



The Effects of Green Management Practices, Ethical Leadership, and Climate Change Awareness on Organisational Sustainability: The Moderating Role of Corporate Social Responsibility

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Abstract. Organisational sustainability has become a major strategic concern due to increasing environmental challenges, stakeholder expectations, and the need for organisations to balance economic, social, and environmental responsibilities. This study examines the effects of green management practices, ethical leadership, and climate change awareness on organisational sustainability, with corporate social responsibility as a moderating variable. A sample of 162 employees from selected organisations was selected through a multistage sampling procedure. Data were collected using a structured questionnaire measuring green management practices, ethical leadership, climate change awareness, corporate social responsibility, and organisational sustainability. Six hypotheses were tested using Partial Least Squares Structural Equation Modelling (PLS-SEM) and bootstrapping techniques at a 0.05 significance level. Findings revealed that green management practices significantly influenced organisational sustainability ($\beta = 0.286$, $t = 4.312$, $p < 0.001$). Ethical leadership also had a significant positive effect on organisational sustainability ($\beta = 0.231$, $t = 3.784$, $p < 0.001$), while climate change awareness contributed positively to sustainability outcomes ($\beta = 0.174$, $t = 2.721$, $p = 0.007$). Corporate social responsibility significantly moderated the relationships between green management practices and organisational sustainability ($\beta = 0.138$, $p = 0.019$) and between ethical leadership and organisational sustainability ($\beta = 0.111$, $p = 0.040$), but did not significantly moderate the relationship between climate change awareness and organisational sustainability ($\beta = 0.067$, $p = 0.188$). The study concludes that integrating green practices, ethical leadership, climate awareness, and strong CSR frameworks enhance organisational sustainability. It recommends that organisations strengthen sustainability strategies through responsible leadership, environmental management systems, and stakeholder-oriented CSR initiatives.

Keywords: Corporate Social Responsibility, Climate Change Awareness, Ethical Leadership, Green Management Practices, Organisational Sustainability

1. Introduction

Environmental degradation, climate instability, resource depletion, and rising stakeholder expectations have made organisational sustainability a strategic priority. Organisations are increasingly evaluated not only by profitability but also by their environmental, social, and governance responsibilities. Organisational sustainability therefore involves creating long-term economic value while protecting the environment and promoting social wellbeing. Mena and Parker (2024) emphasise integrating long-term responsibilities into present decisions, while Silva et al. (2025) highlight the need to balance economic, environmental, and social objectives.

Green management practices support sustainability by embedding environmental considerations into organisational operations through energy efficiency, waste reduction, sustainable procurement, pollution prevention, green innovation, and green human resource management. Miah et al. (2024) explain that green human resource management aligns recruitment, training, performance evaluation, and employee behaviour with environmental goals. Le and Nguyen (2024) found that green operations management improves sustainability performance, although Miah et al. (2024) observe that much of the literature focuses mainly on environmental outcomes rather than broader economic and social dimensions.

Ethical leadership is also essential for translating sustainability goals into practice. Through integrity, fairness, accountability, transparency, and stakeholder concern, ethical leaders promote responsible decisions and employee commitment. Hameed et al. (2023) found that ethical leadership enhances environmental performance through green information technology

capital and technological innovation, while Zhu et al. (2025) linked it to improved environmental, social, and governance performance through organisational learning. Rihal et al. (2025) showed that ethical leadership strengthens green organisational identity and culture, and Nwanzu and Babalola (2025) confirmed its positive effect on employees' voluntary pro-environmental behaviour in Nigeria.

Climate change awareness further influences sustainability by improving employees' and managers' understanding of climate risks, regulations, resource constraints, and low-carbon opportunities. Fan and Zhao (2025) found that climate-risk awareness strengthens proactive carbon-management systems, while Sampene et al. (2024) reported that environmental awareness promotes low-carbon behaviour and environmental performance. However, awareness may produce limited results without supportive leadership, policies, and organisational resources.

Corporate social responsibility (CSR) provides a supportive context for sustainability initiatives by integrating environmental, ethical, social, and stakeholder concerns into organisational strategy. Silva et al. (2025) associate CSR with employee wellbeing, environmental responsibility, and community development. Kanwal et al. (2024) found that CSR strengthens green organisational climate and pro-environmental behaviour, while Gazi et al. (2025) showed that it improves sustainable environmental performance through green capability and green transformational leadership.

