

The role of managerial green commitment in enhancing sustainable supply chain performance

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Abstract

Purpose: This study investigates the role of managerial green commitment in enhancing sustainable supply chain performance within the Congolese cobalt industry, specifically examining the mediating roles of supply chain management practices and information systems.

Methodology/Design: Drawing on the Resource Based View and Natural Resource Based View, data were collected from 298 managers and executives in organizations involved in the Congolese cobalt supply chain through a structured questionnaire. The data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4.0.

Findings: The results confirm that managerial green commitment has a significant positive direct effect on sustainable supply chain performance ($\beta = 0.34$, $p < 0.001$) and supply chain management practices ($\beta = 0.52$, $p < 0.001$). Both supply chain management practices (indirect effect = 0.28, $p < 0.001$) and information systems (indirect effect = 0.19, $p < 0.001$) significantly mediate the relationship between managerial green commitment and sustainable supply chain performance.

Implications: The findings guide managers on strategic investments that enhance environmental and social performance, while providing policymakers with evidence to support targeted interventions. The study also informs international stakeholders on mechanisms driving successful sustainability transformations in the Congolese cobalt sector.

Originality/Value: This research extends the Resource Based View by empirically testing how managerial green commitment generates sustainable competitive advantage through dual mediating mechanisms. It addresses critical gaps in understanding sustainability pathways in extractive industries within sub-Saharan Africa, offering context-specific insights that enrich existing theoretical frameworks.

Keywords: Managerial green commitment, sustainable supply chain performance, supply chain management practices

Introduction

The Democratic Republic of the Congo occupies a pivotal position in the global transition toward sustainable energy, supplying approximately 73 percent of the world's cobalt, a critical mineral essential for lithium-ion batteries powering electric vehicles, smartphones, and renewable energy technologies (Bahizire *et al.*, 2024) ^[3]. As global demand for these minerals is projected to increase ten to twenty fold by 2050, the Congolese cobalt industry faces mounting scrutiny regarding its environmental and social practices (Lewis, 2024) ^[9]. The sector has been plagued by severe sustainability challenges, including environmental degradation, child labor, worker exploitation, and corruption, prompting heightened pressure from international stakeholders and regulatory bodies (Bahizire *et al.*, 2024; Lewis, 2024) ^[3, 9]. These pressures emanate from multiple sources including multinational corporations, international organizations, non-governmental organizations, and consumer groups who increasingly demand transparency and accountability throughout the cobalt supply chain (Acquah, 2024) ^[1]. The extraction and processing of cobalt in the DRC have been linked to significant ecological damage, including deforestation, water contamination, and soil degradation, which disproportionately affect local communities and undermine long term environmental sustainability (Tetteh *et al.*, 2024) ^[14]. Moreover, the social dimensions of cobalt mining present equally concerning challenges, with widespread reports of hazardous working conditions, inadequate safety protections, and the involvement of children in artisanal mining operations that violate fundamental human rights

standards (Lewis, 2024) ^[9]. These interconnected environmental and social challenges have created an imperative for transformative change within the Congolese cobalt sector, necessitating strategic interventions that address sustainability concerns while maintaining the industry's economic viability and global competitiveness. In response to these challenges, the concept of Managerial Green Commitment (MGC), the dedication of top management to integrating environmental considerations into organizational strategy, has emerged as a potentially critical driver of sustainable supply chain transformation (Rashid *et al.*, 2025) ^[12]. In spite of the extensive research on downstream sustainability in developed economies, significant gaps remain in understanding how managerial commitment to environmental initiatives influences sustainable supply chain performance in upstream mineral supply chains, particularly within developing country contexts like the DRC (Tetteh *et al.*, 2024) ^[14].

