orientation are more likely to develop green products, cleaner processes, renewable energy solutions, and environmentally responsible technologies. Such innovations allow firms to reduce environmental harm while maintaining competitiveness. Research has demonstrated that green innovation mediates the relationship between CSR and environmental performance, especially in emerging markets and manufacturing contexts (Bonsu et al., 2024; Xu et al., 2024). Other studies have shown that renewable energy, humanistic culture, and green knowledge reinforce CSR and corporate environmental performance, highlighting the importance of organizational learning and knowledge-based sustainability practices (Basheer et al., 2025). Similarly, CSR contracting and sustainability-oriented incentives can improve green innovation performance by aligning

managerial objectives with ecological priorities (Hou et al., 2025). These findings reinforce the idea that CSR becomes environmentally effective when organizations build internal capacities that transform social commitments into concrete green actions.

Environmental reporting and disclosure also constitute an important dimension of this relationship. Sustainability reporting, environmental information disclosure, and ecological accounting practices provide mechanisms for monitoring and communicating environmental performance. They also expose firms to institutional pressures from regulators, investors, media, and civil society. Studies have shown that sustainability reporting is shaped by institutional pressures and can enhance transparency, accountability, and stakeholder trust (Andrades et al., 2024; Khalili et al., 2024; Mahmoudi et al., 2023). In financial and capital-market settings, disclosure quality may also affect financing costs and investor perceptions, indicating that environmental transparency has economic consequences (Luo et al., 2019; Su & Zhang, 2019). Media coverage can further discipline polluting firms by increasing public scrutiny and reputational risk (Wang & Zhang, 2020). Therefore, environmental performance is embedded in a broader governance system where CSR, disclosure, leadership, and stakeholder monitoring interact with each other.

The financial implications of sustainability have also attracted scholarly attention. While some studies suggest that sustainability performance can contribute to financial performance by improving reputation, efficiency, and investment quality, others indicate that environmental cost management may not always produce immediate financial gains. For example, research on business sustainability performance has emphasized the mediating role of optimal investment in the relationship between sustainability and financial outcomes (Mansour et al., 2022). Studies on environmental cost management in petrochemical companies listed on the Tehran Stock Exchange have shown that environmental costs may have mixed or insignificant effects on certain financial performance indicators, suggesting that environmental initiatives should not be evaluated only through short-term accounting returns (Shahabi et al., 2025). Similarly, research on board gender diversity, sustainability, and firm performance has demonstrated that governance characteristics may shape the sustainability–performance relationship (Shakil et al., 2024). These findings suggest that environmental performance must be understood as a multidimensional strategic outcome rather than a narrow financial indicator.

In the Iranian capital-market context, the relationship between CSR, leadership, and environmental performance is especially significant. Companies listed on the Tehran Stock Exchange operate under increasing expectations regarding sustainability reporting, green finance, environmental accountability, and social responsibility. Domestic studies have examined CSR, firm value, organizational identity, sustainability reporting, green transformational leadership, environmental regulations, and financial indicators, showing that sustainability-related constructs are becoming increasingly relevant in Iranian management and accounting research (Dehghanizadeh & Tavakoli Elahabadi, 2024; Faraji et al., 2020; Khalili et al., 2024; Mahmoudi et al., 2023; Shahabi et al., 2025). In financial institutions, the emergence of FinTech-based innovation, green finance, and green human resource management has also been linked to green transformational leadership, suggesting that technological and financial innovation may support leadership-based sustainability transformation (Khalafi & Ashrafi, 2025). However, despite growing attention to these issues, there remains a need for integrated empirical models that explain how CSR contributes to environmental performance through leadership mechanisms within firms listed on the Tehran Stock Exchange.

The theoretical foundation of the present study can be explained through stakeholder theory, institutional theory, and transformational leadership theory. Stakeholder theory suggests that firms must respond to the expectations of multiple stakeholder groups and that environmental performance is one way of maintaining stakeholder legitimacy. Institutional theory explains how regulatory pressures, social norms, media scrutiny, and sustainability reporting expectations encourage firms to adopt environmentally responsible practices (Amoako et al., 2021; Andrades et al., 2024). Transformational leadership theory explains how leaders can inspire followers, create shared vision, stimulate innovation, and institutionalize values within organizations. When integrated, these perspectives suggest that CSR provides the normative and strategic foundation for environmental responsibility, while green transformational leadership supplies the behavioral mechanism that converts this foundation into measurable environmental performance. Studies on environmental pressures, marketing capacity, and environmental innovation strategy further support the view that firms respond to ecological demands through strategic and organizational capabilities (Yu et al., 2017). Moreover, research on green supply chain competition, carbon

emissions, and financing risk indicates that sustainability transformation requires coordinated strategic decisions across financial, technological, and operational domains (Tolliver et al., 2020; Wu & Kung, 2020).

