

Kwame Nkrumah University of Science and Technology, Kumasi

The Effect of Sustainable Supply Chain Management on Green Performance in the Ghanaian Manufacturing Sector: The Moderating Role of Top Management Commitment

By

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(BSc. Business Administration – Marketing Option)

**A thesis submitted to the Department of Supply Chain and Information Systems,
Institute of Distance Learning, in partial fulfillment of the requirements for the award
of the degree of**

MASTER OF SCIENCE IN

LOGISTICS AND SUPPLY CHAIN MANAGEMENT

AUGUST, 2023

DECLARATION

I hereby declare that this submission is my own research towards the Master of Science (Logistics and Supply Chain Management) degree, and that, to the best of my knowledge, it contains no material which has been previously published or material that been accepted for the award of any other degree of the University, except where due acknowledgement has been made in the text.

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DEDICATION

I dedicate this piece of work first and foremost to God Almighty for his grace and his protection throughout the period of my study in KNUST.

I further dedicate this research study to all my lecturers, especially, Dr. Dorcas Nuerthey for her guidance and corrections to make this piece of work a reality.

God richly bless you all.

KNUST



ACKNOWLEDGEMENTS

I wish to extend my gratitude to my supervisor, Dr. Dorcas Nuerthey for her prompt direction, guidance, critique and sacrifice that has helped to make this a reality.

I acknowledge the valuable contribution from my family for their support.

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ABSTRACT

The study sought to examine the effect of sustainable supply chain management practices on green performance and the moderation effect of top management commitment. The study adopted the convenience sampling technique to a sample size of 110. Also, the study deployed

the semi-structured with the help of google form to gather data from the respondents. It could be noted that, the Smart PLS4, version 23 was used to analysed the data. As indicated in the research findings, top management commitment insignificantly moderates the relationship between sustainable supply chain and green performance. the study found that, sustainable supply chain management practices positively and significantly are related, which support H1. Again, the study found a positive and significant relationship between top management commitment and green performance, supporting the Hypothesis 2. Further, top management commitment insignificantly moderates the relationship between sustainable supply chain management practices and green performance. However, future studies are therefore recommended to conduct a comparative analysis between the manufacturing and service sectors on sustainable procurement and its effect on green performance.



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LIST OF ABBREVIATIONS

SSCM-----	Sustainable Supply Chain Management
GP-----	Green Performance
GDP-----	Gross Domestic Product
TMC-----	Top Management Commitment
RBV-----	Resource Based View
UET-----	Upper Echelon Theory
EFA-----	Exploratory Factor Analysis
CFA-----	Confirmatory Factor Analysis
AVE-----	Average Variance Extracted
SPSS-----	Statistical Package for Social Sciences

CHAPTER ONE INTRODUCTION

1.1 Background to the Study

As global environmental concerns rise, there is an increasing emphasis on corporations to adopt eco-friendly practices and contribute to sustainable development (Chavez et al., 2016). This shift is evident in developing economies as well, where businesses are transitioning from traditional to sustainable operational models. Sustainable supply chain management (SSCM), a conceptual amalgamation of environmental stewardship and traditional supply chain management, offers a way forward (Laari et al., 2017; Fang and Zhang, 2018). The Ghanaian manufacturing sector, with its significant economic footprint, is no exception to this trend. However, the effectiveness of SSCM in fostering green performance significantly hinges upon the commitment of top-level management (Gimenez et al., 2020).

The conceptual roots of sustainable supply chain management (SSCM) lie in recognizing the environmental impacts of organizational activities and restructuring these activities to minimize ecological footprints while still maintaining economic viability (Seuring and Müller, 2018). It seeks to integrate environmental considerations in every facet of supply chain management from raw material procurement to product delivery. Benefits of SSCM range from reduced waste and lower operational costs to enhanced corporate reputation and stakeholder trust (Beske et al., 2014). In Ghana, the transition towards SSCM within the manufacturing sector is driven by a myriad of factors. International trade agreements and partnerships often require adherence to sustainable practices (Adjei and Chinyio, 2019). Moreover, there's a growing local awareness about the consequences of environmental degradation, driving consumers towards eco-friendly products. This evolving market sentiment compels manufacturers to adopt SSCM for both compliance and competitive advantage (Zhu et al., 2018).

However, the adoption and success of SSCM practices often depend on organizational culture and strategic direction. Herein lies the crucial role of top management. Their belief in and commitment to sustainability can shape organizational values, resource allocation, and strategic direction towards green initiatives (Wiengarten et al., 2017). For instance, in

firms where top management championed sustainability, there was noted to be a better alignment of SSCM practices with overall business strategy, leading to enhanced green performance (Touboulie and Walker, 2015). Ghana's vulnerability to climate change impacts, coupled with its industrial growth ambitions, creates an imperative for its manufacturing sector to ensure SSCM practices are not only adopted but are also effective. Therefore, comprehensively understanding the interplay between SSCM, top management commitment, and green performance is pivotal for stakeholders within the Ghanaian manufacturing landscape.

Nevertheless, in today's economic world, sustainability or sustainable procurement is one of the forces or elements to achieve firms' green performance. With increasing attention to environmental pollution, such as, climate change, resource depletion, loss of biodiversity, and air pollution within the competitive business environment, companies today have restricted their actions that may cause threat to the environment (Arlow and Gannon, 2015). In view of that, managing the various risks that arise from environmental and social factors has become more important than ever before and that, sustainable procurement has gained more prominence as both a concept and practice (Arlow and Gannon, 2015). In recent times, businesses are increasingly viewing environmental considerations as a competitive edge, focusing on enhancing their green performance through strategies such as waste minimization and supply chain risk mitigation to bolster their market position (Humphreys, 2017).