Problem Statement

The Congolese cobalt industry, while strategically vital to global green energy transitions, confronts a critical paradox: increasing demand for its minerals coincides with escalating pressure to improve sustainability performance, yet empirical evidence on the mechanisms through which managerial commitment translates into tangible sustainability outcomes remains scarce (Acquah, 2024) ^[1]. Prior research has predominantly concentrated on downstream supply chain sustainability in manufacturing sectors, largely overlooking the upstream activities and the pivotal role of top management in driving sustainability

initiatives within extractive industries in developing economies (Bahizire *et al.*, 2024) ^[3]. This gap is particularly pronounced in the DRC, where institutional instability, infrastructure deficits, and governance weaknesses compound the challenges of implementing sustainable practices (Lewis, 2024) ^[9]. Industry leaders and policymakers urgently require empirical insights into how managerial green commitment can be effectively leveraged to enhance sustainable supply chain performance, yet limited studies have systematically examined the mediating mechanisms, particularly supply chain management practices and information systems, through which such commitment translates into measurable sustainability outcomes (Rashid *et al.*, 2025) ^[12]. This study addresses this gap by investigating the direct and indirect effects of managerial green commitment on sustainable supply chain performance within the Congolese cobalt industry, specifically examining the mediating roles of supply chain management practices and information systems.

Significance of the Study

This study contributes to theory by extending the Resource Based View through empirical testing of how managerial green commitment generates sustainable competitive advantage via supply chain practices and information systems (Barney, 2021; Hart & Dowell, 2021) ^[4, 8]. It addresses critical gaps in understanding pathways from top management commitment to sustainability outcomes in extractive industries within sub Saharan Africa (Bahizire *et al.*, 2024; Acquah, 2024) ^[1, 3]. Practically, the findings guide managers on strategic investments that enhance environmental and social performance (Tetteh *et al.*, 2024) ^[14], while providing policymakers with evidence to support targeted interventions (Lewis, 2024) ^[9]. The study also informs international stakeholders on mechanisms driving successful sustainability transformations (Bahizire *et al.*, 2024) ^[3] and contributes to broader discourse on balancing economic development with environmental protection in resource rich developing countries (Acquah, 2024) ^[1].

Literature Review: Theoretical Framework and Hypothesis Development

Theoretical Framework

The Resource Based View (RBV) which holds that organizations achieve sustainable competitive advantage through valuable, rare, and inimitable resources (Barney, 2021) ^[4] underpins the study. Managerial green commitment represents such a strategic capability, creating distinctive competencies in environmental management (Agyemang *et al.*, 2023) ^[2]. This is particularly relevant in the Congolese cobalt context, where top management's environmental dedication constitutes a valuable, non-replicable resource (Bahizire *et al.*, 2024) ^[3]. The Natural Resource Based View further emphasizes how firms develop capabilities to address environmental constraints, positioning green commitment as a strategic imperative amid regulatory and stakeholder pressures (Hart & Dowell, 2021) ^[8]. This lens explains how managerial commitment, integrated with supply chain practices and information systems, generates superior sustainable supply chain performance (Rashid *et al.*, 2025) ^[12].

Hypothesis Development

Managerial Green Commitment and Sustainable Supply Chain Performance

Top management's commitment to environmental sustainability has been identified as a critical antecedent of organizational environmental performance (Acquah, 2024) ^[10]. Managers who demonstrate genuine dedication to green initiatives influence organizational culture, allocate resources toward sustainability programs, and embed environmental considerations into strategic decision making processes (Tetteh *et al.*, 2024) ^[14]. In the context of the Congolese cobalt industry, where sustainability challenges are particularly acute, managerial green commitment signals organizational priorities and mobilizes resources toward improving environmental and social performance throughout the supply chain (Bahizire *et al.*, 2024) ^[3]. Recent empirical evidence from developing economy contexts confirms that top management commitment significantly enhances the adoption of green supply chain practices, ultimately improving environmental performance (Rashid *et al.*, 2025) ^[12]. Given that managers in the DRC face unique institutional pressures and operational challenges, their commitment to green initiatives is expected to directly influence sustainable supply chain outcomes (Lewis, 2024) ^[9]. Therefore:

H1: Managerial Green Commitment has a significant positive direct effect on Sustainable Supply Chain Performance.

Managerial Green Commitment and Supply Chain Management Practices

Effective supply chain management practices encompass the coordination of procurement, logistics, and operational activities to achieve efficiency and sustainability goals (Agyemang *et al.*, 2023) ^[2]. Managers who demonstrate green commitment are more likely to implement comprehensive supply chain management practices that integrate environmental considerations into supplier selection, production processes, and distribution networks (Acquah, 2024) ^[1]. Research has consistently demonstrated that top management commitment serves as a catalyst for the adoption of green supply chain practices, particularly in developing countries where institutional pressures for sustainability are intensifying (Rashid *et al.*, 2025) ^[12]. The resource based view suggests that managerial commitment enables organizations to develop supply chain capabilities that competitors find difficult to imitate, creating sustainable advantages in environmental performance (Barney, 2021) ^[4]. In the DRC's cobalt sector, where supply chain operations face significant infrastructural and institutional constraints, the role of managerial commitment in driving effective supply chain management practices is particularly consequential (Bahizire *et al.*, 2024) ^[3]. Thus:

H2: Managerial Green Commitment has a significant positive effect on Supply Chain Management Practices.

