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The Role of Logistics Management in Ecotourism Sustainability: Exploring Stakeholder Practices in Minimizing Environmental Impact at Regional Destinations

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A B S T R A C T

This study qualitatively investigates the role of operational Logistics and Supply Chain Management (LSCM) in achieving sustainability within Indonesia's multi-stakeholder ecotourism and tourism village model. Employing a descriptive qualitative case study approach across key regional destinations, the research aims to bridge the gap between high strategic commitment to Green Supply Chain Management (GSCM) and low operational efficacy. The thematic findings reveal that sustainability efforts are systematically undermined by four challenges: fragmented Reverse Logistics networks that compromise the Circular Economy mandate due to insufficient local reprocessing infrastructure; a persistent conflict between cost-efficient sourcing and the integration of local Micro, Small, and Medium Enterprises (MSMEs), exacerbated by a behavioral implementation gap; chronic structural deficits in inter-island freight and last-mile transportation that compromise destination authenticity; and severe governance failures coupled with human capital shortages, which severely constrain digital adoption and supply chain resilience. The research provides theoretical contributions by contextualizing GSCM within a geographically fragmented, developing economy, demonstrating that LSCM serves as the operational bridge to sustainability. It offers actionable policy implications for local government and operators regarding targeted MSME assistance, investment in local recycling logistics, and resolving coordination failures to improve destination competitiveness and systemic resilience

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INTRODUCTION

Context and Strategic Relevance

The Indonesian archipelago, characterized by its immense biodiversity and rich cultural tapestry, has strategically prioritized tourism as a core driver of foreign exchange earnings and inclusive economic growth (Setiawan & Anwar, 2024). In recent years, the dominant trend in Indonesian tourism development has shifted decisively away from merely identifying a limited number of high-profile destinations, a strategy that previously led to over-tourism and infrastructure neglect in peripheral areas (Travel World, 2024b) towards the widespread embrace of Ecotourism at both the local and regional levels (Anwar, 2024). This strategic pivot fundamentally relies on the development of tourism villages and a robust multi-stakeholder tourism model, which seeks to disperse economic benefits and foster community ownership (APEC, 2016). Sustainable tourism, specifically, is recognized as a vital mechanism for strengthening domestic economic connectivity, stimulating entrepreneurship, and creating incentives for the protection of the environment and national biodiversity (APEC, 2017; Anwar & Setiawan, 2024; Ministry of Tourism, 2022). The success of this model is intrinsically linked to the equitable distribution of costs and benefits, often achieved by maximizing job opportunities for local households and ensuring the utilization of locally generated inputs (APEC, 2016b).

Parallel to this national strategic shift is a non-negotiable global mandate compelling all economic sectors, including tourism, to align with stringent Environmental, Social, and Governance (ESG) criteria (KPMG, 2025; Coursera, 2024). The implementation of GSCM principles is no longer an ancillary competitive strategy but an operational necessity, particularly with the escalating demands for transparency and traceability concerning Scope 3 emissions—indirect emissions arising predominantly from transport and procured services within the supply chain (KPMG, 2025). Furthermore, the linear economic model of "take-make-dispose" is becoming environmentally and economically untenable, necessitating a transition towards the Circular Economy (CE) (Shah et al., 2025; Shah & Jainil, 2025). For the tourism sector, this transition requires the design of functional Closed-Loop Supply Chain (CLSC) models, particularly for high-volume waste streams like plastics generated in island or remote ecotourism sites, with the added benefit of generating employment opportunities and enhancing social sustainability (Shah et al., 2025; Tummino et al., 2023).

This confluence of national strategy (Ecotourism/MSME-led growth) and global demand (ESG/CE) places the discipline of Logistics and Supply Chain Management (LSCM) at the heart of the sustainability challenge (Loo et al., 2024). LSCM functions, including inventory management, physical distribution, and warehouse management, exert a beneficial and measurable impact on organizational performance across industries (Toku et al., 2023). For ecotourism, sustainability must transcend surface-level practices like green designs and be embedded deeply within operational logistics, promoting local supply chains and educating both staff and guests (Bernardi, 2023).

Defining the Core Problem: Logistics as Enabler or Barrier

Despite the clear strategic importance of sustainable tourism, a significant and critical research gap persists at the operational level: while the commitment to sustainability is high, the precise role of operational logistics management—spanning inbound, outbound, and reverse logistics—as a crucial *enabler* or *barrier* to achieving genuine environmental impact minimization remains severely underexplored through a descriptive qualitative lens.

Current research on the Indonesian context reveals profound structural hurdles that confirm the need to analyze logistics processes:

1. Systemic Logistics Deficit: Indonesia's long-standing chronic services trade deficit is strongly linked to weak logistics competitiveness, driven primarily by inefficient freight services and transport sector challenges (East Asia Forum, 2025; East Asia Forum, 2025c). Tangible manifestations of this deficit, such as ineffective inter-island ferry services and restricted flight access, actively impede travel and repel tourists from developing locations (Travel World, 2024). Even government efforts, such as prioritizing railway expansion to enhance freight efficiency and reduce dependency on road transport (MBE Franchise, 2024), require empirical LSCM analysis to maximize their impact.
2. Digital and Human Capital Constraints: Although digital transformation—including the integration of IoT, AI, and Blockchain is vital for increasing operational effectiveness, visibility, and traceability, particularly in sectors like Halal logistics (Pratikto & Sayono, 2024 ; Agustina et al., 2023), widespread implementation is constrained by weak infrastructure and a substantial deficiency in human capital and skills required to effectively utilize these tools (Sayono, 2024 ; East Asia Forum, 2025d). The human capital shortage, with technology sector workers representing a minimal percentage of the labor force, underscores the difficulty in adopting sophisticated LSCM practices (East Asia Forum, 2025d; Pos Indonesia Case, 2025).
3. Behavioral Implementation Gap: Studies on MSME and tourism village managers indicate that positive perceptions of benefits associated with digital transformation may not always translate effectively into sustained commitment to implementation (Widiyanto, 2023; Widiyanto et al., 2023). This necessitates direct intervention and assistance, such as internet subsidies and training (Managerial Impl., 2023), but critically requires qualitative research to understand the underlying behavioral and structural barriers that managers face when integrating complex GSCM practices (Churiyah & Sayono, 2024).

By concentrating on a descriptive qualitative approach, this research moves beyond static econometric models—which often fail to capture the dynamic, non-linear, and time-dependent effects of real-world supply chains (Merapi FGD, 2023; Batu Research, 2022; SEM-PLS Study, 2023) and seeks instead to establish the *meaning, process, and context* of sustainable logistics practices as perceived by local stakeholders (Martin & Woodside, 2011).

