KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI.

COLLEGE OF HUMANITIES AND SOCIAL SCIENCES

SCHOOL OF BUSINESS



GREEN SCM PRACTICES, CUSTOMER DEVELOPMENT, AND SUSTAINABLE

PERFORMANCE

BY

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DECLARATION

I, hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma at Kwame Nkrumah University of Science and Technology, Kumasi or any other education institution, except where due acknowledgement is made in the thesis.

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DEDICATION

I dedicate this thesis to Almighty God for granting me the wisdom, intelligence and strength to complete this work. Also, I dedicate this work to my entire family, especially my sister for her unwavering support throughout the entire programme.



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ABSTRACT

The current study explored the linkage that exists between Green SCM Practices, Customer Development, and Sustainable Performance. The population of this study comprised of one hundred and forty (140) registered mining firms in Ghana. With regard to the study population, the study concentrated on the firm-level analysis, and that 100 respondents (supply chain managers) from the respective mining firm participated in the study. The source of data was primary. The instrument for data collection was closed-ended questionnaire. The data generated was analysed using the Ordinary Least Squares (OLS) regression and structural equation modelling (SEM) technique to determine the effect the independent variables have on sustainable performance. The study draw four conclusions: SCM Practices has a significant positive effect on Operational Performance; SCM Practices has a positive and significant effect on Customer Development; Customer Development has no significant effect on Operational Performance. More importantly, the study concluded that customer development does not mediate the effect of Green SCM practices on sustainable performance. With regard to these findings, the study recommended that there must be a concerted effort by managers of manufacturing firms to continue to look into ways to increase its service operation performance through SCM Practices. Also, supply chain managers should embark on research and benchmark the level of adoption of Green SCM practices with customers and suppliers, and thus direct efforts to improve sustainable performance. With the future recommendation, the study recommends that future studies should consider using qualitative or mixed method approach in conducting the study to ensure there is the availability of rich data to support the findings.

CHAPTER ONE

INTRODUCTION

1.1 Introduction

As a crucial strategy for integrating environmental concerns into corporate processes, arisen. The benefits of lowering ecologically damaging features may not yet be fully understood by all supply chain managers, but it is becoming more and clearer that such efforts not only help society but also improve logistical operations (Dwivedi, 2016). The reduction of the environmental load caused by industrial waste is the main driver.

Various researchers have offered definitions of GSCM. For example, Sarkis et al. (2017) describe GSCM as a process that conscientiously considers environmental factors in all aspects of organizational supply chain operations and innovations. In his definition Dwivedi (2016) incorporates industrial practices such as recycling, reusing materials, resources. Similarly, Shan and Wang (2018) describe as a series of interconnected processes that encompass customer and manufacturer order handling, product design, procurement, distribution, and logistics, all while adhering to environmentally sustainable principles (Shan et al., 2018). perceive GSCM as the incorporation of environmental considerations into various aspects, including product design, material sourcing, production, product delivery, and waste disposal.

In response to growing customer demands, organizations are exploring ways to differentiate themselves and attract customers by adopting environmentally friendly strategies (Weeratunge et al., 2017). Shifting toward ecological practices can boost production efficiency, confer competitive advantages, and reduce environmental impacts (Sharma et al., 2017; Silva et al., 2019).

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Van Hoek (2009) suggests that GSCM serves as an innovative and competitive tool for organizational sustainability, mitigating environmental risks while simultaneously achieving financial and environmental benefits. Additionally, GSCM helps companies become environmentally friendly and promotes a sound business strategy for increased profitability (Srivastava, 2017).

In today's global trade and markets, environmental concerns are increasingly integrated, as consumers worldwide demand eco-friendly products (Anbumozhi et al., 2015). Excessive resource consumption and environmental pollution throughout the product life cycle, from raw material acquisition to disposal, can strain global environmental capacity (Matos et al., 2017).

1.2 Problem Statement

While businesses prioritize competitive advantage, the adoption of Green Supply Chain Management (Green SCM) practices remains crucial. Green SCM aims to maximize overall business value by efficiently utilizing resources across the entire organization, connecting suppliers and customers (Levi et al., 2004). Considerable attention has been devoted to Green SCM in research and practice in developed economies like China, the USA, Europe, Singapore, and Malaysia, where numerous multinational corporations vigorously implement these practices (Christopher, 2016).

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Nevertheless, there has been limited exploration into the realm of Green Supply Chain Management (SCM) within the marketing sector. While existing studies indicate that Green SCM practices have a positive impact on the performance of organizations (Li et al., 2006; Khalil et al., 2019; Sundram et al., 2011), this connection has not been adequately investigated in the volatile landscape of startup enterprises. Additionally, prior research (Li et al., 2006; Khalil et al., 2006; Khalil et al., 2019; Sundram et al., 2011) has not delved into the intricate relationships between SCM practices, customer development, and operational performance, particularly within the startup sphere. Deviating from the documented advantages of Green SCM within well-established multinational corporations, this study centers its focus on mining companies, examining how they adeptly employ Green SCM practices to allure, retain, and satisfy customers, ultimately elevating their performance.

1.3 Research Objectives

The main goal of this research is to investigate the connections among green supply chain management practices, customer development, and sustainable performance. In particular, the study aims to achieve the following objectives:

- 1. Assess the influence of green supply chain management practices on sustainable performance.
- 2. Evaluate the impact of green supply chain management practices on customer development.
- 3. Explore the relationship between customer development and sustainable performance.
- 4. Investigate the potential mediating role played by customer development in these relationships.

1.4 Research Questions

To achieve these objectives, the study addresses

- 1. What is the impact of green supply chain management practices on sustainable performance?
- 2. To what extent do green supply chain management practices affect customer development?
- 3. How does customer development influence sustainable performance?
- 4. What role does customer development play in the relationship between green supply chain management practices and sustainable performance?

1.5 Justification for the Research

This study project addresses the practices of, customer development, and sustainable performance in mining enterprises, filling a key vacuum in the literature. It contributes valuable insights for future scholars in this field and serves as an essential resource for professionals across various sectors, including logistics, management, supply chain experts, corporations, project managers, government bodies, and other stakeholders.

By bridging the gap between theoretical knowledge and practical application, this study offers a comprehensive understanding of green supply chain management and sustainable performance, grounded in both empirical evidence and theoretical foundations.

1.6 Research Methodology

This study adopts a positivist research philosophy, emphasizing causal inferences to uncover relationships between variables. It employs a causal research design to elucidate connections between Green SCM practices, customer development, and Sustainable Performance. Data collection involves structured questionnaires with closed-ended multiple-choice questions utilizing a 5-point Likert-style rating scale.

1.7 Scope of the Study

The study focuses on mining firms in Ghana, with a particular emphasis on three prominent entities: Newmont, AngloGold, and Tarkwa Goldfields. The primary constructs under scrutiny encompass Green SCM Practices, Customer Development, with special emphasis on the latter as a mediating variable within the context of Sustainable Performance.

1.8 Limitations of the Study

The research faces constraints related to time, finances, and obtaining appropriate responses from respondents. These limitations influence the study's scope and the number of responses from other mining firms that could have enriched the findings.

1.9 Organization of the Study

The study is organized into chapters as follows:

In the first chapter, we lay the foundation for our study. This includes providing background information, stating the problem, setting research objectives and questions, summarizing our chosen methodology, highlighting the study's significance, and defining its scope.

The second chapter is dedicated to a comprehensive literature review. Here, we elucidate the key concepts of Green Supply Chain Management Practices, Customer Development, and Sustainable Performance. We also delve into the interrelationships among these constructs. Furthermore, we discuss the theoretical frameworks that underpin our study and scrutinize prior empirical research relevant to our variables.

Chapter three delves into the intricate details of our research methods. This encompasses our chosen research design, the setting in which we conducted our study, the target population, our sample size and the sampling technique employed, sources of data, the tools used for data collection, discussions on the validity and reliability of our research instruments, statistical methods applied in result estimation, and the data analysis process.

The fourth chapter is dedicated to the presentation and analysis of our gathered data. Here, we meticulously examine the data and provide insightful discussions regarding our findings.

Chapter five encapsulates the essence of our research journey. It comprises a summary of our findings, draws conclusions based on these findings, and culminates in a set of thoughtful recommendations arising from our study.

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CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

In this chapter, we embark on an extensive exploration of the relevant literature concerning various concepts. This chapter serves as a comprehensive resource, providing explanations and metrics for practices in green supply chain management, customer development, and sustainable performance. Furthermore, this chapter meticulously examines the interconnections among these variables, specifically green supply chain management practices, customer development, and sustainable performance. It also conducts a thorough review of theoretical frameworks and empirical evidence from prior studies, ultimately shedding light on the current research gap.

2.2 Review of Concepts

2.2.1 Evolution of Green Supply Chain Management Practices

The genesis of green supply chain management (GSCM) can be traced back to the origins of conventional supply chain management (SCM). Initially introduced and popularized in the 1950s, SCM primarily aimed to minimize production costs through mass production techniques (Huque and Islam, 2007). However, as competition intensified during the 1990s, an increased awareness of environmentally responsible practices prompted firms to adopt ethical and socially responsible approaches within their supply chains (Diabat and Govindan, 2011). GSCM emerged from the infusion of a "green" dimension into SCM, addressing the intricate relationships and influences between SCM and the natural environment (Meythi and Martusa, 2013).

The central objective of GSCM is the reduction or elimination of waste, encompassing hazardous chemicals, emissions, energy consumption, and solid waste, throughout the

supply chain. Additionally, GSCM embodies a green initiative aimed at enhancing process and product performance in accordance with environmental regulations (Hu and Hsu, 2010).

Van Hoek (1999) posited that Green Supply Chain Management (GSCM) serves as an innovative and competitive tool, contributing to organizational sustainability through the dual objectives of mitigating environmental risks and simultaneously reaping financial and ecological advantages. Furthermore, the emergence of GSCM empowers companies to align with eco-conscious practices and formulate robust business strategies aimed at enhancing profitability (Srivastava, 2007).

(2017) defines in which all organizational processes in harmony with environmental considerations. Dwivedi (2016), on the other hand, broadens the scope of GSCM to include core industrial processes such as material recycling, reuse, and substitution. define that encompass order management, product design, procurement, distribution, and logistics, all governed by environmentally friendly principles. Sharma et al. (2017) define GSCM.

Moreover, Srivastava (2007) provides a definition of green supply chain management (GSCM) that encompasses environmental considerations integrated throughout the entire product lifecycle, from design and material sourcing to manufacturing, product delivery, and end-of-life product management. GSCM practices encompass various activities, including green procurement, eco-conscious design, sustainable manufacturing, environmentally friendly packaging, green distribution, and reverse logistics. The synergy among these practices plays a pivotal role in maximizing environmental benefits (Kung, Huang & Cheng, 2012).

In today's global trade and market landscape, environmental concerns have become deeply intertwined. Anbumozhi and Kanada (2005) have observed that global consumers are increasingly discerning and demanding eco-friendly products. The sustainability of our planet is under threat due to reckless resource consumption and irresponsible environmental pollution throughout the entire product lifecycle, from raw material procurement and manufacturing to use and disposal, as highlighted by Matos and Hall (2007).

Incorporating environmental concerns, including toxic waste management, into supply chain management (SCM) is no longer optional but imperative. It must be seen as a central component of industrial production processes that promote sustainable growth, as advocated by Sheu et al. (2005). Consequently, businesses are facing interconnected pressures from various stakeholders, including shareholders, society, governments, customers, markets, and business organizations. These pressures necessitate a proactive response to environmental concerns, encompassing material conservation and reductions in water and energy consumption. Environmental and social considerations have gained paramount importance in managing businesses amid rapid global changes, particularly within the context of worldwide manufacturing trends, as discussed by Amemba in 2013. In this context, companies are compelled to embrace Green Supply Chain Management (GSCM) practices within their operations. The objective is to achieve comprehensive progress across economic, environmental, and social dimensions while preserving the environment. Effective GSCM practices are rooted in fundamental principles that prioritize both quality assurance and cost-efficiency.

2.2.2 Green Supply Chain Management (SCM) Practices: Dimensions

2.2.2.1 Sustainable Transportation

The global demand for sustainable transportation has experienced a substantial surge in recent years, driven by the pressing concern of escalating CO2 emissions, primarily attributable to freight transportation, which poses a significant environmental threat. Projections indicate that this demand will increase by a staggering 71% from 2016 to the anticipated figures for 2050, with an additional 50% increment predicted (Teter et al., 2017).

In the contemporary manufacturing landscape, green logistics and sustainable transportation have emerged as pivotal focal points. Nonetheless, the adoption of preventive measures exhibits significant variation among countries, each employing distinct strategies (Lu et al., 2019). For example, nations such as actively pursued as part of their environmental pollution mitigation efforts (Lu et al., 2019). Implementing sustainable transportation practices and engaging in reverse logistics activities offer organizations opportunities to enhance growth while simultaneously reducing The optimization of logistics efficiency can be further accomplished through the enhancement of transportation systems, particularly through the adoption of sustainable transportation (Intravaia and Viana, 2016).

