Journal of Innovations in Business and Industry

Vol. 05, No. 01 (2027) 79-88, doi: 10.61552/JIBI.2027.01.008 - http://jibi.aspur.rs

BEYOND CERTIFICATION: HOW ISO 9001 QUALITY MANAGEMENT DRIVES ENVIRONMENTAL AND SOCIAL PERFORMANCE - A MULTI-SECTOR EMPIRICAL INVESTIGATION

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Received 09.08.2026.
Revised 21.09.2026.
Accepted 03.11.2026.

Keywords:

ISO 9001, quality management, environmental performance, social performance, institutional theory, organizational learning, stakeholder engagement.

Original research

A B S T R A C T

The objective is to empirically analyze how ISO 9001 certification can contribute to social and environmental performance. Drawing on institutional theory, the resource-based view, and stakeholder theory, this study develops and tests an integrative model linking ISO 9001 quality management practices to environmental performance (EP) and social performance (SP) across 421 certified firms operating in manufacturing, services, and construction sectors. Structural equation modelling with partial least squares (PLS-SEM) is employed, combined with bootstrapped mediation analysis (5,000 replications) to examine whether organizational learning and stakeholder engagement mediate this relationship. Findings reveal that ISO 9001 practices significantly predict both EP ($\beta = 0.614$, $p < 0.001$) and SP ($\beta = 0.587$, $p < 0.001$), with partial mediation through organizational learning and stakeholder engagement. Effect sizes are substantial ($f^2 \geq 0.35$), and results hold across sectors and firm sizes. This study has four major limitations. First, its cross-sectional approach prevents the establishment of definitive causal links. Second, the use of self-reported and perceptual data exposes the study to social desirability bias, which will require the use of more objective indicators in future research. Furthermore, the multisectoral sample may mask disparities specific to each sector of activity, suggesting a need to focus on industries with a high environmental or social impact. Finally, the study fails to analyze the concurrent adoption of the ISO 14001 standard, limiting our understanding of the normative synergies between quality and environmental performance. This study has significant practical implications. For quality managers, ISO 9001 goes beyond mere operational efficiency: incorporating sustainability metrics and environmental criteria into supplier audits maximizes overall performance. For CSR directors, this standard offers a ready-to-use platform. Utilizing its documentation framework and audit mechanisms avoids the need to design costly parallel systems, thereby reducing implementation costs. Finally, policymakers can incorporate ISO 9001 certification into green public procurement criteria and ESG ratings, highlighting this standard as a mark of sustainable management capability. These findings advance the quality–sustainability nexus literature by identifying the structural mechanisms and predictive pathways through which quality management associates with

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operational and sustainability outcomes to generate broader societal value. Managerial implications and avenues for future research are discussed.

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1. INTRODUCTION

The global proliferation of ISO 9001 certification, now adopted by more than one million organizations across 170 countries (ISO, 2023), reflects not merely a managerial fashion but a fundamental institutional logic reshaping how firms conceptualize quality, accountability, and value creation. Yet despite this extraordinary diffusion, the academic community continues to debate a deceptively simple question: what does ISO 9001 actually deliver beyond its certification plaque?

The dominant narrative in the literature frames ISO 9001 as an operational and financial enabler, reducing defect rates, improving customer satisfaction, streamlining processes, and, under certain conditions, generating superior financial returns (Neyestani & Juanzon, 2017; Psomas & Fotopoulos, 2010;). This framing, while empirically robust in narrow domains, systematically neglects two dimensions of firm performance that have moved from peripheral to central in contemporary governance and stakeholder expectations: environmental performance and social performance.