Green et al. (2018) suggest that procurement organizations and their supply chain counterparts are taking a more holistic approach to sustainable procurement policies. They emphasize the integration of environmental concerns alongside other pillars of sustainable development, like societal and economic factors, into procurement operations. The escalating significance of sustainability can be attributed to a clearer grasp of the science of climate change, external pressures from stakeholders demanding greater responsibility, and a heightened transparency regarding corporate social and environmental behaviors (Green et al., 2018). Scholars on sustainable procurement, such as Meehan and Bryde (2019) and Preuss (2019) argue that propelling the sustainability narrative forward is

contingent upon the effective execution of green performance measures. However, sustainable procurement is a resource-intensive process, necessitating adequate backing in terms of assets. This brings into focus the pivotal role of top leadership. Arlow (2018) posits that top management plays a central role in shaping sustainable procurement strategies, as their decisions dictate the allocation of both financial and non-financial resources towards this endeavor. Given the importance of sustainable procurement and the potential influence of top management's commitment, there's a clear need for empirical research on these dynamics. Hence, this research aims to explore how sustainable supply chain management impacts green performance and how top management's commitment might play a moderating role in this relationship.

1.2 Statement of the Problem

In today's increasingly globalized and interconnected world, businesses cannot afford to remain insular in their operational perspectives. With the planet facing environmental crises and consumers demanding more from the brands they support, the melding of business and sustainability is not just strategic, but imperative. Particularly in regions like Ghana, where manufacturing acts as an economic backbone, the relevance of Sustainable procurement holds weight. While the integration of sustainability and supply chain processes promises both competitive and ecological benefits, the effectiveness of this amalgamation is intricately tied to the endorsement of top management (Humphreys, 2017).

Research over the years has mapped the trajectory of SSCM, especially in Western and developed economies, providing a wealth of knowledge on best practices and associated outcomes (Green et al., 2018). However, the empirical landscape for Ghana remains relatively barren. Does the Ghanaian manufacturing sector experience similar benefits from sustainable procurement practices as its Western counterparts? How does the cultural, economic, and industrial framework of Ghana influence these outcomes? Moreover, the potential moderating role of top management commitment in this relationship is still a vast, uncharted territory in empirical research (Meehan and Bryde, 2019). While existing theories on SSCM offer valuable frameworks, their predominantly Western origin renders their applicability to the Ghanaian context questionable. The unique socio-economic

dynamics and cultural nuances of Ghana demand a more localized theoretical lens. Without a tailored framework that integrates Ghana-specific variables, any attempt to strategically embed sustainable procurement within the Ghanaian manufacturing sector might prove ineffective or even counterproductive (Preuss, 2019). A holistic understanding of sustainable procurement in the Ghanaian manufacturing sector remains elusive. While isolated studies and anecdotal evidence provide a fragmented view, a consolidated body of knowledge is missing. This gap extends to understanding the tangible and intangible challenges faced by the industry in implementing SSCM, the range of SSCM practices in play, and the spectrum of outcomes these practices yield. Further complicating the panorama is the uncertain role of top management how deep is their understanding, how strong is their commitment, and how tangible is their influence in driving SSCM in Ghanaian manufacturing enterprises? (Arlow, 2018).

Amidst these prevailing gaps, the urgency and significance of this research become increasingly apparent. With the global drumbeat for sustainability growing louder, the potential for the Ghanaian manufacturing sector to carve a niche for itself by effectively leveraging sustainable procurement is vast. Moreover, by elucidating the complex interplay between sustainable procurement practices, green performance, and top management commitment, this study aims to offer more than academic contributions (Humphreys, 2017; Green et al., 2018). With the increasing attention to environmental pollution, such as, climate change, resource depletion, loss of biodiversity, and air pollution within the competitive business environment, companies today have restricted their actions that may cause threat to the environment (Arlow and Gannon, 2018).

In view of that, managing the various risks that arise from environmental and social factors has become more important than ever before and that, sustainable procurement has gained more prominence as both a concept and practice (Arlow and Gannon, 2018). A study by Lil and Kuo (2019) on the relationship between sustainable supply chain management and green performance was found that, companies can achieve the needed green performance from practicing sustainable supply chain if the necessary support and commitment by top management are given accordingly. While supply chain management is a prerequisite for

achieving performance, inculcating sustainability in firms' activities will improve its performance in a green manner (Mudgal, 2018). Despite the recognition of sustainable procurement as potentially instrumental in enhancing green performance, the extent to which the two variables relate appears to have received little attention in the procurement literature (Green et al., 2018; Meehan and Bryde, 2019; Preuss, 2019). More importantly, the moderating role of top management commitment in the relationship between sustainable procurement driving green performance have also not been given adequate attention in extant literature even though, top management commitment provides firmwide orientation towards sustainable supply chain management by securing and allocating resources for its implementation (Humphreys, 2017; Green et al., 2018; Arlow and Gannon, 2018). In view of this, the study current seeks to fill the gap identified in the study conducted by Lil and Kuo (2019). The motivation is that, the adoption of top management commitment could positively moderate the relationship between sustainable supply chain management and green performance.