Despite this growing literature, several gaps remain. First, many studies have examined the direct relationship between CSR and environmental performance without sufficiently explaining the internal organizational processes through which this relationship occurs. Second, although green innovation and green capabilities have been widely examined, less attention has been paid to the specific mediating role of green transformational leadership as a leadership-based mechanism. Third, many studies have been conducted in different international contexts, while evidence from Iranian listed companies remains relatively limited. Fourth, prior research often treats environmental performance as an outcome of policies or technologies, whereas the role of leadership in translating CSR into practical environmental action requires deeper empirical analysis. Even studies from adjacent fields, such as ecological accounting, auditing ecosystems, and sustainable urban frameworks, indicate that sustainability outcomes require systemic coordination among accounting, governance, and managerial processes (Chen et al., 2025; Ghisellini et al., 2024; Huy & Phuc, 2023). Therefore, examining the mediating role of green transformational leadership can help clarify the “black box” between CSR commitments and corporate environmental achievements.

Some references in the field also highlight the need for caution in interpreting environmental behavior across contexts. For instance, broader behavioral and ecological studies show that group behavior, vigilance, and collective response patterns may depend on contextual and social dynamics, which can conceptually remind organizational scholars that environmental behavior is rarely isolated from group-level influences (Childress & Lung, 2023). Likewise, studies on renewable energy determinants, environmental quality, and macroeconomic pollution drivers show that environmental outcomes are shaped by multilevel factors ranging from national policy to firm-level governance (U. S. Ahmad et al., 2022; Kamal et al., 2021; Khalid et al., 2021). Therefore, the firm-level relationship between CSR and environmental performance should be examined through models that recognize both strategic commitments and internal organizational mechanisms.

Accordingly, the present study seeks to contribute to sustainable management, accounting, and organizational behavior literature by developing and testing a model in

which corporate social responsibility affects corporate environmental performance both directly and indirectly through green transformational leadership. The focus on financial managers, heads of accounting departments, and accounting experts in companies listed on the Tehran Stock Exchange is important because these professionals are closely involved in reporting, resource allocation, financial control, and organizational performance evaluation. Their perceptions provide valuable insight into how CSR, leadership, and environmental performance are connected in corporate practice. By examining these relationships through structural equation modeling, the study aims to provide empirical evidence on whether green transformational leadership functions as a key pathway through which CSR commitments are transformed into environmental outcomes.

The aim of this study is to examine the mediating role of green transformational leadership in the relationship between corporate social responsibility and environmental performance among companies listed on the Tehran Stock Exchange.

2 Methods and Materials

This study was conducted as an applied research project and employed a descriptive–correlational design. From the perspective of data collection, the research followed a survey-based approach, while its analytical framework was based on deductive–inductive reasoning. Since the data were collected at a single point in time, the study adopted a cross-sectional design. The primary objective was to examine the relationships among corporate social responsibility, green transformational leadership, and environmental performance and to assess the mediating role of green transformational leadership in the proposed conceptual model.

The statistical population consisted of financial managers, heads of accounting departments, and accounting experts working in companies listed on the Tehran Stock Exchange during the 2025 fiscal year. Because no official statistics regarding the exact size of the target population were available, the population was assumed to be unlimited. Therefore, the required sample size was determined using Cochran's formula for an unknown population. Based on a confidence level corresponding to a standard normal value of 1.96, an estimated population proportion of 0.50, and a sampling error of 0.05, the minimum required sample size was calculated as 384 participants. To enhance the reliability and generalizability of the findings, 460 questionnaires were distributed among eligible participants using an accessible

sampling procedure. A total of 401 questionnaires were returned, of which 395 were complete and suitable for statistical analysis, resulting in a response rate of approximately 86.95%. The final sample therefore comprised 395 respondents representing the accounting and financial management professionals of publicly listed firms.