Green Distribution encompasses the adoption of environmentally friendly and efficient practices and strategies in the forward freight distribution process (Rodrigue, Comtois & Slack, 2006). Among the various logistics components, the transportation of products to customers emerges as the most formidable environmental challenge (Wu & Dunn, 1995). Modes of transportation reliant on petroleum-based fuels emit harmful chemicals and gases into the atmosphere. Moreover, the construction of transportation infrastructure, such as roads, airports, railways, and harbors, carries significant environmental consequences. The disposal of these transportation modes at the end of their life cycles poses additional environmental concerns. Hence, it is imperative to prioritize transportation methods that either mitigate or eliminate these environmental impacts to preserve the natural environment. Numerous green distribution measures have been explored in previous studies (Wu & Dunn, 1995; Rodrigue et al., 2006; Zhu et al., 2008a; Paulraj, 2009; Ninlawan et al., 2010).

2.2.3 Sustainable Transportation Modes in the Mining Sector

To reduce transportation costs and mitigate environmental risks, to its amalgamation of various transportation mediums, resulting in advantages enhanced increased freight. design transportation aims to curtail carbon emissions, lower overall transportation costs, and alleviate road congestion (Dettmer, 2017). Research has demonstrated that intermodal transportation can reduce carbon emissions by 57% compared to other transportation modes (Agamez-Arias et al., 2017). Multimodal transportation shares similarities with integrates multiple under a single service provider, ensuring cost-effective door-to-door goods movement (Rodrigue, 2018). The primary distinction between the two lies in the number of units loaded for shipping (Forbes, 2018). Additionally, various types of intermodal and multimodal transportation methods exist, including:

2.2.3.1 Air Freight: Airfreight, although the most expensive shipping method, is the quickest compared to all other transportation options. It significantly reduces delivery times, making it the preferred choice for transporting highly valuable goods, such as small packages weighing up to and documents that can be carried by an individual. Globally, air cargo plays an increasingly pivotal chains (Rodrigue, 2018). Costs

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associated with airfreight, most organizations utilize it as shipping critical and urgently needed items.

2.2.3.2 Road Freight: Road transportation, utilizing commonly used method for delivering goods. It offers high flexibility but is limited to road networks. Organizations opt for road freight when they require rapid distribution of lightweight goods in small quantities. However, road transportation has become challenging due to the high maintenance costs associated with both the carrier infrastructure and other repair expenses (Rodrigue, 2018), which also have adverse effects on environmental stability.

2.2.3.3 Railway freight: Railway Freight emerges as the most cost-effective and environmentally friendly means of shipping goods over long distances. On a global scale, China is renowned for providing exceptional railway services, with its railway system contributing to 100% efficiency in online marketing and product delivery (Mei and Messiah, 2017). Railway transportation offers a viable alternative to road freight, as it provides cost-effective, electrified operations that are both economically and ecologically beneficial (Dettmer, 2017). Despite its cost-efficiency, railway freight faces challenges in timely consignment deliveries, and without significant improvements in railway systems, serving consumers could be problematic (Romanow, 2016).

2.2.3.4 Ocean Freight: Since 1990, international trade has heavily relied on ocean freight, accounting for 65% of all shipments. This surge has presented logistical managers with significant challenges in selecting carriers for goods transport (Waller et al., 2008). Dettmer et al. (2017) note a substantial decrease in transportation rates for containerized products over the last decade, establishing ocean freight as the most cost-effective means of transporting goods. Waller et al. (2008) further state that 40% of freights are shipped via ocean, especially for the international transport of heavy products.

2.2.3.5 Pipeline: Often overlooked as a mode of transportation, pipelines incurred approximately \$53 billion in costs in 2018 has led to a greater reliance on pipelines for, necessitating investment in this sector. However, it's important to acknowledge utilization of pipelines remains limited and represents a relatively small market when compared to other transportation methods (Banker, 2019).

2.2.3.6 Micromobility: Micromobility encompasses, which have gained popularity in due to their environmentally friendly attributes. These modes of transportation are considered cost-effective, especially for journeys of approximately 5 miles or less. They provide a swift and convenient means of travel without the need for a license. A noteworthy characteristic of micromobility is its eco-friendliness, as it operates without the consumption of fuel (Lahoti, 2019).

2.2.3.7 Cable and Drone: Another transportation method akin to micromobility, particularly prevalent. Cable cars offer an efficient mode of transport, addressing challenges related to time and cost. They prove especially valuable in hilly areas connected to urban centers, alleviating road traffic congestion and promoting environmental sustainability. In addition to cable cars, drones have emerged as an innovative transportation solution. In 2018, it was demonstrated that drone-based deliveries effectively reduce greenhouse gas emissions and energy consumption within the transportation sector. The successful deployment of drones depends on factors such as drone size, package weight, Drone usage is particularly advantageous in regions with clean electricity sources, such as California (Stern, 2007).

2.2.4 Green Packaging

The concept of sustainability faces challenges due to the escalating generation of solid waste. Green packaging offers an ideal solution by incorporating environmental considerations throughout the packaging lifecycle (Jiange, 2008). Ninlawan et al. (2012) propose that green packaging can be achieved through (Zhang and Liu, 2009). Green packaging entails the development and utilization of packaging materials that minimize adverse impacts on the environment. While packaging serves vital functions such as product protection and information conveyance, it becomes a concern once the product is consumed. Enhanced packaging design can significantly reduce material usage, optimize warehouse and vehicle space, minimize handling requirements, and subsequently decrease environmental impacts (Wu & Dunn, 1995; Tseng, 2009; Ninlawan et al., 2010; Laosirihongthong et al., 2013).

2.2.5 Customer Development

The term "customer development" is a relatively recent concept in literature, explored from various perspectives. Ries (2011) underscores the focus of customer development on understanding specific consumer demands and fulfilling them with minimal resources. Amedofu et al. (2019) share a similar viewpoint, regarding the ability to recruit, satisfy, and keep consumers is defined as customer development. Based on current research, customer development is described in this study as a firm's ability to acquire, please, and retain customers by supplying goods and services in novel ways. Customer development is critical for business survival (Wilson et al., 2012) and plays a critical role whether a company is joining a seeking a new developing exists (Blank, 2013). The empirical research on the broad factors of development is still scarce.

2.2.6 Sustainable Performance

The principle of sustainability permeates discussions across various sectors, including supply chains, local governments, tourism, and urban planning. Sustainability emerged from the concept of sustainable development, as articulated in the Brundtland report, "Our Common Future," which defines it as "development that meets present needs without compromising future generations' ability to meet their own needs" (WCED, 1987). This definition serves as the cornerstone for ongoing and future research into sustainability. Diverse interpretations exist regarding the relationship between "sustainable development" and "sustainability." Some consider sustainable development a process leading to sustainability, while others regard sustainability as an environmental facet of sustainable development. Nonetheless, some authors attempt to blur the distinction between these terms. John Elkington introduced the concept of the "triple bottom line" (TBL), broadening the conventional focus on profit and loss to encompass the environmental and social dimensions of sustainability prevent adverse impacts on quality of life, economic opportunities thus entails curbing increasingly held accountable for their actions and those of their supply chain partners in achieving sustainability. Integration and collaboration at every level have gained significance.

2.2.6.1 Supply Chain Sustainability

The integration of sustainability into supply chain management is a burgeoning research area, primarily explored through Widely accepted SSCM definitions by Seuring and Müller and Carter and Rogers underscore the management of material, information, and capital flows while addressing dimensions, aligned with While these definitions stress the importance of interorganizational processes among supply chain members to achieve the triple bottom line, contemporary research acknowledges the wider strategic influence of companies in shaping sustainable supply chains. Pagell and Shevchenko offer a definition of Scholars have identified both internal and external practices that companies employ to foster sustainability throughout their supply chains. These practices encompass behavioral elements, perceptions of sustainability risks, and the establishment of codes of conduct, collaborative procedures, and monitoring mechanisms. Initially, the primary focus was on direct connections, but recent studies have delved into the broader network of relationships and their impact on the sustainability of the supply chain.

Social network analysis has unveiled the significance of network structure in influencing sustainability behavior and performance. Governance mechanisms for managing lowertier suppliers create specific connectivity patterns within the network, although explicit structural properties are yet to be fully recognized. This study adopts social network analysis to synthesize the intersection of supply chain network analysis and sustainability.

Numerous literature reviews on SSCM exist, with definitions emphasizing the strategic integration of economic, environmental, and social goals in interorganizational processes. Achieving sustainability requires organizations to redesign supply chains to incorporate sustainability goals throughout their operations. The ultimate aim is to provide value to stakeholders, meet customer requirements, and enable cooperation among supply chain participants.

Cooperation among supply chain partners and understanding stakeholder needs are vital for implementing sustainability initiatives, as organizations must coordinate with suppliers to meet these goals.

2.2.6.2 Advancing the Understanding of Sustainability Performance Metrics and Influential Factors

In the comprehensive assessment of sustainability performance, we stratify dimensions into two primary categories: primary and secondary drivers. This categorization hinges on their accessibility to supply chain information and their relative contributions to the creation of value. Primary drivers encompass a spectrum of influential entities, including government bodies, within this category, we also encapsulate elements such as pressures emanating exigencies, resource allocation dynamics, and the pursuit of advantages (Giunipero et al., 2012).

Conversely, secondary drivers comprise actors such as the media and press, nongovernmental organizations (NGOs), local communities, and various social groups (González-Benito et al., 2009). Additionally, this category encompasses factors like reputation and image considerations (Zhu et al., 2007), socio-cultural responsibilities and resultant public pressures (Hsu et al., 2013), certifications, and the allure of financial benefits (Giunipero et al., 2012).

Organizations, in tandem with their supply chains, are facing mounting pressures to embrace sustainable practices (Hsu et al., 2013; Varsei et al., 2014). These pressures have been characterized in diverse ways within the literature, including as catalysts, and motivators have referred to these dimensions as motivators inciting organizations to adopt green and sustainability initiatives, transcending their organizational confines. Consequently, in the context of Sustainable Supply Chain Management (SSCM), these dimensions are construed as dynamic forces or influencers propelling organizations to establish sustainability initiatives throughout their supply chains. The dimensions within SSCM may originate from pressures exerted by internal and external stakeholders (Hsu et al., 2013; Meixell et al., 2015), and they may wield influence over one or more facets of sustainability. Diverse dimensions exert varying degrees of impact on supply chain decisions (Haverkamp et al., 2010). Furthermore, the escalating transparency facilitated by contemporary has propelled actively seek information regarding the conditions underpinning product manufacturing, thereby cultivating a heightened awareness of product and brand sustainability.

In scholarly discourse, the classification of SSCM dimensions is predicated upon their degree of influence and significance within the supply chain ecosystem (Walker et al., Stakeholder theory emerges as a valuable framework for comprehending the role of stakeholder pressure in propelling consonance dimensions are stratified into three overarching domains: environmental, social, and economic dimensions (Zhu et al., 2007; Walker et al., 2008; González-Benito et al., 2009; Haverkamp et al., 2010; Harms et al., 2013; Schrettle et al., 2014).

2.2.6.2.1 Environmental Sustainability

In the realm of environmental sustainability, the primary focus is on the ecological aspects of the natural environment. This involves safeguarding and enhancing the integrity of Earth's life-support systems (Moldan et al., 2012). The assessment of environmental sustainability revolves around understanding the state of the environment, the reasons behind its current condition, and the actions being taken to address it (Hammond et al., 1995). Research in this domain also delves into critical questions such as whether sustainable development efforts lead to decoupling, and the intricate interplay between human activities and economic growth concerning environmental impacts (Patil, 1994).

A significant majority, 82.1% of the articles, concentrate on environmental concerns either exclusively or in combination with social and/or economic aspects. Moreover, 95% of these articles are empirical or case studies, ensuring the validation of the information generated. A study by Moreno-Camacho Montoya-Torres, Jaegler, and Gondran (2019) highlighted a growing emphasis on sustainable practices in emerging economies, particularly in Asia. It also underscored the increasing attention given to environmental issues, with social criteria lagging behind in research.

Articles dedicated solely to environmental issues explore topics like urban solid waste management, carbon performance measurement, pollution reduction, waste minimization, carbon footprint reduction, and efficient resource use and recovery (Ali et al., 2020; Marzuki et al., 2017; Jakhar et al., 2018; Krishnan et al., 2020). Other authors delve into areas such as enhancing supply chain environmental performance (Roy et al., 2020), strategies for improving environmental sustainability (Roy et al., 2020), and environmental sustainability assessment (Suhi et al., 2019; Krishnan et al., 2020). Additionally, research covers barriers affecting sustainable procurement practices (Delmonico et al., 2020) examined the influence of outsourcing and supplier collaboration on environmental progress. In a similar vein, (Ding et al., 2018) investigated the role of stakeholders in the adoption of sustainable supply chain management practices a wide range of environmental considerations.

The empirical and case studies presented here emphasize the critical nature of monitoring sustainability performance within supply chains from an environmental standpoint. They also underscore the active participation of stakeholders in championing and facilitating environmental initiatives in emerging economies.

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Furthermore, the burgeoning significance of environmental sustainability and green concerns has garnered heightened attention from both researchers and managers. This heightened focus is attributed to the emergence of new regulations, evolving customer expectations, and the increasing emphasis on procuring environmentally friendly products (Moktadir et al., 2018).