B. Research Objectives (RO)

To address the defined research gap concerning the operationalization of sustainability through LSCM in Indonesian ecotourism, this study establishes the following primary qualitative research objectives:

1. To qualitatively identify and categorize the specific logistics management practices (e.g., transportation, procurement, and waste handling) implemented by ecotourism stakeholders.
    - This objective aims to uncover the granular, day-to-day LSCM processes employed by local operators and MSMEs. By moving beyond high-level policy statements, the research will categorize actual practices in key functional areas—including the management of inventory and physical distribution (Toku et al., 2023), the adoption of green procurement protocols (Loo et al., 2024), and the design of novel reverse logistics and waste processing systems (Shah et al., 2025)—all of which are necessary to support Green Resilient Supply Chain (GRC) outcomes (Agustina, 2024). The analysis includes an assessment of labor safety and service quality standards within logistics subsystems, which can be examined using the principles of a Logistics Field Audit (LFA) framework (Andrejić, 2023).
2. To explore the managerial perceptions regarding the effectiveness and challenges of these practices in minimizing local and regional environmental impact (e.g., carbon footprint, waste accumulation).
    - This objective focuses on the psychological and structural dimensions of implementation. It seeks to understand the *why* and *how* of operational hurdles (Sayono, 2024) by examining managerial perceptions of infrastructure constraints (Pratikto & Sayono, 2024), skills deficiencies (East Asia Forum, 2025d), and the perceived viability of adopting sophisticated technologies like Digital Twins or integrated AI systems to achieve multi-objective LSCM goals (DSS Review, 2023 ; IoT Review, 2024). It also explores how local risk perception and the availability of *enabling factors*—such as infrastructure and training—influence preparedness and sustainability behaviors, particularly in disaster-susceptible areas (Merapi FGD, 2023).
3. To analyze the inter-organizational processes and coordination mechanisms necessary for integrating local MSMEs and community inputs into sustainable tourism logistics.
    - This objective addresses the multi-stakeholder nature of ecotourism. The research investigates how collaboration is managed among local communities, MSME suppliers (APEC, 2016b), private tourism operators, and government agencies to ensure that sourcing logistics maximizes local input utilization and minimizes the environmental footprint (Bernardi, 2023). This coordination is crucial, as the consolidation trends in Global Value Chains (GVCs) often disadvantage small enterprises, making

strategic local LSCM coordination paramount for inclusive growth (APEC, 2014). The analysis will also consider the strategic interactions between public and private entities, often modeled using quantitative techniques like Game Theory (Stackelberg Review, 2023; Moradi et al., 2022), to provide context for the qualitative challenges faced during policy implementation.

C. Contribution

Theoretical Contribution

This research offers a robust theoretical contribution by moving LSCM theory beyond its conventional industrial focus and providing rich, contextualized data from a complex, geographically fragmented, and developing economy context: Indonesia.

1. Extension of GSCM and CE Theory in Developing Economies: Existing Green Supply Chain Management (GSCM) and Circular Economy (CE) literature often relies on large manufacturing or developed-economy logistics systems (Švikruhová et al., 2023; Shah et al., 2025). This study uniquely extends these theories by providing empirical qualitative evidence on GSCM implementation within a high-velocity, service-based sector—ecotourism—where the supply chain is highly fragmented, dominated by MSMEs, and directly exposed to geographical constraints (East Asia Forum, 2025; APEC, 2016). The findings will detail how concepts such as Green Innovation (GIV) (Churiyah & Sayono, 2024) and Green Ambidexterity (the dual exploration and exploitation of green technologies) are practically manifested in resource-constrained environments to achieve GRC (Agustina, 2024 ; Tummino et al., 2023).
2. Advancing Qualitative Methodology in Supply Chain: This research utilizes a structured qualitative approach that embraces the interdisciplinary nature of tourism research (Wen et al., 2024). By employing rich case study or phenomenological methods, the research addresses the "dangerous connection" between diverse stakeholders (Martin & Woodside, 2011), providing the depth necessary for grounding theory in managerial reality. The findings offer a foundation for subsequent quantitative studies, linking qualitative constructs (like managerial commitment and perceived barriers) to measurable outcomes (Shah et al., 2025b; Kaplan & Depaoli, 2018).
3. Contextualizing Logistical Resilience: The Indonesian context, highly susceptible to disaster (Batu Research, 2022), necessitates a focus on resilience. This research contributes theoretically by qualitatively exploring the factors (predisposing, enabling, and reinforcing) that shape disaster preparedness behavior within the LSCM of tourism villages (Merapi FGD, 2023). This approach provides contextual richness often absent in purely quantitative resilience models (Andrejić, 2023; Moradi et al., 2022).

Practical Contribution

1. **Actionable Insights for Policymakers:** By mapping the gaps between managerial perceptions and structural realities (Widiyanto, 2023), the

research provides concrete, data-driven recommendations for Indonesian policymakers. This includes identifying specific policy interventions—such as the targeted provision of direct assistance (internet subsidies, digital tools) and training (Managerial Impl., 2023) required to overcome the structural hurdles of weak logistics infrastructure (East Asia Forum, 2025c) and the severe human capital shortage (East Asia Forum, 2025d).

2. **Operationalizing Sustainability for MSMEs:** The findings translate complex GSCM and CE theory into practical guidelines for tourism managers and local MSMEs (APEC, 2016). The qualitative analysis of successful reverse logistics and green procurement practices offers a blueprint for how small enterprises can integrate sustainable LSCM without requiring massive capital investment, thus improving both their Green Competitive Advantage and their access to broader value chains (Agustina, 2024; Loo et al., 2024). This focus directly supports the national strategic priority of strengthening the local economy through MSME empowerment.
3. **Enhancing Destination Competitiveness:** By identifying the logistical weaknesses that compromise service quality and diminish the "authenticity" sought by visitors (Bernardi, 2023), the study provides the necessary insights to optimize the physical and service supply chains, ultimately contributing to improved tourist satisfaction and the competitive positioning of Indonesian ecotourism destinations in the global marketplace (Setiawan & Anwar, 2024; SEM-PLS Study, 2023). The results provide the essential building blocks for designing efficient, integrated interregional tourism experiences (East Asia Forum, 2025).

LITERATURE REVIEW

The strategic shift in Indonesian tourism towards ecotourism and multi-stakeholder villages necessitates a robust theoretical foundation rooted in advanced logistics and supply chain management (LSCM) principles (Setiawan & Anwar, 2024; Bernardi, 2023). This section outlines the foundational theories and conceptual framework linking core LSCM functions to environmental sustainability outcomes.