Data were collected through standardized questionnaires with established psychometric properties. Corporate Social Responsibility (CSR), which served as the independent variable, was measured using the questionnaire developed by Banerjee (2002). This instrument consists of four items designed to assess the extent to which organizations integrate social and ethical responsibilities into their business activities. Responses were recorded on a five-point Likert scale ranging from “strongly disagree” (1) to “strongly agree” (5), with higher scores indicating stronger perceptions of corporate social responsibility.

Environmental Performance, the dependent variable of the study, was measured using the scale developed by Laosirihongthong et al. (2013). This instrument contains five items that evaluate an organization's environmental achievements and its commitment to environmentally sustainable practices. Participants responded to each item using the same five-point Likert scale ranging from “strongly disagree” to “strongly agree.” Higher scores reflected better environmental performance and stronger environmental management outcomes.

Green Transformational Leadership, the mediating variable, was assessed using the questionnaire developed by García-Morales et al. (2012). The instrument consists of five items designed to evaluate leadership behaviors that inspire employees toward environmental responsibility, sustainability, and ecological innovation. Similar to the other measures, responses were recorded on a five-point Likert scale ranging from “strongly disagree” (1) to “strongly agree” (5). Higher scores represented stronger perceptions of green transformational leadership within the organization.

The collected data were analyzed using both descriptive and inferential statistical techniques. Descriptive statistics were employed to summarize the demographic characteristics of the respondents and provide an overview of the study variables. Inferential analyses were conducted to test the proposed hypotheses and examine the structural relationships among the constructs.

To evaluate the measurement model, reliability and validity assessments were performed, including Cronbach's alpha, composite reliability, average variance extracted (AVE), convergent validity, and discriminant validity. The

predictive relevance and overall goodness-of-fit of the model were also examined to ensure the adequacy of the measurement and structural models. Structural Equation Modeling (SEM) based on the Partial Least Squares (PLS) approach was utilized to assess the direct and indirect relationships among corporate social responsibility, green transformational leadership, and environmental performance. Path coefficients, t-values, and significance levels were used to determine the strength and significance of the hypothesized relationships. Statistical analyses were performed using SPSS version 25 for preliminary analyses and SmartPLS 3 for measurement and structural model estimation. This analytical approach enabled the simultaneous examination of multiple relationships and the testing of the mediating effect of green transformational leadership within the proposed conceptual framework.

3 Findings and Results

The descriptive results showed that the final sample consisted of 395 respondents. In terms of gender, men

constituted the largest proportion of participants, with 296 respondents (75.00%), while women accounted for 99 respondents (25.00%). Regarding age, most participants were between 46 and 55 years old (173 respondents; 43.75%), followed by those older than 56 years (148 respondents; 37.50%) and those up to 45 years old (74 respondents; 18.75%). In terms of work experience, the majority of respondents had more than 10 years of experience (272 respondents; 68.75%), while 123 respondents (31.25%) had less than 10 years of experience. These findings indicate that the sample mainly consisted of middle-aged and experienced accounting and financial professionals, which may strengthen the professional relevance of the responses.

The predictive capability of the model was evaluated using the Stone–Geisser non-parametric test. The Q^2 values showed that none of the values were negative, indicating that the minimum predictive relevance requirements of the model were met.

Table 1

Goodness-of-fit indicators

Dimension	CV.Community (Q^2)
Green transformational leadership	0.712
Environmental performance	0.699
Corporate social responsibility	0.753

After assessing the measurement and structural models, the overall fit of the model was examined using the GOF index. Since the obtained GOF value was 0.672, which is

higher than the strong threshold of 0.36, the overall model fit was confirmed as highly acceptable.

Table 2

Communality and R^2 values

Latent variable	Communality	R^2
Green transformational leadership	0.848	0.546
Environmental performance	0.837	—
Corporate social responsibility	0.673	0.602

Table 3

Overall model fit

Mean Communality	Mean R^2	GOF
0.786	0.574	0.672

The results of confirmatory factor analysis showed that all factor loadings were above 0.70, indicating adequate item validity. In addition, all t-values were greater than 1.96,

confirming that the observed indicators significantly explained their corresponding latent constructs.