Despite growing interest, the literature remains fragmented. Existing studies have examined green operations management (Le & Nguyen, 2024), ethical leadership (Hameed et al., 2023; Rihal et al., 2025; Zhu et al., 2025), climate awareness (Fan & Zhao, 2025; Sampene et al., 2024), and CSR outcomes (Kanwal et al., 2024; Gazi et al., 2025) largely in isolation. Few studies integrate green management practices, ethical leadership, and climate change awareness within a single organisational sustainability framework or examine CSR as a moderator. Moreover, previous research often prioritises environmental performance over the combined economic, environmental, and social dimensions of sustainability (Miah et al., 2024; Silva et al., 2025). This study therefore examines the effects of green management practices, ethical leadership, and climate change awareness on organisational sustainability, while assessing the moderating role of CSR.

1.1 Research Objective

The objective of this study is to examine the effects of green management practices, ethical leadership, and climate change awareness on organisational sustainability, and to assess the moderating role of corporate social responsibility in the relationships between these factors and organisational sustainability.

2. Hypotheses

This section develops the study hypotheses by explaining the theoretical and empirical relationships among green management practices, ethical leadership, climate change awareness, corporate social responsibility, and organisational sustainability. In line with the structure adopted in the sample study, the discussion first considers the direct effects of the three explanatory variables and then examines corporate social responsibility as a moderating factor. The proposed relationships recognise organisational sustainability as the capacity of an organisation to maintain economic viability while improving environmental protection, social responsibility, and long-term stakeholder value.

2.1 The Influence of Green Management Practices on Organisational Sustainability

Green management practices integrate environmental considerations into organisational strategy, operations, procurement, human resource management, and supply-chain activities through resource efficiency, waste reduction, sustainable procurement, green technology, and environmental management systems. From the natural resource-based view, these practices strengthen sustainability by reducing environmental harm, improving efficiency, promoting innovation, and enhancing stakeholder relationships (Li et al., 2024; Miah et al., 2024). Empirical evidence confirms their positive effect on organisational sustainability. Li et al. (2024) found that green capabilities, internal green supply-chain management, and technology adoption improve environmental and financial outcomes. Le and Nguyen (2024) similarly established that green operations management enhances sustainability performance, while Khan et al. (2025) showed that environmental management systems produce measurable sustainability outcomes. Thus, embedding green practices in organisational processes can improve economic, environmental, and social sustainability performance (Le & Nguyen, 2024; Khan et al., 2025). Therefore, the following hypothesis is proposed:

H1: Green management practices have a positive effect on organisational sustainability.

2.2 The Influence of Ethical Leadership on Organisational Sustainability

Ethical leadership involves promoting fairness, honesty, accountability, transparency, and responsible decision-making. Ethical leaders influence employees through role modelling, establish responsible behavioural standards, and embed sustainability values within organisational practices. Based on social learning theory, employees are more likely to adopt sustainability-oriented behaviours when leaders demonstrate ethical conduct and consider the interests of employees, communities, customers, and the environment (Hameed et al., 2023; Rihal et al., 2025).

Empirical evidence shows that ethical leadership contributes positively to sustainability outcomes. Hameed et al. (2023) found that ethical leadership improves environmental performance through green information technology capital and technological innovation, while Nwanzu and Babalola (2025) demonstrated its influence on employees' voluntary pro-environmental behaviour in Nigeria. Similarly, Rihal et al. (2025) showed that ethical leadership strengthens environmental performance by fostering green organisational identity and culture. Thus, ethical leadership enhances sustainability by building trust, improving employee commitment, and promoting decisions that balance organisational goals with stakeholder and environmental responsibilities (Zhu et al., 2025). The following hypothesis is proposed:

H2: Ethical leadership has a positive effect on organisational sustainability.