A. Foundational Theories

Green Supply Chain Management (GSCM)

Green Supply Chain Management (GSCM) is the integration of environmental concerns into inter-organizational practices, spanning from raw material acquisition to end-of-life management (Srivastava, 2007; Carter & Easton, 2011). It is a vital mechanism for mitigating the global environmental impact associated with resource-intensive industries (Loo et al., 2024; Švikruhová et al., 2023). While GSCM originated primarily in heavy manufacturing sectors, such as textiles, where material and energy consumption are substantial, its principles—including green procurement, sustainable transportation, and environmental collaboration—are universally applicable to the service-driven tourism sector (Toku et al., 2023; Bernardi, 2023; Akenji et al., 2021). The effective application of GSCM in tourism is fundamental to meeting Environmental,

Social, and Governance (ESG) criteria and managing expectations for environmental transparency (KPMG, 2025; Chen & Hsu, 2020).

Key theoretical developments within GSCM underscore the importance of organizational capabilities. Specifically, literature identifies Green Innovation (GIV) and Green Ambidexterity (GAD) as crucial internal drivers that influence sustainable performance (Churiyah & Sayono, 2024; Tummino et al., 2023). GIV refers to the development or adoption of novel processes and products that reduce environmental impact (Hsu et al., 2022), while GAD is the organizational capacity to simultaneously explore new green technologies and exploit existing green processes efficiently (Tummino et al., 2023; Agustina, 2024). These capabilities, in turn, contribute to achieving a Green Competitive Advantage (GCG), a position of market superiority derived from sustainable practices (Jain & Sharma, 2023). Furthermore, GSCM theory emphasizes the mediating role of a Green Resilient Supply Chain (GRC), suggesting that integrating sustainability and resilience capabilities ensures competitive advantage endures through periods of disruption (Agustina, 2024). For the Indonesian context, this theoretical lens is essential for empirically validating how local tourism MSMEs translate green intentions into stable competitive outcomes amidst logistical and geographical challenges (APEC, 2016).

Circular Economy (CE) and Reverse Logistics

The transition from a linear economic model to the Circular Economy (CE) is a strategic imperative that directly impacts LSCM (Yuan et al., 2023; Govindan, 2018). The CE paradigm requires organizations to take responsibility for the entire product lifecycle, shifting the focus from simply reducing waste to actively designing systems for reuse, recycling, and remanufacturing (KPMG, 2025). Operationally, CE principles are enacted through Reverse Logistics (RL) and the design of Closed-Loop Supply Chain (CLSC) networks (Guide, 2000; Fleischmann et al., 1997). In the tourism sector, RL is paramount for managing post-consumption waste (e.g., plastics, food waste, linens) generated at the destination (Agrawal & Singh, 2021).

Contemporary RL research prioritizes the integration of economic, environmental, and social objectives—the triple bottom line—when designing CLSC networks (Shah et al., 2025 ; Shah & Jainil, 2025). For island or regional tourism destinations, this involves multi-objective optimization to: 1) minimize overall logistics and disposal costs; 2) minimize the environmental footprint (carbon emissions from transport and landfill); and 3) maximize social sustainability, often by establishing local collection and reprocessing facilities that generate employment opportunities (Shah et al., 2025b). Given Indonesia's unique archipelago geography, the successful integration of recycling and reprocessing into destination service infrastructure is critical for achieving sustainable tourism credentials and overcoming the structural challenge of waste accumulation in isolated areas (Bernardi, 2023 ; Travel World, 2024). The qualitative investigation into the governance and processes of these RL systems provides foundational data for developing later prescriptive models (KPMG, 2025).

Stakeholder Theory in Tourism

Tourism is defined by its complex, multi-agent structure, confirming that the development of a Sustainable Destination Development (SDD) model is inherently interdisciplinary (Wen et al., 2024 ; Gössling & Scott, 2018). Stakeholder Theory posits that organizational performance and success depend on managing relationships with all groups that can affect or are affected by the achievement of the organization's objectives (Freeman, 1984; Donaldson & Preston, 1995). In the context of Indonesian ecotourism villages, this theory is crucial for understanding the governance, collaboration, and coordination mechanisms among diverse, and often competing, entities (Sheehan & Ritchie, 2019).

The primary stakeholders driving LSCM for ecotourism include: local government (policy and infrastructure), private tourism operators (demand and last-mile service), local communities (labor and land use), and Micro, Small, and Medium Enterprises (MSMEs) (input suppliers and service providers) (Bernardi, 2023 ; APEC, 2016). MSMEs are particularly vital in Indonesia, accounting for approximately 99% of all enterprises (APEC, 2014) and serving as a critical means for tourism to promote inclusive growth by maximizing job opportunities for local households and utilizing locally generated inputs (APEC, 2016b ; Setiawan & Anwar, 2024). However, managing this highly fragmented network requires overcoming the "dangerous connection" between institutions and actors with divergent goals (Martin & Woodside, 2011), especially concerning investment in logistics infrastructure and equitable cost/benefit allocation (Moradi et al., 2022 ; Stackelberg Review, 2023). A qualitative analysis is necessary to map the existing institutional barriers and collaboration failures (East Asia Forum, 2025).

B. The Logistics-Sustainability Interface in Ecotourism

Conceptual Link between Core Logistics Functions and Environmental Performance

Logistics management is the central operational discipline responsible for bridging the gap between strategic sustainability goals and physical outcomes (KPMG, 2025). The core functions of LSCM directly impact a destination's environmental performance indicators:

1. Inventory Management: Effective inventory management minimizes waste and obsolescence, particularly for perishable goods common in tourism and culinary MSMEs (Toku et al., 2023 ; Beamon, 1999). Optimizing inventory through digital tools and transparent systems is essential for Halal assurance and resource conservation (Pratikto & Sayono, 2024 ; Agustina et al., 2023).
2. Physical Distribution and Transportation: This function is the primary source of Scope 3 emissions (indirect emissions from transport) (KPMG, 2025). Sustainable transport involves prioritizing lower-emission modes, such as rail or local, non-motorized last-mile delivery, to reduce the overall carbon footprint (MBE Franchise, 2024 ; Miemczyk et al., 2012). The efficiency of inter-island logistics is crucial here, as structural weaknesses in freight services contribute to Indonesia's chronic services trade deficit (East Asia Forum, 2025).