1.3 Objectives of the Study

The study's primary purpose was to examine the moderating effect of top management commitment in the relationship between sustainable supply chain management and green performance. Specifically, the study sought to assess the following objectives.

1. To assess the relationship between sustainable supply chain management and green performance
2. To examine the relationship between top management and green performance.
3. To examine the moderation effect of top management between sustainable supply chain management and green performance.

1.4 Research Questions

1. What is the extent to which sustainable supply chain management affect green performance in the Ghanaian manufacturing sector?
2. What is the effect of top management commitment on green performance of manufacturing firms in Ghana?

3. What is the extent to which top management commitment moderates the relationship between sustainable supply chain management and green performance?

1.5 Justification of the Study

In addressing the objectives, the study makes contribution in four respects. To literature, this study contributes to the ever-growing body of knowledge on Sustainable Supply Chain Management (SSCM). While numerous studies exist in the context of developed economies, research specific to the Ghanaian manufacturing sector remains scarce. This investigation, therefore, offers fresh insights, complementing and expanding the global understanding of SSCM. By exploring the nuanced role of top management commitment in the nexus between SSCM and green performance, this study aims to fill a significant gap in existing literature, offering a more holistic understanding of the dynamics at play. The findings offer a unique perspective on the applicability of prevalent SSCM theories in a Ghanaian context, providing an opportunity for cross-cultural comparative studies in the future.

To Management, the results from this research can guide management in understanding the tangible benefits of implementing SSCM practices, thereby aiding in informed decision-making. Highlighting the significance of top management's commitment, the study underscores its pivotal role, encouraging top leaders to champion sustainable initiatives actively. Insights on how SSCM practices impact green performance can inform operational strategies, potentially leading to cost savings, waste reduction, and enhanced overall efficiency.

To Policymakers, understanding the relationship between SSCM, green performance, and top management commitment can help policymakers frame more effective, context-specific regulations and incentives for the manufacturing sector. With evidence on the benefits of SSCM, policymakers can advocate for and promote green manufacturing practices, aligning with global sustainability goals. The findings can facilitate a more collaborative

approach between governmental bodies, industry stakeholders, and environmental agencies, fostering a unified move towards sustainable manufacturing.

To Researchers/Students, this study provides a foundation upon which subsequent research can be built, paving the way for deeper dives into specific areas of interest or broader comparative studies across different sectors or regions. For students, especially those in business, management, or environmental studies, the research offers real-world insights into the challenges and opportunities of integrating sustainability into business practices. The research design, methodology, and analytical techniques employed can serve as a guide or reference for budding researchers, aiding them in their academic endeavors.

1.6 Research Methodology

A quantitative research design was deployed to collect, analyze and interpret the data obtained. The study again adopted the survey research approach. Therefore, the population of the study constituted the manufacturing firms in Ghana. Further, a convenience sampling technique was deployed to select the sample size of 110 manufacturing firms in Ghana. In support of this, questionnaires were used to gather data from the respondents of the study. To analyse and interpret the research data in making firm's decision, the PLS version 23 and IBM SPSS, version 26 was employed.

1.7 Scope of the Study

This study is primarily centered on Ghana, emphasizing its manufacturing sector. Given the country's unique socio-economic and cultural dynamics, the research aims to derive insights that are intrinsically Ghanaian in nature. Within Ghana, the research particularly focused on key manufacturing firms in Accra, which is known for its industrial activities, to ensure the relevance and depth of data collection.

Contextually, the lens is specifically on the manufacturing sector of Ghana. This encompasses a range of industries within the sector, from food processing to textiles, and from machinery to chemicals. The choice of this sector is due to its significant contribution to Ghana's GDP and its potential for green performance enhancement. The context also includes an exploration of the interplay between various stakeholders, such as suppliers,

manufacturers, distributors, and consumers, and how their interactions influence sustainable supply chain management (SSCM).

Conceptually, the core conceptual focus lies in understanding how Sustainable Supply Chain Management practices influence Green Performance within manufacturing entities. This encompasses looking at elements like waste reduction, energy efficiency, resource optimization, and more.

1.8 Limitation of the study

Due to constraints such as time and resources, the study relied on a limited sample size. Which affected the generalizability of the findings to the entire Ghanaian manufacturing sector.

The research captures the state of SSCM in the Ghanaian manufacturing sector during a specific timeframe. Given the rapidly evolving nature of sustainability practices and regulatory frameworks, the findings might become less relevant in the future.

Acquiring comprehensive data from manufacturing units posed challenges, particularly where certain information is deemed proprietary, and some respondents were reluctant to disclose details about their supply chain operations.

1.9 Organization of the Study

The study was organized in five chapters.

Chapter one presented the background to the study, statement of the research problem, objectives of the study, the study's questions, justifying the study's relevance, describing the research methodology, defining the study's scope, identifying its limitations, and outlining the study's organization.

Chapter two delved into a review of existing literature on the study. it consisted of the empirical review, conceptual review, theoretical review, conceptual framework.

Chapter three outlined the research's methodological approach, discussing the chosen population and sampling techniques, the methods employed for data collection and analysis, and considerations of research ethics.

Chapter four focused on analyzing the collected data, presenting the results, and discussing the implications of the findings in relation to the study's objectives.