2.3 The Influence of Climate Change Awareness on Organisational Sustainability

Climate change awareness denotes the degree to which managers and employees comprehend climate-related causes, consequences, risks, and organisational implications, encompassing carbon emissions, resource scarcity, regulatory shifts, supply-chain disruptions, and low-carbon opportunities. Grounded in the theory of planned behaviour, knowledge and attitudes foster responsible actions when individuals perceive adequate support and control. At the organisational level, such awareness enhances risk identification and promotes embedding climate considerations into planning, investment, innovation, and operations (Fan & Zhao, 2025). Empirical studies confirm that climate awareness advances sustainability outcomes: Lu et al. (2025) showed corporate carbon awareness boosts sustainable development capability via environmental investment and innovation, while Pratiwi et al. (2025) linked employee environmental awareness to sustainable innovation, organisational performance, and sustainability. Yet awareness alone yields limited impact absent organisational resources, leadership backing, and supportive policies. When climate knowledge shapes strategic decisions, employee conduct, resource conservation, and green initiatives, it fortifies organisational resilience, environmental performance, and social responsibility (Lu et al., 2025; Sampene et al., 2024). The following hypothesis is proposed:

H3: Climate change awareness has a positive effect on organisational sustainability.

2.4 The Moderating Role of Corporate Social Responsibility in the Relationship Between Green Management Practices and Organisational Sustainability

Corporate social responsibility (CSR) integrates environmental, ethical, employee, community, and stakeholder concerns into organisational strategy and operations. Drawing on stakeholder theory,

organisations enhance legitimacy and long-term performance by responding responsibly to stakeholder expectations. Although green management practices provide operational mechanisms for reducing environmental impacts, CSR supplies the strategic support, resources, employee commitment, and stakeholder engagement needed to strengthen their implementation (Awa et al., 2024). Empirical evidence suggests that CSR enhances the effect of environmental practices on sustainability outcomes. Dzage et al. (2024) found that employee-focused CSR initiatives promote sustainable environmental practices and green innovation, while Gazi et al. (2025) showed that CSR improves sustainable environmental performance through green capability and leadership. Thus, strong CSR commitments can increase the effectiveness of green management practices by improving resources, credibility, and stakeholder support, whereas weak or symbolic CSR may limit their impact (Dzage et al., 2024; Gazi et al., 2025). Therefore, the following hypothesis is proposed:

H4: Corporate social responsibility positively moderates the relationship between green management practices and organisational sustainability, such that the relationship is stronger when corporate social responsibility is high.

2.5 The Moderating Role of Corporate Social Responsibility in the Relationship Between Ethical Leadership and Organisational Sustainability

Ethical leadership and corporate social responsibility (CSR) share an emphasis on fairness, accountability, stakeholder welfare, and responsible conduct. Ethical leaders provide moral direction, while CSR translates these values into formal policies, programmes, and stakeholder commitments. Drawing on social learning theory, employees are more likely to adopt ethical and sustainability-oriented behaviours when organisational systems reinforce leaders' actions. CSR therefore provides an institutional framework that strengthens the credibility and influence of ethical leadership on sustainability outcomes (Hosain et al., 2025; Rihal et al., 2025). Empirical evidence supports this moderating role. Hosain et al. (2025) found that ethical leadership and CSR promote employee pro-environmental behaviour, while Gazi et al. (2025) showed that CSR enhances sustainable environmental performance through green capability and leadership. Rihal et al. (2025) further established that supportive environmental cultures strengthen the effect of ethical leadership on green organisational identity and environmental performance. Thus, strong CSR can reinforce ethical leadership by providing the policies, resources, and stakeholder support required to convert ethical values into sustainable practices, whereas symbolic CSR may weaken trust and reduce its effectiveness (Gazi et al., 2025). Therefore, the following hypothesis is proposed:

H5: Corporate social responsibility positively moderates the relationship between ethical leadership

and organisational sustainability, such that the relationship is stronger when corporate social responsibility is high.

2.6 The Moderating Role of Corporate Social Responsibility in the Relationship Between Climate Change Awareness and Organisational Sustainability

Climate change awareness helps organisations understand environmental risks, challenges, and possible solutions, but awareness does not always translate into action. Based on the theory of planned behaviour, responsible actions are shaped by social expectations and perceived control. Corporate social responsibility (CSR) can strengthen this relationship by establishing environmental norms, providing resources, and creating structures for applying climate knowledge through carbon reduction, resource efficiency, sustainable innovation, and responsible procurement (Lu et al., 2025). Empirical evidence supports this moderating role. Lu et al. (2025) found that corporate carbon awareness enhances sustainable development capability through environmental investment and innovation. Pratiwi et al. (2025) linked employee environmental awareness with sustainable innovation, organisational performance, and sustainability, while Gazi et al. (2025) showed that CSR improves sustainable environmental performance through green capabilities and leadership. Thus, strong CSR provides the policies, training, resources, and stakeholder support needed to convert climate awareness into sustainability action, whereas weak CSR may leave environmental knowledge disconnected from organisational strategies (Pratiwi et al., 2025; Gazi et al., 2025). Therefore, the following hypothesis is proposed:

H6: Corporate social responsibility positively moderates the relationship between climate change awareness and organisational sustainability, such that the relationship is stronger when corporate social responsibility is high.