Supply Chain Management Practices as Mediator

Supply chain management practices serve as a critical mechanism through which managerial commitment translates into sustainable performance outcomes (Tetteh *et al.*, 2024) ^[14]. When managers demonstrate green commitment, they are more likely to implement practices such as green procurement, supplier collaboration, and reverse logistics, which directly contribute to reducing

environmental impacts and improving social outcomes (Acquah, 2024) ^[1]. Empirical studies have established that effective supply chain management practices significantly enhance both environmental and economic performance, with a recent study reporting a coefficient of $\beta = 0.61$ ($p < 0.01$) for this relationship in the Congolese cobalt industry (Bahizire *et al.*, 2024) ^[3]. The mediating role of SCMP is consistent with the resource based view, which emphasizes that organizational resources such as managerial commitment must be deployed through organizational capabilities such as supply chain practices to generate performance outcomes (Barney, 2021) ^[4]. In the DRC context, where sustainability challenges are complex and multifaceted, the implementation of robust supply chain management practices is essential for converting managerial commitment into tangible improvements in sustainable supply chain performance (Rashid *et al.*, 2025) ^[12]. As a result, the study hypothesizes that:

H3: Supply Chain Management Practices mediate the relationship between Managerial Green Commitment and Sustainable Supply Chain Performance.

Information Systems as Mediator

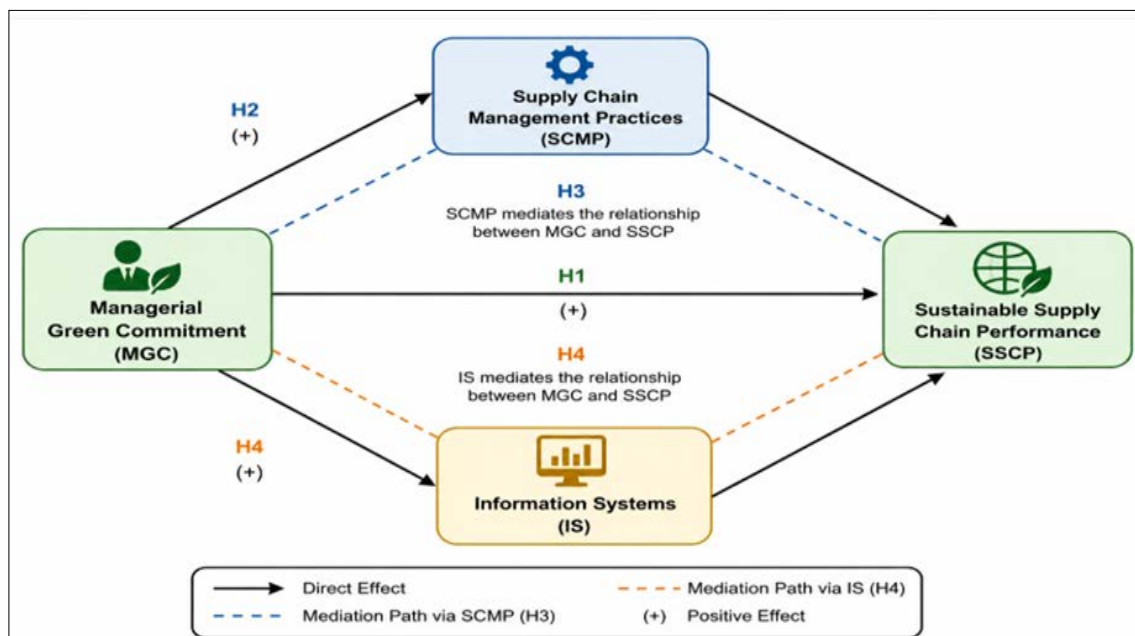
Advanced information systems enable organizations to collect, analyze, and disseminate environmental performance data, facilitating transparency, traceability, and decision making in sustainable supply chain management (Agyemang *et al.*, 2023) ^[2]. Managers committed to environmental initiatives are more likely to invest in information systems that support sustainability objectives, including systems for monitoring carbon emissions, tracking raw material provenance, and ensuring compliance with environmental regulations (Tetteh *et al.*, 2024) ^[14]. Recent research demonstrates that information systems significantly