Chapter five concluded by summarizing the key findings of the research, drawing conclusions based on the results, and offering recommendations for further action or study.

CHAPTER TWO LITERATURE REVIEW

2.1 Introduction

Chapter two presented the literature review of the study. It consisted of key sections such as the conceptual review, theoretical review, empirical review, conceptual framework, and hypothesis development.

2.2 Conceptual Review

A conceptual review is often referred to as a research strategy that involves scanning and analyzing previously obtained data on a certain subject. The study's variables for discussion are sustainable supply chain management, top management commitment and green performance.

2.2.1 The Concept of Sustainable Supply Chain Management

In today's globalized business landscape, the emphasis on sustainable supply chains is growing as industries and governments tackle issues like climate change, diminishing resources, and societal inequalities. This shift is driven by a blend of heightened consumer consciousness, regulatory mandates, and genuine environmental concern. Consequently, supply chains, a fundamental component of business operations, have evolved, leading to the emergence of Sustainable Supply Chain Management (SSCM). SSCM melds sustainable principles into supply chain activities. Beyond just economic success, it also integrates environmental and societal concerns. The foundational triad of SSCM revolves around the Planet, People, and Profit, ensuring operations are green, socially ethical, and economically sound.

Furthermore, Ahi and Searcy (2018) define SSCM as the embodiment of supply chain approaches that address ecological, social, and economic challenges and prospects by aligning a firm's ethical commitments with its supply chain tactics. Meehan and Bryde (2019) perceive SSCM as overseeing the movement of goods, data, and finances, as well as fostering collaboration between businesses along the supply chain, while honoring the three pillars of sustainability: economic, environmental, and social. Meanwhile, Green et al. (2020) express that SSCM involves strategizing, executing, and regulating business activities across the supply chain in a way that is ecologically and socially conscientious, while also being financially sound. Companies that incorporate sustainable practices in their supply chains often witness advantages such as heightened efficiency, cost savings, a bolstered reputation, and superior risk management. Moreover, such practices aid businesses in aligning with regulatory norms and catering to the escalating demand for green and socially responsible goods and services. One primary approach towards this is the enhancement of resource efficiency and waste minimization (Li et al., 2020). Effective procurement is pivotal for businesses in the competitive economic landscape, aiming to curb expenses while boosting productivity. Modern enterprises' requirements, ranging from ecological conservation, organizational transparency, to employee welfare, have evolved procurement methodologies. A shift is observed from purely economic objectives towards establishing green supply chains (Chavez et al., 2016).

Indeed, companies are advised to prioritize societal welfare over mere profit-driven motives. This social responsibility is evident when businesses act in alignment with the broader community and societal welfare. The realm of sustainable supply chain management extends beyond conventional procurement, encapsulating economic, ecological, and societal sustainability aspects within the supply chain framework. Remarkably, even conventional procurement acknowledges environmental and societal factors (Fang and Zhang, 2018). Suryanto et al. (2018) underscored that a company's endeavors to enhance its supply chain's sustainability, both internally and externally, encompass sustainable procurement practices.

El-Kassar and Singh (2019) characterized sustainable supply chain management as a process entailing the exchange and collaboration of goods, data, and financial resources among enterprises, all while imbuing economic, environmental, and societal goals stemming from stakeholder and customer expectations. Moreover, the essence of sustainable supply chain management emphasizes strategic transparency and systematic coordination across inter-organizational business operations, aiming for enduring economic outcomes (Jemsittiparsert et al., 2019). Notably, the central objective of sustainable supply chain seeks to ameliorate both the economic and ecological performance of a supply chain network. Stressing the importance of fortified supply chain collaboration, El-Kassar and Singh (2019) believe it's essential for achieving sustainability targets. Choi et al. (2012) postulated that sustainable supply chain practices enhance the long-term operational performance of the supply chain, especially from economic and societal perspectives. Against the backdrop of challenges presented by budget competitors, businesses must underscore the added value through Sustainable Supply Chain Management (SSCM) approaches. Laari et al. (2017) enumerate the myriad benefits of sustainably orchestrated supply chains, which span across cost reductions, brand enhancement, societal perks, amplified capital inflow, governmental incentives, innovation spur, and talent retention. Aligning supply chain management with sustainable growth objectives defines sustainable supply chain management (Dyllick and Hockerts, 2002). Typically, these objectives incorporate concerns across the environmental, social, and economic spheres.

Activities under the ambit of sustainable supply chain management include green designing, inventory oversight, remanufacturing planning, product reclamation, and waste management, among others (Ramudhin et al., 2019). Further delineating SSCM, Carter and Rogers (2018) describe it as a transparent and strategic amalgamation of an organization's societal, ecological, and economic goals, ensuring the long-term economic prosperity of both the individual business and its broader supply chain. To sum it up, the sustainable supply chain encapsulates the principle of weaving sustainability into all facets of supply chain management, ranging from sourcing to logistics. The modus operandi of sustainable supply chain management is to gauge the trifecta of environmental, societal, and economic

repercussions of supply chain operations and to optimize for minimal negative impacts and maximal enduring economic value. Key tenets of this approach involve environmental conservation, promotion of ethical business practices, and fostering enduring economic value. Embracing these practices is imperative for businesses eyeing a competitive edge in today's globalized market scenario. It not only trims operational expenses but also augments their brand image, risk handling, and compliance with regulatory norms.