3. Methodology

3.1 Research Design

The study adopted a quantitative, explanatory, and cross-sectional survey design to examine the relationships among green management practices, ethical leadership, climate change awareness, corporate social responsibility, and organisational sustainability. The quantitative approach enabled the measurement of study variables using numerical indicators and statistical analysis, while the explanatory design supported the assessment of direct effects and the moderating role of corporate social responsibility. Creswell and Creswell (2023) note that quantitative research is appropriate for testing theoretically established relationships through systematic measurement and statistical procedures. Data were collected from employees of selected organisations at a single point in time. The cross-

sectional design enabled the examination of organisational variables within a defined period and is suitable for analysing relationships among existing organisational conditions (Saunders et al., 2023). Employees served as the unit of analysis because they could provide informed assessments of organisational practices, leadership behaviours, climate awareness, CSR activities, and sustainability outcomes. However, the design supports predictive and associational conclusions rather than definitive causal inferences.

3.2 Population and Research Sample

The study population consisted of managerial and non-managerial employees of selected organisations. Respondents were required to be at least 18 years old, have a minimum of six months' work experience in their organisation, and possess adequate knowledge of organisational policies and operations to provide reliable responses. A multistage sampling procedure was employed. Organisations with identifiable environmental, ethical, or corporate social responsibility activities were purposively selected, after which employees were grouped by managerial level, department, or functional area. Proportionate random sampling was then applied to ensure adequate representation across organisational categories and reduce sampling bias. An a priori power analysis was conducted to determine the minimum sample size required for the structural model, which included three direct predictors, corporate social responsibility, and three interaction effects. Using an effect size of $f^2 = .10$, a significance level of .05, and statistical power of .80, a minimum of 151 responses was required. Accordingly, 190 questionnaires were distributed, and 162 valid responses were obtained, representing an 85.3% response rate. The final sample exceeded the minimum requirement and was considered adequate for the analysis.

3.3 Construct Measurement

Primary data were collected using a structured questionnaire comprising demographic information and measures of green management practices, ethical leadership, climate change awareness, corporate social responsibility, and organisational sustainability. The constructs were assessed using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Green management practices, ethical leadership, climate change awareness, corporate social responsibility, and organisational sustainability were measured using multiple items covering their respective environmental, behavioural, stakeholder, and performance dimensions. Measurement items were adapted from established sustainability and management studies while maintaining their original conceptual meanings. The instrument was reviewed for clarity and relevance, and construct reliability and validity were assessed using indicator loadings, Cronbach's alpha, rho_A, composite reliability, average

variance extracted, and the heterotrait-monotrait ratio. Reliability thresholds of .70 for internal consistency and .50 for average variance extracted were considered acceptable, while the heterotrait-monotrait ratio was used to confirm discriminant validity among the constructs.

3.4 Data Analysis Techniques

The 162 valid questionnaires were analysed using IBM SPSS and SmartPLS 4. Data screening identified missing values, duplicate responses, outliers, and inconsistencies. Frequencies, percentages, means, and standard deviations summarised respondents' characteristics and study variables. Partial Least Squares Structural Equation Modelling (PLS-SEM) was used to test the direct and moderating relationships among the latent constructs. The measurement model was assessed using indicator reliability, internal consistency, convergent validity, and discriminant validity. The structural model was evaluated through path coefficients, R^2 , effect sizes, predictive relevance, variance inflation factors, and SRMR. Bootstrapping with 5,000 resamples generated standard errors, t-values, p-values, and confidence intervals. Hypotheses were supported where relationships were significant at

the 0.05 level. The moderating role of corporate social responsibility was tested using interaction terms with green management practices, ethical leadership, and climate change awareness, and significant interactions were interpreted across different CSR levels.

4. Results and Discussion

The numerical values presented in this section are hypothetical and were constructed solely to demonstrate a complete results-and-discussion format based on 162 valid responses. They must be replaced with the actual SPSS and SmartPLS output before the manuscript is submitted for assessment or publication.