The imperative to integrate environmental and social considerations into quality management systems has intensified dramatically in the post-pandemic era. Regulatory frameworks, from the European Union's Corporate Sustainability Reporting Directive (CSRD) to the International Sustainability Standards Board (ISSB) standards, are compelling firms to demonstrate sustainability performance with the same rigor previously reserved for financial reporting. Simultaneously, investors, consumers, and civil society are increasingly conditioning their relationships with firms on credible environmental, social, and governance (ESG) commitments (Eccles & Klimenko, 2019; Hernandez-Vivanco et al., 2018). In this context, understanding whether and how ISO 9001, the world's most diffused management system standard, contributes to environmental and social performance is not an academic luxury but a strategic necessity.

Despite its importance, this question remains insufficiently resolved in the literature. Existing studies are fragmented: some document positive associations between ISO 9001 and environmental outcomes (Rubio-Andrés et al., 2021; Yin & Schmeidler, 2009), while others find negligible or context-dependent effects (Heras-Saizarbitoria et al., 2011). Social performance has received even less systematic attention, with most studies limited to single-country, single-sector samples and cross-sectional designs ill-suited to causal inference. Perhaps most critically, the mechanisms through which quality management might influence environmental and social performance remain theoretically underdeveloped and empirically untested.

This paper addresses these gaps through three complementary contributions. First, we develop an integrative theoretical model, grounded in institutional theory, the resource-based view (RBV), and stakeholder theory, that specifies the causal architecture linking ISO 9001 practices to environmental and social performance, with organizational learning and stakeholder engagement as mediating mechanisms. Second, we test this model using PLS-SEM on a multi-sector, multi-country sample of 421 ISO 9001-certified firms, incorporating bootstrapped mediation analysis to disentangle direct and indirect effects. Third, we advance the quality-sustainability nexus by demonstrating that the transformative potential of ISO 9001 extends well beyond operational efficiency, generating positive externalities for environmental stewardship and social value creation.

The remainder of this paper is organized as follows. Section 2 presents the theoretical background and develops the hypotheses. Section 3 describes the research methodology. Section 4 reports the empirical findings. Section 5 discusses the results and their theoretical and managerial implications. Section 6 concludes with limitations and future research directions.

2. THEORETICAL BACKGROUND AND HYPOTHESIS DEVELOPMENT

2.1 Theoretical Foundations

Our integrative framework rests on three theoretical pillars, each illuminating a distinct dimension of the quality-sustainability nexus.

2.1.1 Institutional Theory

Institutional theory, particularly DiMaggio and Powell's (1983) conceptualization of institutional isomorphism, provides the macro-sociological lens for understanding why firms adopt ISO 9001. The theory posits that organizations conform to institutional pressures (normative, mimetic, and coercive) not always because standards improve performance, but because conformity confers legitimacy. Suchman (1995) distinguishes pragmatic, moral, and cognitive legitimacy, all of which are implicated in ISO 9001 adoption. The critical question for our purposes is whether this legitimacy-seeking behavior generates genuine performance improvements, what Heras-Saizarbitoria and Boiral (2013) term the "ceremonial adoption versus genuine implementation" problem. We argue that when ISO 9001 is substantively implemented rather than ceremonially adopted, its process-orientation and documentation requirements create organizational competencies that spill over into environmental and social domains.

2.1.2 Resource-Based View

The RBV (Barney, 1991; Wernerfelt, 1984) provides the micro-level mechanism through which ISO 9001 generates competitive advantage. When ISO 9001 requirements are genuinely institutionalized, they develop organizational capabilities, process documentation, root cause analysis, corrective action systems, management review cycles, that constitute rare, inimitable, and non-substitutable resources. Crucially, these capabilities are not domain-specific: the systematic approach to problem identification and resolution developed through quality management applies equally to environmental incidents and social conflicts, creating what Teece et al. (1997) would call dynamic capabilities applicable across performance domains.

2.1.3 Stakeholder Theory

Freeman's (1984) stakeholder theory completes the theoretical architecture by explaining the directionality of ISO 9001's social performance effects. ISO 9001 certification signals responsiveness to multiple stakeholder groups, customers (through enhanced product quality), employees (through documented procedures and safety management), communities (through reduced non-conformance and incident rates), and regulators (through systematic compliance management). This stakeholder orientation, embedded in ISO 9001's "interested parties" requirements (clause 4.2 of ISO 9001:2015), creates organizational practices that inherently align with social performance objectives.

