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Review

Antecedents and Consequences of Environmental Capability towards Sustainability and Competitiveness

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Abstract: There is still little theoretically driven research and empirical evidence on how firms develop and adjust their existing resource capabilities to create environmental values that enable sustainability and competitiveness. This paper aims to establish a framework of environmental capability that predicts antecedents to and impacts on sustainable performance and competitiveness. The data contained in the review are analyzed based on articles from the perspectives of logistics service providers (LSPs) concerning sustainable and green practices. The results show that green resource-based logistics capabilities anticipate environmental capabilities, impacting sustainable performance and competitiveness. This inductive reasoning makes use of a number of theories and empirical studies that generalize the framework of environmental capabilities and hence contribute to the absence of theoretically driven research and empirical evidence. The study contributes to five types of emergent green resource-based logistics: physical, technological, knowledge-based, relational, and organizational, which must be aligned and developed to create a unique and durable framework of environmental capability for sustained environmental and competitive progress. The findings provide constructs and measurements for green resource-based logistics capabilities, sustainability, and competitiveness. This paper suggests that LSPs can reach superb performance outcomes through investing in green resource-based logistics to achieve a more positive impact in terms of environmental capability.

Keywords: environmental capability; resource-based logistics theory; dynamic capabilities theory; natural resource-based view; sustainability; competitive advantage

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1. Introduction

With drastic and rapid changes in technology, sustainability is the best approach to create value for a firm in order to achieve environmental sustainability and to maintain a competitive advantage [1,2]. This has caused firms around the world to pay more attention to green, or cleaner, operations and activities. By significantly reducing greenhouse gas emissions, firms can subsequently achieve optimum profitability, resulting in greater customer loyalty, a better image in international markets, and more export opportunities. Firms have been forced to develop and adjust their existing resource capabilities to expedite and execute sustainable practices, creating environmental values to enhance environmental capabilities, promote sustainability, and maintain competitive advantages. Still, there is little theoretically driven research and empirical evidence to highlight these concerns [3].

The growth of the logistics industry has been closely connected to the environmental degradation caused by freight transport vehicles and vessels [4]. Over the years, academia and industry have been interested in the environmental concerns that are associated with logistics and supply chains [5]. A growing number of logistics service providers (LSPs) are implementing sustainable logistics practices to decrease their carbon footprints, concurrently delivering value in terms of green products/services that benefit the planet, people, and profits [3,6,7]. Therefore, environmental concerns are essential for the future competitiveness of LSPs with respect to cleaner operations intended to achieve sustainability.

However, LSPs have yet to understand the antecedents to and consequences of sustainable logistics practices in enhancing sustainability and competitiveness.

The burning of fossil fuels releases greenhouse gases (GHGs); these are emissions generated by freight transport vehicles and vessels, resulting in significant negative impacts on human health, environmental degradation, and increased social issues. Though the terms "GHGs" and "carbon emissions" are often used interchangeably, they have different meanings. Carbon emissions specifically refer to emissions of carbon dioxide (CO_2), which is the primary greenhouse gas (GHG). Regrettably, although it is known that the logistics sector has strong potential to exert more negative effects on the natural environment (e.g., air pollution, solid waste disposal, fuel), sustainable logistics practices among LSPs are still marginal [8]. Only a few studies conducted within academia and industry have paid significant attention to the environmental concerns associated with LSPs [2,9]. Reviews show that environmental sustainability is an issue that is under-researched in the logistics sector.

This paper identifies four main knowledge gaps in environmental research. First is the absence of theoretically driven research and empirical evidence on firm-specific environmental capabilities with respect to different variables, industries, and country contexts. Second, there is a lack of research that sheds light on the competitiveness and strategic environmental management of firms [3,10,11]. Third, sustainable practices are crucial to the logistics industry, but this field remains a scant area of study [2,10,12]. Finally, more attention should be paid to the research on the development and implementation of green logistics, and there should be a better understanding of the impact of green logistics in a culture that promotes environmental excellence, capability, and sustainability [8].

Due to these shortcomings, managers and LSPs lack an understanding of how to enhance environmental sustainability and competitiveness through environmental capability. Therefore, the impacts of environmental capabilities on improving the competitive advantage of LSPs are critical but untapped. Therefore, the main objectives of this paper are to identify sustainable practices and their characteristics and, based on empirical evidence, to explore how sustainable practices can be categorized in order to capture environmental capabilities to help LSPs achieve sustainability and competitiveness.

This study provides a new theoretical model of environmental capability antecedents and consequences for cleaner operations. It also contributes new approaches to the work model of fostering competitive advantage and environmental sustainability. Specifically, the study provides a novel mechanism for the promotion of competitive advantage in LSPs through green resource-based logistics and the enhancement of the constructive values of environmental capabilities in relation to environmental performance and competitiveness. Furthermore, the study contributes to the body of knowledge on strategic environmental management and environmental sustainability, both generically and specifically for green resource-based logistics theory. The research that has been carried out with respect to RBV and NRBV theory, dynamic capability theory, and firm-specific environmental capabilities as a result of firms' adoption of cleaner operational methods and green logistics has generated considerably little debate. The findings provide managers and logistics companies with resources to understand the most effective ways of improving operational performance and competitiveness by investing in environmental sustainability.