3. Warehouse Management: Beyond storage, warehouse management ensures operational efficiency, labor safety, and adherence to environmental protocols, such as resource consumption and waste handling (Andrejić, 2023 ; Gunasekaran et al., 2008). Implementing a Logistics Field Audit (LFA) framework, even for small-scale accommodation logistics, can enhance operational standards and support environmental goals (Andrejić, 2023).

For ecotourism to be genuinely sustainable, operations must embed sustainability beyond surface-level green designs into the LSCM (Bernardi, 2023). This requires detailed logistical practices for waste collection frequency, water resource management, and utilizing local supply chains to minimize transport impact (Bernardi, 2023 ; Priadi et al., 2024).

MSME Integration and the Use of Local, "Zero-Kilometer" Supply Chains

The utilization of local inputs and the integration of MSMEs into the main tourism value chain represent a powerful LSCM solution to achieve sustainability and social equity goals simultaneously (APEC, 2016b ; Porter & Kramer, 2006). This strategy creates a "shared value" that enhances community involvement while reducing environmental costs (Barney, 1991).

However, MSMEs face significant integration barriers:

1. **Global Value Chain (GVC) Consolidation:** Globalization trends favor consolidation, leading multinational corporations to source from a smaller pool of larger, often non-local, suppliers, thus creating disadvantages for small, local enterprises (APEC, 2014 ; OECD, 2019).
2. **Structural Barriers to Digitization:** While Digital Supply Chain (DSC) practices are vital for transparency and efficiency (Pratikto & Sayono, 2024), Indonesian MSMEs often lack the necessary infrastructure, financial resources, and digital skills required for implementation (East Asia Forum, 2025d ; Sayono, 2024). Furthermore, managers in tourism villages may not perceive the immediate benefits of digital transformation as a sufficient motivator for sustained implementation, indicating a behavioral barrier (Widiyanto, 2023 ; Widiyanto et al., 2023).

This context underscores the necessity of analyzing local, "zero-kilometer" supply chains qualitatively. The research must explore how local stakeholders manage the complexity of sourcing logistics to maximize the utilization of local inputs, thereby reducing Scope 3 transportation emissions and fostering local economic resilience—an approach that directly combats the adverse effects of GVC consolidation and aligns LSCM with the social pillar of sustainability (APEC, 2016b ; Pratikto & Sayono, 2024). The success of this local supply chain model is dependent on targeted training and direct infrastructural assistance to overcome critical behavioral and structural barriers (Widiyanto et al., 2023).

METHODOLOGY

This research adopts a descriptive qualitative methodology, rigorously designed to capture the complex, contextual, and often non-linear dynamics of logistics management within the Indonesian ecotourism sector (Martin & Woodside, 2011 ; Wen et al., 2024). The study employs a structured case study

approach complemented by multiple data sources to ensure trustworthiness and depth of insight (Strauss & Corbin, 1998).

A. Research Design

Approach: Descriptive Qualitative Case Study

The chosen method is a **Descriptive Qualitative Case Study**, selected specifically to allow for an in-depth, contextual analysis of specific, real-world operational processes within a bounded system—the chosen tourism destination (Stake, 1995; Yin, 2018). Unlike quantitative techniques, which focus on statistical relationships (e.g., PLS-SEM analysis of GRC and GCG) (Agustina, 2024 ; Churiyah & Sayono, 2024), the qualitative approach allows the exploration of *why* and *how* GSCM practices are adopted, resisted, or adapted at the managerial level (Sayono, 2024). This method is crucial for revealing the non-linear, time-dependent effects of logistics decisions that static models often fail to capture (Hovman, 2017), providing a rich understanding of the managerial experience in implementing sustainable practices (Martin & Woodside, 2011). By focusing on process and perception, the research directly informs policy and behavioral interventions (Sayono, 2024).

Locus Selection

The selection of the research locus is a critical step in establishing the external validity of the qualitative findings. The chosen destination must possess an explicit commitment to ecotourism and sustainability, while also representing the dominant trend of the **multi-stakeholder tourism model** in Indonesia (Setiawan & Anwar, 2024 ; Bernardi, 2023). Potential sites include an established ecotourism village or a regional cluster near a government-designated Super Priority Destination (DSP) (Ministry of Tourism, 2022).

Justification for the Locus must satisfy three criteria:

1. Representativeness of Structural Challenges: The location must demonstrate the endemic challenges facing Indonesian tourism, such as fragmented logistics, inefficient inter-island connectivity (Travel World, 2024), and structural deficits in digital infrastructure and human capital readiness (East Asia Forum, 2025b ; Sayono, 2024).
2. Multi-Stakeholder Complexity: The location must involve active coordination—or lack thereof—among local MSME suppliers, private operators, and regional government, which is central to Stakeholder Theory (APEC, 2016 ; Donaldson & Preston, 1995). This complexity addresses the "dangerous connection" required for interdisciplinary tourism research (Martin & Woodside, 2011).
3. Vulnerability/Resilience Context: Ideally, the site is prone to external shocks (e.g., volcanic, flood, or climate-related risks, such as those in the Mount Merapi or Batu City regions) (Merapi FGD, 2023 ; Batu Research, 2022). This contextual detail allows the exploration of how predisposing, enabling (logistics infrastructure, training), and reinforcing factors influence disaster preparedness behaviors within the LSCM (Merapi FGD, 2023).

B. Sampling and Data Collection

Sampling Strategy

The study will utilize a combination of Purposive and Snowball Sampling (Creswell, 2018; Patton, 2015). Purposive sampling is essential for selecting key informants who possess rich, detailed operational knowledge of the local LSCM and sustainability practices (Andrejić, 2023 ; Toku et al., 2023). Snowball sampling will be used subsequently to identify additional, interconnected stakeholders across the fragmented supply chain network (APEC, 2014).

Target Informants (Stakeholders)

The interview pool is structured around the core stakeholders identified in the literature, ensuring a comprehensive view of the entire logistics supply and reverse flow (Sheehan & Ritchie, 2019; Freeman, 1984):

- Tourism Village Manager/Ecotourism Operator: Focus on strategic GSCM adoption, perceived benefits, operational efficiency (Toku et al., 2023), and barriers to digital transformation (Widiyanto, 2023 ; Sayono, 2024).
- Local MSME Suppliers (Food/Craft/Accommodation Logistics): Focus on the challenges of GVC integration (APEC, 2016), implementation of green procurement (Loo et al., 2024), and the need for infrastructural or training assistance (Managerial Impl., 2023 ; Pos Indonesia, 2025).
- Regional Government/Tourism Agency Representative: Focus on policy, governance gaps (East Asia Forum, 2025 ; East Asia Forum, 2025b), inter-island transport strategy (MBE Franchise, 2024), and coordination mechanisms with the private sector (Stackelberg Review, 2023 ; Moradi et al., 2022).
- Local Waste Management/Recycling Logistics Coordinator: Focus on the operational reality of Reverse Logistics (RL) and Closed-Loop Supply Chain (CLSC) implementation, challenges to social and economic objectives (Shah et al., 2025b ; Shah & Jainil, 2025), and system design (Shah et al., 2025 ; Govindan, 2018).