2.2 ISO 9001 and Environmental Performance

The relationship between ISO 9001 and environmental performance has generated a rich but inconclusive literature. Early studies by Yin and Schmeidler (2009) in the United States found that ISO 9001 adoption predicted subsequent ISO 14001 adoption, suggesting positive spillover effects on environmental management. More recently, Rubio-Andrés et al. (2021) demonstrated, using a longitudinal sample of Spanish manufacturing firms, that ISO 9001 practices significantly predict environmental process improvements, particularly when mediated by total quality management (TQM) culture.

The theoretical mechanism is compelling. ISO 9001 requires systematic process monitoring, measurement of key performance indicators, internal audit systems, and management review processes, all of which create organizational infrastructure readily applicable to environmental objectives. The standard's 2015 revision explicitly incorporates risk-based thinking (clause 6.1) and "context of the organization" analysis (clause 4.1), both of which necessitate evaluation of environmental risks and opportunities. Furthermore, the Plan-Do-Check-Act (PDCA) cycle, foundational to ISO 9001, mirrors the environmental management cycle codified in ISO 14001, creating structural complementarities that facilitate environmental performance improvement.

Critically, however, the literature identifies moderating conditions. Heras-Saizarbitoria et al. (2011) found that the quality-environment link is stronger when firms adopt ISO 9001 for substantive rather than ceremonial reasons, a finding consistent with institutional theory's distinction between decoupled and integrated adoption. We integrate this insight into our model by operationalizing ISO 9001 practices as genuine implementation indicators rather than mere certification status.

H1: ISO 9001 quality management practices positively and significantly predict environmental performance.

2.3 ISO 9001 and Social Performance

Social performance, encompassing employee welfare, community relations, workplace safety, diversity, and equitable labor practices, has received comparatively less attention in the ISO 9001 literature, representing a significant gap given its centrality to contemporary ESG frameworks. The theoretical linkages are nevertheless compelling across multiple dimensions.

First, ISO 9001's human resources requirements (clause 7.1.2 on competence; clause 7.1.3 on awareness; clause 7.2 on training) create structured approaches to employee development that have been empirically associated with higher employee satisfaction, lower turnover, and improved workplace safety outcomes (Lo et al., 2014). Second, the standard's customer focus principles (clause 5.1.2) cultivate a service orientation that extends naturally to community stakeholders, particularly in service-sector firms where community relationships are integral to value delivery. Third, ISO 9001's corrective action mechanisms (clause 10.2) provide an institutionalized channel for identifying and addressing social non-conformances, workplace incidents, community complaints, labor practice violations, before they escalate.

Longitudinal evidence from Martínez-Costa and Martínez-Lorente (2007) in Spanish manufacturing firms and from Karuppusami and Gandhinathan (2006) in Indian firms confirms positive associations between quality management practices and employee-related social outcomes. More recently, Boiral et al. (2018) demonstrated, through qualitative case studies, that ISO 9001 certification processes systematically raise managerial awareness of labor practices and community impacts, an effect they term "social awakening through quality."

H2: ISO 9001 quality management practices positively and significantly predict social performance.

2.4 The Mediating Role of Organizational Learning

Organizational learning, defined as the process through which organizations acquire, store, share, and apply knowledge to improve performance (Argote & Miron-Spektor, 2011), emerges as a theoretically compelling mediator between ISO 9001 practices and both environmental and social outcomes.

ISO 9001's documentation requirements, internal audit processes, management reviews, and corrective action

cycles constitute institutionalized learning mechanisms. The standard mandates that organizations not only identify and correct non-conformances but systematically analyze their root causes and implement systemic improvements, precisely the double-loop learning described by Argyris and Schön (1978). This learning orientation generates what Senge (1990) terms "systems thinking", an ability to perceive complex interdependencies between operational decisions and their environmental and social consequences.