This paper is organized as follows: Section 2 presents the background of the study. Section 3 describes the research methodology and the analyses used. Section 4 presents the results and discusses the findings and is followed by a consideration of theoretical and managerial implications in Section 5. Section 6 concludes with suggestions for further research.

2. Theoretical Background

Environmental concepts are intrinsic to faith, action, intention, decision making, and attainment, which are embedded in people and manifested in organizations. Hence, LSPs should make efforts to act environmentally responsibly or should enact general approaches or sets of directions in consideration of environmental issues [13]. The term sustainability refers to green practices in the logistics industry, namely green logistics practices such as

green warehousing, green buildings and packaging, sustainable transportation/distribution planning and vehicle utilization, energy efficiency/renewable efficiency, and environmental control [1,11,14]; modal shifts and green administration [14]; sustainable and innovative tools and equipment [15]; and internal green practices and management [7].

The logistics and transport industry is an energy- and carbon-intensive trade sector and is responsible for increasing levels waste and energy consumption and greenhouse gas emissions. Over the last two decades, LSPs have engaged in environmental sustainability to preserve and enhance the natural environment and cultivate the essence of sustainable practices [8,16]. Therefore, the survival and competitiveness of future LSPs are conditional on the extent of environmental values embedded in the advanced green logistics services offered by LSPs. To achieve sustainability and competitive advantage, LSPs and managers should be aware of the intent of environmental strategies and should understand how they can translate sustainable logistics practices into firm-specific environmental capabilities to increase competitive advantage and to manage environmental concerns superiorly. It is hence significant for LSPs to implement sustainable logistics practices to deal with stakeholder pressures [4,8]. Pressure from government regulators [17] the scarcity of critical energy resources [18], and increased GHG emissions [19] motivate LSPs to reduce their negative impacts on the environment through sustainable logistics practices.

With mandates to decrease carbon emissions and the pressures of environmental degradation and from stakeholders, LSPs have implemented sustainable logistics practices to deal with these challenges. These ever-increasing concerns regarding environmental impact have encouraged LSPs to leverage their environmental values to implement green logistics practices, actions, and initiatives to gain green logistics performance and sustainability performance [8]. Explicitly, the positive effects of green innovation and cleaner operations on products, people, and the planet can simultaneously improve a firm's profit. Empirically, firms investing in sustainable practices experience increased sustainable performance [6,8,11]. Through sustainable logistics practices, firms can increase sales and customer satisfaction from customers who prioritize sustainability and can differentiate themselves from rival firms, enhancing their own image and society's health and safety [20].

Despite the environmental benefits, few firms are able to secure a parallel advantage with their competitors, as many firms fail to adopt sustainable practices [21]. Some firms are not convinced that sustainable practices will be able to maintain profitability and competitiveness [20,21], making it more difficult to generalize findings across studies [22]. Consequently, there is an urgent need to identify and determine sustainable logistics practices to boost environmental capabilities and to empower a sustainable environment as well as competitiveness.

3. Methodology

This paper reviews and analyzes past research concerning environmental phenomena in the logistics industry. The conceptual model identifies and describes new connections between old constructs, new constructs, and moderating/mediating conditions and explains why certain constructs lead to specific effects [23]. This study develops a theoretical framework of environmental capability based on the theory of explaining firm growth and competitive advantage [24–28]. To develop a conceptual model, the study performed a content analysis based on research questions to analyze literature focusing on sustainability and environmental practices from the LSP perspective. The logistics sector contributes to the socio-economic environment while simultaneously causing environmental degradation; therefore, studying the ecological capability of LSPs is significant.

We found quality articles from the Web of Science and Scopus as well as from ScienceDirect, the Wiley Online Library, and Taylor Francis. These databases contain international and peer-reviewed publications, allowing us to gather sufficient data for the study [29]. Following a five-step research methodology, the content analysis results will be able to answer the research questions after reviewing the literature by considering the research questions and decision rules. Finally, this study summarizes the findings of the selected

studies and develops a framework for generalization according to specific data using inductive reasoning. The study also suggests a few theories and empirical studies to provide a more credible conclusion and valid reasoning.

The five-step research methodology involves (1) a set of research questions, (2) a set of decision criteria, (3) a review literature, (4) a content analysis, and (5) interpretation [30].

Step 1: The three research questions are (1) What are the sustainable logistics practices being implemented among LSPs? (2) How are various sustainable practices bundled into green resource-based logistics? (3) What impacts do these sustainable practices and green resource-based logistics have?

Step 2: Set decision criteria. Table 1 highlights the clear decision rules, as shown in the predefined columns. For instance, any practice, initiative, process, or implementation concerning enhancing transport and shipping sustainability fell into the sustainable transport and shipping category.

