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GREEN CULTURE AND ENVIRONMENTAL SUSTAINABILITY OF BUSINESS ORGANIZATIONS IN ONDO STATE SMES

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ABSTRACT

This study investigates the relationship between green culture and environmental sustainability among small and medium-sized enterprises (SMEs) in Ondo State, Nigeria. Anchored in stakeholder theory, the resource-based view (RBV), and institutional theory, the study employs a descriptive survey research design using primary data from 340 respondents across selected SME clusters in Akure, Ondo, and Ore. Green culture is conceptualized along four dimensions: green values and norms, green leadership commitment, green employee involvement, and green communication and awareness. Environmental sustainability is operationalized through waste management and recycling, energy efficiency and conservation, pollution prevention, and sustainable resource utilization. Data were collected through a structured questionnaire and analyzed using descriptive statistics (frequencies, percentages, means, standard deviations) and inferential statistics (Pearson correlation, multiple linear regression, ANOVA) via SPSS v27.0. Findings reveal that green culture exists at a moderate extent (Grand Mean = 3.24, SD = 1.08), with green leadership commitment most pronounced (Mean = 3.51) and green employee involvement least developed (Mean = 2.89). Environmental sustainability registers at a moderate level (Grand Mean = 3.01, SD = 1.12), with waste management and recycling most practiced (Mean = 3.18) and sustainable resource utilization least practiced (Mean = 2.78). Pearson correlation confirms a statistically significant positive relationship between overall green culture and overall environmental sustainability ($r = 0.542$, $p < 0.01$). Multiple regression analysis further confirms significant positive relationships between green culture dimensions and environmental sustainability ($R = 0.602$, $p < 0.001$, $R^2 = 0.362$), indicating that the four dimensions jointly explain 36.2% of the variance in environmental sustainability. The study concludes that cultivating green culture significantly relates to enhanced environmental sustainability among Ondo State SMEs by embedding ecological values into organizational routines, leadership behaviors, and employee practices. Recommendations include institutionalizing green reward systems, developing sector-specific environmental guidelines for SMEs, and strengthening government–private sector partnerships to finance green transitions in the SME sector.

Keywords: Green Culture; Environmental Sustainability; Green Human Resource Management; Small and Medium Enterprises; Ondo State; Stakeholder Theory.

JEL Classification Codes: Q56; M14; L26; O13

1 INTRODUCTION

Small and medium-sized enterprises (SMEs) constitute the backbone of Nigeria's economy, with the Small and Medium Enterprises Development Agency of Nigeria (SMEDAN) and the National Bureau of Statistics (NBS) reporting over 36.9 million micro, small, and medium enterprises accounting for approximately 96.7% of all businesses, 45% of national GDP, and over 80% of total employment. The contemporary global business environment is increasingly characterized by the imperative of environmental stewardship, compelling enterprises across all sectors to integrate sustainability principles into their operational frameworks (Ajibola, 2020). Despite this significant economic footprint, Nigerian SMEs remain largely underexplored in the context of green organizational culture and environmental sustainability, particularly in relation to how internal cultural dynamics relate to ecological performance in sub-national economies (Omoyajowo et al., 2024). The concept of green culture, rooted in the broader organizational culture literature and extended through green management theory, refers to the system of shared values, beliefs, assumptions, and behavioral norms that prioritize environmental responsibility and sustainable resource use within an organization (Renwick et al., 2013). In organizations with strong green cultures, ecological considerations are embedded in decision-making processes, leadership behaviors, employee routines, and communication patterns, creating an institutional environment where sustainability is viewed as a collective obligation rather than a peripheral compliance activity (Jabbour & Santos, 2008). Nigeria, ranked among the nations with significant environmental degradation challenges due to rapid industrialization and weak regulatory enforcement, presents a compelling context for examining how organizational culture can be leveraged to advance sustainability outcomes (Omofonmwan & Osa-Edoh, 2008).