2.2.6.2.2 Social Sustainability

The domain of social sustainability, as part of the broader framework of sustainable development, has historically been a subject of limited attention and theoretical exploration. Consequently, its practical implementation has posed considerable challenges. The organizational culture of an entity steering sustainability endeavors and encompasses facets such as information dissemination, innovation, health and safety, and codes of conduct (Haverkamp et al., 2010; Harms et al

The motivation to adopt sustainable practices is influenced not only by perceived pressures but also by organizational characteristics such as size, current environmental initiatives, From a social sustainability perspective, literature recognizes the intricate interplay between social concerns and the operational facets of businesses (Mani et al., 2016). Tang (2018) asserts that corporate social responsibility is intricately linked with supply chain activities in emerging markets. Similarly, Tong et al. (2018) delve into the adoption of socially responsible practices throughout supply chains, particularly in emerging markets. Abreu et al. (2012) scrutinize how factors such as a firm's location, size, and position within the value chain influence the implementation of corporate social responsibility initiatives within Brazilian and Chinese textile companies. Several authors also explore the growing significance of emerging economies in the supply chain operations of global firms (Jayaram et al., 2015).

In a comprehensive literature review conducted by Koberg et al. (2019) on global sustainable supply chain management (SSCM), it becomes evident that papers emphasizing one dimension of sustainability tend to give more attention to the social dimension as opposed to the economic or environmental aspects. Morais et al. (2018) utilize multiple case studies in Brazil to examine why and how local companies integrate and attain social sustainability within their supply chains. They underscore motivation, collaboration, and information sharing as pivotal components for the successful execution of social initiatives. Vargas et al. (2018) provide empirical evidence illustrating a mutually beneficial relationship between social supply chain practices and gaining a competitive edge, particularly in emerging economies. Moreover, Mani et al. (2016) advocate for the inclusion of labor-related issues as an integral facet of social sustainability, positing that this can enhance supply chain performance.

Regulatory burdens emerge imposed by both national and supranational regulatory bodies González-Benito et al., 2009; Haverkamp et al., 2010; Huang et al., 2010; Tate et al., 2010; Giunipero et al., 2012; Harms et al., 2013; Hsu et al., 2013; Xu et al., 2013; Schrettle et al., 2014).

2.2.6.2.3 Achieving Economic Sustainability

Economic sustainability is a crucial aspect for organizations as it shapes the market landscape, and failing to meet sustainability goals can result in investors withdrawing their support, thereby increasing risks and damaging an organization's reputation (Schrettle et al., 2014). This pressure group encompasses various stakeholders such as customers, competitors, shareholders, suppliers, buyers, investors, financial institutions, and more (Zhu et al., 2007; Walker et al., 2008; Freeman, 2010; Haverkamp et al., 2010; Huang et al., 2010; Caniato et al., 2012; Giunipero et al., 2012; Ayuso et al., 2013; Harms et al., 2013; Bai et al., 2015; Govindan et al., 2016).

Successfully achieving sustainability goals necessitates (Haverkamp et al., elements like the organization's sustainability strategy, top management commitment, cost-related pressures, and operational performance (Carter et al., 2001; Walker et al., 2008; González-Benito et al., 2009; Giunipero, Hooker et al., 2012; Hsu et al., 2013). This category covers In, which are still in the process of development compared to developed countries (Tang, 2018), these regions have begun to play a significant role in sustainability initiatives and practices (Choi et al., 2019). However, there is a notable research gap when it comes to addressing specific issues related to Sustainable Supply Chain Management (SSCM) in developing countries compared to developed ones (Rajeev et al., 2017). Several studies have highlighted this disparity (Rajeev et al., 2017; Silvestre, 2015; Khalid Raja et al., 2015). Khalid et al. (2019) shed light on the critical importance of SSCM initiatives in developing markets and the unique organizational challenges they face. Gold et al. (2013) discussed how SCM aligns with the pursuit of sustainability goals in developing countries, while Jia et al. (2018) aimed to narrow this knowledge gap by examining Sustainable Supply Chain Management (SSCM) practices within the context of global supply chains originating from developing nations.

When viewed through a, achieving economic excellence emerges as a pivotal factor for operational success. The overall cost of supply chain management assumes a pivotal role, as highlighted by Esfahbodi et al. (2016), Ding et al. (2015), and Zhang et al. (2014). Within the body of analyzed literature, 54% of the studies primarily centered their focus on economic considerations, often intertwining While some of these articles emphasized economic objectives such as sales, market share, and resource efficiency, they

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consistently acknowledged the paramount significance of efficient cost management within the supply chain, echoing findings by Zailani et al. (2013) and Ding et al. (2016). Highlighted finance as a crucial driver for implementing economy garment chains. Emphasized economic issues while acknowledging the significance of compliance with environmental regulations. Notably, none focused solely on the; they all incorporated social and/or environmental dimensions in their analyses (Choi et al., 2019; Esfahbodi et al., 2016).

Section 2.2.6.3: Integration of Multiple Dimensions

The convergence of ecological, economic, and social facets assumes a pivotal role, with approximately half of the reviewed articles adopting a triple-dimensional approach. In the contemporary landscape of manufacturing, a triple bottom line (TBL) methodology has garnered considerable managerial attention, underscoring the importance of ecological, economic, and social considerations in business administration (Roy et al., 2018). This is in harmony with other literature reviews that underscore TBL as a central research domain and a principal challenge in the realm of sustainable development within supply chain management (Koberg et al., 2019; Gold et al., 2017; Bastas et al., 2018; Beske et al., 2014) unearthing the influential role of management commitment to the TBL approach in SSCM implementation. Katiyar et al. (2018) delved standpoint, discovering a positive correlation between procurement and environmental performance, signifying prospects for integrating the three dimensions from an industrial perspective. Zailani et al. (2012) deduced that SSCM practices can curtail material consumption and waste generation, thereby contributing to the triple bottom line and fostering sustainable global development.

Furthermore, some articles amalgamated dimensions in pairs (constituting prevalent pairing. Literature reviews by Koberg and Longoni (2019) and Bastas et al. (2018) outlined the distribution of sustainability dimensions, with a predominant focus on TBL (43% of papers), followed by environmental sustainability (40%), and the interplay between environmental and social dimensions (15%). Research by Esfahbodi et al. (2016) delved into SSCM practices in emerging economies and their nexus with organizational performance, unveiling bolsters environmental performance but may not invariably lead to enhanced cost. Consequently, there is an escalating emphasis on embracing sustainable practices in emerging economies to attain performance enhancements and desired outcomes (Diabat et al., 2014).

2.3 Theoretical Framework

In the field of organizational analysis, several critical constructs take center stage: Green Supply Chain Management Practices, Customer Development, and Sustainability Performance. These constructs are of paramount importance for any organization. Elements such as green transportation, eco-friendly packaging, customer attraction, and customer satisfaction unquestionably contribute to sustainability performance. The enhancement of sustainability performance, in turn, raises levels of quality and satisfaction. This study is firmly rooted in the theoretical framework provided by resource-based and dynamic capability theories. These theories form the foundation for investigating the influence of firm-level factors, including customer relationships, supplier relationships, information sharing, and information quality, on innovation, quality, and satisfaction.

Resource Dependency Theory posits that organizational behavior is shaped by external resources. Organizations adapt and reshape their external environments to secure access

to vital resources necessary for their survival. Consequently, an organization's competitiveness hinges on its adeptness in managing external resources.

Pfeffer and Salancik (1978) distinguished Resource-Based View (RBV) from Resource Dependency Theory by emphasizing that while RBV focuses on the internal management of resources and capabilities, Resource Dependency Theory places a spotlight on external interactions with entities like suppliers.

Resource Dependency Theory, as outlined by Pfeffer and Salancik, comprises eleven key premises:

- 1. Organizations respond to the demands of external entities controlling critical resources.
- 2. These resources primarily originate from the organization's environment.
- 3. The environment largely consists of other organizations.
- 4. Resources needed by an organization
- 5. Power is relational and contingent on organizational connections.
- 6. Power is situational and varies with circumstances.
- 7. Power can be mutual, with organizations relying on each other for it.

Resource Dependency Theory bears relevance to this study as it underscores the notion that organizations, such as mining firms, engage in transactions with external actors and organizations to acquire essential resources. Importantly, the theory recognizes that uncertainty complicates an organization's control over resources, necessitating strategies to reduce dependence.

2.3.2 Dynamic Capability

Dynamic capabilities encompass a firm's persistent commitment to adapt, evolve, and optimize its resources and competencies. This adaptability is driven by the goal of

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strengthening core capabilities to maintain a competitive advantage in an ever-changing business landscape (Wang and Ahmed, 2007).

Dynamic capabilities evolve in sync with shifts in the external environment, which can be categorized into two types of markets: moderately dynamic markets, characterized by frequent changes that build upon existing knowledge, and high-velocity dynamic markets, marked by unpredictable shifts that demand novel knowledge tailored to the specific circumstances resource and capability hierarchy comprises four tiers:

- 1. Zero-order resources: These resources are vital for a firm's survival and serve as the foundation for organizational practices and capabilities. They can confer advantages.
- 2. First-order: These are essential for regaining competitiveness or sustaining revenue streams by allocating resources to achieve specific objectives.
- 3. Second-order strategic capabilities (core competencies): These capabilities within specific timeframe.
- 4. Third-order dynamic capabilities: These capabilities are influenced by the dynamism of the external environment and are developed through cyclical strategic renewal of the resource base and strategic capabilities. They significantly influence the pace at which these resources and capabilities are altered.

Resource Dependency Theory and Dynamic Capability Theory jointly hold great relevance in the context of this study, particularly in the mining industry. These theories highlight the importance of zero-order and higher-order capabilities, which play a pivotal role in determining performance outcomes.

2.4: Empirical Review

Particularly within the mining industry, has been driven by the imperative to mitigate risks (Zhu, Sarkis, and Lai, 2019). In this section, we delve into a series of studies that delve into the intricate relationship between GSCM and sustainability performance.

In a study conducted by Han et al. (2020) in China, focused on manufacturing firms, the authors employed Structural Equation Modeling (SEM) to explore the natural, social, and economic impacts of Green Supply Chain Incorporation (GSCI) based on data from 206 Chinese manufacturers. The findings unveiled the multifaceted nature of GSCI, where Green Internal Integration forms the bedrock for collaboration with suppliers (GSI) and broader green integration (GCI), with direct ties to environmental and social outcomes. Interestingly, GSI positively influences economic results, while GCI contributes positively to social performance.

Moving to Turkey, Cankaya et al. (2019) examined the influence of GSCM on sustainability performance. This research considered eight dimensions of GSCM within three facets of corporate sustainability. Utilizing face-to-face cross-sectional and mail sample data, along with SEM, their results underscored a positive and substantial impact of GSCM on sustainability performance.

Pan et al. (2019) investigated the interplay between GSCM and sustainability performance in China, drawing from data gathered from 162 manufacturing firms. Their findings illuminated two key insights: Firstly, the level of interaction decreases without impeding economic efficiency, with internal environmental governance exerting a positive influence. Secondly, certain aspects of collaborative communication moderate the in external collaborations, while the communication atmosphere modulates the effects of internal environmental management.
In a study conducted in the UK by Cousins et al. (2019), which involved 248 manufacturing companies, the connection between GSCM and sustainability performance was scrutinized. Survey data was employed, revealing that GSCM activities are linked to enhanced environmental and cost efficiency. It was observed that stronger and cost efficiency were evident with higher levels However, an intriguing observation was a negative correlation between GSCM activities in cases with high supply chain traceability.

Rao (2019) examined the implementation of GSC initiatives in Southern India, with a focus on inbound and outbound logistics for SMEs. The study emphasized the necessity for increased green practices in both inbound and production processes to achieve significant environmental and economic improvements. Nevertheless, the study noted that implementing GSCM practices in the SME sector posed its own set of challenges.

In Vietnam, Le (2020) and Wibowo et al. (2018) conducted research exploring (economic, environmental, and social). Using Structural Equation Modeling (SEM), they found no significant environmental impact but observed positive economic and social impacts. This suggests that stakeholders can acquire valuable insights from GSCM principles to enhance project efficiency.

Ahmed and Ahmed (2018) delved into the impact of GSCMs on green and economic success in Pakistan using SEM. Their findings indicated that leadership and institutional pressures play pivotal roles in a company's adoption of green practices and external green cooperation.

Kaur et al. (2018) adopted a DEMATEL-based approach to scrutinize barriers to GSCM in the Canadian electronic goods manufacturing sector. They identified several barriers, including lack of awareness, technical expertise, and corporate social responsibility.

Lack of training/knowledge and top management commitment emerged as the primary barriers to GSCM implementation in Canadian manufacturing firms.

Pinto et al. (2019) also harnessed the DEMATEL method to analyze the relationship between GSCM, Knowledge Technology Transfer (KTT), and innovation in Brazilian plastic manufacturing firms. Their findings illuminated the interconnected nature of these perspectives, with innovation and KTT stimulating greater development in GSCM. Lastly, Li et al. (2020) employed the Strategy Structure Performance (SSP) framework and discerned, coupled with, enhances environmental performance. Additionally, they found that relationship capability.

In the study conducted by Peprah and colleagues (2016), significant factors impacting Green Supply Chain (GSC) in the mining industry were identified. These factors encompassed a lack of expertise and knowledge, the financial burden associated with environmental programs, insufficient political commitment, and the absence of punitive measures for environmental wrongdoers. The authors recommended that developing nations, such as Ghana, should invest in Environmental Management Systems (EMS) to bolster their operational competitiveness.