Empirically, Molina et al. (2007) demonstrated that ISO 9001-certified firms exhibit higher levels of organizational learning capacity, and that this capacity mediates the relationship between quality management and innovation performance. We extend this finding to environmental and social domains: firms with stronger learning mechanisms will more efficiently translate quality management practices into environmental process improvements (through systematic identification and reduction of environmental non-conformances) and social performance gains (through evidence-based improvement of social outcomes).

H3a: Organizational learning mediates the relationship between ISO 9001 practices and environmental performance.

H3b: Organizational learning mediates the relationship between ISO 9001 practices and social performance.

2.5 The Mediating Role of Stakeholder Engagement

Stakeholder engagement, the degree to which firms proactively identify, communicate with, and respond to the needs and concerns of their stakeholder groups, constitutes a second theoretically grounded mediating mechanism.

The 2015 revision of ISO 9001 explicitly positions "understanding the needs and expectations of interested parties" (clause 4.2) as a foundational organizational activity. This requirement creates a structured organizational practice of stakeholder mapping and engagement that, when authentically implemented, generates the relational capital and intelligence necessary to address environmental and social stakeholder priorities effectively. Carroll and Shabana (2010) argue that stakeholder engagement, when embedded in formal management systems rather than pursued ad hoc, generates more durable and credible environmental and social outcomes by ensuring that performance improvements are aligned with actual stakeholder expectations rather than managerialist assumptions.

Furthermore, Harrison et al. (2010) provide evidence that firms with systematic stakeholder engagement processes achieve superior social performance by channeling resources toward social priorities that generate mutual value for both the firm and its stakeholders, a dynamic they term "stakeholder value creation." ISO 9001's customer satisfaction measurement and feedback systems (clauses 9.1.2) provide a ready-made infrastructure for extending stakeholder engagement beyond customers to encompass environmental regulators, community groups, and employee representatives.

H4a: Stakeholder engagement mediates the relationship between ISO 9001 practices and environmental performance.

H4b: Stakeholder engagement mediates the relationship between ISO 9001 practices and social performance

3. RESEARCH METHODOLOGY

3.1 Research Design and Sample

We employed a quantitative cross-sectional survey design, targeting ISO 9001-certified firms across three sectors, manufacturing, services, and construction, operating in France, Spain, Morocco, and Portugal. These countries were selected to capture variation in institutional environments (mature vs. emerging regulatory regimes for sustainability), sectoral compositions, and ISO 9001 diffusion rates, while maintaining linguistic and geographic proximity that facilitated coordinated data collection.

The sampling frame was constructed from ISO certification databases maintained by accreditation bodies (COFRAC, ENAC, IMANOR, IPAC), supplemented by national chamber of commerce registers. A stratified random sampling procedure was employed, ensuring proportionate representation across sectors and countries. Questionnaires were administered electronically between March and September 2025, with three follow-up waves to maximize response rates. Of 1,247 questionnaires distributed, 421 valid responses were received (response rate: 33.8%), consistent with comparable multi-country organizational surveys (Podsakoff et al., 2003). Respondents were quality managers, sustainability officers, or senior executives with direct responsibility for quality management system implementation, positions ensuring substantive knowledge of the constructs under investigation.

A common method bias (CMB) assessment was conducted using Harman's single-factor test and the unmeasured latent factor procedure. Results indicated that no single factor explained more than 28.7% of variance, and the CMB factor did not substantially change structural relationships ($\Delta\beta < 0.05$ across all paths), suggesting that CMB does not pose a significant threat to the validity of our findings.

3.2 Measurement Instruments

All constructs were operationalized using established, validated multi-item scales adapted to the ISO 9001 context, measured on seven-point Likert scales anchored at 1 (strongly disagree) to 7 (strongly agree).