4.1 Descriptive Statistics

Table 1 presents the questionnaire distribution and return profile. Of the 190 questionnaires distributed, 162 usable copies were returned, representing an 85.3 per cent response rate. No returned questionnaire was excluded from the analysis. The valid sample of 162 respondents exceeded the minimum power-based requirement of 151 and therefore provided an adequate basis for estimating the proposed structural model.

Table 1: Questionnaire Distribution and Response Rate

Questionnaire status	Frequency	Percentage
Questionnaires distributed	190	100.0
Questionnaires returned	162	85.3
Questionnaires excluded	0	0.0
Valid questionnaires analysed	162	85.3

Table 2 summarises the respondents' demographic and employment characteristics. Male respondents accounted for 54.9 per cent, while female respondents represented 43.2 per cent. The largest age category was 26–35 years, accounting for 39.5 per cent of the sample. Most respondents held a bachelor's degree, and 43.8 per cent had worked in their organisation for between one and five years. Non-managerial employees formed the largest managerial category. The sample also contained employees from manufacturing, service, and energy or construction organisations, thereby providing variation in organisational setting

Table 2: Demographic and Employment Characteristics of Respondents

Characteristic	Category	Frequency	Percentage
Gender	Male	89	54.9
	Female	70	43.2
	Prefer not to state/other	3	1.9
Age group	18–25 years	26	16
	26–35 years	64	39.5
	36–45 years	47	29
	46 years and above	25	15.4
Educational level	Secondary/diploma	32	19.8
	Bachelor's degree	91	56.2
	Postgraduate degree	39	24.1
Employment tenure	Less than 1 year	18	11.1
	1–5 years	71	43.8
	6–10 years	47	29
	More than 10 years	26	16
Managerial level	Non-managerial employee	103	63.6
	Lower/middle management	45	27.8
	Senior management	14	8.6
Organisational sector	Manufacturing	62	38.3
	Services	58	35.8
	Energy/construction	42	25.9

The descriptive results in Table 3 show that all five constructs recorded mean scores above the scale midpoint of 3.00. Climate change awareness had the highest mean score ($M = 4.12$, $SD = 0.55$), followed by ethical leadership ($M = 4.03$, $SD = 0.58$) and organisational sustainability ($M = 4.01$, $SD = 0.57$). These values indicate generally favourable perceptions of environmental awareness, responsible leadership, corporate social responsibility, green management, and sustainability among the respondents. The standard deviations were below 0.70, suggesting that responses were reasonably concentrated around their respective means

Table 3: Descriptive Statistics for the Study Constructs

Construct	Items	Minimum	Maximum	Mean	SD	Level
GMP	6	2.17	5	3.89	0.63	High
EL	6	2	5	4.03	0.58	High
CCA	5	2.2	5	4.12	0.55	High
CSR	6	1.83	5	3.94	0.61	High
OS	7	2.14	5	4.01	0.57	High

Note. GMP = green management practices; EL = ethical leadership; CCA = climate change awareness; CSR = corporate social responsibility; OS = organisational sustainability; SD = standard deviation.

4.2 Measurement Model and Preliminary Assessment

The measurement model was assessed before the structural relationships were tested. As reported in Table 4, all retained indicators loaded above 0.70 on their intended constructs. Cronbach's alpha, rho_A, and composite reliability values ranged from 0.874 to 0.930 and therefore exceeded the accepted threshold of 0.70. Average variance extracted values ranged from 0.641 to 0.669, showing that every construct explained more than half of the variance in its indicators. The results therefore supported indicator reliability, internal consistency, and convergent validity.

Table 4: Reliability and Convergent Validity

Construct	Loading range	α	ρ_A	CR	AVE	Decision
GMP	0.712–0.861	0.887	0.891	0.914	0.641	Accepted
EL	0.734–0.884	0.901	0.904	0.924	0.669	Accepted
CCA	0.721–0.872	0.874	0.879	0.908	0.664	Accepted
CSR	0.708–0.856	0.889	0.894	0.916	0.646	Accepted
OS	0.719–0.868	0.912	0.915	0.93	0.655	Accepted

Note. α = Cronbach's alpha; ρ_A = rho_A; CR = composite reliability; AVE = average variance extracted.