Environmental sustainability, as conceptualized within the sustainable development literature, encompasses the capacity of organizations to minimize negative ecological impacts while maintaining economic viability through responsible waste management, energy conservation, pollution control, and sustainable resource utilization (Masocha & Fatoki, 2018). In the context of SMEs, environmental sustainability specifically involves the adoption of practices that reduce carbon footprints, optimize resource use, and align business operations with environmental regulations and stakeholder expectations (Adesua-Lincoln, 2025). The relationship between organizational culture and environmental performance has been extensively documented in corporate management literature, yet the specific relationship between green culture and SME sustainability in developing economy contexts, particularly Southwest Nigeria, remains significantly under-researched (Adu et al., 2023). Ondo State, located in the Southwest geopolitical zone of Nigeria, presents a compelling context for examining green culture and environmental sustainability in the SME sector. The state hosts a diverse array of small and medium enterprises spanning agro-processing, trading, hospitality, artisanal manufacturing, and services, concentrated in urban centers such as Akure (the state capital), Ondo town, and the industrial corridor of Ore (Ondo State Government, 2025). These enterprises face mounting pressures for environmental compliance, including waste disposal regulations, deforestation concerns in timber-dependent industries, and energy costs that compel transitions toward efficiency. However, the extent to which green cultural attributes leadership commitment, shared environmental values, employee participation, and green communication relate to the adoption of sustainable practices among Ondo State SMEs remains empirically unverified.

The significance of this study lies in its potential to bridge the gap between organizational culture theory and environmental management practice in Nigerian SMEs. While existing literature has predominantly focused on large corporations in developed economies (Renwick et al., 2013; Barney, 1991), the unique structural, financial, and governance constraints facing Nigerian SMEs demand context-specific empirical investigation (Ajape & Adesina, 2026). Furthermore, as the global community intensifies its focus on Sustainable Development Goals (SDGs), particularly SDG 12 (responsible consumption and production) and SDG 13 (climate action), understanding how green culture relates to environmental sustainability becomes critical for enterprise competitiveness and ecological stewardship (United Nations, 2025). This study, therefore, seeks to examine the relationship between green culture and environmental sustainability among selected SMEs in Ondo State, Nigeria, thereby contributing to both academic discourse and practical management interventions in the region.

1.1 Problem Statement

Despite the growing recognition of environmental sustainability as a strategic imperative for organizational effectiveness, empirical evidence regarding the specific patterns through which Nigerian SMEs relate to ecological alignment remains fragmented and inconclusive (Ajibola, 2020). Nigerian SMEs, which collectively represent the dominant form of business organization, face peculiar challenges in implementing structured environmental management due to financial constraints, limited technical expertise, resistance to change, and inadequate integration of cultural factors into sustainability planning (Omoyajowo et al., 2024; Adesua-Lincoln, 2025). The problem is particularly acute in Ondo State, where SME operations are characterized by informal management structures, reactive compliance postures, and a predominant focus on short-term survival rather than long-term ecological sustainability (Akinlo, 2016). The concept of green culture defined as the internalization of environmental values, leadership commitment to ecological goals, employee participation in sustainability initiatives, and systematic green communication has received limited scholarly attention in the Nigerian SME context. While studies in developed economies have demonstrated that organizational culture significantly relates to environmental performance and competitive advantage (Garavan et al., 2023), the applicability of these findings to resource-constrained SME contexts in Nigeria remains questionable. Existing research on environmental management in Nigeria has predominantly examined isolated dimensions such as green human resource management practices, waste disposal patterns, and regulatory compliance, often neglecting the dynamic cultural processes through which green values relate to sustainable organizational behaviors across enterprise domains (Kofar Sauri et al., 2025; Ahakwa et al., 2021). For instance, Kofar Sauri et al. (2025) found that green training and green employee acquisition significantly relate to environmental performance among manufacturing SMEs in Katsina State, but the study did not explicitly examine the overarching green cultural milieu within which these discrete practices operate.

Moreover, the measurement and conceptualization of green culture in SME contexts lack standardization, particularly for sub-national applications in Southwest Nigeria. While the organizational culture literature provides foundational logic for understanding culture as shared values and norms (Hofstede, 2001), the specific dimensions of green culture encompassing green values, green leadership, green employee involvement, and green communication require empirical validation within the Ondo State SME context (Renwick et al., 2013). The absence of such validation creates a significant knowledge gap that limits the ability of SME owners, policymakers, and development partners to design effective sustainability interventions (Chowdhury et al., 2025). The environmental challenges confronting Ondo State further exacerbate this problem. With Nigeria's SME sector characterized by inadequate waste management infrastructure, unreliable energy supply, and weak regulatory enforcement (Onu & Umeokafor, 2019), and with the Southwest region grappling with deforestation, urban pollution, and climate vulnerability, SMEs in Akure, Ondo, and Ore must navigate resource inefficiencies, rising operational costs, and community environmental expectations while attempting to maintain market competitiveness (Ondo State Ministry of Environment, 2025). These institutional pressures demand SME owners and managers who possess not only technical competencies but also broad-based green cultural capabilities that enable holistic environmental alignment across functional boundaries. However, the extent to which current cultural dynamics within these enterprises relate to the development of environmental sustainability remains unknown. This study, therefore, addresses the critical problem of understanding the relationship between green culture and environmental sustainability among selected SMEs in Ondo State, with the aim of generating evidence-based insights for enhancing green management in Nigeria's SME sector.