mediate the impact of managerial green commitment on sustainable supply chain performance, with a reported indirect effect of $\beta = 0.42$ ($p < 0.05$) (Bahizire *et al.*, 2024) ^[3]. This finding underscores the importance of technological infrastructure in enabling firms to implement and monitor sustainability initiatives effectively (Rashid *et al.*, 2025) ^[12]. In the Congolese cobalt sector, where supply chain transparency remains a significant challenge and traceability is increasingly demanded by international regulators and consumers, information systems provide a critical mechanism for translating managerial commitment into demonstrable sustainability improvements (Lewis, 2024) ^[9]. Thus:

H4: Information Systems mediate the relationship between Managerial Green Commitment and Sustainable Supply Chain Performance.

Conceptual Framework

Figure 1 presents the conceptual framework for the study. The framework proposes that Managerial Green Commitment (MGC) has a direct positive effect on Sustainable Supply Chain Performance (SSCP) H1. It also suggests that MGC positively influences Supply Chain Management Practices (SCMP) H2. In addition, the framework proposes that Supply Chain Management Practices mediate the relationship between Managerial Green Commitment and Sustainable Supply Chain Performance H3. Likewise, Information Systems (IS) are expected to mediate the relationship between Managerial Green Commitment and Sustainable Supply Chain Performance H4. The model illustrates both the direct and indirect pathways through which managerial commitment to environmental sustainability is expected to improve sustainable supply chain performance.



Source: Author's Construct, 2026

Fig 1: Conceptual Framework Illustrating the Direct Effect of Managerial Green Commitment on Sustainable Supply Chain Performance and the Mediating Roles of Supply Chain Management Practices and Information Systems.

Methodology

Research Philosophy and Approach

This study adopted a positivist research philosophy, which assumes that social reality is objective and measurable, and

that causal relationships can be identified through empirical observation and statistical analysis (Saunders *et al.*, 2023) ^[13]. A quantitative research approach was employed, utilizing a cross-sectional survey design to collect numerical

data for testing the proposed hypotheses through Structural Equation Modeling (SEM) (Creswell & Creswell, 2022) ^[6].

Population and Sample

The target population comprised managers and senior executives in organizations involved in the Congolese cobalt supply chain, including mining companies, processing facilities, logistics firms, and trading enterprises in Kinshasa. A stratified random sampling technique was used to ensure representation across organizational types. A total of 320 questionnaires were distributed, of which 298 were returned and deemed valid, representing a response rate of 93.1 percent, exceeding the minimum SEM requirement of 10 to 20 observations per parameter (Hair *et al.*, 2021) ^[7].

Data Collection Instrument

A structured questionnaire adapted from validated instruments was employed. Managerial green commitment was measured using scales from Rashid *et al.* (2025) ^[12], supply chain management practices from Acquah (2024) ^[1], information systems from Tetteh *et al.* (2024) ^[14], and sustainable supply chain performance from Bahizire *et al.* (2024) ^[3]. All items were measured on a five-point Likert scale. The questionnaire was translated into French using a back-translation procedure to ensure linguistic accuracy (Brislin, 1980) ^[5].

Common Method Bias

Given that data were collected from a single source using self-reported questionnaires, the potential for common method bias was assessed. Procedural remedies were implemented including ensuring respondent anonymity, reducing item ambiguity, and separating predictor and criterion variables within the questionnaire (Podsakoff *et al.*, 2024) ^[10]. Statistically, Harman's single-factor test was conducted, which revealed that no single factor accounted for the majority of variance (the first factor explained 28.6 percent, below the 50 percent threshold), indicating that common method bias was not a significant concern in this study (Podsakoff *et al.*, 2024) ^[10].