Table 4*Factor loadings and t-values of questionnaire items*

Variable	Factor loading	t-value
Corporate social responsibility	0.864	45.745
Corporate social responsibility	0.864	42.632
Corporate social responsibility	0.789	38.837
Corporate social responsibility	0.760	25.860
Environmental performance	0.934	99.555
Environmental performance	0.925	84.853
Environmental performance	0.917	70.723
Environmental performance	0.919	97.571
Environmental performance	0.878	41.710
Green transformational leadership	0.915	66.833
Green transformational leadership	0.933	10.172
Green transformational leadership	0.906	58.692
Green transformational leadership	0.915	63.217
Green transformational leadership	0.935	94.092
Green transformational leadership	0.915	66.833

The values of average variance extracted were higher than 0.50 for all variables, confirming convergent validity. Moreover, Cronbach's alpha and composite reliability

values for all constructs were above the acceptable threshold, showing that the internal consistency of the measurement model was satisfactory.

Table 5*Convergent validity and reliability*

Dimension	Cronbach's alpha	Rho	Composite reliability	AVE
Green transformational leadership	0.955	0.955	0.965	0.848
Environmental performance	0.951	0.952	0.963	0.837
Corporate social responsibility	0.837	0.835	0.891	0.673

Discriminant validity was examined using the Fornell–Larcker criterion. The square root of AVE for each construct was greater than its correlations with the other constructs,

confirming the discriminant validity of the measurement model.

Table 6*Fornell–Larcker criterion for discriminant validity*

Constructs	Green transformational leadership	Environmental performance	Corporate social responsibility
Green transformational leadership	0.921		
Environmental performance	0.490	0.915	
Corporate social responsibility	0.539	0.545	0.820

The R² results showed that the model explained 60.2% of the variance in environmental performance. The adjusted R²

value was 0.601, indicating that the explanatory power of the model remained stable after adjustment.

Table 7*R² values of the research model*

Dimension	R ²	Adjusted R ²
Environmental performance	0.602	0.601

Figure 1

Standardized Path Coefficients of the Research Model

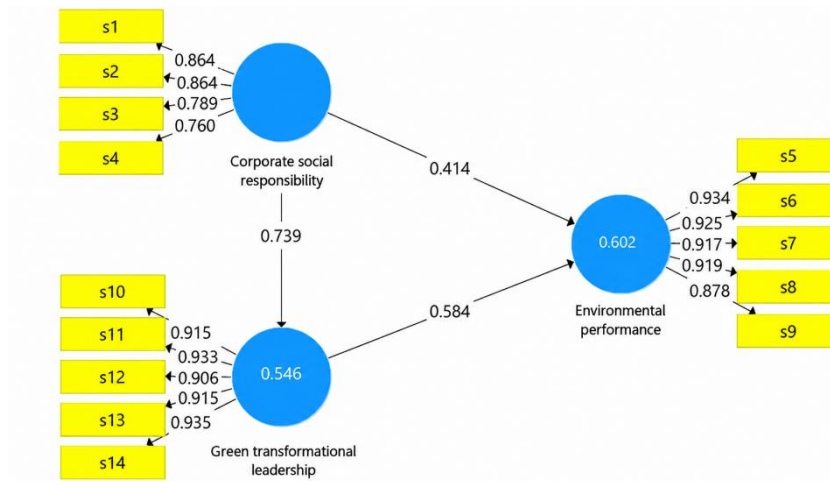
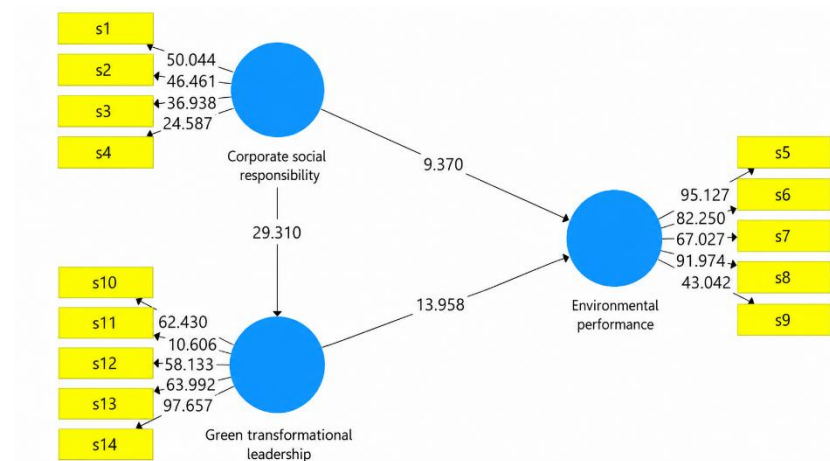