1.2 Research Objectives

The broad aim of this study is to investigate the relationship between green culture and environmental sustainability among selected SMEs in Ondo State, Nigeria. The specific objectives are:

- To examine the relationship between green culture and environmental sustainability among selected SMEs in Ondo State, Nigeria.
- To examine the relationship between green culture dimensions (green values and norms, green leadership commitment, green employee involvement, and green communication and awareness) and environmental sustainability among selected SMEs in Ondo State, Nigeria.

1.3 Research Hypotheses

Drawing from the specific research objectives, the following null hypotheses are formulated for empirical testing:

- H_{01}: There is no significant relationship between green culture and environmental sustainability among selected SMEs in Ondo State, Nigeria.
- H_{02}: There is no significant relationship between green culture dimensions and environmental sustainability among selected SMEs in Ondo State, Nigeria.

2 LITERATURE REVIEW (CONCEPTUAL REVIEW)

2.1 Green Culture

Green culture represents an organizational cultural dimension that describes the extent to which environmental values, ecological consciousness, and sustainability norms are embedded in the shared assumptions and behavioral patterns of organizational members (Renwick et al., 2013). Unlike traditional organizational cultures where economic efficiency and profit maximization dominate decision-making criteria, green cultures feature ecological mindfulness, leadership commitment to environmental goals, participative green employee engagement, and systematic communication of sustainability priorities (Jabbour & Santos, 2008). This conceptualization aligns with the broader understanding of organizational culture as a system of shared values, beliefs, and assumptions that shape behavior, but adds the critical dimension of environmental responsibility as the organizing principle for institutional dynamics (Ajape & Adesina, 2026). The theoretical foundations of green culture can be traced to the intersection of organizational culture theory and environmental management literature. Hofstede's (2001) seminal work on national cultures established that shared values influence organizational practices, while subsequent green management scholars (Jabbour et al., 2008; Renwick et al., 2013) demonstrated that these values can be deliberately oriented toward ecological sustainability. In the context of SMEs, green culture manifests through multiple operational dimensions: (1) green values and norms, where environmental responsibility is accepted as a core organizational priority; (2) green leadership commitment, where owners and managers model ecological behaviors and allocate resources to sustainability initiatives; (3) green employee involvement, where workers participate in environmental decision-making and improvement activities; and (4) green communication and awareness, where sustainability information flows systematically across organizational levels and to external stakeholders (Garavan et al., 2023).

Empirical evidence on green culture in African SMEs remains emerging. Kofar Sauri et al. (2025) examined green human resource management practices and environmental performance among manufacturing SMEs in Katsina State, finding that green training, green employee acquisition, and green health and safety significantly related to environmental outcomes. However, this study focused on discrete HR practices rather than the overarching cultural environment. In the Southwest Nigerian context, Adesua-Lincoln (2025) investigated challenges to environmental sustainability and circular economy practices among Lagos SMEs, finding that lack of awareness, financial constraints, and inadequate government support hindered adoption. Yet, this study did not explicitly examine green culture as a correlate of sustainability engagement. Ahakwa et al. (2021) studied Ghanaian manufacturing SMEs and found that green recruiting, green training, and green remuneration positively related to environmental performance through green innovation, suggesting that cultural orientation toward sustainability mediates practice-outcome relationships.

2.2 Environmental Sustainability

Environmental sustainability refers to the degree to which organizations minimize negative ecological impacts, optimize resource utilization, and align operational processes with environmental stewardship principles (Masocha & Fatoki, 2018). This construct contrasts with environmental degradation, which emphasizes resource depletion, pollution, and ecological damage resulting from business activities. In the context of SMEs, environmental sustainability encompasses the multidimensional coherence between operational practices and ecological imperatives, including waste management, energy conservation, pollution prevention, and sustainable sourcing (Adu et al., 2023). The conceptualization draws from the triple bottom line framework (Elkington, 1997) and the sustainable development goals, which posit that organizational effectiveness requires balancing economic, social, and environmental performance.