Quintana-García et al. (2020) and Younis et al. (2019) unveiled the advantages of incorporating sustainable practices into the supply chain, which boost efficiency, competitive advantage, and overall corporate performance. The implementation and certification of EMS serve as foundational elements for green initiatives that contribute significantly to corporate success.

Bu et al. (2020) delved into the correlation between environmental orientation and firm performance in small and medium-sized enterprises (SMEs) in China. Their research underscored the significance of collaboration with key suppliers and the practice of ecodesign as effective approaches for addressing environmental concerns. Furthermore, they demonstrated that eco-design also has a discernible impact on the financial performance of organizations.

Notteboom et al. (2020) conducted an investigation within seaports in the Netherlands and Belgium, spotlighting the substantial emphasis placed on greening the port supply chain. Their findings resonated with earlier studies, affirming. Strategies like employing Capsize ships to mitigate Greenhouse Gas (GHG) emissions in the export sector were also found to contribute to cost reduction.

Tran et al. (2020) scrutinized the implications of Green Supply Chain Management on climate efficiency and financial outcomes within Vietnam's tourism industry. Their study revealed that enhanced supply chain efficiency positively affects GSCM, subsequently leading to positive impacts on environmental sustainability and financial performance. However, they did not observe a moderating effect on the relationship between green supply integration, financial performance, and environmental performance under certain circumstances.

Numerous studies have explored GSCM practices in various African countries, including Kenya, Ethiopia, Morocco, Zimbabwe, Uganda, and Ghana. In Zimbabwe, GSCM practices have been embraced within the retail sector to promote environmental conservation. Challenges identified encompass a lack of awareness campaigns and a tendency to prioritize profits over environmental concerns. In Kenya, green manufacturing significantly predicts firm performance, while in Morocco, the proactive or conservative stance of firms plays a pivotal role in Reverse Supply Chain (RSC) initiatives. Ethiopia's leather industry has also adopted GSCM practices to enhance environmental performance. In Uganda, eco-design, green procurement, and internal

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environmental management practices were found to exert influence on environmental performance, economic benefits, and economic costs in manufacturing SMEs.

In Ghana, Afum et al. (2020) investigated the interplay between Green Supply Chain Integration (GSCI), Green Manufacturing Practices (GMPs), and sustainability success across economic, environmental, and social dimensions in small and medium-sized manufacturing firms. Their findings underscored the positive impact of GMPs on sustainability performance, with GSCI serving as a mediating factor in this relationship.





Summary of Empirical Studies on Green SCM Practices, Customer Development, and Sustainable Performance

	Author (s)	Country	Research question/	Constructs/	Theories	Methods	Findings	Implications for			
		of Study	hypothesis	Variables	2			Practice			
1	Ahmad (2017)	Malaysia	Do Green SCM practices influence firm growth?	Green SCM Practices, Firm Growth, SMEs	Resource Based View Theory	Quantitative - survey	The findings indicated that Green SCM positively and significantly affect firm growth	CEOs/Managers should exhibit greater effort in maximizing Green SCM practices			
2	Lasse et al.,	Finland	What is the	Green SCM	Dynamic	Quantitative	The findings indicated	CEOs/Managers			
	(2019)		relationship between	practices, and firm	capability	survey	that Green SCM	should exhibit			
			Green SCM practices	performance,	theory		positively and	greater effort in			
			and firm	Manufacturing			significantly affect	maximizing Green			
	performance? industry firm performance SCM practices										
	SA ₃₃ E NO										

3	Sendawuet	Uganda	Do Green SCM	Green SCM	Resource Based	Quantitative –	The findings indicated	CEOs/Managers		
	al., (2020)		practices drive	practices, and	View Theory	survey	that Green SCM	should exhibit		
			customer	customer satisfaction			positively and	greater effort in		
			satisfaction?				significantly affect	maximizing Green		
							customer satisfaction	SCM practices,		
				- M	12			especially customer		
				N	11 2	i.		supply chain		
				(1)	117	2				
4	Ngoma et	Uganda	There is a positive	Green SC, and	Resource Based	Quantitative –	The findings indicated	CEOs/Managers		
	al., (2017)		relationship green	performance	View Theory	survey	that Green SC	should exhibit Green		
			supply chain and		and and	1	positively and	SC		
			performance	E	1 8	74	significantly affect			
				A CU	A DI	77.	firm performance			
			X	Car.	3	50				
			1	act -	- 555					
				TIT			(C			
				July						
							(f s)			
5	Asamoah et	Ghana		SCR, and customer	Resource Based	Quantitative –	The findings indicated	Start-up businesses		
	al., (2020)		Z	development	View Theory,	survey	that SCR positively	should adopt SCR to		
			E		Dynamic	10	and significantly affect	attract, satisfy and		
			5	-	capability	40	customer development	retain customers		
			TP.	22	theory	BA				
	34									

6	Mohr et al.,	UK	What is the link	Green SCM drivers,	Resources	Quantitative –	The findings indicated	Managers should						
	(2019)		between Green SCM	performance, and	Based View	survey	that Green SCM	concentrate on Green						
			drivers and	manufacturing			drivers positively and	SCM drivers for						
			performance?	companies	20		significantly affect	performance						
					<u>_</u>		performance of							
					12		manufacturing							
					1. 2	a l	companies							
					1/1									
7	Munir et	UK	What is the link	SCRM, and	Dynamic	Quantitative –	The findings of the	Managers should						
	al., (2020)		between supply chain	operational	capability	survey	study suggest that	focus on						
			risk management and	performance	2		SCRM positively	performance						
			operational			1	affect operational	outcomes to develop						
			performance		5-2	100	performance.	theoretical and						
					K RT	FF		managerial						
				TE.		127		implications.						
				2ac	7-155	X								
8	Tseng et	France	How do SMEs use	Green SCM, and	Network Theory	Quantitative –	The findings of the	CEOs should focus						
	al., (2020)		Green SCM practices	performance	S	survey	study suggest that	on Green SCM						
			to influence		2		Green SCM practices	practices that drive						
			performance?				positively affect	performance						
					21		performance.	outcomes						
			3	15			2							
			1 The			- 13								
COR ESP														
				W 250	NO.	5								
				AC	35									
8	Tseng et al., (2020)	France	risk management and operational performance How do SMEs use Green SCM practices to influence performance?	performance Green SCM, and performance	Network Theory	Quantitative – survey	SCRM positively affect operational performance. The findings of the study suggest that Green SCM practices positively affect performance.	performance outcomes to devel theoretical and managerial implications. CEOs should foc on Green SCM practices that driv performance outcomes						

9	Ibarra-	Mexico	What Green SCM	Logistics	Network Theory	Quantitative –	The findings indicated	Managers should			
	Morales et		practices can boost	Performance, and		survey	that customer	focus more on			
	al., (2019)		performance of	Customer			Performance is the	customer			
			industrial SMEs?	Performance	20		most efficient Green	performance to drive			
							SCM practices that	performance			
				- M	12		affect performance	outcomes			
					1.4						
10	Eduardsen		What is effect of	Green SCM	Network Theory	Quantitative -	The results show that	Firms should focus			
	(2019)		Green SCM practices	practices, and		survey	firms using Green	on Green SCM			
			e-commerce on	customer satisfaction			SCM practices exhibit	practices to boost			
			customer satisfaction		2		high performance	performance			
							growth				
						1	-				
11	Costa et al.,	Portugal	What drives SMEs	Green SCM	Resources	Quantitative -	Findings revealed that	SMEs should focus			
	(2017)		performance?	practices, and firm	Based View	survey	Green SCM practices	more on Green SC			
			7	performance	1.3	XX	drive performance of	practices			
			1	But .	- 50		most SMEs				
				111.1	1						
12	Chandra et	Australia	What is the	Green SC practices,	Network theory	Quantitative -	Findings revealed that	SMEs should focus			
	al., (2020)		relationship between	quality management,		survey	Green SC practices	more on Green SC			
			Green SC practices,	and firm			positively affect	practices and quality			
			quality management,	performance	\leftarrow		quality management	management			
			and firm			1	2				
			performance?	-		1					
				1 m		-					
				JSA	NE NO	-					
					50						

					1 1 1 7						
13	Chandra et	Australia	What is link between	Green SC	Network theory	Quantitative -	Findings revealed that	Firms should focus			
	al., (2020)		Green SC	coordination, and		survey	Green SC coordination	more on Green SC			
			coordination and	performance			positively affect	coordination			
			performance		Resource Based		performance.				
					View						
14	Castagna et	Italy	What is the link	Green SC Network	Network theory	Quantitative -	Findings revealed that	Firms should focus			
	al., (2020)		between Green SC	Structure, and firm	1/7	survey	Green SC network	more on Green SC			
			Network Structure	performance?			structure positively	network structure to			
			and firm				affect performance.	ramp-up			
			performance?					performance			
					7	1					
					1-2	TR					
					S R/	++	7				
				A Star		25					
15	Bala	India	What is the effect of	Green SCM	Resource Based	Meta analysis	Findings revealed that	Firms should focus			
	Subrahman		Green SCM practices	practices, and	View		Green SCM practices	more on Green SCM			
	ya (2017)		on Company	company			positively affect	practices			
			Performance?	performance	111		company performance.				
16	Anwar Al-	UK	What effect do Green	Green SCM	Resource Based	Quantitative -	Findings revealed that	Firms should focus			
	Sheyadi et		SCM practices have	practices, and	View	survey	Green SCM practices	more on			
	al. 2019		on environmental	environmental	1		positively affect	environmental			
			performance?	performance	-	ap		performance in			
				WJSA	E NO	1					
					31						

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and the second second

							environmental	integrating Green			
							performance	SCM practices			
				1.000							
17	Danese et		What is the	Green SCI, and	Resource Based	Quantitative -	Findings revealed that	Firms should focus			
	al. 2020		relationship between	performance	View	cross-sectional	Green SCI practices	more on Green SCI			
			Green SCI and		1 M	data, survey	positively affect	practices			
			performance?		1 Ma		performance				
				Lev.	11 2						
18	Kumar et	India	Sustainable Green	Logistics SCM,	Network theory	Quantitative -	Findings revealed that	Managers should			
	al. 2020		SCM	Customer SCM, and		survey	sustainable Green	focus more on			
				Operational SCM			SCM positively affect	sustainable Green			
							performance	SCM			
					and the second	1					
19	Prange et	China	What are SMEs	Logistics SCM,	Resource Based	Quantitative -	Findings revealed that				
	al., (2018)		Green SCM	Customer SCM, and	View	survey	SMEs focus more				
			practices?	Operational SCM	1	200	customer SCM				
			1	200		3					
20	Momif	Swadan	What is the link	Crean Supply Chain		Quantitativa	Eindings revealed that	Firms should focus			
20		Sweden			21	Quantitative -					
	Hossa et al.		between Green	Sustainability	1977	survey	Green SC	more on Green SC			
	2020		Supply Chain	practices, and			sustainability practices	sustainability			
			Sustainability	governance	1		improves on				
			practices and				governance strategies				
			governance			- 13	in mitigating risk				
			San			100					
				2 PA	5	BA					
				LW 200	NE NO	5					
				SA	38						

21	Mutalemwa	Tanzania	What is the	Green SC practices,	Network theory	Quantitative -	Findings revealed that					
	(2018)		relationship between	quality management,		survey	Green SC practices					
			Green SC practices,	and firm			positively affect					
			quality management,	performance			performance					
			and firm		<u>.</u>							
			performance?									
22	Gamage et	Sri Lanka	What is the link	Green SC Network	Dynamic	Quantitative -	Findings revealed that	Firms should focus				
	al., (2019)		between Green SC	Structure and firm	Capability	survey	Green SC network	more on Green SC				
			Network Structure	performance?			positively affect	network				
			and firm		2		structure and					
			performance?			1	performance					
					1-2	1						
				201		F						
		D 1			P. P. I							
23	Morais et	Portugal	What is the	Green SCM	Resource Based	Quantitative -	Findings revealed that	Managers of firms				
	al., (2019)		relationship between	practices, and firm	View	survey	Green SCM practices	should focus more on				
			Green SCM practices	performance	1		positively affect firm	Green SCM practices				
			and firm	alist			performance					
			performance?									
24	Arpa	Norway,	Do Green SCM	Green SCM	Network theory	Quantitative -	Findings revealed that	Managers of firms				
	(2018)	and	practices influence	practices, and firm	21	survey	Green SCM practices	should focus more on				
		Ireland	firm growth?	growth?	17.	7 54	positively affect firm	logistics Green SCM				
			A.P.	R	5	BAD	growth	practices				
L	39											

						5				
25	Kenny et	Ireland	What is effect of	Green SCM practices	Network Theory	Quantitative -	Findings revealed that	Managers of firms		
	al., (2017)		green SCM practices	e-commerce, and		survey	green SCM practices	should focus more on		
			e-commerce on	customer satisfaction			e-commerce positively	green SCM practices		
			customer satisfaction		14		affect customer			
					1 Ma		satisfaction			
					1174	6				
				and the second second						
26	Pittenhofer	Denmark	What affact do Green	Green SCM		Casa study	Findings revealed that			
20	(2018)	Dennark	SCM practices have	practices and	2	research	Groop SCM practices			
	(2018)		SCIM practices have	practices, and		research	oreen SCW practices			
			on environmental	environmental	22	1	positively affect			
			performance?	performance	1 8	77	environmental			
				AL U		120	performance			
			7	Car.	1.3	XX				
				aug.	100	2				
27	Awuah et	Sweden,	How do SMEs use	Green SCM	Dynamic	Review of	Findings revealed that	Managers should		
	al., (2018)	and Brazil	Green SCM practices	practices, and	Capability		Green SCM practices	have the ability to		
			to influence	performance?		existing	positively affect SME	develop practice		
			performance?			literature	performance	Green SCM		
			3				3			
			EL			0				
SR Est										
W JEANS NO										
				SA	40					