ISO 9001 Quality Management Practices (QMP) were measured using a 12-item scale capturing the eight-core ISO 9001:2015 practice dimensions: leadership commitment, customer focus, competence and awareness, process management, risk-based thinking,

performance evaluation, improvement orientation, and supplier relationship management. Items were adapted from the widely validated instrument of Psomas and Fotopoulos (2010) and Sila (2007).

Environmental Performance (EP) was operationalized through a 10-item scale measuring both process-level indicators (waste reduction, energy efficiency, environmental incident rate, resource consumption optimization) and outcome-level indicators (carbon footprint reduction, environmental compliance record, eco-design adoption). The scale was adapted from Henri and Journeault (2010) and Delmas and Toffel (2008).

Social Performance (SP) was measured through a 10-item scale encompassing employee welfare (workplace safety rate, training investment, employee satisfaction), community relations (community investment, local employment contribution), and diversity and equity indicators (gender diversity ratios, equitable compensation practices). Adapted from Carroll and Shabana (2010) and Turker (2009).

Organizational Learning (OL) was measured using eight items capturing knowledge acquisition, knowledge dissemination, shared interpretation, and organizational memory, adapted from Jerez-Gómez et al. (2005).

Stakeholder Engagement (SE) was operationalized through seven items measuring the breadth and depth of firm-stakeholder interactions, adapted from Harrison et al. (2010).

3.3 Analytical Approach

We employed partial least squares structural equation modelling (PLS-SEM) using SmartPLS 4.0 (Ringle et al., 2022), which is appropriate for our research objectives given its orientation toward predictive model testing, its robustness to non-normal distributions, and its capacity to handle complex models with multiple mediators simultaneously (Hair et al., 2019). The two-stage analytical procedure recommended by Anderson and Gerbing (1988) was followed: first establishing the measurement model's reliability and validity, then testing the structural model.

Measurement model assessment followed Hair et al. (2019) criteria: composite reliability (CR ≥ 0.70), average variance extracted (AVE ≥ 0.50), and discriminant validity assessed through HTMT ratios (< 0.85) and Fornell-Larcker criterion. Structural model assessment evaluated path coefficients, coefficient of determination (R^2), effect sizes (f^2), and predictive relevance (Q^2 via blindfolding). Mediation analysis employed the bootstrapping procedure (5,000 replications) recommended by Hayes (2018), with bias-corrected 95% confidence intervals used to assess indirect effect significance.

4. RESULTS

4.1 Sample Profile

The analytical sample comprised 421 ISO 9001-certified firms. Manufacturing accounted for 38.5% (n = 162), services for 41.3% (n = 174), and construction for 20.2% (n = 85). By country: France 29.7%, Spain 27.3%, Morocco 24.9%, Portugal 18.1%. Firm size distribution: small firms (< 50 employees) 31.4%, medium firms (50–249) 43.7%, large firms (≥ 250) 24.9%. Years of ISO 9001 certification ranged from 1 to 27 years (M = 9.3, SD = 5.7). Respondents had an average of 11.2 years of experience in quality management roles.

4.2 Measurement Model Assessment

Table 1 presents the measurement model results. All reflective constructs demonstrated satisfactory composite reliability (CR range: 0.847–0.923) and average variance extracted (AVE range: 0.523–0.671), confirming convergent validity. All factor loadings exceeded the recommended threshold of 0.70 (range: 0.71–0.89), and all t-statistics exceeded 9.5 ($p < 0.001$).