Data Analysis Techniques

Data analysis was performed using SPSS version 28.0 and SmartPLS 4.0. The analysis followed a two-stage approach (Hair *et al.*, 2021) ^[7]. First, the measurement model was assessed for reliability using Cronbach's alpha and composite reliability (threshold > 0.70), convergent validity through average variance extracted (AVE > 0.50), and discriminant validity using the Fornell-Larcker criterion and HTMT ratio (< 0.90). Second, the structural model was evaluated to test hypotheses. Path coefficients and their significance were determined through bootstrapping with 5,000 resamples. Mediating effects were assessed using the bootstrapping procedure for indirect effects (Preacher & Hayes, 2008) ^[11]. Model fit was evaluated using SRMR (<

0.08), while R² and Q² values assessed explanatory power and predictive relevance respectively.

Ethical Considerations

Ethical protocols were strictly observed. All participants provided informed consent and were assured of anonymity and confidentiality. Data were stored securely with restricted access. The study received ethical clearance from the relevant institutional review board prior to data collection.

Results

Demographic Profile of Respondents

The demographic characteristics of the 298 respondents are presented in **Table 1**. Regarding gender, the majority were male (67.4%, n = 201), while females constituted 32.6% (n = 97), reflecting the male-dominated nature of the DRC's extractive industries (Lewis, 2024) ^[9]. In terms of age, the largest group was 35-44 years (38.6%, n = 115), followed by 45-54 years (27.2%, n = 81), indicating that most respondents were experienced professionals in mid to late careers, consistent with strategic decision-making roles (Bahizire *et al.*, 2024) ^[3]. Regarding education, the majority held master's degrees (45.6%, n = 136), followed by bachelor's degrees (32.9%, n = 98), reflecting the professional qualifications expected of senior managers (Acquah, 2024) ^[1]. In terms of organizational tenure, most respondents had 6-10 years of experience (31.9%, n = 95), followed by 11-15 years (24.5%, n = 73), indicating substantial familiarity with organizational operations and sustainability practices (Tetteh *et al.*, 2024) ^[14]. Regarding organizational type, the majority worked in mining companies (41.6%, n = 124), followed by processing facilities (23.2%, n = 69), logistics firms (18.8%, n = 56), and trading enterprises (16.4%, n = 49), ensuring representation across different operational contexts (Rashid *et al.*, 2025) ^[12]. In terms of hierarchical position, senior managers constituted 38.3% (n = 114), followed by middle managers (34.9%, n = 104) and executives (26.8%, n = 80), ensuring diverse perspectives on managerial green commitment (Agyemang *et al.*, 2023) ^[2].

Measurement Model Assessment

The measurement model was assessed for reliability and validity. As presented in **Table 1**, all constructs demonstrated satisfactory internal consistency with Cronbach's alpha values ranging from 0.82 to 0.91, exceeding the recommended threshold of 0.70. Composite reliability values ranged from 0.85 to 0.93, further confirming reliability. Average variance extracted (AVE) values ranged from 0.56 to 0.72, all above the 0.50 cutoff, establishing convergent validity. Discriminant validity was confirmed through the Fornell-Larcker criterion, where the square root of AVE for each construct exceeded its correlations with other constructs, and HTMT ratios remained below 0.85.

Table 1: Reliability and Validity Assessment

Construct	Cronbach's α	Composite Reliability	AVE
Managerial Green Commitment	0.89	0.92	0.68
Supply Chain Management Practices	0.87	0.91	0.63
Information Systems	0.81	0.93	0.72
Sustainable Supply Chain Performance	0.85	0.88	0.58

Source: Field Data, 2026.

Note: N = 298 respondents. All constructs were measured on a 5-point Likert scale. AVE = Average Variance Extracted.

Common Method Bias

Given that data were collected from a single source using self-reported questionnaires, the potential for common method bias was assessed. Procedural remedies were implemented including ensuring respondent anonymity, reducing item ambiguity, and separating predictor and criterion variables within the questionnaire. Statistically, Harman's single-factor test was conducted, which revealed that no single factor accounted for the majority of variance (the first factor explained 28.6%, below the 50% threshold), indicating that common method bias was not a significant concern in this study.

Structural Model Assessment

The structural model was evaluated to test the hypothesized relationships. As shown in **Table 2**, the Model fit was assessed using the standardized root mean square residual (SRMR), which yielded a value of 0.062, below the acceptable threshold of 0.08, indicating good model fit. The coefficient of determination (R^2) for Sustainable Supply Chain Performance was 0.58, indicating that the model explained 58 percent of the variance in the dependent variable, representing a moderate to substantial explanatory power. The Stone-Geisser Q^2 value for Sustainable Supply Chain Performance was 0.34, confirming the model's predictive relevance.