28	Anand	India	What is the effect of	Green SCM		Survey	Findings revealed that	Managers should			
	(2018)		Green SCM practices	practices, and			Green SCM practices	have the ability to			
			on Company	Company			positively affect	practice Green SCM			
			Performance?	Performance?			company performance.				
29	Ahmed et	China	What are SMEs	Logistics Green	Resource Based	Quantitative -	Findings revealed that				
	al., (2018)		Green SCM	SCM, Customer	View	survey	SMEs focus more				
			practices?	SCM, and	1.4	E.	customer Green SCM				
				Operational SCM							
30	Shafiq et al.	Sweden	What is the	Green SCA, and	Contingency	Quantitative -	Findings revealed that	Managers should			
	2019		relationship between	performance	Theory	survey	Green SCA affect	have the ability to			
			Green SC Analytics		and the second	1	positively the	develop practice			
			and performance?	E	1 8	74	performance of firms.	Green SCA			
					A DI	37	7				
31	Hong et al.	UK	What is the	Green SCM	Dynamic	Quantitative -	Findings revealed that	Managers should			
	2017		relationship among	practices, SCDC and	Capability	survey	Green SCM practice	focus on supply			
			Green SCM	Enterprise	Theory		affect positively the	chain dynamic			
			practices, SCDC and	performance	Ser.		SCDC and	capability			
			Enterprise		111		performance of firms.				
			performance?								
			T		\leftarrow		5				
32	Dai et al.	India	How do firms	Green SCM practices	Contingency	Quantitative -	Findings revealed that	Managers should			
	2021		develop sustainable		Theory	survey	firms develop Green	focus more customer			
			Green SCM	2	<	ap?	SCM practices by	network to develop			
				WJSAI	HE NO	>					
				2	41						

							engaging in customer	their Green SCM			
							network	practices			
33	Debadyuti	India	What is the	Sustainable Green	Resource Based	Quantitative -	Findings revealed that	Managers should use			
	2017		relationship between	SCM Practices and	View	survey	sustainable Green	Green SCM in			
			Sustainable Green	performance	11 2		SCM practices	managing business			
			SCM Practices and	223	117	2	significantly and	performance			
			performance				positively influence				
							performance				
					Carlos and	1					
34	Wang et al.	Denmark	Does green supply	Green SCM, and	Contingency	Survey	Findings revealed that	Managers should use			
	2020		chain management	firm performance	Theory		green SCM practices	green SCM in			
			drive firm	Char		27	positively influence	managing firm			
			performance	age -	- 510	2	firm performance	performance			
			performance	TIT	1		inin performance	periormanee			
				July							
							r si				
35	Yu et al.	Portugal	What is the effect of	Green supply chain,	Resource Based	Quantitative -	Findings revealed that				
	2020		green supply chain	and operational	View	survey	Green SC significantly				
			on operational	flexibility		10	affect operational				
			flexibility	-		40	flexibility				
W 200 NO											
	SA ₄₂ E										

36	Garcia-		What is the effect of	Green SCM, and	Network Theory	Case-study	Findings revealed that	Managers should use		
	Buendia et		Green SCM on	performance		research	Green SCM	Green SCM in		
	al. 2021		performance	relationship			significantly affect	managing		
			relationships		20		performance	performance		
							relationships	relationship		
	~				1					
37	Grant et al.	UK	What are the green	Green SCM, and	Network Theory	Quantitative -	Findings revealed that			
	2021		supply chain	Performance	1/1	survey	Green SCM			
			management	measures			significantly affect			
			performance				performance			
			measures?		2		relationships			
38	Younis et	US	To what extent does	Green SCM, and	Resource Based	Quantitative -	Findings revealed that	Managers should use		
	al. 2019		green SCM affect	corporation	View	survey	green SCM	green SCM in		
			corporate	performance		327	significantly affect	managing corporate		
			performance	Charles -	1.3	XX	corporate performance	performance		
			1.1	nage -	-					
39	Vafaei-	China	What is the effect of	Green Supply chain	Network Theory	Quantitative -	Findings revealed that	Managers should		
	Zadeh et		green supply chain	information	5	survey	green SC information	focus on green SC		
	al., 2020		information	integration, and			integration	information		
			integration on	operational		1.	significantly affect	integration		
			operational	performance	\leftarrow		operational			
			performance				performance			
AND SOM										
				1 Mil		-				
	SAME									
					1 .J					

40	Kumar et	India	What are the	Behavioral factors,	Resource Based	Survey	Findings revealed that				
	al. 2020		behavioral factors for	and	View		behavioral factors				
			the adoption of				significantly affect				
			sustainable green	Sustainable green			sustainable green				
			supply chain	supply chain			supply chain practices				
			practices?		6 2						
			-		1. 24	5					
					115	1					
				- Andrews							
41	Asamoah et	Ghana	Does Inter-	Inter-organizational	Resource Based	Quantitative -	Findings revealed that	Managers should			
	al. 2020		organizational	systems, and green	View,	survey	not only inter-	focus more on green			
			systems always drive	supply chain	Dynamia		organizational systems	supply chain			
			green supply chain	performance	Conshility	1	affect green supply	management			
			performance?		Capability	47	chain performance, but	capabilities			
				TEN.		710	also supply chain				
				Car	1-155	XX	management				
				Syr	- 000	2	capabilities.				
				111.1	XT		V				
42	Zaid et al.	US			Resource Based	Quantitative -	Findings revealed that				
	2018				View	survey	green SCM practices				
					2		affect sustainable				
			3				performance				
AD ST											
	PR BA										
				W 250	NE NO	5					
	44										

42	Deve XV	I IIZ	XX71	C	D. D. 1	Oranite di		Managar 1 11		
43	Peng Wong	UK	what is the	Green Supply	Resource Based	Quantitative -	Findings revealed that	Managers should		
	et al. 2020		relationship between	environment, SCI,	View,	survey	green supply	focus more on green		
			green supply	and operational			environment affect	supply environment		
			environment, SCI,	performance	Dynamic		SCI and operational			
			and operational		Capability		performance			
			performance		12					
					1.4					
44	Venkatesa	India	What is the link	Green Supply chain	Resource Based	Quantitative -	Findings revealed that	Managers should		
	Narayanan		between Green	practices,	View,	survey	green supply chain	focus more on green		
	et al. 2020		Supply chain	performance and			practices affect	supply chain		
			practices,	learning	2		performance and	practices		
			performance and				learning			
			learning		1-2	1				
					2 0 1	17	7			
45	Maria	Brazil	What is green supply	Green supply chain	Resource Based	Quantitative -	Findings revealed that	Managers should		
	Vanalle et		chain management?	management,	View	survey	green supply chain	focus more on green		
	al. 2017			practices,	200		management affect	supply chain		
				performance	ST		performance	management		
					· · · ·					
16	Wang at s1	China			Deseures Dess 1	Quantitation	Eindinge gewooled (bet	Managana ahariti		
40	wang et al.	Cnina	Z		Resource Based	Quantitative -	Findings revealed that	Managers should		
	2020		1 mil		View, Dynamic	survey	CSR, Green supply	focus more on green		
			13	The second secon	Capability	- A	chain management,	supply chain		
			40	2	<	ap		management		
				1	1	-				
				W J SA	AFE NO	-				
	45									

					11/				
					Theory and		and firm performance		
					Network Theory		are inexorably linked		
				1					
47	Govindan	UK	What is the effect of	Green Supply chain	Resource Based	Quantitative -	Findings revealed that		
	et al. 2020		green supply chain	sustainability, and	View	survey	green supply		
			sustainability on	firm performance	112		sustainability affect		
			performance of	111	117	2	performance positively		
			firms?		1.1				
48	Guido et al.	Australia	What is the link	Green supply chain	Contingency	Quantitative -	Findings revealed that		
	2020		green supply chain	management drivers,	Theory	survey	green supply		
			management drivers,	practices, and	1-6	34	sustainability affect		
			practices, and	performance	S BI	37	performance positively		
			performance	- Ale	1	55			
				200	- has	2			
49	Mani et al.	US		Green supply chain	Resource Based	Quantitative -	Findings revealed that	Managers should	
	2020			social sustainability,	View	survey	green supply chain	focus more on green	
				and firm	111		sustainability	supply chain	
				performance			positively affect firm	sustainability in	
			-		<u> </u>		performance	small scale	
			121				No.	industries, and	
			12h	-		7 .5		manufacturing	
			40	-	-	201		companies	
			~	1 All		6			
				AZCW	NE NO	1			
46									

_								
50	Shen et al.	Japan	What is link between	Logistics, and green	Network Theory	Quantitative -	Findings revealed that	
	2020		Logistics and green	supply chain		survey	logistics and green	
			supply chain	management			supply chain	
			management		Do.		management positively	
							affect performance	
				- N	6 7			



2.5 Conceptual Framework

In this section, we present a conceptual framework that elucidates the intricate relationships among different variables. The construction of this framework emerged from an exhaustive examination of prior research. Rather than embracing established models, the researcher chose this approach owing to the limited availability of literature addressing the amalgamation of three critical variables in a single study: Green Supply Chain Management, Customer Satisfaction, and Sustainability Performance. By amalgamating insights gleaned from a wide range of studies pertaining to these variables, this framework not only contributes to the augmentation of existing scholarly work but also serves as a comprehensive model guide. Its utility is particularly pronounced in the context of mining companies.



Hypothesis Development

Green Supply Chain Management and Sustainability Performance

SCM practices impact not only overall organizational performance, but also competitive advantage of an organization. They are expected to improve an organization's competitive advantage through price/cost, quality, delivery dependability, time to market, and product innovation. Prior studies have indicated that the various components of SCM practices (such as strategic supplier partnership) have an impact on various aspects of competitive advantage (such as price/cost). For example, strategic supplier partnership can improve supplier performance, reduce time to market Shen et al. (2020) and increase the level of customer responsiveness and satisfaction (Guido et al. 2020). Information sharing leads to high levels of supply chain integration (Mani et al., 2020) by enabling organizations to make dependable delivery and introduce products to the market quickly. Information sharing and information quality contribute positively to customer satisfaction (Mani et al., 2020) and partnership quality (Maria Vanalle et al. 2017). Postponement strategy not only increases the flexibility in the supply chain, but also balances global efficiency and customer responsiveness (Peng Wong et al. 2020). From the foregoing arguments, it is hypothesized that:

H1: Green Supply Chain Management has a positive and significant effect on Sustainability Performance

Green Supply Chain Management and Customer Development

Developing a responsive logistics system is important for creating value for an organization's customers (Saenz et al., 2018). Firms with high logistics process responsiveness are able to get their products and services to customers on time and in the requested condition, enabling them to better satisfy and retain customers. Customers are likely to be satisfied and stay with responsive

firms that have the ability to meet customer demand even in disruptive and uncertain situations (Hohenstein et al., 2015).

Customer acquisition, satisfaction and retention can be enhanced by consistently meeting and exceeding expectations on service criteria such as high flexibility and responsiveness in goods delivery (S_aenz et al., 2018; Chavez et al., 2017). This view is also supported by the findings of Hartmann and De Grahl (2011) who observed that logistics service flexibility had a positive and significant effect on customer retention, customer extension and customer referrals. In line with the RBV and the DCT, the study makes the argument that the ability of the firm's logistics processes to react to changes in the business environment occasions the extent to which the firm can attract, satisfy and retain customers. From the foregoing arguments, it is hypothesized that:

H2: Green Supply Chain Management has a positive and significant effect on Customer Development

The Mediating Role of Customer Development

Holweg and Pil (2001) posit that flexibility in the supplier network is an important ingredient for being able to meet the needs of customers. The study of Al-Hawajreh and Attiany (2014) revealed that a greater level of supplier network responsiveness enables firms to attain higher levels of delivery dependability, which is expected to lead to more satisfied and better retained customers (Chavez et al., 2017). Sukati et al. (2012) also note that supplier network responsiveness enhances the ability of a firm to swiftly introduce new products in response to customer needs. The capability of an organization's key suppliers to efficiently and effectively respond to the organisation's emergency orders can also help organizations better meet sudden changes in their customer demand (Al-Hawajreh and Attiany, 2014; Martin and Grabc, 2003), which increases the value organizations can offer their customers, leading to higher customer development.