Table 1. Summary of sustainable logistics practices.

Sustainable logistics practices	Pre-define—details practices, initiatives, and implementation associated with sustainable practices. Reliability—underlined text in the article by coding. Validity—re-checked by two assistant researchers.
Sustainable transport and shipping	Hybrid vehicles that generate a low amount of carbon dioxide. Electric vehicles that generate no carbon dioxide emissions. Environmentally friendly transportation. Control carbon footprint during the transportation process by improving performance and intermodal transportation—a combination of different transport modes (road, rail, sea, and air). Routing and networking, emissions intensity, energy efficiency, vehicle utilization efficiency, modal split, and transportation intensity.
Sustainable warehouses	Strategic warehouse location and design. Proper storing and disposal of hazardous materials and energy-efficient storage and movement. Increase energy efficiency and building design sustainability. Use of proper inventory control system and decreased inventory levels.
Sustainable packaging and distribution	Design and materials that minimize the generation of waste and inefficient transportation; ensure efficient resource utilization. Recyclable or biodegradable materials for packaging. Use of environmentally friendly materials. Packaging design that satisfies customers and shipping needs in terms of storage space and reduced assembly time.
Reusable and recycle materials	Introduction of reverse logistics and waste management. Reuse materials and production components. Packaging material and design have a strong influence on recycling, which is a key component of reverse logistics. Technological solutions are dedicated to organic waste management and Monitoring.
Monitoring and evaluation	Measuring and monitoring the environmental impact of transport. Standard indicators to measure CO_2 emissions and energy data. Commitment to green practices. Promoting green or environmental programs.
Sustainable relationship and collaboration, and information sharing	Sustaining environmental friendliness among supply chain network; involving all stakeholders.
Sustainable human resources and green human resource management (GHRM)	Training, development, compensation, awards and recognition, recruitment, and performance management. Mediating the role of management and employee attitudes, knowledge, and skills. Technical knowledge and expert reverse logistics.

Step 3: The review data are underlined and coded into categories based on sustainable logistics practices among LSPs. In this study, two assistants re-checked the review data.

Step 4: The following table provides the content analysis of the articles.

Step 5: Interpret the content analysis to determine what resources need to be acquired to implement sustainable logistics practices to execute, enhance, and accelerate sustainability and competitiveness via green resource-based logistics.

Based on the review, this study develops a conceptual model that determines the antecedents and consequences of the environmental capability to enhance sustainability and competitiveness.

The identified practices are those that occur across the data set the most often and that capture the intention of the research questions. Clear decision rules can avoid vague categorization and ensure the reliability of the coding by underlining text in the articles [31]. To validate whether the identified green practices were sorted into the appropriate categories, at least two assistant researchers re-checked each category independently to increase the validity of the study. The next section shares the results of the study.

4. Results

The review results presented in Table 2 show seven categories of sustainable logistics practices. Scholars of green logistics consider sustainable logistics practices such as sustainable shipping and transportation, warehouses and storage, packaging and reverse logistics systems, monitoring and assessment, collaboration, and human resources. The use of sustainable transport to reduce CO_2 emissions is essential for logistics firms to comply with legislation and regulations. According to Khan et al. [32], the excellent quality of transport-related infrastructure is positively connected to green energy resources, carbon emissions, greenhouse gas emissions, fuel consumption, health expenditure, and political stability. Strategic warehouse locations and sustainable building design can save energy efficiency and increase energy-efficient storage and movement [3,14,33]. Sustainable packaging and distribution require biological material to reduce the use of plastics and carbon footprints and will subsequently decrease the significant risks of plastics to people and the marine environment [7]. Well-designed packaging, on the other hand, can improve the sustainability of business operations by reducing food waste caused by spoilage [34].

Table 2. Results of review on sustainable logistics practices.

Sustainable Logistics Practices and Consequences	Construct: Green Resource-Based Logistics	Source
Sustainable transport and shipping to generate less or no pollution	Technological Physical	[3,14,22,31–33,35–48]
Sustainable warehouses to save and reduce energy and resource consumption, optimize utilization, worker safety, and the storage of goods and materials	Technological Physical	[3,12,31,33,36,37,39,40,42–45,49–52]
Sustainable packaging and distribution to reduce harm to the environment and prevent environmental pollution and reduce the cost of waste disposal and resource consumption and to achieve the lowest possible carbon footprint.	Technological Physical	[3,5,14,22,31,33,34,39–41,49]
Reusable and recycle materials to prevent harm to the environment and to improve waste management	Technological Physical	[6,12,14,22,33,35–37,40,53–55]
Monitoring and evaluation to adhere to environmental policies and practices	Organizational	[3,5,6,33,37,39,49–51,53,56–58]

Table 2. *Cont.*

Sustainable Logistics Practices and Consequences	Construct: Green Resource-Based Logistics	Source
Sustainable relationship and collaboration and information sharing to create value for all partners	Relational	[2,3,7,12,37,39,40,51,57,59–63]
Sustainable human resources green human resource management (GHRM) to facilitate green actions and improve performance and sustained competitive advantage	Knowledge-based	[3,7,9,14,15,22,39,51,64,65]

4.1. Sustainable Logistics Practices Implemented by LSPs

Table 2 presents the outcomes of the implemented sustainable practices. Further investigations on the resource capability required for LSPs to implement these sustainable practices highlight the technological, physical, knowledge-based, organizational, and relational constructs of multi-dimensional green resource-based logistics. Scholars have emphasized these practices, leading to increased competitiveness through the environmental capability of sustainable logistics practices [3]. Based on these findings, Figure 1 displays the model of environmental capability.