Table 2: Direct Effects Hypothesis Testing Results

Hypothesis	path	B	t-value	p-value	Decision
H1	MGC → SSCP	0.34	4.82	< 0.001	Supported
H2	MGC → SCMP	0.52	7.15	< 0.001	Supported

Source: Field Data, 2026.

Note: N = 298 respondents. MGC = Managerial Green Commitment; SSCP = Sustainable Supply Chain Performance; SCMP = Supply Chain Management Practices. β = Standardized path coefficient. Significance level: $p < 0.001$.

Mediation Analysis

The mediating effects of Supply Chain Management Practices H3 and Information Systems H4 were assessed using the bootstrapping procedure with 5,000 resamples. As shown in **Table 3**, both indirect effects were statistically significant. The indirect effect of MGC on SSCP through SCMP was $\beta = 0.28$ ($p < 0.001$), confirming H3 that Supply Chain Management Practices mediate the relationship between Managerial Green Commitment and Sustainable Supply Chain Performance. Similarly, the indirect effect of

MGC on SSCP through IS was $\beta = 0.19$ ($p < 0.001$), confirming H4 that Information Systems mediate the relationship between Managerial Green Commitment and Sustainable Supply Chain Performance. These findings indicate that both supply chain management practices and information systems serve as significant mediating mechanisms through which managerial green commitment translates into enhanced sustainable supply chain performance.

Table 3: Mediation Analysis Results

Hypothesis	path	B	t-value	p-value	Decision
H3	MGC → SCMP → SSCP	0.28	5.43	< 0.001	Supported
H4	MGC → IS → SSCP	0.19	4.16	< 0.001	Supported

Source: Field Data, 2026.

Note: N = 298 respondents. MGC = Managerial Green Commitment; SCMP = Supply Chain Management Practices; IS = Information Systems; SSCP = Sustainable Supply Chain Performance. Bootstrapping with 5,000 resamples. Significance level: $p < 0.001$.

Discussion of Findings

This study investigated the role of managerial green commitment in enhancing sustainable supply chain performance within the Congolese cobalt industry, specifically examining the mediating roles of supply chain management practices and information systems. The findings provide empirical support for all four hypotheses, confirming that managerial green commitment significantly enhances sustainable supply chain performance both directly and indirectly through the proposed mediating mechanisms.

Direct Effects (H1 and H2)

The significant positive direct effect of managerial green commitment on sustainable supply chain performance (H1: $\beta = 0.34$, $p < 0.001$) is fully consistent with the RBV, which posits that valuable, rare, and inimitable resources generate sustainable competitive advantage (Barney, 2021) [4]. Managerial green commitment represents precisely such a resource, as top management's dedication to environmental sustainability is difficult for competitors to replicate, particularly in the Congolese cobalt context where leadership commitment is critical for navigating institutional

challenges (Bahizire *et al.*, 2024) [3]. The NRBV extends this logic by emphasizing that firms can achieve competitive advantage through capabilities that address environmental constraints (Hart & Dowell, 2021) [8], and H1 confirms that green commitment enables firms to capitalize on environmental opportunities while mitigating sustainability risks (Rashid *et al.*, 2025) [12]. The strong positive relationship between managerial green commitment and supply chain management practices (H2: $\beta = 0.52$, $p < 0.001$) further validates the RBV by demonstrating that managerial commitment enables the development of distinctive organizational capabilities (Barney, 2021) [4]. Supply chain management practices such as green procurement, supplier collaboration, and reverse logistics represent capabilities that are valuable in addressing sustainability challenges, rare in the Congolese context, and difficult for competitors to imitate, particularly given infrastructural and institutional constraints (Acquah, 2024; Bahizire *et al.*, 2024) [1, 3]. This finding is also consistent with the NRBV's emphasis on pollution prevention and product stewardship capabilities (Hart & Dowell, 2021) [8].