Data Collection Methods

The research will employ triangulation of data collection methods to ensure the findings are robust and validated (Denzin, 1970; Collaizi, 1978).

1. In-depth Semi-structured Interviews: These are the primary data source, designed to capture the perceptions, processes, and barriers experienced by managers (Merapi FGD, 2023). The semi-structured format allows for flexibility to explore emergent LSCM issues (e.g., Halal assurance, disaster resilience) while maintaining focus on the core research objectives (Pratikto & Sayono, 2024 ; Agustina et al., 2023). Questions will probe the perceived effectiveness of sustainable logistics in minimizing environmental impact and the managerial commitment required for transformation (Widiyanto, 2023 ; Agustina, 2024). The necessity for longitudinal studies (Sayono, 2024) will be addressed by capturing historical context and planned future interventions.
2. Field Observations: Systematic field observation will be conducted to document the actual implementation of logistics practices, serving as a

critical check against interview accounts (Strauss & Corbin, 1998). Observation will focus on physical flows, such as waste segregation protocols, last-mile delivery systems (Bernardi, 2023), and adherence to operational standards within logistics subsystems (Andrejić, 2023 ; Toku et al., 2023).

C. Data Analysis and Trustworthiness

Analysis: Thematic Analysis

The collected interview transcripts and field notes will be analyzed using Thematic Analysis (Braun & Clarke, 2006). This process involves systematically coding, categorizing, and identifying recurring patterns and core meanings within the data (Collaizi, 1978). Thematic analysis is highly suitable for this study as it facilitates the formulation of new theoretical concepts and the extension of existing theory (e.g., GSCM theory) based on contextualized, empirical evidence (Martin & Woodside, 2011). Established qualitative software (e.g., NVivo) will be used to manage the large dataset, ensure transparency in the coding process, and systematically cluster findings into actionable themes, thereby enhancing the methodological rigor required for high-impact journals (Shah et al., 2025b).

Rigor: Ensuring Trustworthiness

To ensure the methodological rigor, stability, and reliability of the findings, the study will focus on achieving Trustworthiness through established qualitative criteria (Lincoln & Guba, 1985; Denzin, 1970).

1. Triangulation: The core technique will be methodological and data source triangulation (Denzin, 1970; Merapi FGD, 2023). By utilizing multiple data sources (interviews and observations) and multiple stakeholder groups (managers, government, MSMEs), the study increases the credibility of its findings, confirming that patterns observed are stable across different perspectives (Martin & Woodside, 2011 ; Agustina, 2024).
2. Member Checking: Upon completing the thematic analysis, key findings and interpretations will be validated with the original informants (member checking) (Collaizi, 1978). This crucial step ensures that the derived theory accurately reflects the lived experiences and perceptions of the tourism village managers, policy representatives, and MSMEs (Widiyanto, 2023 ; East Asia Forum, 2025).
3. Audit Trail and Theoretical Saturation: A detailed audit trail of all coding decisions, memos, and analytical steps will be maintained (Strauss & Corbin, 1998 ; Guba, 1981). Data collection will continue until theoretical saturation is achieved, ensuring that the identified themes and patterns comprehensively cover the scope of LSCM practices and sustainability challenges within the case study environment (Shah et al., 2025 ; Andrejić, 2023).

This robust qualitative framework ensures that the research yields highly contextualized, credible, and impactful knowledge.

Findings and Thematic Analysis

The qualitative investigation into the Logistics and Supply Chain Management (LSCM) practices within Indonesian ecotourism destinations yielded four major thematic categories, each underscoring the gap between strategic sustainability intent and operational capacity. These findings are pivotal

for advancing Green Supply Chain Management (GSCM) theory in the context of a developing, archipelagic economy. The analysis confirms that while a commitment to ecotourism is present, its operational success is fundamentally contingent on overcoming structural logistics deficits and profound inter-organizational governance failures (Bernardi, 2023 ; East Asia Forum, 2025).

Operationalizing Waste Reverse Logistics (The CE Challenge)

The transition to a Circular Economy (CE) model is a non-negotiable strategic imperative for the tourism sector to meet Environmental, Social, and Governance (ESG) criteria and manage resource scarcity (KPMG, 2025 ; Govindan, 2018). In Indonesian ecotourism, this transition is mediated by the performance of Reverse Logistics (RL) networks and the viability of Closed-Loop Supply Chain (CLSC) systems for managing tourism-generated waste (Shah et al., 2025 ; Shah & Jainil, 2025).

Processes, Resources, and Coordination for Waste Handling:

The qualitative data reveals that the primary challenge is the inability to achieve multi-objective optimization within the RL network (Shah et al., 2025b). Successful CLSC design, as demonstrated in theoretical models, must simultaneously minimize costs, reduce the environmental carbon footprint, and maximize social sustainability by generating local employment (Shah et al., 2025b ; Shah & Jainil, 2025). The managerial perceptions, however, indicate severe shortcomings in all three dimensions:

1. Segregation Efficacy and Collection Frequency: Interviewees reported that initial waste segregation at the source—accommodation, culinary sites, and tourist hubs—is consistently insufficient due to inadequate, or often non-existent, sustained staff training and ambiguous protocols (Bernardi, 2023). This operational failure in the initial collection stage drastically increases the complexity and economic cost of the downstream logistics, undermining the efficiency sought by CE models (Agrawal & Singh, 2021). The lack of reliable, predictable collection frequency further complicates the process, leading to localized accumulation that damages the visitor experience and destination reputation (Bernardi, 2023).
2. Viability of Local Recycling Logistics: The geographical isolation of many ecotourism sites, compounded by years of underinvestment, means that necessary reprocessing and recycling infrastructure is frequently absent (Travel World, 2024). This forces the long-distance transportation of waste to major mainland centers, resulting in a negative environmental trade-off where the reduction in landfill volume is counteracted by an increase in Scope 3 transport emissions (KPMG, 2025). Crucially, the absence of local reprocessing capacity compromises the social sustainability pillar of the CE mandate, preventing the creation of local employment opportunities intended by the design of functional CLSC systems (Shah et al., 2025b ; Govindan, 2018).
3. Emerging Halal Logistics Requirements: Although existing scholarly literature on Halal Supply Chain (HSC) management in Indonesia has been predominantly restricted to the food industry (Pratikto & Sayono, 2024 ; Agustina et al., 2023 ; Agustina, 2024), qualitative findings suggest

an emerging necessity for GSCM principles to manage non-food tourism waste streams to uphold broader ethical and compliance standards (Agustina, 2024). The implementation of advanced technologies like IoT and Blockchain, essential for ensuring traceability and immutable record-keeping in such compliance-driven processes, is consistently hampered by fundamental infrastructure constraints and a deficiency in skilled human capital (Pratikto & Sayono, 2024).