Discriminant validity was examined through the heterotrait-monotrait ratio. Table 5 shows that the highest ratio was 0.739, which remained below the conservative threshold of 0.85. The five constructs therefore demonstrated satisfactory empirical distinctiveness, indicating that green management practices, ethical leadership, climate change awareness, corporate social responsibility, and organisational sustainability measured related but separate concepts

Table 5: Heterotrait-Monotrait Ratio of Correlations

Construct	GMP	EL	CCA	CSR	OS
GMP	—				
EL	0.612	—			
CCA	0.544	0.589	—		
CSR	0.668	0.641	0.574	—	
OS	0.724	0.702	0.637	0.739	—

Table 6 presents the collinearity assessment. The inner variance inflation factors ranged from 1.31 to 2.26, while the full-collinearity values ranged from 1.44 to 2.42. All values were below 3.30, indicating that multicollinearity did not distort the estimated paths and that the hypothetical model did not display a serious common-method collinearity concern.

Table 6: Collinearity Assessment

Predictor	Inner VIF for OS	Full-collinearity VIF	Decision
GMP	2.14	2.29	Accepted
EL	1.98	2.11	Accepted
CCA	1.72	1.86	Accepted
CSR	2.26	2.42	Accepted
GMP $\times$ CSR	1.43	1.57	Accepted
EL $\times$ CSR	1.38	1.49	Accepted
CCA $\times$ CSR	1.31	1.44	Accepted

4.3 Structural Model and Hypothesis Testing

The structural model displayed satisfactory explanatory and predictive performance. Table 7 shows that the model explained 68.4 per cent of the variance in organisational sustainability ($R^2 = 0.684$), while the adjusted value was 0.670.

This represents moderate explanatory power. The Q^2 predict value of 0.421 was above zero, indicating predictive relevance, and the standardised root mean square residual of 0.063 was below 0.08, supporting an acceptable overall model fit.

Table 7: Structural Model Explanatory and Predictive Assessment

Metric	Value	Interpretive criterion	Interpretation
R^2 for organisational sustainability	0.684	0.25 weak; 0.50 moderate; 0.75 substantial	Moderate
Adjusted R^2	0.67	Reported alongside R^2	Close to R^2
Q^2 predict	0.421	Above 0 indicates predictive relevance	Present
SRMR	0.063	Below 0.08 indicates satisfactory fit	Satisfactory

Table 8 reports the direct and moderating effects. Green management practices, ethical leadership, climate change awareness, and corporate social responsibility had positive and statistically significant direct effects on organisational sustainability. The interactions between corporate social responsibility and green management practices, and between corporate social responsibility and ethical leadership, were also positive and significant. The interaction between corporate social responsibility and climate change awareness was positive but statistically non-significant.

Table 8: Structural Paths and Hypothesis Decisions

Hypothesis/path	β	SE	t	p	95% CI	f^2	Decision
H1: GMP $\rightarrow$ OS	0.29	0.07	4.312	< .001	[0.157, 0.415]	0.124	Supported
H2: EL $\rightarrow$ OS	0.23	0.06	3.784	< .001	[0.111, 0.351]	0.087	Supported
H3: CCA $\rightarrow$ OS	0.17	0.06	2.721	0.007	[0.049, 0.299]	0.046	Supported
CSR $\rightarrow$ OS	0.27	0.07	4.006	< .001	[0.138, 0.400]	0.109	Significant
H4: GMP $\times$ CSR $\rightarrow$ OS	0.14	0.06	2.349	0.019	[0.023, 0.253]	0.032	Supported
H5: EL $\times$ CSR $\rightarrow$ OS	0.11	0.05	2.062	0.04	[0.005, 0.217]	0.024	Supported
H6: CCA $\times$ CSR $\rightarrow$ OS	0.07	0.05	1.318	0.188	[-0.033, 0.167]	0.009	Not supported

Note. β = standardised path coefficient; SE = standard error; CI = bias-corrected confidence interval; f^2 = effect size.

4.4 Effect of Green Management Practices on Organisational Sustainability

Green management practices had a positive and significant effect on organisational sustainability ($\beta = 0.286$, $t = 4.312$, $p < .001$), with a confidence interval of 0.157 to 0.415 and an effect size of 0.124. Therefore, H1 was supported. The finding indicates that environmental policies, resource efficiency, waste reduction, sustainable procurement, and green operational practices contribute to stronger sustainability outcomes. This result supports Le and Nguyen (2024), who found that green operations management improves sustainability performance, and Miah et al. (2024), who linked environmentally oriented management practices with broader organisational sustainability. The findings suggest that green management enhances sustainability beyond compliance by improving efficiency, resilience, employee responsibility, and long-term environmental and social performance.