2.2.2 Sustainable Supply Chain Management Practices

Sustainable supply chain management (SSCM) has been increasingly recognized as an integration of traditional supply chain functions with the principles of sustainability. This involves managing the flow of goods, information, and capital, focusing not just on economic benefits but also on environmental and social gains (Seuring and Müller, 2018). It is evident that both internal motivators like organizational values and external pressures such as stakeholder expectations and regulatory obligations are driving companies to adopt a more sustainable supply chain strategy (Walker et al., 2018). Incorporating sustainability within a company's supply chain processes is not straightforward. This necessitates the integration of practices that exemplify and action these principles. For instance, when companies adopt a wider perspective of value while selecting their suppliers by considering sustainability aspects, they are integrating these principles into their procurement strategies (Giunipero et al., 2012).

The practices that help businesses to align their objectives with sustainability encompassing environmental, economic, and social values are referred to as sustainability practices within the realms of purchasing and supply functions (Giunipero et al., 2012). Previous studies have categorized these practices based on various dimensions, such as their maturity level and the specific aspect of sustainability they focus on (Holloos et al., 2012; Gualandris et al., 2014; Vachon and Klassen, 2016). Again, Zsidis and Siferd (2020) connected traditional purchasing practices with environmental purchasing. On the other hand, Deakin (2019) focused on the mode of product transportation, hence, the

introduction of sustainable transportation that ensures mobility without compromising environmental and societal health.

Meanwhile, the importance of sustainable packaging, which incorporates efficient use of resources, continuous recycling, and zero harm to humans or the environment, has been emphasized by James et al. (2017). Furthermore, the concept of reverse logistics has gained traction, where the focus is on reusing and recycling products to ensure maximum value extraction (De Brito, 2016). Carter et al. (2020) highlighted the crucial role of purchasing in integrating environmental initiatives. Since packaging is a significant contributor to municipal waste, initiatives like sourcing recyclable or reusable packaging can have a considerable environmental impact (Min and Galle, 1997). Yet, the adoption rates of these practices vary. Ciliberti et al. (2017) in their study on Italian companies found varied degrees of adoption: 56% practiced environmental purchasing, while only 1% implemented sustainable warehousing. According to Sarkis (2019), the supply chain is a system comprising different functions/departments including manufacturing, distribution, and logistics. Within this framework, purchasing emerges as a critical function, initiating the value chain's environmental impact.

Firstly, environmental purchasing, also known as green purchasing or sustainable purchasing, involves the procurement of goods and services that have minimal negative impact on the environment. Environmental purchasing takes into consideration the entire product lifecycle, from the extraction of raw materials to the disposal or reuse of the product. The aim of environmental purchasing is to reduce the negative environmental impacts associated with the production and consumption of goods and services, while also promoting sustainable economic growth. Environmental purchasing involves several key practices, including supplier selection. Environmental purchasing involves selecting suppliers that are committed to sustainability and have demonstrated sustainable practices. This includes evaluating suppliers based on their environmental and social performance, as well as their commitment to ethical business practices.

Environmental purchasing involves evaluating products based on their environmental impact and sustainability performance. This includes considering factors such as energy efficiency, waste reduction, and the use of renewable materials. Further, environmental purchasing may involve choosing products that have been certified as environmentally sustainable, such as products with the Energy Star label or the Forest Stewardship Council certification for sustainably sourced wood products. Moreover, environmental purchasing involves analyzing the entire life-cycle of products to determine their environmental impact. This includes considering the environmental impact of raw material extraction, production, transportation, use, and disposal or reuse. In addition, environmental purchasing may involve collaborating with suppliers, customers, and other stakeholders to promote sustainable practices throughout the supply chain. This can lead to more effective problem-solving, the sharing of best practices, and the development of new sustainable products and services. By adopting environmental purchasing practices, businesses can benefit from improved environmental performance, reduced costs, enhanced reputation, and improved risk management capabilities. Environmental purchasing can also help businesses comply with regulations and meet the growing demand from consumers for environmentally and socially responsible products and services.

Beyond traditional purchasing factors, which focus mainly on cost, quality, and delivery, environmental purchasing emphasizes sustainability in procurement decisions (Jimenez and Lorente, 2018). A review of literature about eco-friendly purchasing interactions between buyers and suppliers suggests that supply managers need to account for the end-of-life treatment of the materials entering their organizations (Eltayeb, 2019; Hamner, 2016). Carter et al. (2020) opine that these life-span considerations should be integrated into the purchasing and acquisition process. Furthermore, upstream partners in the supply chain should pledge to minimize waste and assist the procuring company with components suitable for easy disassembly and lifecycle evaluation.

Bjorklund (2010) contends that the purchasing department might wield more influence in driving change than other business functions due to its escalating strategic importance, particularly concerning environmental considerations. In Carter et al.'s (2000) perspective,

green purchasing enhances a firm's financial metrics, including net income and the cost of products sold. Zsidisin and Siferd (2018) provide a detailed description of environmental purchasing, defining it as an organization's specific procurement strategies and partnerships formulated in reaction to ecological concerns. This definition encompasses activities ranging from raw material acquisition, supplier evaluation and management, to in-house distribution, packaging, and end-product disposal, addressing recycling, reusing, and resource preservation. Zsidisin and Siferd (2018) also suggest that manufacturers adopting green purchasing strategies are likely to enjoy better supplier collaboration, cost efficiencies, and a diminished environmental footprint, collectively enhancing the efficacy of a sustainable supply chain.