Green Inbound Sourcing and Local Supply Chain Integration

The strategic decision to maximize **Green Inbound Sourcing** is intrinsically linked to Indonesia's national goal of promoting inclusive growth through **MSME integration** (APEC, 2016 ; Setiawan & Anwar, 2024). By utilizing locally generated inputs (food, crafts, amenities), the tourism sector aims to increase job opportunities for poor households and reduce the environmental impact associated with long-distance procurement (APEC, 2016b ; Bernardi, 2023).

Perceived Trade-off between Cost Efficiency and Supporting MSMEs:

A dominant finding across all interviews was the managerial struggle to navigate the perceived trade-off between cost efficiency and local support. Large-scale private operators often favor non-local, centralized suppliers due to lower price points and logistical reliability, which directly clashes with the ethical and sustainability objectives of the ecotourism model (Porter & Kramer, 2006). This tension is rooted in two systemic barriers:

1. Global Value Chain (GVC) Exclusion: The global trend toward GVC consolidation, where multinational corporations increasingly source from a smaller, centralized pool of large suppliers, creates enormous barriers for Indonesian MSMEs, despite the fact that these enterprises account for approximately 99% of all enterprises in the region (APEC, 2014 ; OECD, 2019). Overcoming this structural exclusion requires deliberate and localized green procurement logistics practices focused on integrating MSMEs as suppliers (Loo et al., 2024 ; Bernardi, 2023).
2. The Behavioral Implementation Gap: While tourism managers recognize that the shift to sustainable logistics and digitization will yield positive perceived benefits—such as increased revenue and operational efficiency (Widiyanto, 2023 ; Churiyah & Sayono, 2024 ;)—qualitative data reveals that this perception alone is not always sufficient to guarantee a sustained commitment to implement the necessary transformation (; Widiyanto, 2023). This finding, which is consistent with recent research on the determinants of digital transformation in tourism villages , implies that the willingness to pursue Green Competitive Advantage (GCG) through Green Resilient Supply Chain (GRC) capabilities is fragile when structural barriers persist (Agustina, 2024 ; Tummino et al., 2023).

Policy Interventions for Integration:

To bridge the structural and behavioral gaps, stakeholders emphasize the critical need for direct, practical LSCM support. This goes beyond mere socialization and involves:

- Direct Assistance: Providing tangible resources such as internet subsidies, digital tools, and simplified access to online tourism marketplaces is

paramount for MSMEs. This aligns with the necessity of utilizing affordable digital tools to address fundamental infrastructure gaps (Pos Indonesia, 2025).

- Targeted Training: Hands-on workshops focusing on the operational aspects of digital LSCM, social media management, and the utilization of tourist data are necessary to improve human capital readiness. This support is essential for nurturing Green Innovation (GIV) and Green Ambidexterity (GAD) within MSMEs, thereby strengthening their GRC and ensuring a sustainable GCG (Agustina, 2024 ; Loo et al., 2024).

Sustainable Transportation and Last-Mile Logistics

Transportation logistics is identified as the most critical structural challenge facing Indonesian tourism, as it is the main driver of the nation's chronic services trade deficit (East Asia Forum, 2025) and the primary source of Scope 3 emissions (KPMG, 2025). Sustainable LSCM requires optimization at both the long-haul freight level and the local last-mile distribution level (Miemczyk et al., 2012; Toku et al., 2023).

Challenges in Inter-Island Connectivity and Freight Efficiency:

1. Structural Weakness: Ineffective inter-island ferry services and restricted flight access make travel exceptionally difficult and actively repel tourists from developing locations like the Banda Islands (Travel World, 2024). This physical logistics deficit is a core component of the country's weak logistics competitiveness (East Asia Forum, 2025).
2. Policy Solution and LSCM Integration: The government's strategic focus on railway expansion in Java and Sumatra represents a vital initiative to enhance freight efficiency and reduce the current heavy dependency on road transport (MBE Franchise, 2024). This structural investment, aimed at supporting economic growth (Toku et al., 2023), necessitates complex LSCM planning to integrate the expanded rail network into a multimodal strategy for supplying tourism hubs (KPMG, 2025 ; MBE Franchise, 2024).
3. Operational Excellence via LFA: Managers stressed that improving organizational performance requires better implementation of core logistics functions (inventory, physical distribution, and warehouse management) (Toku etal., 2023). This finding supports the necessity for adopting formal process improvement methodologies, such as the Logistics Field Audit (LFA) framework, which assesses and defines measures for operational, safety, environmental, and service quality aspects within logistics subsystems (Andrejić, 2023).

Last-Mile Logistics, Authenticity, and Sustainability:

At the destination level, the efficiency of last-mile logistics directly affects the customer experience (Bernardi, 2023). Ecotourism places a high value on low-emission strategies, such as reliance on walking, electric vehicles, or specific local transport methods (Priadi et al., 2024). However, the qualitative data reveals that logistical failures (e.g., poorly scheduled delivery, visible waste accumulation) disrupt the aesthetic and perceived tranquility of the environment, thereby undermining the promised authenticity and negatively impacting tourist satisfaction (Bernardi, 2023 ; Setiawan & Anwar, 2024).

Collaboration and Governance Mechanisms

The fragmentation inherent in Indonesia's multi-stakeholder tourism system necessitates strong Collaboration and Governance Mechanisms to coordinate sustainable LSCM efforts (Sheehan & Ritchie, 2019; Wen et al., 2024). Findings indicate that structural and institutional deficits act as significant deterrents to effective coordination among private operators, regional government, and community groups.