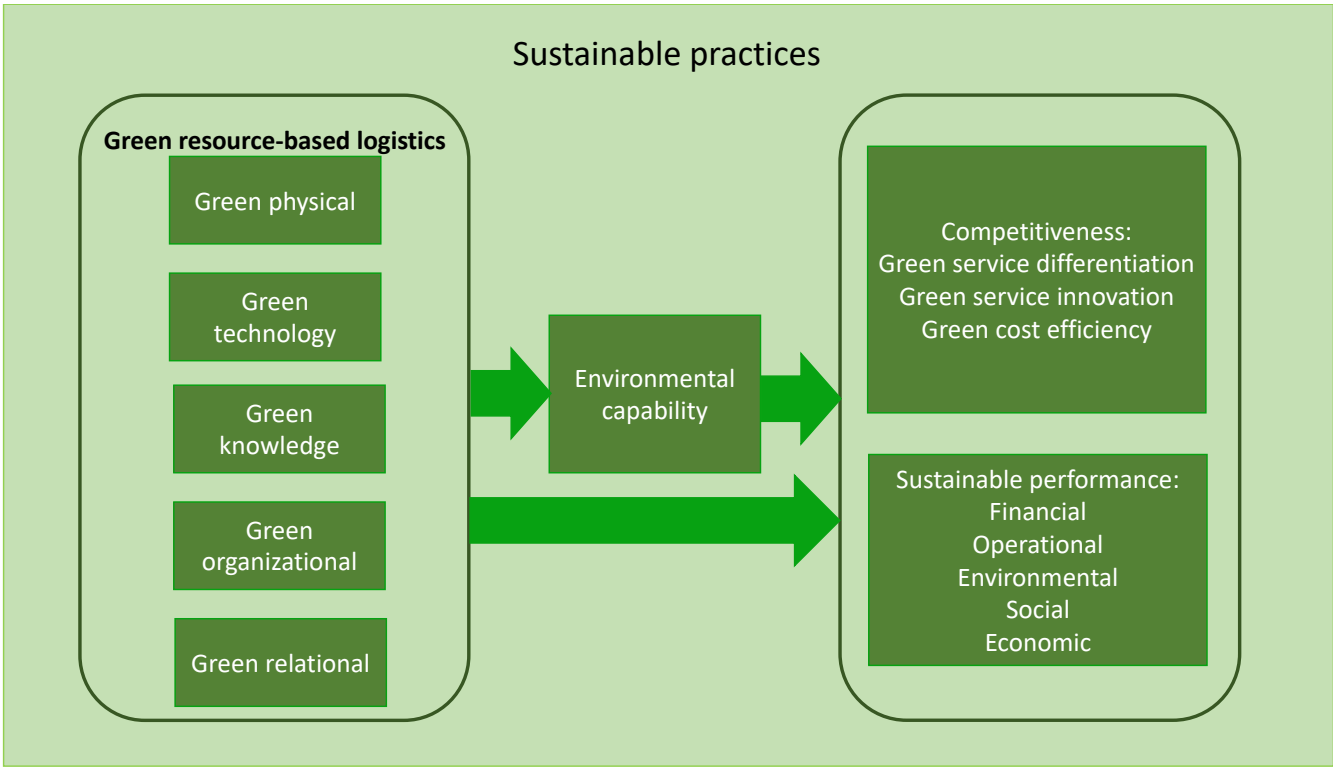

Figure 1. A theoretical framework of environmental capability.

Extensive reviews about green logistics indicate sustainability initiatives, transport mode decisions, green initiatives, green actions, and green matters or practices [7,64,66,67] as well as collaboration in the adoption of green initiatives [68–70] and the introduction of technologies during green initiative adoption [71,72] as environmental concerns among LSPs. Past research discusses sustainable logistics practices such as green transport and freight-forwarding, green buildings and warehouses, green distribution and transportation, green packaging and other green value-added services, technology, green human capital, technical expertise and skills, experts and specialists, collaboration and information,

negotiations between buyers and sellers, and the involvement of all stakeholders and management in adhering to environmental policies and practices.