Figure 2

T-Values of the Research Model



The direct hypothesis testing results showed that all three direct paths were statistically significant. Corporate social responsibility had a positive and significant effect on environmental performance ($\beta = 0.414$, $t = 9.370$, $p = 0.0001$). Corporate social responsibility also had a positive and significant effect on green transformational leadership

($\beta = 0.739$, $t = 29.310$, $p = 0.0001$). Furthermore, green transformational leadership had a positive and significant effect on corporate environmental performance ($\beta = 0.584$, $t = 13.958$, $p = 0.0001$). Since all t-values were greater than 1.96, all direct hypotheses were confirmed at the 95% confidence level.

Table 8

Results of direct hypothesis testing

Hypothesis	Path coefficient	t-value	Significance level	Result
Corporate social responsibility significantly affects environmental performance.	0.414	9.370	0.0001	Confirmed
Corporate social responsibility significantly affects green transformational leadership.	0.739	29.310	0.0001	Confirmed
Green transformational leadership significantly affects corporate environmental performance.	0.584	13.958	0.0001	Confirmed

The indirect effect of corporate social responsibility on environmental performance through green transformational leadership was calculated by multiplying the path coefficient from corporate social responsibility to green transformational leadership by the path coefficient from green transformational leadership to environmental performance. The indirect effect was 0.432. The Sobel test

result showed that this indirect effect was significant, as the obtained z-value was 3.284, which was greater than the critical value of 1.96. Therefore, the mediating role of green transformational leadership in the relationship between corporate social responsibility and environmental performance was confirmed.

Table 9

Sobel test results

Independent variable	Mediating variable	Dependent variable	Path coefficient	z-value	Result
Corporate social responsibility	Green transformational leadership	Environmental performance	0.432	3.284	Confirmed

The VAF statistic was used to determine the strength of the mediating effect. The obtained VAF value was 0.511, indicating that approximately 51% of the total effect of corporate social responsibility on environmental performance was explained indirectly through green transformational leadership. Since the direct effect of corporate social responsibility on environmental performance was also significant, green transformational leadership played a partial mediating role in this relationship.

4 Discussion

The purpose of this study was to examine the effect of corporate social responsibility (CSR) on environmental performance and to investigate the mediating role of green transformational leadership among companies listed on the Tehran Stock Exchange. The findings revealed that corporate social responsibility has a positive and significant effect on environmental performance. Furthermore, CSR was found to exert a significant positive effect on green transformational leadership, while green transformational leadership also demonstrated a significant positive impact on environmental performance. In addition, the results confirmed the mediating role of green transformational leadership in the relationship between CSR and environmental performance, indicating that a substantial proportion of the influence of CSR on environmental outcomes is transmitted through leadership mechanisms. Overall, the findings support the argument that environmental sustainability within organizations is not merely a consequence of formal social responsibility policies but also depends on leadership processes that translate sustainability values into organizational behavior and environmental actions.

The first finding demonstrated that corporate social responsibility significantly improves environmental performance. This result suggests that organizations that actively integrate social, ethical, and environmental considerations into their strategic decision-making are more capable of achieving favorable environmental outcomes. CSR encourages organizations to invest in environmentally responsible practices, improve ecological accountability, adopt sustainable technologies, and reduce negative environmental externalities. From a stakeholder theory perspective, organizations that recognize their obligations toward multiple stakeholder groups are more likely to develop sustainable practices that enhance environmental performance. The present finding is consistent with previous studies reporting positive associations between CSR and environmental performance across different sectors and countries (M. Ahmad et al., 2022; Al-Ali & O'Mahony, 2025; Basheer et al., 2025). Similarly, empirical evidence has shown that organizations with stronger CSR commitments tend to exhibit higher levels of environmental accountability, ecological responsibility, and sustainability-oriented decision-making (Amoako et al., 2021; Dhar et al., 2022; Xu et al., 2024). Research conducted in developing and emerging economies has also emphasized that CSR contributes to environmental performance by encouraging organizations to allocate resources toward pollution prevention, environmental management systems, and sustainability initiatives (M. Ahmad et al., 2022; Bhat et al., 2024). Moreover, studies focusing on environmental reporting and sustainability disclosure indicate that CSR-oriented organizations tend to be more transparent regarding environmental issues, which further motivates them to improve ecological performance and maintain legitimacy among stakeholders (Andrades et al., 2024; Mahmoudi et al.,

2023; Zimon et al., 2022). Therefore, the significant relationship observed in this study reinforces the notion that CSR serves as an important strategic driver of environmental performance.