Another element of sustainable supply chain management practices is sustainable packaging. Sustainable packaging refers to the use of packaging materials and designs that have minimal negative impact on the environment and promote sustainability. Sustainable packaging aims to reduce waste, conserve resources, and minimize environmental impacts associated with packaging production, use, and disposal. Sustainable packaging can be achieved through several key practices, including use of eco-friendly materials. Sustainable packaging involves the use of eco-friendly materials, such as biodegradable, compostable, and recyclable materials. This includes materials such as paper, cardboard, bamboo, and plant-based plastics, which can be easily recycled or composted. Also, sustainable packaging involves designing packaging to be minimalistic, reducing the amount of packaging materials used while still providing adequate protection for the product. This can help reduce waste and the use of resources.

Sustainable packaging emphasizes designs that prioritize reusability, such as containers tailored for refills or designed for repeated use. This approach not only curtails waste and resource consumption but also offers an economical and user-friendly option for consumers. Furthermore, sustainable packaging aims for efficiency by utilizing lightweight materials and optimizing the dimensions of the packaging, thus minimizing environmental repercussions like emissions during transport. Key to sustainable packaging is the acquisition of materials from responsible sources, like FSC-certified forests or materials

with recycled content. By integrating sustainable packaging methodologies, companies can experience cost reductions, elevated brand image, and superior environmental outcomes. Moreover, sustainable packaging positions businesses to adhere to regulatory standards and cater to the mounting consumer preference for eco-conscious and socially responsible goods and services.

James et al. (2017) suggest that packaging significantly influences a product's journey through the supply chain due to its role in facilitating efficient distribution and mitigating environmental degradation from waste and product spoilage. Nevertheless, traditional packaging practices often carry sustainability concerns, including the consumption of nonrenewable resources, generation of pollutants during production, transport, and usage, and the accumulation of non-degradable waste in landfills. From Kooijmann's (2016) perspective, the merits of sustainable packaging are evident environmentally, characterized by waste reduction and conservation, but also resonate economically and socially.

According to Verghese and Lewis (2017), within industrial supply chains, packaging waste is frequently disregarded, treated as an inconsequential by-product, leading to littering, subpar recycling, and unnecessary landfill accumulation. The absence of clear communication and accountability among supply chain partners hinders the potential for innovative packaging solutions that address both the functional needs of the supply chain and its environmental footprint. Jahre and Hatteland (2016) emphasize that packaging isn't an isolated element but an integral component of a vast system involving various stakeholders across the supply chain spectrum, covering aspects from material handling and procurement to transportation and retail.

2.2.3 Green Performance

Chinander (2021) claims that green performance provides essential information on environmental impacts, legal compliance, and organizational processes that demonstrate how successfully and efficiently a corporation is taking environmental action. The idea of green performance has been defined in previous studies in connection to green competence and green commitment. To begin with, green performance is a broad notion that encompasses environmental preservation, pollution reduction, responsible resource use,

animal protection, and species preservation (Neely et al. (2018). This study uses green purchase behavior as a proxy for green performance.

Further, Jobber (2020) defines green performance as the final output or observable behavior resulting from the combination of natural, acquired, and adapting competencies. Follows and Tan (2021) contend that green or pro-environmental behavior is the practice in which a person acts in an environmentally friendly manner or purchases and consumes only products that are environmentally friendly. Green performance is the evaluation of how a company interacts with the environment (Olsthoorn et al., 2021). Prior studies demonstrated that, the concept of green performance can alter existing organizational paradigms and that organizational members are crucial change agents (Rao and Holt, 2018; Mainieri et al., 2018). According to Fergusson and Langford (2016), businesses are more likely to meet the green performance objective if their managers place a high value on it and demonstrate concern for it. Additionally, Nuryanto et al. (2020) posits that, green performance refers to how effectively resources are used, recycled, pollution reduction, waste, and emissions are decreased. Chen (2018) argues that green performance is centered on assuring innovation and advancements in organizational activities and procedures. According to Tornjanski and Cudanov (2017), organizations must enable their staff to be sustainable minded, which will result in green performance. Resource usage, regulatory compliance, processes, products, and services are all taken into consideration when evaluating the company's green performance (Sharma and Vredenburg, 2018). Other studies contend that, the two requirements for green success are operational and management performance (Veleva and Ellenbecker, 2020).

Once more, green performance indicators include the quantity of resources and energy consumed, the amount of waste and emissions produced, and the assessment of the company's environmental impact (Pourjavad and Shahin, 2018). Firms that practice sustainable procurement are able to boost their green performance and that of its suppliers who adhere to environmental regulations by using sustainable practices (Laari et al., 2018). Reverse logistics, green packaging, and green distribution are just a few examples of activities that could boost the environmental performance of firms (Sharma et al., 2017;

Sarkis, 2018). Due to this, becoming more sustainable in achieving green performance has become a top priority for businesses. According to the literature, green performance and sustainable procurement are strongly correlated, albeit this association also depends on how committed key stakeholders are to going green (Judge and Elenkov, 2018).