Recent scholarship has begun to specify the dimensions of environmental sustainability in SME contexts. Following the OECD's green growth framework and adapted for developing economy applications, the present study operationalizes environmental sustainability along four dimensions: (1) waste management and recycling the systematic reduction, reuse, and recycling of operational waste; (2) energy efficiency and conservation the adoption of practices and technologies that reduce energy consumption and carbon emissions; (3) pollution prevention the proactive measures to minimize air, water, and soil contamination from business operations; and (4) sustainable resource utilization the responsible sourcing and consumption of raw materials to ensure long-term ecological balance (Omoyajowo et al., 2024; Adesua-Lincoln, 2025).

The relationship between organizational culture and environmental sustainability is well-established in management literature. Organizations with supportive green cultures achieve higher environmental performance when cultural values and sustainability practices are aligned, while cultural misalignment creates resistance, inefficiency, and implementation failure (Okerenu & Odiri, 2024). However, the specific relationship between green culture and SME sustainability within Southwest Nigeria requires further empirical validation. Chowdhury et al. (2025) noted in their comprehensive review that while green human resource management has gained prominence in organizational research, empirical investigation of green culture's relationship with environmental sustainability in developing economy SME contexts remains a significant research desideratum. This study addresses this gap by examining whether green culture relates positively to environmental sustainability among Ondo State SMEs.

2.3 Green Culture and Environmental Sustainability: The Conceptual Link

The conceptual linkage between green culture and environmental sustainability rests on the premise that internalized environmental values create structural and behavioral enablers for ecological performance. When sustainability is embedded in organizational culture through leadership modeling, shared norms, employee participation, and systematic communication, environmental practices transition from peripheral compliance activities to core organizational routines (Renwick et al., 2013). In SMEs with strong green cultures, owners and managers formulate ecological strategies with input from employees who possess grounded knowledge of operational realities, reducing the implementation gap between sustainability intent and practice (Jabbour & Santos, 2008). The mechanisms through which green culture relates to environmental sustainability include value internalization, leadership signaling, participative innovation, and stakeholder responsiveness (Garavan et al., 2023). In green-culture SMEs, employees internalize environmental values such that ecological considerations become automatic decision criteria, reducing the need for external regulatory pressure. Leadership signaling occurs when owners visibly commit to sustainability through resource allocation and personal behavior, creating authentic cues that motivate employee compliance and innovation. Participative innovation emerges when employees are involved in green improvement initiatives, generating bottom-up solutions to environmental challenges that top-down directives might overlook. Stakeholder responsiveness occurs when green communication channels enable enterprises to respond effectively to customer preferences, community expectations, and regulatory requirements for environmental responsibility (Ahakwa et al., 2021).

Furthermore, green culture facilitates the development of dynamic green capabilities the capacity to continuously adapt environmental practices to changing regulatory, technological, and market conditions. As Barney (1991) argued in the resource-based view, unique and valuable organizational resources that are difficult to imitate provide sustainable competitive advantage. In green-culture SMEs, the combination of shared environmental values, committed leadership, engaged employees, and systematic communication constitutes a socially complex resource that enhances environmental performance in ways that isolated technical investments cannot replicate. The contemporary SME landscape is characterized by precisely such dynamism, with evolving environmental regulations, emerging green technologies, and shifting consumer preferences creating continuous demands for ecological adaptability. Green culture, by distributing environmental cognition across organizational levels, enhances the distributed learning necessary for responsive sustainability management. In the Ondo State SME context, the conceptual link between green culture and environmental sustainability assumes particular significance due to the structural characteristics of these enterprises. With management structures that are often informal and centralized around owner-managers, Ondo State SMEs exhibit cultural patterns that can either accelerate or impede sustainability transitions (Akinlo, 2016). Agro-processing enterprises in Akure, timber businesses in Ondo town, and trading enterprises in Ore operate within communities with increasing environmental awareness, yet face infrastructure deficits that complicate green transitions. The extent to which this conceptual linkage holds empirically in the specific context of Ondo State SMEs remains to be established, providing the primary motivation for this study.

3 THEORETICAL FRAMEWORK

This study is anchored in three complementary theoretical lenses: stakeholder theory (Freeman, 1984), the resource-based view (RBV) of the firm (Barney, 1991), and institutional theory (DiMaggio & Powell, 1983). Stakeholder theory posits that organizations must respond to the interests of multiple stakeholders including employees, customers, communities, regulators, and the natural environment to achieve long-term success. In the context of SMEs, stakeholder theory suggests that environmental sustainability emerges not merely from regulatory compliance but from the alignment of organizational practices with the ecological expectations of stakeholders who possess power, legitimacy, and urgency (Freeman et al., 2010). Green culture serves as the internal mechanism through which SME owners recognize, prioritize, and respond to stakeholder environmental concerns, transforming external pressures into internalized organizational values. The resource-based view provides the rationale for examining green culture as a strategic resource. Barney (1991) argued that firms achieve sustained competitive advantage through resources that are valuable, rare, inimitable, and non-substitutable. Green culture meets these criteria: it is valuable because it enhances environmental performance and reputation; rare because few SMEs in Nigeria have systematically developed it; inimitable because it emerges from complex social interactions over time; and non-substitutable because no single practice can replicate the systemic influence of shared environmental values (Kofar Sauri et al., 2025). In Ondo State SMEs, where financial and technical resources are scarce, green culture represents an accessible strategic resource that can drive sustainability without requiring massive capital investment.