The second finding revealed that corporate social responsibility has a strong positive effect on green transformational leadership. This finding is theoretically meaningful because CSR establishes a value system that emphasizes sustainability, ethical responsibility, stakeholder welfare, and long-term environmental stewardship. Such values create an organizational climate that encourages leaders to adopt environmentally responsible behaviors and to inspire employees toward sustainability goals. Green transformational leadership emerges when organizational leaders internalize environmental values and communicate a compelling sustainability vision to organizational members. The result aligns with previous studies indicating that CSR contributes to the development of leadership styles that support environmental responsibility and sustainability transformation (Bhat et al., 2024; Mukhtar et al., 2024). Research has shown that socially responsible organizations are more likely to cultivate leadership behaviors that encourage environmental innovation, sustainability-oriented decision-making, and employee engagement in green initiatives (Aghajani & Behboudi, 2023; Heydari, 2023). Furthermore, studies examining green organizational culture and sustainability strategies have reported that CSR-oriented organizational environments facilitate the emergence of green transformational leadership by embedding environmental values into organizational norms and managerial practices (Dehghanizadeh & Tavakoli Elahabadi, 2024; Khalafi & Ashrafi, 2025). This finding suggests that CSR is not limited to external stakeholder relations but also shapes internal leadership processes that influence organizational sustainability trajectories.

The third finding indicated that green transformational leadership significantly enhances environmental performance. This result is consistent with transformational leadership theory, which posits that leaders influence organizational outcomes by motivating followers, creating shared vision, stimulating innovation, and encouraging commitment to collective goals. When these leadership behaviors are directed toward environmental objectives, employees become more willing to participate in sustainability initiatives, engage in green innovation, and adopt environmentally responsible behaviors. Green transformational leaders promote environmental awareness, support experimentation with sustainable practices, and

encourage continuous improvement in environmental management. The current finding is supported by numerous studies demonstrating that green transformational leadership is positively associated with environmental performance, green innovation, and sustainable competitive advantage (Awan et al., 2023; Demir et al., 2025; Singh et al., 2020). Prior research has found that leaders who emphasize environmental values can foster organizational learning, increase environmental commitment among employees, and improve ecological performance indicators (Dehghanizadeh & Tavakoli Elahabadi, 2024; Khalafi & Ashrafi, 2025). Similarly, studies investigating green human resource management and sustainability initiatives have reported that leadership serves as a critical mechanism for aligning employee behavior with environmental goals (Awan et al., 2023; Singh et al., 2020). Therefore, the present findings provide additional empirical support for the argument that leadership is a key organizational resource for achieving sustainability objectives.

One of the most important findings of the study concerns the mediating role of green transformational leadership. The Sobel test confirmed that green transformational leadership partially mediates the relationship between CSR and environmental performance, while the VAF statistic indicated that approximately 51% of the total effect of CSR on environmental performance is transmitted through this mediating mechanism. This finding suggests that CSR does not influence environmental performance solely through direct organizational investments or environmental policies. Rather, a considerable portion of its impact occurs because CSR shapes leadership behaviors, which subsequently influence employees, organizational culture, and sustainability-oriented practices. In other words, CSR provides the normative foundation for environmental responsibility, whereas green transformational leadership serves as the behavioral mechanism through which these values are operationalized. This interpretation is highly consistent with recent studies emphasizing the mediating roles of leadership, green capabilities, green strategy, and green innovation in translating CSR into environmental outcomes (Al-Ali & O'Mahony, 2025; Bhat et al., 2024; Bonsu et al., 2024). Similar evidence has shown that sustainability initiatives are more effective when organizational leaders actively champion environmental goals and encourage employees to engage in environmentally responsible activities (Hou et al., 2025; Mukhtar et al., 2024). Furthermore, studies investigating knowledge management, innovation, and sustainable

performance have demonstrated that organizational capabilities frequently function as mediating mechanisms connecting strategic sustainability commitments to operational outcomes (Khan et al., 2025; Nasir et al., 2024; Zameer et al., 2022).