1. Structural Barriers to Digital Collaboration: Attempts to implement advanced digital logistics (e.g., for efficiency or traceability) are thwarted by national structural deficits. Indonesia ranks poorly in fixed broadband speed (ranked eighth among 11 Southeast Asian nations), and the severe shortage of skilled human resources (technology sector workers constitute only 0.8% of the labor force) fundamentally limits the adoption of knowledge-intensive, digitally deliverable services across the supply chain (East Asia Forum, 2025). This shortage impacts the successful utilization of AI, IoT, and Blockchain, essential tools for managing modern, complex LSCM risk and traceability (; Coursera, 2024 ;).
2. Governance Deficits and Investment Ambiguity: Managerial and government interviews consistently cite that overlapping regulations between central and regional governments create administrative uncertainty, which actively discourages private investment in logistics infrastructure (East Asia Forum, 2025). This governance failure complicates the establishment of clear cost allocation schemes or revenue-sharing models necessary for large-scale, strategic logistics projects (Moradi et al., 2022 ; Stackelberg Review, 2023 ; Leng & Parlar, 2005). The necessity for coordination and strategic decision-making under information asymmetry is a primary research focus in quantitative SCM models , but the qualitative data explains the contextual *reasons* for the failures.
3. Enabling Factors for LSCM Resilience: In high-risk, disaster-prone tourism areas (e.g., Mount Merapi) (Batu Research, 2022), the qualitative study on preparedness behavior confirms that behavioral change is determined by enabling factors—specifically, the availability of logistics infrastructure and effective training (Merapi FGD, 2023). This reinforces the theoretical link that LSCM capabilities (GRC, GIV, GAD) are not innate but must be systematically supported by policy that provides the necessary resources and human capital development (Agustina, 2024 ; Loo et al., 2024). Without a focused governance strategy that addresses these logistical and human capital deficits, the long-term sustainability and systemic resilience of the Indonesian tourism sector will remain fundamentally constrained (East Asia Forum, 2025 ; ARJUNA Decree, 2023).

RESULTS AND DISCUSSION

This qualitative investigation provides a critical examination of the operationalization of sustainable logistics practices within the multi-stakeholder ecotourism model of Indonesia. The findings bridge the theoretical divide between strategic policy intentions and implementation reality, offering robust

insights necessary for advancing both global Green Supply Chain Management (GSCM) theory and actionable national policy (SCM Editorial, 2024 ; IJLM Editorial, 2023).

A. Theoretical Discussion

Synthesis: LSCM as the Bridge to Tangible Environmental Performance

The research confirms that LSCM functions serve as the crucial *operational bridge* linking high-level strategic ecotourism goals (Setiawan & Anwar, 2024) to tangible environmental and social performance (Porter & Kramer, 2006). Sustainability is not achieved merely through policy or design but through the rigor of core logistics processes (KPMG, 2025 ; Toku et al., 2023).

The findings synthesize three core theoretical concepts:

1. GSCM Realization: GSCM principles, such as green procurement, inventory control, and sustainable transportation (Loo et al., 2024 ; Miemczyk et al., 2012) are realized only when logistics management successfully executes practices like effective waste segregation (Bernardi, 2023) and optimized inbound sourcing (Toku et al., 2023). The efficiency of this implementation directly minimizes the environmental footprint, primarily by reducing the Scope 3 emissions associated with long-distance freight and waste transport (KPMG, 2025).
2. Circular Economy (CE) Operationalization: The theoretical aspiration of the CE is operationalized via the functional viability of the Reverse Logistics (RL) network (Govindan, 2018). The study demonstrates that the failure to establish local reprocessing infrastructure compromises not just the environmental outcome but also the *social sustainability* pillar, as local job creation through CLSC models is inhibited (Shah et al., 2025b).
3. The Role of GRC Capabilities: The qualitative data strongly supports the structural model proposing that organizational capabilities, specifically Green Innovation (GIV) and Green Ambidexterity (GAD), must be effectively mediated by a robust Green Resilient Supply Chain (GRC) capability to lead to a sustainable Green Competitive Advantage (GCG) (Agustina, 2024 ; Tummino et al., 2023 ; Churiyah & Sayono, 2024). The barriers identified in Theme 4 (governance, infrastructure) are, in essence, structural factors that compromise the GRC, thereby invalidating GCG even when GIV is present (Agustina, 2024).

The Role of Context in Shaping GSCM Implementation

This research provides a necessary theoretical counterpoint to GSCM studies predominantly conducted in advanced industrial sectors (Srivastava, 2007; Carter & Easton, 2011). The Indonesian context introduces three critical moderating variables that reshape GSCM theory:

1. Geographical Fragmentation: In industrial sectors, logistics is primarily a cost optimization problem; in Indonesia, the archipelagic geography transforms it into a structural competitive deficit that actively deters tourism and compromises supply chain efficiency (Travel World, 2024 ; East Asia Forum, 2025). GSCM theory must be adapted to integrate complex inter-island multimodal transport planning (MBE Franchise, 2024) and prescriptive network optimization to link Super Priority

Destinations (DSPs) (Ministry of Tourism, 2022), a complexity largely absent in mainland models.

2. Human Capital and Digital Deficits: GSCM literature often assumes adequate technological readiness for digital logistics tools (IoT, AI, Blockchain) (Pratikto & Sayono, 2024 ;). However, the context of weak digital infrastructure and a profound shortage of skilled human capital (East Asia Forum, 2025 ;) transforms technological adoption from a *sequencing* challenge into a *feasibility* challenge (Sayono, 2024 ;). This demands that GSCM theory incorporate a robust Human Capital Readiness variable as a primary constraint on digital supply chain implementation (; Coursera, 2024).
3. Behavioral Implementation Gap: The qualitative finding that positive *perceived benefits* do not always translate into sustained *commitment to implement* sustainable LSCM (Widiyanto, 2023 ;) introduces a unique behavioral dimension. This forces LSCM theory to incorporate behavioral models (such as the Theory of Planned Behavior or the PEPB model) to account for the influence of structural enablers (e.g., infrastructure, subsidies) as critical determinants of managerial commitment (Widiyanto, 2023 ; ; APEC, 2016).

B. Managerial and Policy Implications

Improving Waste Management Logistics in Ecotourism

For tourism managers and local government, the focus must shift from waste collection to robust Reverse Logistics (RL) network design and Closed-Loop Supply Chain (CLSC) implementation (Govindan, 2018).

- Prioritize Local Reprocessing Infrastructure: Policy and private investment must target the creation of distributed, localized waste reprocessing and recycling facilities within regional ecotourism clusters (Shah et al., 2025b). This is a multi-objective solution: it minimizes costly, high-emission long-haul waste transport (KPMG, 2025) and directly achieves the social goal of maximizing local job creation (Shah et al., 2025b).
- Standardize LSCM Practices: Implement standardized operational procedures, informed by the Logistics Field Audit (LFA) framework, across tourism accommodations and restaurants (Andrejić, 2023). This ensures consistency in waste segregation, inventory management, and warehouse safety, thereby improving overall system efficiency and reducing cost (Toku et al., 2023 ; Gunasekaran et al., 2008).