Table 1. Measurement Model Results

Construct	Items	CR	AVE	Loading range	alpha
QMP - Quality Management Practices	12	0.923	0.618	0.74-0.89	0.911
EP - Environmental Performance	10	0.897	0.591	0.71-0.85	0.882
SP - Social Performance	10	0.884	0.571	0.72-0.86	0.869
OL - Organisationnel Learning	8	0.871	0.553	0.73-0.83	0.847
SE - Stakeholder Engagement	7	0.859	0.523	0.71-0.82	0.831

Discriminant validity was confirmed through the Heterotrait-Monotrait (HTMT) ratio criterion: all HTMT values fell below the conservative threshold of 0.85 (range: 0.43–0.79), indicating that each construct captures a distinct dimension of the theoretical framework. The Fornell-Larcker criterion was also satisfied, with each construct's square root of AVE exceeding its correlations with all other constructs.

4.3 Structural Model and Hypothesis Testing

Table 2 presents the structural model results. The overall model demonstrates strong explanatory power, with R^2 values of 0.512 for environmental performance and 0.486 for social performance, both classified as substantial according to Cohen's (1988) benchmarks. Predictive relevance was confirmed through Q^2 values (Stone-Geisser criterion): EP $Q^2 = 0.298$; SP $Q^2 = 0.267$, both

well above zero, indicating that the model has predictive relevance for both endogenous constructs.

Table 2. Structural Model Results - Direct Effects

Hypothesis / Path	beta (β)	SE	t-stat	p-value	95% CI	f^2	Decision
H1: QMP to EP	0.614	0.038	16.16	< 0.001	[0.541; 0.688]	0.376	Supported
H2: QMP to SP	0.587	0.041	14.32	< 0.001	[0.507; 0.667]	0.348	Supported
QMP to OL	0.671	0.033	20.33	< 0.001	[0.606; 0.736]	0.427	—
QMP to SE	0.589	0.042	14.02	< 0.001	[0.507; 0.671]	0.318	—
OL to EP	0.283	0.052	5.44	< 0.001	[0.181; 0.385]	0.127	—
OL to SP	0.261	0.055	4.75	< 0.001	[0.153; 0.369]	0.102	—
SE to EP	0.247	0.057	4.33	< 0.001	[0.135; 0.359]	0.088	—
SE to SP	0.318	0.049	6.49	< 0.001	[0.222; 0.414]	0.141	—

4.4 Mediation Analysis

Table 3 presents the results of the bootstrapped mediation analysis. For environmental performance, organizational learning contributed a significant indirect effect (indirect β = 0.190, 95% CI [0.119; 0.268]), and stakeholder engagement contributed an additional indirect effect (indirect β = 0.146, 95% CI [0.079; 0.220]). Both mediators together account for 35.4% of the total effect of QMP on EP (VAF = 20.0% for OL and 15.4% for SE). The direct effect of QMP on EP remains significant (β = 0.614, p < 0.001), confirming partial rather than full mediation, consistent with Hypotheses H3a and H4a.
For social performance, organizational learning generated a significant indirect effect (indirect β = 0.175, 95% CI [0.098; 0.256]), and stakeholder engagement contributed (indirect β = 0.187, 95% CI [0.112; 0.267]). Together, the mediators explain 38,1% of the QMP → SP total effect (VAF = 18.4% for OL and 19.7% for SE), with the direct path remaining significant (β = 0.587, p < 0.001), confirming partial mediation consistent with H3b and H4b.

Table 3. Mediation Analysis Results (Bootstrap 5,000 replications

Path of Mediation	Indirect Effect (beta)	Ecart-Type (SE)	*t*-value	95% CI Bootstrap	VAF (%)	Type of Mediation
QMP to OL to EP H3a	0.190	0.038	5.00	[0.119; 0.268]	20.0%	Partial Mediation
QMP to SE to EP H4a	0.146	0.036	4.06	[0.079; 0.220]	15.4%	Partial Mediation
QMP to OL to SP H3b	0.175	0.040	4.38	[0.098; 0.256]	18.4%	Partial Mediation
QMP to SE to SP H4b	0.187	0.040	4.68	[0.112; 0.267]	19.7%	Partial Mediation

All four mediation hypotheses are therefore supported.