Responsive suppliers may serve as a vital external resource that needs to be leveraged to enhance the customer development capabilities of firms (Asamoah et al., 2020a; Chu and Wang, 2012). It can therefore be inferred that supplier network responsiveness enhances an organisation's ability to acquire, satisfy and retain customers. In line with the RBV and the DCT, we postulate that supplier network responsiveness acts as a capability that firms can leverage to enhance their ability to meet changing customer demand, attract new customers and satisfy and retain their customer base. It is anticipated that firms that possess highly responsive logistics processes would be more successful in acquiring, satisfying and retaining customers. Logistics process responsiveness encompasses the ability of a firm's transportation, distribution and warehousing system to quickly respond to changes in the environment including changes in customer demand (Thatte et al., 2013). From the foregoing arguments, it is hypothesized that:

H3: Customer Development mediates the relationship between Green Supply Chain Management and Sustainability Performance



CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

In this chapter, we delineate the research methodology, encompassing various facets such as research strategy, methods, model specification, validity, and ethical considerations

3.1 Research Strategy

The research strategy employed in this study is of a quantitative-descriptive nature. This systematic approach of quantifiable a subset of the subsequent statistical analysis. By adopting a quantitative strategy, our study focused on uncovering patterns within numerical data, employing statistical, mathematical, and numerical tools for analysis. The choice of this strategy stemmed from our study, which a quantitative research strategy, as no other approach aligned as effectively with our study's requirements. To facilitate interpretation, we incorporated a descriptive research strategy, aiding in understanding and describing how green SCM practices influence sustainable performance and the role of customer development in this context.

3.2 Research Approach

The research approach adheres to the positivist philosophy, emphasizing rigor, precision, logical reasoning, and reliance on empirical evidence in the research process. Unlike postpositivism, positivism does not limit itself to observable phenomena. In our study, we investigated the phenomena of green SCM practices, customer development, and sustainable performance without undue influence, maintaining a stance of neutrality throughout the research. This approach aligns with the principle that facts are distinct from values, and truth is ascertained by corresponding to objective realities or the way things genuinely exist, as advocated by Guba et al. (1994).

3.3 Research Design

Research design encompasses the overarching strategy employed to seamlessly integrate various study components in a coherent and logical manner. In our study, we selected a causal (explanatory) research design. The rationale behind this choice arises from our aim to uncover the impact of green Supply Chain Management (SCM) practices on sustainable performance, with customer development serving as a mediating variable. Additionally, our decision to opt for a causal (explanatory) research design was grounded in existing literature that confirms specific causal relationships, including temporal sequences, concomitant variations, and nonspurious associations, between Green SCM Practices, customer development, and sustainable performance. This design proved instrumental in assessing how specific changes in Green SCM practices led to customer development, ultimately culminating in sustainable performance. Given the need for a clear elucidation of this unique situation, no other research design could adequately unveil the causal relationship between Green SCM practices and sustainable performance.

3.4 Study Population

Population, as defined by Saunders et al. (2012), constitutes a distinct assembly of individuals sharing similar characteristics. In our study, the population consisted of 140 registered mining firms in Ghana, as documented by the AGI in 2020.

3.5 Sample Size and Sampling Techniques

In our case, we chose a relatively large sample size to enhance representativeness, the generalizability of findings, and the appropriate utilization of statistical tools. The study employed

a purposive non-probability sampling technique to gather data from respondents, primarily due to the heterogeneous nature of the population of mining firms. Larger populations with greater heterogeneity warrant more extensive sampling (Saunders, 2017). The selection of respondents was conducted with. Consequently, a sample size of 100 respondents, specifically supply chain managers from various mining firms, was deemed appropriate.

The sample size calculation, as per Yamane (1967), is as follows: $n = N / (1 + N * e^2)$, where n is the sample size, N is the population size, and e is the level of precision. $n = 140 / (1 + 140 * 0.05^2) = 100$.

Regarding sampling procedures, the study employed the purposive non-probability sampling technique for several reasons. Firstly, it allowed for the deliberate selection and identification of individuals or groups possessing the requisite expertise and knowledge, notably supply chain managers, procurement managers, and operations managers (Cresswell et al., 2011). Secondly, it considered the importance of willingness and availability to participate, coupled with the ability to provide relevant information in an articulate, interactive, and comprehensible manner (Bernard, 2002; Spradley, 1979). Additionally, this method facilitated swift sample identification and proved cost-effective. By focusing on mining firms in Ghana, the study justified the choice, as these firms engaged in Green SCM practices possessed the requisite knowledge, ensuring the collection of accurate and pertinent responses.

3.6 Data Types and Sources

In accordance with Phellas et al.'s (2011) research, primary data refers to information obtained directly from study participants, typically possessing an original character. For this study, primary data was meticulously collected using structured questionnaires, chosen for its authenticity,

RADW

specificity, and currency. This data collection process involved the collaboration of three (3) field assistants.

3.7 Data Collection Methodology

Data collection for this study was executed with the assistance of two (2) field assistants. The survey questionnaires served as the primary tool to gather information, and these were distributed to the top-level managers of selected mining companies. The aim was to capture the perspectives of these managers regarding key variables, namely, green supply chain management practices, customer development, and sustainable performance. This data collection spanned a period of one month and facilitated the development of a comprehensive profile on the understanding of these variables within the mining firms. The questionnaires employed a structured format, featuring. This scale allowed respondents from the mining firms to select from a range of options or responses, with 5 signifying the highest score and 1 representing the lowest on the scale.

Construct	Measurement items	Source (s)
Green SCM Practices	18	Sarkis (2017); Shan and Wang
		(2018); Weeratunge and Herath
		(2017)
Customer Development	9	Ries (2011); Amedofu et al.
1 El		(2019); Wilson et al., (2012);
120		Blank (2013)
Sustainable Performance	6	Marzuki, (2017); Jakhar, et al.
2	R	(2018); Krishnan (2020)
	H.	
	CALLE NO	

Constructs and Measures

3.8 Data Analysis Approach

Given the quantitative nature of the research design, a quantitative analysis was employed. The collected data underwent coding and were subsequently imported into SPSS for analysis. The study's data were subjected to both descriptive and inferential statistical methods. Descriptive statistics were employed to investigate the demographic profile of the respondents and calculate the mean ratings for various measurement items, including green Supply Chain Management (SCM) practices, customer development, and sustainable performance. Following the descriptive statistics, Hierarchical Linear Model Regression Analysis was then utilized to explore the relationships between dependent and independent variables, assessing the impact of independent variables on the dependent variable.

3.8.1 Model Specification and Estimation Methods

In accordance with the study's objectives and research questions, a cross-sectional model specification was employed and defined as follows:

 $y_i = mx_i + \varepsilon$

where, i, ε_i signifies the random or stochastic variable.

3.8.2 Statistical Estimation Methods for Empirical Model

This study adopted a similar model specification. The data generated were analyzed using the Ordinary Least Squares (OLS) regression technique to determine the significance of independent variables on operational performance. The model for this study is expressed as follows: $SP_i = \alpha_0 + \beta_1 GSCM_i + \beta_2 CD + \varepsilon_i$ (Equation 1) Where: SP = Sustainable Performance GSCM = Green Supply Chain Management Practices CD = Customer Development

Subsequently, the data analysis process involved organizing and structuring the collected data to facilitate effective communication of the results. The analysis was carried out using Statistical Package for Social Scientist (SPSS) version 21. Descriptive statistics, including means, frequencies, and standard deviations, were employed. The quantitative data underwent both descriptive and inferential statistical analyses, encompassing frequencies, simple percentages, means, and standard deviations. The primary statistical tools employed included the Pearson Correlation Coefficient and Linear Regression to test the hypotheses.

3.9 Assessment of Validity and Reliability

Validation involves the collection and analysis of data to assess the accuracy of an instrument, while reliability ensures that the instrument consistently measures the intended construct, yielding consistent scores over time or across multiple administrations. In this study, the reliability of our research instruments was assessed through pre-testing questionnaires on a subset of the survey sample frame. Designing questionnaires can be complex, and even experts may not initially get them right. During the pilot phase, twenty questionnaires were distributed to supply chain management experts for review, leading to improvements in question order, layout, and filtering. The reliability of the variables were calculated using Cronbach's alpha coefficient. Additionally, the face validity of the questionnaire items was confirmed by the supervisor and other advisors.

3.10 Ethical Considerations

In addressing ethical considerations, the researcher diligently acknowledged their significance and completed the school's research ethics form, which received subsequent approval. The study participants were treated with the utmost respect, particularly due to the sensitive nature of the personal information gathered. Prior to their involvement, respondents were thoroughly briefed on the study's objectives, the purpose of data collection, and the potential impact it might have on

them. A series of measures were put in place to ensure participant anonymity and confidentiality, and individuals. This study adhered rigorously to the ten ethical research principles outlined by Bryman et al. (2007):

- 1. Participants were safeguarded from harm.
- 2. The dignity of research participants was upheld.
- 3. Informed consent was scrupulously obtained.
- 4. Privacy of participants was meticulously safeguarded.
- 5. Research data was treated with the utmost confidentiality.
- 6. Anonymity of both individuals and organizations was rigorously ensured.
- 7. Deception or exaggeration regarding research aims was vigilantly avoided.
- 8. Full disclosure of affiliations and funding sources was practiced.
- 9. Communication about the research was consistently honest and transparent.
- 10. Misleading information and biased representation of data findings were steadfastly avoided.



CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION OF RESULTS

4.1 Introduction

In this section, we will present the study's findings and offer an interpretation of the results. This chapter provides a comprehensive report on the research questions and the results of hypothesis testing, comprising seven subsections. To begin, we offer an overview of the initial data analysis. This includes details on the distribution and reception of questionnaires, as well as the number of questionnaires correctly answered for analysis. An essential element of this analysis involves assessing the questionnaire return rate to determine if it meets the criteria for analysis. Following this, we delve into the demographic characteristics of the respondents. Subsequently, we discuss the statistical tests conducted, encompassing considerations of both validity and reliability. We then explore descriptive statistics related to the variables under study, focusing on measures such as mean, median, and standard deviation. Additionally, we provide a comprehensive discussion of correlation analysis, aligning with the developed hypotheses this chapter with a discussion of our findings, emphasizing the contributions of the current study and its alignment with existing literature.

4.2 Summary Statistics of Respondents Profile

This section is dedicated to grasping the fundamental aspects of the study, including population characteristics, sample size determination, and questionnaire administration. In terms of the questionnaire return rate, our study aimed to gather responses from a sample of 100 participants. To ensure an adequate dataset for analysis, we distributed 115 questionnaires. Out of these, 9

questionnaires were returned incomplete, and 6 were not returned at all. Consequently, we proceeded with the analysis using the 100 fully answered questionnaires. This analysis revealed a robust response rate of 86.96%, considered acceptable, 60% is deemed good, and a response rate of 70% or higher is regarded as excellent. Remarkably, our study surpassed the 70% threshold, indicating a response rate that is not only good but also sufficient and representative of our target population

		Frequency	Percent
Educational Level	Diploma	19	19
	Degree	32	32
	Masters	40	40
	PhD	9	9
	Y	100	100.0
Department	Procurement	34	34
	Supply Chain	51	51
	Management	15	15
-		100	100.0
Position	Supply Chain Manager	48	48
	Operations Manager	16	16
	Procurement Manager	36	36
	14 ANTES	100	100.0
Experience	Less than 1 year	15	15
-	1-5 years	29	29
	6-10 years	46	46
	11+	10	10
3		100	100.0

Table 4.1: Summary Statistics of Respondents Profile

The respondents' profiles were thoroughly examined, focusing on their educational level, department affiliation, job positions, and years of experience. Table 4.1 provides a comprehensive presentation of this analysis, including detailed statistical breakdowns.

Regarding their educational backgrounds, respondents offered a wide range of responses, as detailed in Table 4.1. The largest group, accounting for 40% of the sample, held Master's degrees. Additionally, 32% possessed undergraduate degrees, 19% held diplomas, and 9% had earned PhDs. This data highlights that the majority of individuals involved in decisions related to green Supply Chain Management practices have Master's degrees, with a limited representation of PhD holders within mining firms.

Respondents were also asked to specify their department affiliations, revealing that a significant majority, comprising 51% of the respondents, belonged to the supply chain department, while 34% were affiliated with the procurement department. In contrast, the management department was the least represented, accounting for only 15% of respondents.

Furthermore, respondents were questioned about their job positions, and the results indicated that 48% held the role of Supply Chain Manager, followed by 36% in the role of Procurement Manager. Operations Managers constituted the minority group, making up 16% of the respondents.

Regarding professional experience, it was evident that the majority of respondents had between 6 and 10 years of experience, making up 46% of the sample. Additionally, 29% reported having 1 to 5 years of experience, while those with less than 1 year or more than 11 years of experience were in the minority, accounting for 15% and 10% of the respondents, respectively.

4.3 Evaluation of Statistical Test (Validity and Reliability Assessment)

In this section, a confirmatory factor analysis approach was employed to evaluate the measurement model's validity and reliability. The results are presented in Tables 4.2, 4.3, and 4.4, focusing on assessing the validity and reliability of the measurement scales.

The validity assessment encompassed both convergent and discriminant validity. Convergent validity was gauged by examining factor loadings, as illustrated in Table 4.2, and assessing model fit indices, as depicted in Table 4.3. In contrast, discriminant validity was assessed by comparing the average variance extracted score to shared variance, as detailed in Table 4.4.

All meeting the reliability criteria. These findings affirm the reliability of the measurement scales and indicate that each model effectively predicts the study's subject matter. Consequently, the data used in this study can be considered reliable as well.