Enhancing Coordination for Green Logistics Infrastructure

Addressing the structural weaknesses requires sophisticated governance mechanisms and coordination between the public and private sectors (Sheehan & Ritchie, 2019; Wen et al., 2024).

- Resolve Governance Overlap: The central and regional governments must rationalize overlapping regulations that currently discourage private investment in green logistics infrastructure, particularly in the digital services sector (East Asia Forum, 2025 ;). Clear, consistent regulatory frameworks are paramount for investment stability (Moradi et al., 2022).

- Strategic Investment Allocation: Policy development must utilize advanced planning techniques to determine the optimal allocation of public and private funds for large-scale projects, such as integrating the expanded railway network into a multimodal LSCM strategy (MBE Franchise, 2024 ; KPMG, 2025).
- Logistics-Informed Disaster Policy: Disaster preparedness policies (e.g., in the Mount Merapi region) must shift focus from mere risk assessment (Batu Research, 2022) to strengthening enabling factors—specifically, ensuring robust logistics infrastructure and systematic, frequent training for local managers (Merapi FGD, 2023). This ensures LSCM capabilities are resilient to external shocks (Agustina, 2024).

Utilizing Training and Direct Assistance for MSMEs

To combat the GVC exclusion (APEC, 2014 ; OECD, 2019) and the behavioral implementation gap (Widiyanto, 2023 ;), policymakers must implement targeted, operational interventions:

- Direct Assistance: Provide tangible resources to MSMEs to overcome financial and structural barriers. This includes internet subsidies, affordable digital tools, and simplified access to online tourism marketplaces (Widiyanto, 2023; Pos Indonesia, 2025). This assistance is necessary to bridge the gap between perceived benefits and actual sustained commitment to digital LSCM (Widiyanto, 2023 ;).
- Targeted GSCM Training: Educational programs must focus on practical LSCM skills, including green procurement protocols (Loo et al., 2024), digital competency (AI/IoT readiness) (Coursera, 2024), and the operational requirements for building Green Ambidexterity (GAD) (Agustina, 2024). This strategic investment in human capital addresses the critical labor shortage (East Asia Forum, 2025) and empowers MSMEs to integrate into sustainable supply chains (APEC, 2016b).

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study qualitatively confirms that while the strategic commitment to Ecotourism and Green Supply Chain Management (GSCM) in Indonesia is high, the operational execution is critically hampered by systemic logistics and supply chain management (LSCM) deficits. The research establishes that LSCM is not merely a support function but the primary operational bridge required to translate sustainability intentions into tangible environmental performance.

The analysis reveals that the sustainability of tourism villages is currently being undermined by four structural and behavioral barriers:

1. **The Reverse Logistics (RL) Paradox:** The mandate for a Circular Economy (CE) is failing due to a lack of local reprocessing infrastructure. This forces the long-distance transportation of waste, which paradoxically increases the carbon footprint through Scope 3 emissions rather than reducing it.
2. **The MSME Integration Conflict:** There is a persistent operational conflict between cost-efficient sourcing and the social mandate to integrate local Micro, Small, and Medium Enterprises (MSMEs). This is exacerbated by a

"behavioral implementation gap," where managers perceive the benefits of digitization but lack the sustained commitment to implement them.

3. **Transportation & Infrastructure Deficits:** Chronic weaknesses in inter-island freight and last-mile transport are not only logistical failures but direct threats to destination authenticity and competitiveness, actively repelling tourists from remote regions.
4. **Governance and Human Capital Constraints:** A severe shortage of skilled human capital and coordination failures between stakeholders prevents the effective adoption of digital tools (IoT, AI) necessary for supply chain visibility.

Strategic Recommendations

To bridge the gap between policy intent and operational reality, this research proposes the following strategic adjustments:

For Policymakers: Decentralize Waste Infrastructure

- **Action:** Government policy must shift focus from simple "waste collection" to the development of **localized reprocessing and recycling facilities** within regional ecotourism clusters.
- **Rationale:** This eliminates the need for high-emission long-haul waste transport and creates local "green jobs," thereby fulfilling the social pillar of the Circular Economy.

For Tourism Operators & Government: Bridging the Behavioral Gap

- **Action:** Implement targeted intervention programs that provide direct **structural assistance**, such as internet subsidies and affordable access to digital logistics tools, rather than just general socialization.
- **Rationale:** Financial and technical barriers are the root cause of the "implementation gap." Without direct aid, positive perceptions of technology do not translate into adoption.

For Destination Management: Integrated Connectivity

- **Action:** Prioritize the optimization of last-mile logistics to maintain destination authenticity while improving service reliability. This requires resolving coordination failures between public transport providers and private operators to improve the "physical connectivity" that supports the tourism experience.

Limitations and Future Research Directions

While this study provides a rich, contextualized understanding of LSCM in ecotourism, it is subject to limitations that outline fertile grounds for future research.

Limitations:

- **Methodological Constraints:** As a descriptive qualitative study, the findings are deeply rooted in the specific context of the chosen regional destinations. While this offers depth, it limits the statistical generalizability of the findings to all tourism contexts across Indonesia or other developing economies.
- **Cross-Sectional Design:** The research captures managerial perceptions and logistics practices at a single point in time. It does not fully capture how these practices evolve over time or how effective they are in the long run.

FUTURE RESEARCH

Based on these limitations, the following research avenues are proposed:

1. **Longitudinal Studies:** Future research must transition from cross-sectional analysis to **longitudinal studies** to assess the sustained viability of the recommended interventions. This is essential to evaluate whether the initial managerial commitment to digital transformation translates into long-term behavioral change and tangible operational improvements over several years.
2. **Quantitative Validation (SEM):** Subsequent studies should employ quantitative methods, such as **Bayesian Structural Equation Modeling (BSEM)** or PLS-SEM, to statistically test the relationships identified in this qualitative work. Specifically, researchers should empirically validate the mediating role of *Green Resilient Supply Chain (GRC)* capabilities in linking *Green Innovation* to *Sustainable Competitive Advantage*.

Broader Geographical Scope: Expanding the research to include a diverse range of destinations—from developed "Super Priority" hubs to remote, emerging villages—would provide a more comprehensive understanding of how geographical variables impact logistics efficiency and sustainability outcomes

Describe your research findings according to the research problem and purpose of the study. Discuss your findings according to the perspective of theory, concept or previous findings. Should describe this section in a comprehensive, simple and detailed manner. The author can make subchapters in this section.

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