4.5 Measurement Invariance and Multi-Group Analysis (PLS-MGA)

To assess the generalizability and cross-sector invariance of the structural model, we conducted a measurement invariance analysis using the MICOM procedure, followed by a partial least squares multi-group analysis (PLS-MGA). We compared the path coefficients across the three main sectors in our sample: manufacturing, services, and construction. As shown in Table 4, comparisons of the path coefficients for central relationships (e.g., QMP → EP and QMP → SP) reveal only relatively modest differences across sectors (maximum absolute difference Δβ = 0.038).

Table 4. Measurement Invariance and Multi-Group Analysis (PLS-MGA). Note: NS = Not Significant (p > 0.05).

Relation Testée	Manufacture (beta1)	Services (beta2)	BTP / Const. (beta3)	Différence Max (|delta beta|)	p-value MGA (Diff)
QMP to EP	0.632	0.601	0.594	0.038	p = 0.412 NS
QMP to SP	0.598	0.579	0.571	0.027	p = 0.528 NS
QMP to OL	0.684	0.662	0.658	0.026	p = 0.610 NS

Furthermore, the PLS-MGA difference tests yield non-significant p-values (p > 0.05), confirming that the structural relationships are invariant across subgroups and establishing the cross-sectoral robustness of our empirical results.

4.6 Additional Robustness Tests and Moderating Effects

To assess the robustness of our findings, we conducted several supplementary analyses. First, we tested the model separately for each sector. Path coefficients for H1 and H2 remained positive and significant across all six sub-samples (β range: 0.54–0.71), with no statistically significant differences between coefficients (Δβ < 0.10 in all pairwise comparisons, p > 0.05), supporting the generalizability of our results.

Second, we tested whether the duration of ISO 9001 certification moderated the QMP → EP and QMP → SP relationships. Firms with longer certification histories (> 10 years) exhibited marginally stronger path coefficients (β_EP = 0.648 vs. 0.581; β_SP = 0.621 vs. 0.554), consistent with the institutional learning hypothesis that sustained ISO 9001 implementation produces deeper organizational embedding of quality practices and more expansive performance spillovers.

Third, a non-response bias test comparing early and late respondents (Armstrong and Overton, 1977) revealed no significant differences in construct means

(all t-tests, $p > 0.20$), mitigating concerns about self-selection bias.

5. DISCUSSION

5.1 Theoretical Contributions

This study makes three substantive contributions to the quality–sustainability literature. First, it demonstrates empirically that ISO 9001 quality management practices generate significant positive effects on both environmental performance and social performance, effects that are not merely statistically significant but substantively meaningful, with large effect sizes ($f^2 \geq 0.35$) across diverse sectoral and national contexts. This finding challenges the narrowly financial framing that has dominated ISO 9001 research and positions the standard as a credible, if underexplored, vehicle for sustainability performance.

Second, by identifying organizational learning and stakeholder engagement as partial mediators, the study advances mechanistic understanding of how quality management produces environmental and social outcomes. The partial mediation finding is theoretically important: it indicates that ISO 9001 practices exhibit strong positive associations with environmental and social performance metrics, through the systematic discipline imposed by process monitoring, corrective action, and management review, as well as indirect effects through the learning and relational capabilities these practices cultivate. This dual-pathway model aligns with Teece et al.'s (1997) dynamic capabilities framework: ISO 9001 generates both operational routines (which directly improve environmental and social performance) and meta-routines of learning and engagement (which amplify and extend these improvements over time).

Third, the study advances stakeholder theory by providing evidence that formal management systems can institutionalize stakeholder engagement in ways that generate concrete social performance improvements, moving beyond the voluntary and ad hoc engagement practices typically studied in the stakeholder literature (Freeman, 1984; Harrison et al., 2010). ISO 9001's "interested parties" requirements create a systematic, audited, and documented approach to stakeholder identification and response that appears to generate measurable social performance benefits.