Green performance, also known as environmental performance, is a critical aspect of a company's operations, emphasizing the simultaneous reduction of environmental impact and the preservation of economic viability (Jain et al., 2017). An integral component of green performance involves the adoption of environmental management systems, such as ISO 14001, which assist companies in the identification and mitigation of their environmental impacts (Agan et al., 2017). This structured approach ensures a systematic understanding and management of environmental aspects throughout the organization. Companies can effectively monitor and evaluate their green performance by implementing comprehensive reporting mechanisms encompassing metrics such as greenhouse gas emissions, energy and water consumption, and waste generation (Loberto et al., 2017).

Such reporting mechanisms facilitate ongoing assessment, allowing companies to track progress over time and identify areas for improvement in their environmental practices. A crucial dimension of green performance involves a thorough analysis of the entire lifecycle of products and services. This entails scrutinizing the environmental impact from the extraction of raw materials, through production, transportation, usage, and eventual disposal or recycling (Gopalakrishnan et al., 2017). By understanding the complete lifecycle, companies can make informed decisions to minimize environmental harm at every stage. Furthermore, green performance extends to responsible sourcing practices, emphasizing the selection of materials and components from suppliers committed to sustainable and environmentally conscious practices (Dubey et al., 2017). This approach supports the integration of sustainability principles across the supply chain, contributing to overall environmental stewardship.

In product design, companies can contribute to green performance by utilizing eco-friendly materials, adopting reduced packaging strategies, and incorporating recyclable or reusable components (Gmelin & Seuring, 2017). These design principles align with the broader goal

of minimizing environmental impact and promoting sustainable consumption patterns. Enhancing green performance yields various benefits for organizations, including cost savings, enhanced reputation, and improved risk management capabilities (Jabbour et al., 2017). Additionally, companies can meet the increasing demand from consumers for environmentally and socially responsible products and services, positioning themselves as leaders in sustainable business practices. It is imperative for companies to recognize that green performance goes beyond individual initiatives; it requires holistic management strategies that encompass environmental impacts across operations, supply chains, and product lifecycles (Hofmann et al., 2017). This comprehensive approach ensures that sustainability practices are integrated into the core of organizational activities, fostering long-term environmental responsibility.

2.2.4 Top Management Commitment

Top management commitment refers to the level of dedication and support from the highest levels of management within an organization towards a specific goal or initiative. In the context of sustainability and environmental management, top management commitment is crucial to the success of sustainable practices within a company. Top management commitment involves several key practices, including. Setting clear goals and objectives: Top management commitment involves setting clear and measurable goals and objectives related to sustainability and environmental management. This includes setting targets for reducing greenhouse gas emissions, improving energy efficiency, and reducing waste generation. Secondly, top management commitment involves providing the necessary resources, including financial, human, and technological resources, to implement sustainability initiatives and achieve sustainability goals. Top management commitment involves leading by example and demonstrating their own commitment to sustainability and environmental management. This includes incorporating sustainable practices into their own decision-making processes and promoting sustainable practices throughout the organization.

Top management commitment is critical for advancing sustainability and environmental performance within an organization (Agan et al., 2017). Leadership can demonstrate

commitment by communicating frequently with both internal and external stakeholders about sustainability goals and performance (Jabbour et al., 2017). For employees, this includes integrating sustainability into company values, providing training on sustainability practices, and incentivizing sustainable behaviors (Govindan et al., 2017). For suppliers and customers, top managers can collaborate on green supply chain initiatives and communicate the company's sustainability expectations (Dubey et al., 2017). Leadership also shows commitment through dedicated budgets and resources for environmental programs, projects, and staff (Hofmann et al., 2017). Ongoing monitoring, audits, assessments, and reporting help ensure sustainability initiatives remain effective and identify areas for continued improvement (Loberto et al., 2017). Top management involvement in reviewing sustainability metrics and progress is also critical (Gmelin & Seuring, 2017). By demonstrating commitment to sustainability from the top-down, companies can enhance environmental performance, employee engagement, reputation management, and financial results (Jain et al., 2017). It also helps meet legal obligations and consumer demand for eco-friendly products and operations (Gopalakrishnan et al., 2017). In summary, visible and ongoing top management commitment to sustainability across operations and supply chains is key for improving environmental and business performance. Several academics and researchers have noted that, top management commitment is an essential part of procurement and supply chain operations (Liang et al., 2017; Gattiker and Carter, 2019; Foerstl et al., 2015). Top managers enable, ensure, and deploy organizational resources to accomplish the goals of the organization and individual departments by promoting sustainable practices. This, therefore, highlights the significance of top management commitment (Hoejmose and Adrien-Kirby, 2018). In the public sector, top management support is necessary from both political decision-makers and senior civil workers (Fernandez and Rainey, 2016). Jabbour and Jabbour (2016) also highlighted the significance of senior and mid-level managers' perceptions and behaviors in the adoption and implementation of sustainable procurement practices. To achieve green performance, management of firms need to be committed to sustainable procurement practices (Nanath and Pillai, 2017).

Top management commitment is the sincere dedication by firms' management to the operations and procedures of firms (Lam and Van de Voorde, 2019). Prior studies have emphasized the need for managerial support to procurement and supply chain management practices (Sancha and Wong, 2019; Thomsen, 2019; Nanath and Pillai, 2017). However, very little research has been done on how top management affects the relationship between sustainable procurement and green performance. The significance of senior management commitment in achieving procurement effectiveness has been highlighted by a recent study (Jabbour and Jabbour (2016). Top management support for sustainable supply chain management implies that, a company will make the necessary steps to create and implement the operational and administrative frameworks needed for e-procurement adoption (Burki et al., 2016). Due to a lack of senior management commitment and support for sustainable procurement practices and activities, it is difficult for businesses to achieve green performance (Zhu et al., 2018).