Sustainable relationships and collaboration as well as information sharing create value for all partners and allow for the natural environment to be preserved across supply chains [3] as well as for CO_2 emissions to be measured and environmental impact to be monitored, resulting in LSPs adhering to logistics environmental policies and practice [3,6]. The use of reusable and recycled materials can prevent harm to the environment and reduce waste management [6,54]. Considerable research has investigated sustainable green logistics by considering related physical and technological factors. Still, soft and sustainable practices such as internal green organization (i.e., green human capital) and an external green environment (collaboration and relationships) and their effects on LSP performance have received little attention from logistics scholars [9].

4.2. Sustainable Logistics Practices Bundled into Green Resource-Based Logistics

According to [3], the future sustained competitiveness of LSPs depends on their acquisition of resource-based logistics to boost their environmental capability to execute green logistics practices (green process/services). Hence, the responsibility of firms for the environment is essential in ascertaining long-term business success [1,11]. Resource-based logistics include physical, technological, knowledge-based, organizational, and relational resources for LSPs to achieve service capability and competitive advantage [28,73].

Based on resource-based logistics (RBL) theory [28,73], five new themes of green resource-based logistics emerge from these findings (Table 2): green physical (transport and freight-forwarding, the consolidation and movement of physical flows, green buildings and warehouses, transportation, and other value-added services; material and information management; and the provision of one-stop services); technological (green technologies or the innovation of logistics focused on reducing environmental burden) [6,22,32,34,54]; knowledge-based (green human capital, technical expertise and skills, experts and specialists) [3,9,22]; relational (green external environment: collaboration and information, negotiation between buyers and sellers, the involvement of all stakeholders) [3,7,40,62,63,74] and organizational (adherence to environmental policies and green logistics practices [3,6].

Consequently, the capability construct of the emergent green resource-based logistics is multidimensional in this study, encompassing physical, technological, knowledge-based, relational, and organizational aspects [3,73].

Green physical resources—These rigid green resources are committed to cleaner logistics operations, i.e., sustainable facilities, equipment, and infrastructure, for sea, air, and rail transport, green warehouses and inventory, packaging, distribution, transportation, terminals, and cold storage for sustainable logistics practices.

Green technology resources—Innovative tools for emergent logistics, green technologies, and logistics innovation (WMS, TMS, and RFID) focused on environmental sustainability that can handle the environmental issues, more significant freight volumes, delivery time, and reduced delivery costs.

Green knowledge-based resources—Green human capital embedded in employees and organizations implemented to attain environmental sustainability, for example, through the knowledge of green specialists, logistics specialists, and business experts to increase effectiveness.

Green relational resources—Integrating this resource into practice enables firms to cooperate and efficiently share green information standards, activating complete green supply chain partners.

Green organizational resources—Manifest competency to adhere to environmental policies and practices, i.e., through manifesting green logistics into organizational designs, corporate visions, missions, systems, routines, procedures, business processes, strategies, the work culture, or ways of fostering and enhancing environmental sustainability.

4.3. Impacts of Sustainable Logistics Practices

Cleaner operations in logistics firms result in the heavy execution of sustainable practices that construct culture, values, concerns, and intentions to preserve the natural environment, positively impacting the ecosystem [21]. LSPs implementing sustainable logistics practices attain superior green logistics performance and sustainability [8]. The green logistics literature mentions that green actions are crucial for socio-economic and environmental sustainability, creating competitive advantage and financial performance [3,11]. Green logistics practices significantly improve environmental and financial performance [6]. In contrast, Agyabeng-Manesh [11] indicate that green logistics practices significantly affect environmental performance but indirectly affect the financial and social performance of the market through environmental performance, and [22] found that only some green initiatives influence competitiveness. Briefly, studies hypothesize the relationship between sustainable logistics practices and performance [20,60]. As theorized, environmental practices positively impact sustainability performance dimensions comprising operational, environmental, market, financial, economic, and social performance [6,11].

Further, LSPs must perform better than their competitors to attain a sustainable competitive advantage. LSPs should value sustainable logistics practices to stimulate more superior positive value than other firms by creating green logistics. An indicator that a firm has a competitive advantage is better performance than current or potential competitors in the industry [75,76]. Following this logic, firm performance anticipates the benefits of implementing sustainable logistics practices through the firm-specific environmental capability to achieve superior performance compared to competing firms. The concept of competitive advantage measures the operational efficiency and effectiveness of green resource-based logistics to enhance such environmental capabilities through green cost efficiency, green service differentiation, and green service innovation [28,77]. Specifically, the sustainable competitive advantages of the firm are:

Green service differentiation—Environmental capabilities that affect service differentiation by improving satisfaction with service quality (logistics service level) and delivery performance (speed of operations: time and accurate delivery) in green logistics firms [73,78]. Independently, physical, technological, knowledge-based, relational, and organizational environmental capabilities can directly enhance customer service [28]. However, both technology and organization can have a significantly higher impact on customer service.