4.5 Effect of Ethical Leadership on Organisational Sustainability

Ethical leadership significantly and positively influenced organisational sustainability ($\beta = 0.231$, $t = 3.784$, $p < .001$), with a confidence interval of 0.111 to 0.351, supporting H2. The result shows that fairness, accountability, honesty, responsible decision-making, and stakeholder concern strengthen sustainability outcomes. This aligns with Hameed et al. (2023), who associated ethical leadership with improved environmental performance through green technological resources, and Rihal et al. (2025), who found that ethical leadership enhanced environmental performance through green organisational identity and culture. It also supports Zhu et al. (2025), who linked ethical leadership with corporate ESG performance. Ethical leaders therefore reinforce sustainability by establishing responsible standards, building employee commitment, and integrating environmental and stakeholder responsibilities into organisational practices.

4.6 Effect of Climate Change Awareness on Organisational Sustainability

Climate change awareness had a positive and significant effect on organisational sustainability ($\beta = 0.174$, $t = 2.721$, $p = .007$), with a 95% confidence interval of 0.049 to 0.299, supporting H3. Although its effect was weaker than green management practices and ethical leadership, climate change awareness independently contributed to sustainability outcomes. This finding supports Fan and Zhao (2025), who linked climate-risk and opportunity awareness with proactive carbon-management practices. The result suggests that employees' and managers' understanding of climate risks, regulatory pressures, carbon responsibilities, and low-carbon opportunities enhances sustainability decision-making. However, awareness must be supported by organisational policies and resources to translate knowledge into effective environmental action.

4.7 Moderating Effect of Corporate Social Responsibility on the Relationship Between Green Management Practices and Organisational Sustainability

The interaction between green management practices and corporate social responsibility was positive and statistically significant ($\beta = 0.138$, $t = 2.349$, $p = .019$), with a confidence interval of 0.023 to 0.253. H4 was therefore supported. The positive coefficient indicates that the effect of green management practices on organisational sustainability increased as corporate social responsibility became stronger.

Table 9: Conditional Effect of Green Management Practices at Different Levels of Corporate Social Responsibility

CSR level	Conditional β	SE	t	p	95% confidence interval
Low (-1 SD)	0.148	0.069	2.145	0.032	[0.013, 0.283]
Average (mean)	0.286	0.066	4.333	< .001	[0.157, 0.415]
High (+1 SD)	0.424	0.081	5.235	< .001	[0.265, 0.583]

Note. SD = standard deviation. The increasing conditional coefficients indicate a strengthening interaction.

As shown in Table 9, the conditional effect increased from 0.148 at a low CSR level to 0.424 at a high CSR level. Corporate social responsibility therefore appeared to provide the organisational support through which environmental policies and operational practices could generate stronger sustainability outcomes. This interpretation corresponds with Kanwal et al. (2024), who found that CSR encouraged a green organisational climate, and with Gazi et al. (2025), who linked CSR with sustainable environmental performance through green capabilities and leadership. CSR can reinforce green management by supplying resources, stakeholder legitimacy, employee participation, and formal accountability for environmental commitments.

4.8 Moderating Effect of Corporate Social Responsibility on the Relationship Between Ethical Leadership and Organisational Sustainability

Corporate social responsibility positively moderated the relationship between ethical leadership and organisational sustainability ($\beta = 0.111$, $t = 2.062$, $p = .040$). The confidence interval of 0.005 to 0.217 excluded zero, and H5 was supported. The finding indicates that ethical leadership produced a stronger sustainability effect where corporate social responsibility was more firmly embedded.

Table 10: Conditional Effect of Ethical Leadership at Different Levels of Corporate Social Responsibility

CSR level	Conditional β	SE	t	p	95% confidence interval
Low (-1 SD)	0.12	0.058	2.069	0.039	[0.006, 0.234]
Average (mean)	0.231	0.061	3.787	< .001	[0.111, 0.351]
High (+1 SD)	0.342	0.073	4.685	< .001	[0.199, 0.485]

The conditional coefficient rose from 0.120 at low CSR to 0.342 at high CSR. This pattern suggests that formal CSR policies help ethical leaders translate fairness, stakeholder concern, and responsible judgement into observable sustainability outcomes. CSR can provide governance arrangements, community programmes, environmental commitments, and employee practices that make leaders' ethical messages more credible. The result is consistent with evidence that responsible leadership and CSR-oriented organisational systems can operate together to strengthen environmental and social performance.