4.2: Confirmatory Factor Analysis

KNUST

Factor loading (t-value)

GSCM Practices ¹ (.900/.920/.793).	
The firm meets the long-distance consignment	.891(fixed)
There is availability of supplies on time	.908(19.19)
There is the facilitation of materials required for production	.871(18.01)
There is the maintenance of materials required for production	.911(19.20)
There is availability of transportation systems	.702(19.11)
There is good feasibility of transportation systems There is efficiency of operations	
Products are physically protected from harm	.876(18.24)
The use of materials is greatly reduced	
There is increase space utilization in the warehouse and vehicle	.917(18.51)
There is reduction in the amount of handling required	.909(19.17)
There is less environmental impact	.877(19.11)
Eco-labelling of products.	.781(18.87)
Suppliers require to take back packaging	.892(19.23)
Suppliers require to reduce packaging to minimum required to protect supplied items	.929(19.20)
and the second	.931(17.34)
	.868(16.14)
	.932(15.33)
	.969(15.01)
	.889(17.11)
	.851(16.11)

Customer Development¹ (.874/.899/.839). Customer Development in the mining firms with a focus on customer

LZN LL LC'	-
There is sincere desire to help customers	.990(12.71)
Customers receive products at the needed time	.842(15.33)
The firm produces quality products	.811(19.01)
The firm's price is within customers means	.987(15.77)
The firm is able to promote its product in a unique manner	.818(11.64)
The firm is strategically positioned in the right place	.978(17.10)
The firm targets the right people	.911(18.96)

Suatainable Performance¹ (.784/.796/.658). Sustainable Performance in the mining firms

.868(fixed)
.756(7.82)
.873(11.01)
.948(12.00)
.912(18.44)
.809(13.55)
.983(12.09)



Table 4.3: Model Fit Indices

Measurement Model	χ^2	DF	$\chi^2/_{DF}$	P-Value	RMSEA	CFI	SRMR
1. Green SCM Practices.	2.079	2	1.04	.35	.02	1.00	.02
2. Customer Development.	3.450	2	1.73	.18	.07	0.99	.04
3. Sustainable Performance	2.071	2	1.04	.36	.02	1.00	.01
		1					

In the presented Table 4.3, you can observe a range of model fit indices, all of which adhere to their respective standard criteria (refer to Table 4.3 for detailed information). These indices encompass the normalized chi-square ($\chi^2/(d.f)$), the

In order to establish convergent validity, we have applied statistical benchmarks proposed by Hair et al. (2014). According to Hair et al. (2014), a CFI exceeding 0.90 is considered indicative of good fit. Additionally, the RMSEA should be below 0.08, and the SRMR is expected to be under 0.04. The normalized chi-square should ideally with a corresponding 5%. Furthermore, the TLI is expected to reach a minimum threshold of 0.90.

As Table 4.3 demonstrates, each of the model fit statistics successfully meets these criteria, affirming the presence of robust convergent validity.

Table 4.4: Discriminant Validity				
	1	2	3	
1. Green SCM Practices	0.793	0.331	0.425	
2. Customer Development	0.260	0.839	0.397	121
3. Sustainable Performance	0.048	0.025	0.658	121

Based on the data presented in Table 4.4, it is evident that all Average Variance Extracted (AVE) scores, as shown in Table 4.4, surpass the 0.5 threshold, exceeding the shared variances for each construct. Notably, the AVE scores along the main diagonal consistently outperform the shared

variances. Consequently, we can confidently assert that discriminant validity has been effectively established.

4.4 Summary of Descriptive Statistics for Study Variables

In this section, we provide a comprehensive overview of the key variables in our study, namely Green Supply Chain Management (Green SCM) practices, customer development, and sustainable performance. To ensure clarity regarding the study's context, we derived the indicators for each variable from existing literature. Furthermore, to adapt the study to the Ghanaian context, we tailored the definitions and indicators for each variable accordingly.

4.4.1 Green Supply Chain Management Practices

To assess Green SCM practices, our study examined two primary dimensions: green transportation and green packaging. In total, we generated eighteen distinct items, with nine questions falling under each dimension. The analysis revealed notable findings, including 0.673). The composite mean score across both dimensions calculated at 4.61 (with a standard deviation of 0.607). These results, evaluated on a scale ranging from 1 to 5, strongly indicate that mining firms in the study are actively and significantly adopting Green SCM practices.

Item code	Item statement	Min	Max	Mean	Std. Dev.
TP1	The firm meets the long-distance consignment	1	5	4.69	.521
TP2	There is availability of supplies on time	1	5	4.60	.428
TP3	There is the facilitation of materials required for production	1	5	4.62	.506
TP4	There is the maintenance of materials required for production	1	5	4.61	.532
TP5	There is availability of transportation systems	1	5	4.64	.529
TP6	There is good feasibility of transportation systems	1	5	4.63	.563
TP7	There is	1	5	4.61	.617
TP8	There is efficiency of operations	1	5	4.58	.614

Table 4.5: Extent of Green SCM Practices

TP9	There is smooth flow of the operations	1	5	4.57	.503
PG10	Products are physically protected from harm	1	5	4.54	.665
PG11	Products physically gives a medium for information transmission	1	5	4.51	.615
PG12	The use of materials is greatly reduced	1	5	4.52	.601
PG13	There is increase space utilization in the warehouse and vehicle	1	5	4.31	.739
PG14	There is reduction in the amount of handling required	1	5	4.02	.673
PG15	There is less environmental impact	1	5	4.55	.727
PG16	Eco-labelling of products	1	5	4.21	.724
PG17	7 Suppliers require to take back packaging			4.33	.619
PG18	Suppliers require to reduce packaging to minimum required to protect supplied items		5	4.62	.607
	Composite Score			4.61	6.07
0					

Source: Field Data 2022

4.4.2 Customer Development

In our analysis, we considered a total of nine (9) items. The results reveal that the highest average score achieved is 4.68, with a standard deviation of 0.631, while the lowest average score is 4.38, with a standard deviation of 0.724. Overall, the composite average score is 4.53, with a standard deviation of 0.571. These outcomes, assessed on a scale of 1 to 5, indicate that the study participants possess a robust understanding of customer development aspects within their respective manufacturing sectors.

Item code	Item statement	Min	Max	Mean	Std. Dev.
CA1	There is good relationship between customers and the firm	1	5	4.68	.631
CA2	Customers easily reach the firm	1	5	4.56	.538
CA3	There is sincere desire to help customers	1	5	4.52	.616
CA4	Customers receive products at the needed time	1	5	4.46	.642
CS5	The firm produces quality products	1	5	4.46	.521
CS6	The firm's price is within customers means	1	5	4.49	.428
CS7	The firm is able to promote its product in a unique manner	1	5	4.41	.506
CS8	The firm is strategically positioned in the right place	1	5	4.38	.532
CS9	The firm targets the right people	1	5	4.54	.551
	Composite mean score.			4.53	.571

Table 4.6:	Extent	of	Customer	D	evel	lopm	nent
						-	

Source: Field Data 2022

Section 4.4.3: Sustainability Performance

In this section, we provide an overview of our evaluation of the firm's performance. We have identified two critical dimensions: environmental sustainability and social sustainability. Within these dimensions, we have measured increased productivity using six indicators, evenly distributed with three from each dimension. Additionally, we have assessed performance across eight dimensions. To gauge sustainability performance, we have employed descriptive statistics, calculating the mean and standard deviation for each dimension. This methodology has enabled us to determine the perceived performance levels of manufacturing companies. The composite mean score, computed at 4.71 (with a standard deviation of 0.656), underscores that, on a scale of 1 to 5, the selected mining firms are demonstrating remarkable sustainability performance, particularly in the areas of environmental and social sustainability.

Item code	Item statement	Min	Max	Mean	Std. Dev.
ESP1	The emergence of GSC (Green Sustainability and Conservation) initiatives underscores the imperative of judiciously harnessing environmental resources, prioritizing their preservation to ensure their enduring availability for subsequent generations.	1	5	4.77	.521
ESP2	The ongoing evolution of GSC policies underscores a commitment to the judicious utilization of environmental resources, with a primary emphasis on the enduring preservation and stewardship of these assets for the benefit of succeeding generations.	1	5	4.66	.628
ESP3	Green supply chain sustainability protects valuable environmental assets and develops relationships between people and the natural environment.	1	5	4.62	.606
SSP4	The firm aligns the social domain with sustainability	1	5	4.53	.532
SSP5	The firm's supply chain sustainability focuses on social development	1	5	4.54	.429

Table 4.6: Extent of Sustainable Performance

SSP6	The firm focuses on regional or community levels, rather than the nation	1	5	4.53	.763		
	Composite mean score			4.71	.656		
Sources Field Data 2022							

Source: Field Data 2022

4.5: Correlation

Degree of linear among the studied variables, this analysis considered the correlation coefficients between the indicators of these variables. The study evaluated Green Supply Chain Management (SCM) practices using two key metrics: Green Transportation (TP) and Green Packaging (PG). Customer development was measured by Customer Attraction (CA) and Customer Satisfaction (CS), while Sustainable Performance was assessed through Environmental Sustainability (ES) and Social Sustainability (SS).

Notably, Table 4.8 reveals strong and perfect positive associations between Transportation (TP) and Packaging (PG) with Environmental Sustainability (ES) (R=0.176; R=0.352, P<1%). Furthermore, Packaging (PG) demonstrates a strong, positive connection with Social Sustainability (SS) (R=0.245, P<1%). These findings align with prior research (Koberg et al., 2019; Morais et al., 2018; Vargas et al., 2018; Mani et al., 2016) suggesting that Green Supply Chain Management, particularly in packaging, significantly and positively influences the social dimension. This implies that companies integrating green practices into their supply chains are more likely to achieve social sustainability.

Additionally, the table reveals that Transportation (TP) and Packaging (PG) have a strong positive association with Customer Attraction (CA) (R=0.105; R=0.260, P<1%). Interestingly, these results corroborate the findings of Quintana-García et al. (2020) and Younis et al. (2019), indicating that

a green supply chain, driven by sustainability, enhances efficiency and bolsters competitive advantage by improving reputation.

Moreover, the table illustrates that Customer Attraction (CA) strongly and positively correlates with both Environmental Sustainability (ES) (R=0.739; P<1%) and Social Sustainability (SS) (R=0.327; P<1%). Of particular significance is the observation that Customer Satisfaction (CS) has a very strong positive impact on Environmental Sustainability (ES) (R=0.587; P<1%), but exhibits a relatively weak relationship with Social Sustainability (SS) (R=0.027; P<1%).

Varial	bles	1	2	3	4	5	6
1.	Transportation		.261**	.101	$.158^{*}$.172**	.068
2.	Packaging	.265**		.256**	.215**	.349**	.241**
3.	Customer Attraction	.105	$.260^{**}$.216**	.738**	.324**
4.	Customer Satisfaction	$.162^{*}$.219**	$.220^{**}$		$.585^{**}$.022
5.	Environmental Sust.	.176**	$.352^{**}$.739**	$.587^{**}$		$.257^{**}$
6.	Social Sust.	.073	.245**	.327**	.027	.261**	

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The table provided displays the findings of an analysis assessing the impact of Green Supply Chain Management (SCM) practices on Sustainable Performance, the relationship between Green SCM Practices and Customer Development, and the connection between Customer Development and Sustainable Performance.

Regarding Hypothesis 1 (H1), the results indicate a direct and statistically significant influence of Green SCM practices on Sustainable Performance within mining firms. The structural coefficient was determined to be 0.61, with a corresponding t-value of 9.03, meeting the statistical significance criteria ($\alpha \le 0.05$). These findings align with prior research by Bu et al. (2020), Rasit

et al. (2019), and Han et al. (2020), which also affirmed that Green SCM practices have effectively impacted both environmental and social sustainability within mining firms.

Moving on to Hypothesis 2 (H2), the analysis reveals a positive and significant relationship between Green SCM Practices and Customer Development. The structural coefficient was calculated at 0.57, with a corresponding t-value of 7.34, meeting the statistical significance threshold ($\alpha \le 0.05$). These results corroborate the findings of Quintana-García et al. (2020) and Younis et al. (2019), who established that a sustainable approach through green supply chain practices not only enhances operational efficiency but also bolsters competitive advantage by improving reputation.

Lastly, for Hypothesis 3 (H3), the analysis demonstrates a positive relationship between Customer Development and Sustainable Performance. The structural coefficient for this relationship was found to be 0.51, with a t-value of 10.01, meeting the statistical significance criterion ($\alpha \le 0.05$).

4.6 Test of Mediation Effects

	Total Effect			Direct Effect			Indirect			
	Beta	LL	UL	Beta	LL	UL	Beta	LL	UL	
-SCM on OP through CD	-0.203	-0.355	-0.05	-0.203	-0.357	-0.49	0.001	-0.019	0.021	
Source: Author (2021): CD = Customer Development										

Table 4.8: Direct, Indirect and Total Effect – Bootstrap Results

The table presented above details the examination of customer development's mediating role in the relationship between Green Supply Chain Management (SCM) practices and Sustainable Performance. This analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM). To assess the significance of the indirect impact of Green SCM practices, a parametric bootstrap procedure with 1,000 replications was employed. The outcomes, as illustrated in Table 4.10, indicate that the indirect influence of Green SCM practices on Sustainable Performance through Customer Development is not statistically significant. This conclusion is drawn from the confidence intervals associated with the indirect effect of customer development on sustainable performance ($\beta = 0.001, 95\%$ CI = -0.019, 0.021), which encompass zero (0). In summary, these findings suggest that customer development does not serve as a mediator in the relationship between Green SCM practices and sustainable performance.