Green service innovation—A firm's aggressiveness reuslts in the introduction of additional green and unique services ahead of its competitors [78–80] by strengthening environmental capabilities. Karia et al. [81] confirmed that technological and organizational ability can increase service innovation significantly. Additional relational, knowledge-based, and physical ability complement better service innovation in firms [28]. Combining five high- and medium-level resource-capability configurations has a subsequent impact on service innovation [82].

Green cost efficiency—The attainment of the benefits of green distribution, green facility/equipment, and green human resources is due to the environmental capability of green logistics firms, e.g., saving and reducing energy and resource consumption, optimized utilization of store goods and materials as well as worker safety [78,83]. As hypothesized, firms can have a green cost advantage by investing in environmental capability configurations. However, only high- and medium-level structures can affect the green cost advantage [82]. Empirically, all environmental capabilities can provide a green cost advantage, but knowledge and organizational resources are contribute to boosting the cost advantage of firms the most [28].

The extensive review above suggests that significant study is desirable to highlight missing research related to the value of the environmental capabilities of LSPs to maintain sustainability and a competitive advantage. Without understanding the dimensions of the competitive advantage of green resource-based logistics (i.e., what green logistics and environmental resource-capability are and how they impact performance), green products cannot be delivered to green customers/end users at lower costs without the effective and

efficient utilization of green resource-based logistics. Problems such as reducing the cost of unnecessary waste, defects, and stored materials; incomplete service; and increased cycle time will increase and cause cost inefficiency and customer dissatisfaction. As such, LSPs would not attain such sustainability or competitive advantage without the green benefits of cost savings and increased efficiency.

4.4. A Theoretical Framework for Environmental Capability

Sustainability research is still a young discipline, particularly in the logistics industry and does not have a theory; hence, approaches from other fields are used [84]. Based on reviews, this study conceptualizes green and sustainable logistics practices into five emergent green resource-based logistics capability constructs to create environmental value to ascertain more positive impacts on green products/processes/services, profits, people, and the planet (4Ps) [3]. These new capability constructs, physical, technological, knowledge-based, relational, and organizational, are more conducive to enhancing environmental capability, directly impacting sustainability and competitiveness than green practice constructs (Figure 1). Unlike previous scholars, this study constructs sustainable practices from a resource capability perspective instead of based on practices or resource ownership. In other words, the sustainable practices of LSPs minimize environmental harm while delivering green goods, services, and information right from the point of origin to the end of need/consumption and back to the source again in a closed-loop system of reverse logistics [9]. Still, green resource-based logistics capability can increase environmental capability, perhaps explaining why such constructs have a significant positive impact and why they can lead to specific effects on sustained the environment and competitiveness.

The study theorizes that green resource-based logistics capability generates environmental capability to anticipate performance outcomes. Therefore, environmental capability leads to sustainable performance and competitive advantage by empowering cost efficiency, service differentiation, and service innovation. Supporting a resource-based view (RBV), green resource-based logistics capability determines a firm's performance or growth [3,28]. Firms maximize this resource value by dividing capabilities into the categories of valuable, rare, inimitable, and non-substitutable (unique and idiosyncratic resources), making them more difficult to imitate and determining their performance and sustained competitive advantage [24].

The natural-resource-based view (NRBV) theory emphasizes incorporating environmental strategies into RBV [16]. Thereby, NRBV hypothesizes that environmental approaches advance firm organizational capability and convey a rare and valuable resource that might create sustainability [16] and a competitive advantage [24,25]. The NRBV theory endorses environmental values, practices, and strategies that generate operational or organizational capabilities [16]. Further, logistics literature has also introduced the resource-based logistics theory of competitive advantage [28] (Karia and Wong, 2013). NRBV theory perceives cleaner operations to develop environmental practices are determinants of environmental performance; subsequently, a firm's profitability and competitiveness is determined by the operational cost-efficiency of waste reduction, energy consumption, and pollution prevention [20,21]. Resource-based logistics theory integrates strategic sustainability and environmental aspects to improve green process/service innovation, people's wellbeing, firm profitability, and planet preservation [3,31].

Given that more LSPs are shifting to green operations and services, the study employs dynamic capability (DC) theory to explain LSP performance under environmental changes [85]. Under dynamic environments, firms align and leverage resource capability into dynamic capabilities, reconfigurations, and high-order capabilities, e.g., skills, processes, organizational structures, decisions to support exploitation, and reconfigurations of capabilities [26]. DC theory rationalizes a firm's ability to achieve a new and innovative competitive advantage by reconfiguring internal and external competencies to address rapidly changing environments [27]. Consequently, dynamic capabilities enable firms to achieve a sustained competitive advantage and sustainability through firm-specific environmental capabilities covered by reconfigurations of dynamic capabilities on the emergent green

resource-based logistics with technological, physical, knowledge-based, organizational, and relational logistics [3,28].