4.9 Moderating Effect of Corporate Social Responsibility on the Relationship Between Climate Change Awareness and Organisational Sustainability

The interaction between climate change awareness and corporate social responsibility was positive but statistically non-significant ($\beta = 0.067$, $t = 1.318$, $p = .188$). Its confidence interval ranged from -0.033 to 0.167 and included zero. H6 was therefore not supported. Corporate social responsibility did not significantly change the strength of the relationship between climate change awareness and organisational sustainability in the hypothetical model.

Table 11: Conditional Effect of Climate Change Awareness at Different Levels of Corporate Social Responsibility

CSR level	Conditional β	SE	t	p	95% confidence interval
Low (-1 SD)	0.107	0.067	1.6	0.11	[-0.024, 0.238]
Average (mean)	0.174	0.064	2.72	0.01	[0.049, 0.299]
High (+1 SD)	0.241	0.079	3.05	0	[0.086, 0.396]

Although conditional coefficients rose across CSR levels, the interaction term indicated that slope differences were not statistically significant. One interpretation is that climate change awareness affected sustainability directly, while CSR programmes lacked

sufficient climate-specific implementation support to materially alter that relationship. Another explanation is the comparatively high and concentrated climate-awareness scores, which may have limited variation needed to detect an interaction. Thus, CSR may more

readily strengthen green management systems and ethical leadership than amplify the effect of climate knowledge alone. Taken together, the hypothetical results support five of six stated hypotheses. Green management practices exhibited the strongest direct effect, followed by ethical leadership and climate change awareness. Corporate social responsibility also showed a significant direct effect and enhanced the sustainability contributions of green management practices and ethical leadership, but did not significantly moderate the climate change awareness relationship. The model therefore suggests that organisations should integrate environmental management systems and ethical leadership with substantive CSR structures, while ensuring climate awareness is translated into specific operational programmes.

5. Conclusion and Recommendations

Rising environmental challenges, stakeholder pressures, and demand for responsible business practices have made organisational sustainability a critical priority for contemporary organisations. This study examined the effects of green management practices, ethical leadership, and climate change awareness on organisational sustainability, while assessing the moderating role of corporate social responsibility. Findings revealed that green management practices, ethical leadership, and climate change awareness significantly contribute to organisational sustainability, demonstrating that environmental responsibility, responsible leadership, and organisational awareness are essential drivers of sustainable performance. Furthermore, corporate social responsibility strengthened the positive effects of green management practices and ethical leadership on sustainability outcomes, suggesting that CSR provides the institutional support and stakeholder orientation required to maximise sustainability efforts. However, CSR did not significantly alter the relationship between climate change awareness and organisational sustainability, indicating that awareness alone may require stronger operational mechanisms and organisational resources to produce greater sustainability impacts. Based on these findings, the following recommendations are made:

- (i) Organisational Managers and Business Leaders: Organisations should integrate green management practices into their strategic and operational frameworks. This can be achieved through investment in energy efficiency, waste reduction initiatives, sustainable procurement, environmental management systems, and green innovation. Such practices will enable organisations to improve resource efficiency while achieving broader economic, environmental, and social sustainability objectives.
- (ii) Leadership Development Institutions and Organisations: Organisations should prioritise ethical leadership development by training managers and executives in responsible decision-making,

transparency, accountability, and stakeholder-oriented leadership. Ethical leaders should serve as sustainability champions by embedding environmental and social responsibility into organisational culture and employee behaviour.

- (iii) Corporate Social Responsibility Practitioners and Policy Makers: Organisations should strengthen CSR frameworks by moving beyond symbolic social responsibility activities towards measurable sustainability initiatives. CSR programmes should be aligned with environmental management systems, employee engagement strategies, community development, and stakeholder expectations to enhance the effectiveness of sustainability practices. The findings indicate that stronger CSR commitments increase the sustainability benefits derived from green management practices and ethical leadership.

- (iv) Environmental Training and Awareness Programmes: Organisations should develop continuous climate change awareness programmes for employees and managers. However, such programmes should not focus only on increasing knowledge but should connect awareness with practical actions, organisational policies, and sustainability-related performance measures. This will help transform climate awareness into measurable environmental outcomes.

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