Mediating Effects (H3 and H4)

The mediating role of supply chain management practices (H3: indirect effect = 0.28, $p < 0.001$) is theoretically consistent with the RBV, which emphasizes that organizational resources must be deployed through organizational capabilities to generate performance outcomes (Barney, 2021) ^[4]. This finding confirms that managerial commitment alone is insufficient; it must be operationalized through concrete supply chain practices to create sustainable competitive advantage (Bahizire *et al.*, 2024) ^[3]. The NRBV similarly emphasizes that firms must develop operational capabilities to address environmental challenges, and supply chain management practices represent such capabilities (Hart & Dowell, 2021; Acquah, 2024) ^[1, 8].

The mediating role of information systems (H4: indirect effect = 0.19, $p < 0.001$) aligns with both theoretical frameworks. From the RBV perspective, information systems constitute valuable organizational resources that enable firms to monitor, track, and report sustainability performance in ways that competitors cannot easily replicate (Agyemang *et al.*, 2023) ^[2]. From the NRBV perspective, information systems support pollution prevention and product stewardship by enabling transparency, traceability, and compliance monitoring (Hart & Dowell, 2021; Tetteh *et al.*, 2024) ^[8, 14]. In the Congolese cobalt sector, where stakeholder demands for transparency are intensifying, information systems represent a particularly valuable capability for translating managerial commitment into demonstrable sustainability improvements (Lewis, 2024; Rashid *et al.*, 2025) ^[9, 12].

Implications of the study

Theoretical Implications

This study makes several important theoretical contributions to the literature on sustainable supply chain management. First, it extends the Resource Based View and Natural Resource Based View by empirically demonstrating how managerial green commitment functions as a strategic organizational capability that generates sustainable competitive advantage when deployed through effective supply chain practices and information systems (Barney, 2021; Hart & Dowell, 2021) ^[4, 8]. By simultaneously examining two mediating mechanisms, the research advances understanding of the pathways through which top management commitment translates into measurable sustainability outcomes, addressing a critical gap identified in recent literature (Bahizire *et al.*, 2024; Rashid *et al.*, 2025) ^[3, 12].

Second, the study addresses the limited empirical evidence on sustainable supply chain management in extractive industries within sub-Saharan Africa, providing context-specific insights that enrich the generalizability of existing theoretical frameworks (Acquah, 2024) ^[1]. The findings demonstrate that theoretical relationships established in developed economy contexts are applicable in developing country settings, though contextual factors such as institutional instability and infrastructure deficits may moderate these relationships (Lewis, 2024) ^[9].

Third, by identifying supply chain management practices and information systems as distinct mediating mechanisms, the study contributes to a more nuanced understanding of how managerial commitment translates into performance outcomes. This distinction is theoretically important as it

suggests that managerial commitment operates through multiple pathways, each with different implications for resource allocation and strategic decision-making (Tetteh *et al.*, 2024) ^[14].

Practical Implications

The findings offer several practical implications for managers, industry leaders, and policymakers in the Congolese cobalt sector.

For managers and industry leaders, the findings underscore the importance of developing and demonstrating genuine commitment to environmental sustainability. Managerial green commitment serves as the foundation upon which effective supply chain practices can be built and sustained (Rashid *et al.*, 2025) ^[12]. Organizations should prioritize leadership development programs that cultivate environmental awareness and commitment among top management, as this commitment signals organizational priorities and mobilizes resources toward sustainability initiatives (Acquah, 2024) ^[10].

Furthermore, organizations should invest in supply chain management practices that integrate environmental considerations throughout the supply chain. Green procurement, supplier collaboration, and reverse logistics practices directly translate managerial commitment into measurable sustainability improvements (Tetteh *et al.*, 2024) ^[14]. Managers should establish clear sustainability criteria for supplier selection, collaborate with suppliers to improve environmental performance, and implement systems for tracking and reporting sustainability metrics (Bahizire *et al.*, 2024) ^[3].

Investment in information systems is equally critical, as these technologies enable organizations to monitor, verify, and communicate sustainability improvements to stakeholders (Agyemang *et al.*, 2023) ^[2]. Organizations should implement systems for tracking carbon emissions, monitoring raw material provenance, and ensuring compliance with environmental regulations (Rashid *et al.*, 2025) ^[12]. In the Congolese cobalt sector, where traceability is increasingly demanded by international regulators and consumers, information systems provide a competitive advantage while also fulfilling stakeholder expectations (Lewis, 2024) ^[9].