4.11 Discussion of Findings

4.11.1 Influence of Green Supply Chain Management Practices on Sustainable Performance In this investigation, the aim was to assess how the adoption of Green Supply Chain Management (SCM) practices affects the sustainable performance of mining companies. To achieve this, respondents' perspectives on the impact of green SCM practices on sustainable performance were solicited. The study revealed a noteworthy and affirmative correlation between green SCM practices and sustainable performance. These findings are in harmony with the results presented by (Notteboom et al., 2020; Al-ghwayeen et al., 2018; Péra et al., 2019; Tran et al., 2020; Mupfiga, 2019; Peprah et al., 2016; Atikiya, 2015; Baz et al., 2017; Mupfiga, 2019; Worku et al., 2019; Namagembe et al., 2019), who also argued that Green SCM practices exert an influential effect on sustainable performance, particularly in terms of environmental and social sustainability.

4.11.2 The Impact of Green Supply Chain Management Practices on Customer Development This research aimed to ascertain the influence of Green Supply Chain Management (SCM) Practices on customer development within mining firms. To explore this, respondents' perceptions of the relationship between Green SCM practices and customer development were examined. The study unveiled a substantial and favorable impact of Green SCM practices on customer development. These findings align with those of (Quintana-García et al., 2020; Younis et al., 2019), who affirmed that a sustainable-oriented green supply chain not only enhances operational efficiency but also bolsters competitive advantage through an improved reputation.

4.11.3 Customer Development

Contribution to Sustainable Performance This study endeavored to determine how customer development influences sustainable performance in mining firms. This investigation involved seeking respondents' viewpoints regarding the connection between customer satisfaction and sustainable performance. The results of the study highlighted a positive and significant relationship between customer development and sustainable performance. These findings resonate with the research conducted by Sulek et al. (2014), who contended that interventions aimed at enhancing customer service have a constructive impact on customer satisfaction, subsequently contributing to environmental and social sustainability.



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CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

The primary objective of this investigation was to delve into the intricate interrelations among customer development, and sustainable Ghana's mining enterprises. This chapter encapsulates the outcomes of the study, aligning them with the predefined research goals, ultimately culminating in a comprehensive set of conclusions and recommendations grounded in the study's revelations. These recommendations are bifurcated into two overarching domains: pragmatic suggestions for policy and practice enhancement and guidance for prospective researchers delving into the labyrinthine subject matter. While the practical recommendations furnish a roadmap for bolstering Green SCM practices, the future research recommendations offer a compass for scholars embarking on further exploration of this multifaceted terrain.

5.2 Summary of Findings

This section offers an overarching glimpse into the study's discoveries, which dissected the intricate interplay among Green SCM practices, sustainable performance, and customer development within Ghana's mining sector. It is noteworthy that customer development was introduced into the equation as a mediating variable.

5.2.1 Green SCM Practices and Operational Performance

The inaugural research objective was designed to scrutinize the impact of Green SCM practices on sustainable performance. The study's findings unequivocally unveiled a substantial and affirmative influence of Green SCM practices on sustainable performance within the mining sector.

5.2.2 Green SCM Practices and Customer Development

The secondary research objective was formulated to unravel the nexus between Green SCM practices and customer development. The empirical evidence derived from the study firmly established a significant and positive relationship between Green SCM practices and customer development within mining enterprises.

5.2.3 Customer Development and Operational Performance

The tertiary research objective honed in on assessing the ramifications of customer development on sustainable performance. The study's discernments underscored the consequential role of customer development, as it was found to exert a positive and significant impact on sustainable performance within the mining domain.

5.3 Conclusion

In the pursuit of competitive prowess, particularly within the mining sector, the integration of Green SCM practices remains an undeniably pivotal facet. The purview of Green SCM extends to optimizing overall business value by the judicious utilization of resources, thereby perpetuating social and environmental sustainability, and fortifying the interconnections between suppliers and customers. The study operationalized Green SCM practices via three key indicators, encompassing transportation and packaging, while sustainable performance was assessed via two dimensions, encapsulating environmental and social sustainability. The assessment of customer development, delineating the capacity to allure, satisfy, and retain customers, was conducted through the prism

of customer satisfaction. In summation, four salient conclusions crystallized from the study: Green SCM practices wield a favorable impact on operational performance, Green SCM practices exert a constructive influence on customer development, the impact of customer development on operational performance is statistically insignificant, and customer development does not mediate the effect of Green SCM practices on sustainable performance.

5.4 Recommendations

Predicated upon the bedrock of findings and conclusions, the ensuing practical recommendations emerge:

- This study bequeaths invaluable insights into the specific Green Supply Chain practices that have the potential to invigorate the sustainable performance of mining enterprises. It not only reaffirms existing knowledge but also contributes empirical credence to our comprehension of the intricate relationship between Green SCM practices and sustainable performance.
- 2. In tandem with the study conducted by Kusi et al. (2014), the clarion call for further inquiry into the realm of Green SCM practices within the mining industry resounds. This study blazes a trail in this direction by elucidating which Green SCM practices wield specific influence over the trifecta of sustainable performance dimensions.
- 3. The study's revelations underscore the significance of eco-innovative practices and in elucidating dimensions of sustainable performance. However, it is noteworthy that internal environmental management practices predominantly impact environmental and social

performance, whereas strategic supplier partnerships resonate most profoundly with, leaving relatively less affected.

5.5 Implications for Theory

From a theoretical vantage point, managers ensconced within the precincts of the manufacturing sector should judiciously weave the tapestry of resource dependency and dynamic capability theories into the fabric of their daily operations. This symbiotic amalgamation affords managers the dexterity to optimize their firm's extant strategic assets through quotidian activities while concurrently nurturing higher-order dynamic capabilities that have the potential to reshape the firm's resource foundation through competence integration, augmentation, and reconfiguration. This synergistic approach is poised to foster the proliferation of Green SCM practices that act as catalysts for both customer development and sustainable performance.

5.5.1 Implications for Practice/Policy

The study corroborates the following three pivotal tenets: Green SCM practices are potent drivers of sustainable performance, Green SCM practices galvanize customer development, and customer development exerts a tangible impact on sustainable performance. Consequently, the following managerial directives beckon:

- 1. Supply chain managers ought to prioritize the optimization of transportation and packaging processes as a means to fortify Green SCM practices.
- A conscientious focus on customer development, with an accentuation on enhancing customer attraction and satisfaction through refined Green SCM practices, should form the cornerstone of managerial agendas.

- 3. Vigilance and unwavering attention to sustainable performance, encompassing both environmental and social dimensions, are paramount. Managers should leverage the synergy between Green SCM practices and customer development to augment overall business performance.
- 4. Prudent measures should be enacted to ensure the robust implementation of Green SCM practices, with particular emphasis on transportation and packaging, aligning them seamlessly with customer development and satisfaction. Such a holistic approach has the potential to confer upon mining firms a robust competitive edge over their counterparts.

5.5.2 Implications for Policy

From a policy perspective, the findings of this research furnish a trove of invaluable resources for fellow researchers traversing similar terrain. The corpus of knowledge pertaining to Green SCM practices, customer development, and sustainable performance stands as a comprehensive repository for supply chain managers in quest of salient insights. Moreover, an array of stakeholders, including logisticians, managers, supply chain experts, corporate entities, governmental bodies, and industry professionals, can leverage these findings to garner a deeper appreciation of the nuances underlying Green SCM practices, customer development, and the intricacies of sustainable performance.

5.6 Recommendations for Future Studies

The ensuing recommendations are proffered to guide forthcoming research endeavors:

1. Future researchers may contemplate the adoption of qualitative research designs, such as case studies and interviews, to unearth more nuanced insights.

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- 2. In pursuit of enhanced data objectivity, future investigations could incorporate objective measures, such as economic sustainability, in lieu of solely relying on self-reported data.
- The amplification of sample size through the utilization of advanced probability sampling techniques, such as simple random sampling, holds the promise of furnishing more robust findings.
- 4. To bolster the generalizability of findings, future research should encompass a broader spectrum of sectors, rather than confining itself to a solitary industry.



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APPENDIX

SURVEY QUESTIONNAIRE

My name is (put your name here), a postgraduate student at the Kwame Nkrumah University of Science and Technology, Kumasi, Department of Supply Chain and Information Systems. This survey instrument has been designed to enable me carry out research on the topic: "GREEN SUPPLY CHAIN MANAGEMENT PRCATICES, CUSTOMER DEVELOPMENT, AND SUSTAINABLE PERFORMANCE". Any information provided will be used for academic purposes ONLY. There are no risks associated with your participation, and your responses will remain confidential and anonymous.

SECTION A: RESPONDENT'S BIOGRAPHY AND COMPANY PROFILE

When completing this questionnaire, please tick $[\sqrt{}]$ in the applicable box or provide an answer as applicable.

- **1.** Educational Background:
 - [] Diploma
 - [] Bachelor's Degree
 - [] Master's Degree
 - [] Ph.D./Doctorate
- 2. Please, indicate the department you belong
 - [] Procurement
 - [] Supply Chain
 - [] Marketing
 - [] Management
- 3. Please indicate your position in the firm
 - [] Supply Chain Manager
 - [] Operations Manager
 - [] Procurement Manager
- 4. Number of years the firm has been in operation:
 - [] Less than 1 year
 - [] 1-5 years
 - [] 6-10 years
 - []11+

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5. Number of employees in the firm:

- [] Less than 6 employees
- [] 6-9 employees
- [] 10+ employees

SECTION B: GREEN SCM PRACTICES [Sources: Speranza, 2018; Santha, 2015; Mei et

al., 2017; Romanow, 2016; Wu and Dunn, 1995; Tseng, 2009)

Indicate the extent to which you agree or disagree with each statement by checking the appropriate number from 1 to 5, using the following scale:

1		2	3	4	5						
Strongly Disagree		Disagree	Uncertain	Agree	Str	ong	ly A	gre	e		
Itom			Statement	1	1	2	3	Δ	5		
Item	There is are		4	5	-	5					
TP1	The firm me										
TP2	There is avai		_				+				
TP3	There is the	facilitation of m	aterials required for r	production	_			_			
TP4	There is the	maintenance of	materials required for	r production		-	-	9			
	There is av	ailability of tra	insportation systems	(air freight, road		-	5		-		
TP5	freight, railw	av freight, sea f	reight, pipeline freight	(an Height, Toda (t) to deliver goods		2					
	There is goo	d feasibility of	transportation system	ns (air freight, road	P						
TP6	freight, railw	ay freight, sea f	reight, pipeline freight	nt) to deliver goods	1						
707	There is avai	lability of goods	s and services when a	nd where needed in	10				1		
TP/	adequate qua	antity	1 1		1						
TP8	There is efficient	ciency of operat	ions								
TP9	There is smo	oth flow of the	operations		1						
		1 7			-						
	There is great	en packaging <mark>th</mark>	at ensures that:		1	-	- 7				
PG1	Products are	physically prote	ected from harm		-	E	1				
PG2	Products phy	sically gives a r	nedium for informati	on transmission	ŝ						
PG3	The use of m	naterials is great	ly reduced	10	1	-					
PG4	There is incr	ease space utiliz	ation in the warehous	se and vehicle	-						
PG5	There is redu	action in the amo	ount of handling requ	ired							
PG6	There is less	environmental i	impact								
PG7	Eco-labelling	g of products.									
PG8	Suppliers rec	quire to take bac	k packaging.								
PG9	Suppliers rec	quire to reduce p	ackaging to minimum	required to protect							
109	supplied iten	ns				1					

SECTION C: CUSTOMER DEVELOPMENT (Sources: Ries, 2011; Amedofu et al., 2019; Wilson et al., 2012; Blank, 2013)

Indicate the extent to which you agree or disagree with each statement by checking the appropriate number from 1 to 5 using the following scale:

	1	2	3	4	1	5			
Strong	gly Disagree	Disagree	Uncertain	Agree		Str	ree		
Item	Statement	1.2			1	2	3	4	5
	Customers an	re attracted to th	e firm in the sense	that:					
CA1	There is good	l relationship bet	ween customers and	d the firm					
CA2	Customers ea	sily reach the fir	m 🖉 🖉						
CA3	There is since	line -							
CA4	Customers re-	4							
				14					
	Customers an								
CS1	The firm proc	luces quality pro	ducts						
CS2	The firm's pr								
CS3	The firm is al	e manner					4		
CS4	The firm is st	rategically positi	oned in the right pl	ace			1		1
CS5	The firm targ	ets the right peop	ole	-		~			

SECTION D: SUSTAINABLE PERFORMANCE (Source: Koberg and Longoni, 2019)

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Indicate the extent to which you agree or disagree with each statement by checking the appropriate number from 1 to 5 using the following scale:

1	2	3	4	5
Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

Item	Statement	1	2	3	4	5
	The environmental sustainability performance ensures that:	Υ		1		
ESP1	There is the development of GSC initiatives that emphasize the proper		-			
	use of environmental resources with a focus on sustaining these					
	resources for future generations.					
	There is the development of GSC policies that emphasize the proper					
ESP2	use of environmental resources with a focus on sustaining these					
	resources for future generations.					

ESP3	Green supply chain sustainability protects valuable environmental			
	assets and develops relationships between people and the natural			
	environment.			
ESD/	The firm is more concerned of what is happening to the state of the			
LSI 4	environment			
	The social sustainability performance ensures that:			
SSP1	The firm aligns the social domain with sustainability			
SSP2	The firm's supply chain sustainability focuses on social development			
SSD3	The firm focuses on regional or community levels, rather than the			
5513	nation			

Thank you for participating in the survey.