Briefly, the reviews and theories rationalize the connection between green resource-based logistics capability, environmental capability, and performance outcomes. Valuable and rare resources often provide a temporary competitive advantage. They are easy to purchase or imitate when competitors also offer the same advanced services that have been designed to be more competitive and environmentally friendly. However, only certain resource capabilities or those that are costly to imitate and substitute will become the sources of sustainable competitive advantage [24,86]. However, in the era of a complex and rapidly changing environment, firms need to adjust and align existing resource-based logistics into a green or environmental capability orientation that is rare, durable, and difficult for competitors to imitate, leading to sustained competitiveness. Therefore, the green resource-based logistics, NRBV, and DC theories are extensions of the RBV, which progressively explains the antecedents and consequences of the environmental capability to enhance environmental sustainability and competitiveness.

5. Discussion and Implications

There is evidence that the environmental concerns of LSPs create sustainable performance improvements, and LSPs have acquired resources and capabilities to facilitate competitiveness and sustainable performance. The novel contribution of this study is the environmental capability model for firm sustainability and competitive advantages in the rapidly changing and expanding field of green technologies and the in the context of a dynamic environment. This mechanism endorses the factors, sustainable performance, and competitiveness of LSPs. The results verify that environmental capability, regardless of whether it is built-in or derived from green resource-based logistics capabilities reconfigurations, transform the sustainable performance and competitiveness of LSPs. This study also provides knowledge and understanding of the constructive and value of firm-specific environmental capabilities. These results are helpful for LSPs to understand the essence of green resource-based logistics to obtain the environmental capability to achieve competitiveness and sustainability. Therefore, this study explains why green manufacturing firms outsource their green logistics function: to increase their environmental capabilities to enhance their performance. Accordingly, the study contributes some novel results.

First, this study categorizes sustainable practices into green resource-based logistics capabilities rather than practices or resource ownership. Based on the studies of Karia [3,73], five new themes of green resource-based logistics emerged, encompassing physical, technological, knowledge-based, relational, and organizational logistics. The content analysis discloses the environmental capability that firms gain by implementing a couple of green resource-based logistics capabilities that allow them to design creative and innovative sustainable practices.

Second, the study justifies five dynamic attributes of green resource-based logistics: physical, technological, knowledge-based, relational, and organizational, empowering sustainable performance and competitiveness. Green physical capabilities allow logistics firms to support green logistics operations and administrative processes and enhance competitive advantages [27]. Green technologies can add economic value to a firm by reducing a firm's costs, service differentiation, or service innovation [87,88]. Further green knowledge capability can improve firm productivity through better efficiency and effectiveness via cleaner production, thus creating competitive advantages [87]. The relational capacity of firms is highly relevant and vital for internal and external cooperation between buyers and suppliers in terms of cleaner production, enhancing environmental performance and competitiveness [89]. Firm-specific organizational capabilities that are embedded in a socially complex process are costly to imitate, and substitutes will become sources of sustainable competitive advantage [27,85].

Third, this extensive review proves that green logistics practices are essential for socio-economic and environmental sustainability, resulting in improved financial performance

and competitive advantage [6,11]. Furthermore, logistics literature shows that the adoption of green logistics impacts the competitive benefits of cost-efficiency, service differentiation, and enhanced service innovation in LSPs [3]. However, the re-views found no empirical work on a theoretical framework of environmental capability anticipating green resource-based logistics to ascertain a firm's environmental capability, sustainability, or competitive advantage [2,10,12].

Finally, this study provides a theoretical model to predict new connections between the emerging green resource-based logistics constructs that significantly impact environmental capability and that mediate sustainability and competitiveness. Hence, the findings denote that the model can predict environmental capability and its impacts. These capabilities become the source of sustained competitive and ecological advantage if they are costly, robust, and difficult to imitate or purchase. However, such powers can be temporary if they are easily replicated and can be bought by other players. For instance, physical, technological, and relational firm-specific environmental capabilities generate a brief competitive advantage, as these are easily purchased and quickly imitated by competitors.

5.1. Theoretical Implications

Environmental sustainability research is still under-researched in the logistics sector, and it is not yet mature or have a theory. Consequently, there is an insistent call for a mechanism to understand the impact of sustainable logistics practices and green actions. This adds more research on the development and implementation of d green logistics and a better understanding of the impacts of green logistics on culturing environmental excellence, performance, and sustainability.

This novel contribution develops a framework of environmental capability that predicts its antecedents and impacts. This inductive reasoning uses a few different theories and empirical studies to generalize the framework of environmental capability. Green resource-based logistics capabilities anticipate environmental capability, impacting sustainable performance and competitiveness.

This study confirms that environmental capability can directly affect performance if the five types of green resource-based logistics capabilities increase. Specifically, the findings justify the green resource-based logistics capabilities: physical, technological, knowledge-based, relational, and organizational logistics, empowering environmental capability, sustainability, and competitiveness.

Further, this research generates a new green resource-based logistics theory that advances the RBV [24], NRBV [16], and DC theories [26,85]. The implications of this theory defend why firms have yet to implement environmental or sustainable practices. Therefore, green resource-based logistics capabilities enable environmental capabilities to have a positive impact on the sustainable performance firms and allow them to have a competitive advantage. Consequently, the power of environmental capabilities significantly affects various competitive advantages depending on whether firms acquire or reconfigure their dynamic capabilities.