Institutional theory complements these perspectives by explaining how external pressures regulatory, normative, and mimetic influence organizational adoption of green practices. DiMaggio and Powell (1983) identified three isomorphism mechanisms: coercive (regulatory pressures), mimetic (imitation of successful peers), and normative (professional standards). In the Nigerian SME context, coercive pressures include environmental regulations from the National Environmental Standards and Regulations Enforcement Agency (NESREA) and Ondo State Waste Management Authority; mimetic pressures arise when successful green SMEs demonstrate competitive advantages; and normative pressures emerge through industry associations and training programs (Masocha & Fatoki, 2018). Green culture mediates these institutional pressures by determining whether external expectations are superficially adopted or deeply embedded in organizational routines. The integration of these theories informs the hypothesized relationship between green culture and environmental sustainability. Based on stakeholder theory, RBV, and institutional theory, it is expected that SMEs with stronger green cultures will demonstrate higher environmental sustainability because cultural embedding enables effective stakeholder responsiveness, creates valuable strategic resources, and facilitates authentic institutional adaptation. This expectation derives from the core proposition that organizational culture shapes how enterprises perceive, interpret, and respond to environmental imperatives (Hofstede, 2001). The empirical testing of this hypothesis in the Ondo State SME context will contribute to extending these theories' applicability to green management in developing economy small business sectors.

4 EMPIRICAL REVIEW

This section reviews five empirical studies that have examined relationships between green culture dimensions, green HRM practices, environmental sustainability, and organizational outcomes in SME and developing economy contexts.

Kofar Sauri, Abubakar, and Mashi (2025) examined the relationship between green human resource management practices and environmental performance among manufacturing SMEs in Katsina State, Nigeria. Using a sample of 141 SME managers and multiple linear regression in SPSS, the study found that green training, green employee acquisition, and green health and safety had significant positive relationships with environmental performance, while green discipline management did not. The study's contribution lies in demonstrating that discrete green HR practices relate to environmental outcomes when properly implemented. For the present study, this finding suggests that green culture's relationship with sustainability may be most pronounced when cultural values are translated into specific HR practices. The Nigerian manufacturing SME context, while different from the mixed-sector Ondo State sample in this study, provides valuable insights into how green practices manifest in resource-constrained environments.

Ahakwa, Yang, Tackie, and Asamany (2021) investigated how green HRM practices related to environmental performance through green innovation among Ghanaian manufacturing SMEs in the Greater Accra Region. Using partial least squares structural equation modeling (PLS-SEM) with 300 business owners, the study found that green recruiting and selection, green training and development, and green remuneration had favorable and significant relationships with environmental performance. The study established that green HR practices foster innovation capabilities that mediate environmental outcomes. The findings are relevant to the present study because they demonstrate how green cultural elements embedded in HR systems create innovation pathways to sustainability, although the study focused on manufacturing rather than mixed-sector SMEs.

Adesua-Lincoln (2025) examined challenges to environmental sustainability and circular economy practices among SMEs in Lagos State, Nigeria. Using mixed methods with survey questionnaires and interviews, the study found that financial constraints, lack of awareness, unfavorable government policies, and inadequate technical skills were the primary barriers to sustainability adoption. Conversely, SMEs engaged in waste minimization, recycling, and local community engagement where customer demand and financial incentives existed. The study's contribution lies in its comprehensive mapping of barriers and enablers in Nigeria’s commercial capital. For the present study, this finding suggests that green culture may be particularly important in overcoming barriers such as lack of awareness and resistance to change by embedding sustainability as a shared value rather than an imposed cost.

Garavan, Ullah, O’Brien, Darcy, Wisetsri, Afshan, and Mughal (2023) examined employee perceptions of individual green HRM practices and their relationship with voluntary green work behavior across multiple countries including developing economies. The study found that employees interpret organizational green practices as signals of institutional commitment, influencing their engagement and behavioral responses. The research highlighted that perceived authenticity in green practices determines employee responses employees respond more positively when they believe institutional commitments are genuine. This finding has implications for the present study: green culture may serve as a positive signal that enhances environmental sustainability because employees perceive leadership commitment and shared values as indicating authentic institutional prioritization of ecological goals.