The findings also contribute to the broader sustainability literature by highlighting the interconnected nature of environmental performance, innovation, reporting, organizational culture, and leadership. Environmental performance is increasingly recognized as a multidimensional outcome influenced by institutional pressures, sustainability reporting practices, stakeholder expectations, and internal organizational capabilities. Research has shown that sustainability reporting, environmental disclosure quality, ecological accounting systems, and environmental governance structures contribute to organizational environmental effectiveness (Ghisellini et al., 2024; Huy & Phuc, 2023; Khalili et al., 2024). Likewise, studies on environmental information disclosure and media attention suggest that transparent environmental communication strengthens accountability and motivates firms to improve environmental performance (Luo et al., 2019; Su & Zhang, 2019; Wang & Zhang, 2020). The current study extends this literature by demonstrating that leadership plays a critical role in connecting organizational sustainability commitments with actual environmental outcomes.

Another important implication of the findings concerns the strategic role of CSR in generating long-term organizational value. Earlier research has demonstrated that CSR positively influences firm reputation, stakeholder trust, sustainability reporting quality, organizational engagement, and firm value (Faraji et al., 2020; Trotta et al., 2017; Zimon et al., 2022). Environmental performance can therefore be viewed not only as an ecological objective but also as a strategic asset that contributes to organizational legitimacy, competitive positioning, and stakeholder confidence. Studies examining sustainability performance and financial outcomes have shown that environmentally responsible organizations are often better positioned to achieve sustainable growth and long-term value creation (Mansour et al., 2022; Shakil et al., 2024). Consequently, organizations should view CSR and green leadership not as compliance mechanisms but as strategic resources capable of supporting both environmental and organizational success.

5 Conclusion

From a practical perspective, the findings are particularly relevant for companies operating in emerging economies and capital markets where environmental regulations, stakeholder expectations, and sustainability reporting requirements are becoming increasingly prominent. The results suggest that environmental performance improvements require more than formal CSR policies. Organizations must also invest in leadership development, sustainability-oriented organizational culture, environmental education, and managerial systems that support environmental responsibility. This interpretation is consistent with studies emphasizing the importance of green finance, renewable energy adoption, environmental innovation, and sustainability governance in achieving ecological objectives (U. S. Ahmad et al., 2022; Basheer et al., 2025; Kamal et al., 2021; Yang & Usman, 2021). By integrating CSR initiatives with leadership development programs, organizations can create a stronger foundation for environmental sustainability and improve their ability to respond to growing environmental challenges.

One limitation of this study is its cross-sectional design, which restricts the ability to establish causal relationships among the variables. In addition, data were collected through self-reported questionnaires, which may introduce common method bias and subjective perceptions. The study was also limited to companies listed on the Tehran Stock Exchange, which may affect the generalizability of the findings to other industries, private firms, or different national contexts. Furthermore, environmental performance was measured based on respondents' perceptions rather than objective environmental indicators.

Future research could employ longitudinal designs to examine how the relationships among CSR, green transformational leadership, and environmental performance evolve over time. Researchers may also investigate additional mediating variables such as green organizational culture, environmental commitment, green innovation capability, or sustainability-oriented knowledge management. Comparative studies across industries and countries would provide deeper insights into contextual influences. Future investigations may also incorporate objective environmental indicators, environmental audits, or sustainability reports to complement perceptual measures.

Organizations seeking to enhance environmental performance should integrate CSR principles into their strategic planning processes and ensure that sustainability

objectives are clearly communicated throughout the organization. Leadership development programs should emphasize environmental responsibility, sustainability vision, and green transformational leadership competencies. Managers should encourage employee participation in environmental initiatives, establish sustainability-oriented performance metrics, and create organizational cultures that support innovation and ecological responsibility. Investment in sustainability reporting systems, environmental training, and green innovation programs can further strengthen environmental performance and contribute to long-term organizational sustainability.

Authors' Contributions

All authors have contributed significantly to the research process and the development of the manuscript.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

In this research, ethical standards including obtaining informed consent, ensuring privacy and confidentiality were observed.

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