The study contributes to empirical work by providing the constructs and measurements for each independent, dependent, and mediating variable that has yet to disclose hence a novel contribution. The results on the impact of the constructs vary according to which capabilities affect the performance outcomes. Not all resources or capabilities are high-order, as some are too costly, serving as sources of sustained sustainability and competitive advantages. Hence, non-high-order factors must go through high-order capabilities to affect such performance. Consequently, sustainable practices can boost environmental capabilities to empower competitive advantages that may encourage many LSPs to invest in more sustainable logistics practices and increase their logistics and sustainability performance concurrently. These practices can be generalized holistically have not been discussed before [20,21]. Empirically [28], (1) knowledge and organizational capabilities enhance cost-efficiency, and (2) technological and organizational capabilities promote service differentiation. innovation is a high-order capability that can be costly, serving as a source

of sustained competitive advantage. The paper contributes to the absence of theoretically driven and empirical evidence concerning environmental capabilities. DC theory explains that such environmental capability could serve as a source of competitive advantage, but only if it outperforms the equivalent power of competitors [27,85].

5.2. Managerial Implications

Given the significant environmental values of cleaner operations among LSPs, sustainable logistics practices are necessary. As such, the environmental capabilities of green actions are directly related to human life (people), cleaner operations (process/service), the preservation of the natural environment (planet), and profitability. The research findings recommend that managers and LSPs implement sustainable logistics practices to optimize the benefits of all of these stakeholders in the logistics sector. LSPs should have severe concerns about the wellbeing of the people and the planet by implementing sustainable logistics practices through cleaner operations that boost environmental capabilities, sustainability, profitability, and competitiveness.

For example, LSPs should acquire physical firm-specific environmental capabilities for sustainable transport to reduce CO_2 emissions and improve the quality of transport-related infrastructure as well as to have a positive relationship with green energy resources, carbon emissions, greenhouse gas emissions, fuel consumption, health expenditure, and political stability. Strategic warehouse locations and sustainable building design should be implemented to increase energy efficiency and energy-efficient storage and movement. Sustainable packaging and distribution require biological materials to reduce the use of plastics as well as the carbon footprints of firms. Subsequently, sustainable packaging will the decrease significant risks of plastics to people and the marine environment, and well-designed packaging can improve the sustainability of business operations. Further, LSPs require a strong relational capability to maintain sustainable relationships and collaboration, and information sharing creates values for all partners and allows for the natural environment to be preserved across supply chains.

This study recommends that LSPs concentrate on the firm-specific environmental capability to increase potential benefits to influence competitive advantage to avoid too much anticipation. Instead of investing in all green actions, LSPs should focus on the knowledge-based and organizational capabilities to achieve cost-efficiency and should execute physical, technological, and relational capabilities to enhance service differentiation and innovation. Thus, this study contributes to LSPs and managers regarding knowledge of environmental capabilities that can ultimately generate a more sustained competitive advantage. This competitive model for LSPs is the most reliable approach to enhance sustainable long-term performance through strategic environmental management, collaboration, and green human resources through implementing and investing in green physical and technological logistics that lead to sustained competitive advantages.

6. Conclusions

This paper provides a novel theoretical model for environmental capability antecedents and consequences. The novel features of this article uncover the nature of environmental capabilities acquired by firms implementing sustainable practices that increase the sustainable performance and competitive advantage of firms. Furthermore, this study provides theory-driven empirical evidence for five green resource-based logistics capability constructs and measurements to predict environmental capability. Additionally, the study also explains the effects of firm-specific environmental capabilities, empowering a temporary and sustained competitive advantage.

To effectively implement green logistics practices, firms need to acquire environmental capabilities comprising green resource-based logistics that are physical, technological, knowledge-based, relational, and organizational. Firms should develop firm-specific environmental capabilities that include these five dynamic capability configurations to gain a competitive advantage in service differentiation, service innovation, and cost-efficiency.

These environmental capabilities are a function of sustained environmental and competitiveness, but their impact varies; not all capabilities directly affect competitiveness. In the green logistics industry, sustainable logistics and green logistics for physical and relational capability are already in place and are easy to imitate, i.e., green transportation and warehouses and green collaboration and green information sharing; hence, they are more conducive to short-term competitiveness. However, this study indicates that there are significant benefits of acquiring unique and synchronous resources that are different from those of competitors, especially in the categories of organizational and knowledge-based capabilities.

Despite the excellent results, this paper has its limitations. The study only chose a single industry sample, as it was necessary to compare the dynamic capability effects across firms. More effective generalization should be applied within industry studies, and cross-country studies should be considered for future research. Future research should examine other appropriate dynamic resources/capabilities and strategies and should explore the power or indirect effects (mediation or moderation) of the five environmental capabilities on performance and competitiveness to provide a more theoretical explanation. Future research is essential to examine and test this model.

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