Masocha and Fatoki (2018) investigated how coercive isomorphic pressures related to sustainability practices among South African SMEs. Using structural equation modeling with 222 SME managers, the study found that coercive pressures significantly impacted the economic, environmental, and social dimensions of sustainable development. The study established that regulatory pressures, industry norms, and stakeholder expectations drive SME sustainability engagement. This finding is particularly relevant to the present study because it suggests that while external pressures are necessary, internal green culture determines whether SMEs respond to these pressures through superficial compliance or deep behavioral change. The developing economy context parallels the Nigerian SME environment, enhancing the study's applicability.

4.1 Knowledge Gap

While existing studies confirm that green HRM practices and external pressures relate to environmental outcomes (Kofar Sauri et al., 2025; Ahakwa et al., 2021; Masocha & Fatoki, 2018), four critical gaps persist. First, green culture research in Nigerian SMEs treats environmental dimensions as discrete practices rather than dynamic cultural processes that relate to sustainability through continuous interaction. Second, the relationship between environmental sustainability dimensions and green culture in SME contexts encompassing waste management, energy efficiency, pollution prevention, and sustainable resource utilization remains underoperationalized in Southwest Nigeria. Third, research overwhelmingly focuses on large corporations and manufacturing sectors, neglecting mixed-sector SMEs in states like Ondo where agriculture, trading, and services dominate. Fourth, stakeholder theory, RBV, and institutional theory lack integrated empirical extension to green culture–sustainability relationships in Nigerian SME contexts. This study addresses these gaps by examining the relationship between green culture and multidimensional environmental sustainability among selected SMEs in Akure, Ondo, and Ore.

5 METHODOLOGY

This study employed a descriptive survey research design to examine the relationship between green culture and environmental sustainability among selected SMEs in Ondo State, Nigeria (Creswell & Creswell, 2018). The study area comprised three major SME clusters: Akure (the state capital, hosting agro-processing, retail, and service enterprises), Ondo town (known for timber, artisanal crafts, and trading), and Ore (a transit hub with logistics, hospitality, and manufacturing SMEs). Both registered and informal SMEs face environmental compliance pressures, waste management challenges, and energy costs, yet differ in sectoral composition and scale. The target population was 680 SME owners and managers across the three clusters meeting inclusion criteria (minimum two years of operation, minimum of five employees, involvement in daily business management), distributed as 280 in Akure, 220 in Ondo, and 180 in Ore. Sample size was determined using Krejcie and Morgan's (1970) formula, yielding 242 respondents. However, to enhance statistical power and account for non-response, 400 questionnaires were distributed, with 340 valid responses returned (85% response rate). Respondents were selected through multi-stage sampling combining purposive cluster selection with stratified random sampling of enterprises within each cluster. Primary data were collected via structured questionnaire with four sections: demographics, green culture (20 items, $\alpha = 0.88$), environmental sustainability (20 items, $\alpha = 0.91$), and open-ended qualitative items, using 5-point Likert scales. Content validity was established through expert review by three academics in environmental management and organizational behavior. Data were analyzed using SPSS v27.0 through descriptive statistics (frequencies, percentages, means, standard deviations) and inferential statistics (Pearson correlation, multiple linear regression, ANOVA) at $p < 0.05$.

5.1 Data Analysis and Presentation of Results

5.1.1 Demographic Characteristics of Respondents

Table 1: Distribution of Respondents by Business Location

Location	Frequency	Percentage (%)
Akure	142	41.8
Ondo	112	32.9
Ore	86	25.3
Total	340	100.0

Source: Field Survey (2026)

The table reveals that 142 (41.8%) of respondents were from Akure, 112 (32.9%) from Ondo town, and 86 (25.3%) from Ore. This distribution reflects the larger SME population in the state capital compared to the other clusters.

Table 2: Distribution of Respondents by Gender

Gender	Frequency	Percentage (%)
Male	218	64.1
Female	122	35.9
Total	340	100.0

Source: Field Survey (2026)

The gender distribution shows male predominance (64.1%), consistent with gender imbalances in Nigerian SME ownership and management.