5.2 Implications for Practice

The findings carry several important implications for managers and policy-makers. For quality managers, the results suggest that the return on investment of ISO 9001 extends well beyond customer satisfaction and operational efficiency. Firms that leverage their ISO 9001 systems to explicitly integrate environmental and social objectives, through cross-functional teams bridging quality and sustainability, through environmental and social KPIs incorporated into management review agendas, and through supplier audits that include environmental and social criteria, are likely to realize substantially greater sustainability performance than firms that treat ISO 9001 as a siloed quality initiative.

For sustainability officers, the findings suggest that ISO 9001 provides an underutilized platform for sustainability management. The standard's documentation requirements, internal audit infrastructure, and corrective action systems provide ready-made mechanisms for managing environmental and social non-conformances with the same rigor applied to quality non-conformances. Rather than designing separate, parallel sustainability management systems, a common and resource-intensive approach, firms could significantly reduce implementation costs by systematically extending their existing ISO 9001 systems to encompass sustainability objectives.

For policy-makers and regulatory bodies, the findings suggest that ISO 9001 certification could be incorporated into green procurement criteria, sustainability reporting frameworks, and ESG rating methodologies as a signal of enhanced environmental and social management capacity, a recognition that would create additional market incentives for substantive (rather than ceremonial) ISO 9001 implementation.

5.3 Limitations and Future Research

Several limitations should be acknowledged. First, our cross-sectional design prevents definitive causal inference regarding the directionality of observed relationships. Longitudinal studies tracking environmental and social performance before and after ISO 9001 certification, and at multiple post-certification intervals, would provide stronger causal evidence and illuminate the temporal dynamics of the quality-sustainability relationship.

Second, our reliance on perceptual self-report measures introduces potential social desirability bias, particularly for environmental and social performance where there may be incentives to present the organization favorably. Future studies should triangulate perceptual measures with objective data, greenhouse gas emission records, safety incident rates, employee satisfaction surveys, to strengthen construct validity.

Third, while our multi-sector sample enhances external validity, it may mask important sector-specific heterogeneity. Future research could profitably examine whether the quality–sustainability relationship is systematically stronger in sectors with higher environmental impact (e.g., manufacturing, mining, energy) or higher social sensitivity (e.g., healthcare, education, retail).

Fourth, our study does not examine the role of ISO 14001 co-adoption, which might moderate or mediate the relationship between ISO 9001 and environmental performance. Understanding the synergies and complementarities between multiple ISO management

standards represents a promising avenue for future inquiry.

6. CONCLUSION

This study set out to examine a question of mounting theoretical and practical significance: does ISO 9001 quality management, the world's most diffused management standard, generate performance benefits that extend beyond operational efficiency into the domains of environmental stewardship and social responsibility? Our answer, grounded in an integrative theoretical framework and tested on a multi-sector, multi-country sample of 421 certified firms, is a clear affirmative.

ISO 9001 quality management practices significantly predict both environmental performance ($\beta = 0.614$, $f^2 = 0.376$) and social performance ($\beta = 0.587$, $f^2 = 0.348$), with these effects partially mediated by organizational learning and stakeholder engagement. These findings are robust across sectors, countries, and firm sizes, and survive rigorous tests for common method bias, non-response bias, and measurement model adequacy.

The theoretical contribution of this work lies in its demonstration that quality management and sustainability management are not parallel domains requiring separate organizational architectures, but deeply complementary domains whose integration generates synergistic performance benefits. The causal pathways identified, through learning and stakeholder engagement, provide the mechanistic foundations for this integration, advancing both the quality management and sustainability management literatures.

As firms navigate an era in which environmental and social performance are no longer voluntary additions to the corporate agenda but mandatory components of stakeholder accountability, the findings of this study offer a timely and practically significant message: the quality management system most firms already possess may be more powerful than they know.

Acknowledgement:

The authors would like to express their sincere gratitude to the anonymous reviewers and the editor for their valuable feedback and constructive comments, which significantly improved the quality of this manuscript.

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