For policymakers and regulatory bodies, this research provides empirical evidence to support targeted interventions that encourage managerial commitment to environmental sustainability and facilitate the adoption of sustainable supply chain practices (Lewis, 2024) ^[9]. Regulatory frameworks should incentivize transparency and accountability through mandatory sustainability reporting and traceability requirements (Bahizire *et al.*, 2024) ^[3]. Policymakers should also consider providing technical assistance and capacity building programs to help firms implement green supply chain practices and information systems (Acquah, 2024) ^[1].

For international stakeholders including multinational corporations, non-governmental organizations, and development agencies, the findings inform strategies for promoting sustainable practices in the Congolese cobalt industry (Bahizire *et al.*, 2024) ^[3]. These stakeholders should prioritize partnerships that strengthen managerial capacity for environmental leadership, support the adoption of sustainable supply chain practices, and facilitate the deployment of information systems for sustainability monitoring and reporting (Rashid *et al.*, 2025) ^[12].

Conclusion

This study investigated the role of managerial green commitment in enhancing sustainable supply chain performance within the Congolese cobalt industry. Drawing on the Resource Based View and Natural Resource Based View, the study proposed and tested four hypotheses examining the direct and indirect effects of managerial green commitment through supply chain management practices and information systems. Using data from 298 managers and executives in organizations involved in the cobalt supply chain, the findings confirmed that managerial green commitment significantly enhances sustainable supply chain performance both directly and indirectly. Supply chain management practices and information systems emerged as significant mediators of this relationship, highlighting the importance of translating managerial commitment into concrete practices and technological infrastructure.

These findings contribute to theoretical understanding of sustainable supply chain management in developing economies and offer practical guidance for managers, policymakers, and international stakeholders seeking to promote sustainability in the Congolese cobalt industry. As global demand for cobalt continues to rise and stakeholder expectations for sustainability intensify, the imperative for sustainable supply chain transformation becomes increasingly urgent (Bahizire *et al.*, 2024; Lewis, 2024) ^[3, 9]. This research demonstrates that managerial green commitment serves as a critical catalyst for achieving this transformation, provided that it is effectively channeled through appropriate supply chain practices and information systems (Rashid *et al.*, 2025) ^[12].

The study also highlights the importance of context in understanding sustainable supply chain management. The Congolese cobalt industry operates within a unique institutional environment characterized by governance challenges, infrastructure deficits, and significant stakeholder pressures (Lewis, 2024) ^[9]. These contextual factors shape both the challenges and opportunities for sustainability transformation, underscoring the need for context-sensitive approaches to research and practice in sustainable supply chain management (Acquah, 2024) ^[1].

In conclusion, this research provides empirical evidence that managerial green commitment is a valuable strategic resource that, when effectively deployed through supply chain management practices and information systems, can significantly enhance sustainable supply chain performance in the Congolese cobalt industry. As the world continues its transition toward sustainable energy, the findings of this study offer timely and relevant insights for promoting sustainability in one of the world's most strategically important mineral supply chains (Bahizire *et al.*, 2024) ^[3].

Limitations of the Study and Suggestion for Future research

Several limitations of this study should be acknowledged. First, the cross-sectional design limits causal inferences, and longitudinal research is needed to confirm causality and examine temporal dynamics (Creswell & Creswell, 2022; Bahizire *et al.*, 2024) ^[3, 6]. Second, reliance on self-reported

data may introduce social desirability bias despite procedural remedies, and future research should incorporate objective performance measures (Podsakoff *et al.*, 2024; Tetteh *et al.*, 2024) ^[10]. Third, the exclusive focus on the Congolese cobalt industry limits generalizability, and future studies should examine these relationships in other extractive industries and developing country contexts (Acquah, 2024; Rashid *et al.*, 2025) ^[1, 12]. Fourth, the study did not explore potential moderators such as institutional instability, organizational culture, stakeholder pressure, and regulatory enforcement, which warrant future investigation (Lewis, 2024; Bahizire *et al.*, 2024) ^[3, 9]. Fifth, the quantitative approach may not capture the full complexity of sustainability practices, and qualitative or mixed-methods research could provide richer contextual insights (Acquah, 2024) ^[1]. Finally, future research should critically examine negative aspects such as greenwashing and the authenticity of managerial motivations underlying green commitment (Lewis, 2024) ^[9].

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