Table 3: Distribution of Respondents by Sector

Sector	Frequency	Percentage (%)
Agro-processing	68	20.0
Trading/Retail	102	30.0
Hospitality	54	15.9
Artisanal Manufacturing	72	21.2
Services	44	12.9
Total	340	100.0

Source: Field Survey (2026)

The sector distribution indicates substantial representation across agro-processing, trading, and manufacturing, enabling comparison of green culture perceptions across diverse enterprise types.

Table 4: Distribution of Respondents by Years of Operation

Years	Frequency	Percentage (%)
2–5 years	98	28.8
6–10 years	124	36.5
11–15 years	78	22.9
Above 15 years	40	11.8
Total	340	100.0

Source: Field Survey (2026)

The majority of respondents (65.3%) had operated for over 5 years, suggesting sufficient organizational history for cultural formation and sustainability practice development.

5.2 Descriptive Analysis of Green Culture

Table 5: Descriptive Statistics for Green Culture Dimensions

Dimension	N	Mean	Std. Dev.	Remark
Green Values and Norms	340	3.31	1.06	Moderate Extent
Green Leadership Commitment	340	3.51	0.98	High Extent
Green Employee Involvement	340	2.89	1.14	Moderate Extent
Green Communication and Awareness	340	3.24	1.10	Moderate Extent
Grand Mean (Green Culture)	340	3.24	1.08	Moderate Extent

Source: Field Survey (2026)

The descriptive analysis reveals a grand mean of 3.24 (SD = 1.08), indicating that green culture exists at a moderate extent among selected Ondo State SMEs. The highest mean score was recorded for green leadership commitment (Mean = 3.51, SD = 0.98), suggesting that SME owners and managers demonstrate relatively strong personal commitment to environmental goals. Conversely, the lowest mean was for green employee involvement (Mean = 2.89, SD = 1.14), indicating limited participative engagement of workers in sustainability initiatives.

5.3 Descriptive Analysis of Environmental Sustainability

The analysis reveals a grand mean of 3.01 (SD = 1.12), indicating a moderate extent of environmental sustainability practices. Waste management and recycling recorded the highest mean (3.18, SD = 1.09), suggesting that SMEs relatively engage in basic waste handling practices. Sustainable resource utilization recorded the lowest mean (2.78, SD = 1.18), indicating significant gaps in responsible sourcing and material optimization.

Table 6: Descriptive Statistics for Environmental Sustainability Dimensions

Dimension	N	Mean	Std. Dev.	Remark
Waste Management and Recycling	340	3.18	1.09	Moderate Extent
Energy Efficiency and Conservation	340	2.95	1.15	Moderate Extent
Pollution Prevention	340	3.12	1.11	Moderate Extent
Sustainable Resource Utilization	340	2.78	1.18	Low Extent
Grand Mean (Environmental Sustainability)	340	3.01	1.12	Moderate Extent

Source: Field Survey (2026)

5.4 Test of Hypotheses

H_{01}: There is no significant relationship between green culture and environmental sustainability among selected SMEs in Ondo State, Nigeria.

H_{02}: There is no significant relationship between green culture dimensions and environmental sustainability among selected SMEs in Ondo State, Nigeria.

5.5 Test of Hypothesis One

Table 7: Pearson Correlation Matrix

Variables	Green Culture	Environmental Sustainability
Green Culture	1	
Environmental Sustainability	0.542**	1

Note: ** Correlation is significant at the 0.01 level (2-tailed).; *Source: SPSS v27*

The Pearson correlation coefficient between green culture and environmental sustainability is $r = 0.542$ ($p < 0.01$), indicating a moderate positive and statistically significant relationship.

Decision: Since $p < 0.01$, we reject H_{01} and conclude that there is a significant positive relationship between green culture and environmental sustainability.

5.6 Test of Hypothesis Two

Table 8: Model Summary for Multiple Regression Analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.602	0.362	0.355	0.902

Source: SPSS v27

The model summary reveals an R-value of 0.602, indicating a moderate positive multiple correlation between green culture dimensions and environmental sustainability. The R-square value of 0.362 indicates that the four green culture dimensions jointly explain 36.2% of the variance in environmental sustainability.

Table 9: ANOVA Results

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	153.824	4	38.456	47.523	0.000
Residual	271.216	335	0.810		
Total	425.040	339			

Source: SPSS v27

The ANOVA results show an F-statistic of 47.523 with a significance value of 0.000 ($p < 0.05$), indicating that the regression model is statistically significant.

Table 10: Coefficients for Multiple Regression Analysis

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta		
(Constant)	0.724	0.172		4.209	0.000
Green Values and Norms	0.212	0.046	0.201	4.609	0.000
Green Leadership Commitment	0.268	0.050	0.235	5.360	0.000
Green Employee Involvement	0.168	0.042	0.171	4.000	0.000
Green Communication and Awareness	0.194	0.044	0.191	4.409	0.000

Source: SPSS v27

The coefficients table reveals positive unstandardized coefficients for all green culture dimensions. The regression equation: Environmental Sustainability = 0.724 + 0.212(Green Values) + 0.268(Green Leadership) + 0.168(Green Employee Involvement) + 0.194(Green Communication)

Decision: Since $p < 0.05$ for the overall model and all individual predictors, we reject H_{02} and conclude that there is a significant positive relationship between green culture dimensions and environmental sustainability.

6 SUMMARY OF FINDINGS

The findings reveal that green culture exists at a moderate extent (Grand Mean = 3.24, SD = 1.08) among selected Ondo State SMEs, with green leadership commitment most pronounced (Mean = 3.51) and green employee involvement least developed (Mean = 2.89) consistent with the centralized, owner-manager governance structures typical of Nigerian SMEs and Adesua-Lincoln's (2025) identification of awareness and participation gaps in Lagos enterprises. Environmental sustainability registers at a moderate level (Grand Mean = 3.01, SD = 1.12), with waste management and recycling most practiced (Mean = 3.18) and sustainable resource utilization least practiced (Mean = 2.78), corroborating Omoyajowo et al.'s (2024) findings on resource and infrastructure constraints in Nigerian SMEs.

Pearson correlation analysis confirms a significant positive relationship between overall green culture and overall environmental sustainability ($r = 0.542$, $p < 0.01$), supporting the stakeholder theory proposition that internalized environmental values relate to ecological performance. Multiple regression analysis further confirms significant positive relationships between green culture dimensions and environmental sustainability ($R = 0.602$, $p < 0.001$, $R^2 = 0.362$), validating the RBV argument that green culture constitutes a valuable strategic resource (Barney, 1991). Green leadership commitment emerged as the strongest dimensional predictor ($\beta = 0.235$, $p < 0.001$), validating Kofar Sauri et al.'s (2025) emphasis on leadership-driven green initiatives in Nigerian SMEs. The demographic profile predominantly male (64.1%), trading sector dominance (30.0%), and mature enterprises (65.3% over 5 years) suggests that established SMEs with longer operational histories possess greater capacity for cultural embedding, yet employee participation remains constrained. The green culture–sustainability connection indicates that while leadership commitment relates strongly to environmental action, employee involvement gaps limit overall performance, aligning with Garavan et al.'s (2023) findings on perceived authenticity and employee engagement in green practices.

7 CONCLUSION

This study investigated the relationship between green culture and environmental sustainability among selected SMEs in Akure, Ondo, and Ore. Three conclusions emerge. First, green culture is present but unevenly developed among Ondo State SMEs: leadership commitment dominates (Mean = 3.51) while employee involvement lags (Mean = 2.89), consistent with the hierarchical management patterns of small enterprises and Hofstede's (2001) characterization of high-power distance in Nigerian organizations. Second, environmental sustainability is multidimensional but inconsistently practiced: waste management dominates (Mean = 3.18) while sustainable resource utilization lags (Mean = 2.78), corroborating Adesua-Lincoln's (2025) identification of cost and knowledge barriers to circular practices. Third, and critically, green culture demonstrates a significant positive relationship with environmental sustainability ($r = 0.542$, $p < 0.01$ for overall relationship; $R^2 = 0.362$, $p < 0.001$ for dimensional relationships), validating stakeholder theory and RBV in the Ondo State SME context and supporting Masocha and Fatoki's (2018) institutional perspective that internal cultural readiness determines the depth of sustainability adoption.

Recommendations

Based on the findings and conclusions of this study, the following recommendations are proposed:

1. SME owners and managers should institutionalize green employee involvement mechanisms, including green suggestion schemes, participatory waste audits, and team-based environmental improvement projects, building on existing leadership commitment to create distributed green cultural ownership across all organizational levels.
2. The Ondo State Government and SMEDAN should develop sector-specific green guidelines and financial incentive programs such as green micro-loans, tax rebates for recycling investments, and subsidized energy audits tailored to the resource constraints of agro-processing, trading, and artisanal manufacturing enterprises.
3. Industry associations and development partners should deliver capacity-building programs equipping SME owners and employees with technical knowledge in sustainable sourcing, energy efficiency, and pollution prevention, addressing the skills gaps that limit sustainable resource utilization and environmental performance in the SME sector.

STATEMENTS ON COMPLIANCE WITH ETHICAL STANDARDS

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