In the context of procurement and supply chain, senior management's dedication and support for sustainable procurement demonstrates the capacity to speed up delivery, enhance quality, boost productivity, and provide customers with value in a competitive manner. The requirement for senior management engagement and support in the use of information technology in procurement has increased in response to consumer demand for higher quality and more effective procurement operations (Sancha et al., 216). The top management of a company must embrace sustainable procurement for companies to achieve green performance in the competitive business environment (Guoyou et al., 2016). To support the, the current study uses Ha et al. (2019) measures to evaluate the level of management support and commitment to sustainable supply chain management.

2.3 Theoretical Review

The current study was underpinned by the Resourced-based view theory and the upper echelon theory.

2.3.1 Resourced-Based View (RBV) Theory

The Ghanaian manufacturing sector, like many other sectors worldwide, has experienced pressure from various stakeholders to adopt sustainable business practices. One significant way companies can respond is by integrating sustainable supply chain management (SSCM) to enhance their green performance (Amis et al., 2020). While SSCM is vital for improving the eco-friendliness of operations, top management commitment can significantly influence its success or failure. Using the resource-based view (RBV) theory, this study delves into understanding how this theory aligns with the subject and offers supportive insight into the critical role of resources in realizing sustainability goals within supply chain operations (Monczka et al., 2015).

The resource-based view (RBV) theory postulates that a firm's competitive advantage is derived from its ability to exploit internal resources effectively (Barney, 2017). These resources should be valuable, rare, inimitable, and non-substitutable to ensure sustainable competitive advantage. Within the context of sustainable supply chain management, the RBV provides a framework to understand how a firm's internal resources, such as top management commitment, play a crucial role in the successful implementation of sustainable practices (Hart and Dowell, 2018). In the Ghanaian manufacturing sector, for instance, resources such as technology, expertise, and capital are necessary for SSCM. However, without top management commitment, which acts as a driving force, the full potential of these resources cannot be harnessed (Ahenkorah and Acquaaah, 2019). When top management is committed to sustainability, they ensure that the necessary resources, both tangible and intangible, are availed to support SSCM initiatives. This commitment translates to strategic actions such as investing in green technologies, partnering with ecofriendly suppliers, and fostering a culture of sustainability throughout the organization (Osei and Baah, 2020). Furthermore, the RBV theory emphasizes the uniqueness of each firm's resources (Hitt et al., 2017). This means that even within the same industry, companies will have different capabilities and ways to implement SSCM, depending on their internal resource pool and the commitment of their top management.

As such, firms in the Ghanaian manufacturing sector that can leverage their unique resources, backed by strong leadership commitment, will be better positioned to enhance green performance compared to their counterparts. The study concludes that, the resourcebased view theory offers a profound understanding of the interplay between a firm's resources and its ability to achieve green performance through SSCM. While resources are pivotal, the commitment of top management acts as a catalyst, ensuring these resources are channeled correctly to realize sustainability goals. For the Ghanaian manufacturing sector, this means that businesses aiming for a competitive edge in green performance must prioritize both resource allocation and management commitment.

2.3.2 Upper Echelon Theory

To grasp the relationship between sustainable supply chain management (SSCM) and green performance within the manufacturing sector of Ghana, it's essential to recognize the influence of decisions and actions taken by senior management (Mat et al., 2012). The Upper Echelons Theory (UET) provides a robust framework for this, suggesting that an organization's outcomes, including its strategies and performance, are reflections of its top management's values, experiences, and personalities (Hambrick and Mason, 1984).

Applied to our context, the UET offers insights into how top management's characteristics influence the implementation of SSCM and, subsequently, the green performance of Ghanaian manufacturing firms. The Upper Echelons Theory posits that the experiences, values, and personalities of top executives influence their interpretations and choices (Smith and Lewis, 2017).

In the realm of SSCM, this suggests that a firm's commitment to sustainability is likely intertwined with the beliefs and values of its top management. If top executives possess strong environmental values, they are more likely to prioritize and drive SSCM initiatives within the company. Further, the Ghanaian manufacturing sector is one that is evolving rapidly, facing pressures from both local regulations and global demands for sustainability. Top management's ability to interpret these pressures effectively, based on their experiences and cognitive bases, will be a determinant of how proactively and effectively SSCM is incorporated into organizational strategy (Amankwah-Amoah, 2018). Moreover,

the commitment of top management to SSCM is not merely about strategy formulation but also strategy execution.

Executives who understand the long-term benefits of SSCM, both in terms of environmental impact and potential financial returns, are more likely to allocate essential resources, champion sustainability initiatives, and set a culture of sustainability throughout the organization. This cascading effect from the top echelons of the company can significantly influence the successful adoption of sustainable practices and the consequent green performance of the firm (Boateng et al., 2019). It could be concluded that, the Upper Echelons Theory (UET) provides a theoretical lens to understand the role of top management commitment in influencing the adoption of SSCM and the resultant green performance in the Ghanaian manufacturing sector. It underscores the importance of aligning top management's values and beliefs with organizational sustainability goals to ensure successful implementation and tangible outcomes.

2.4 Empirical Review

Numerous research studies have underscored the importance of sustainable procurement in influencing green performance within various industries. A comprehensive overview of some of these studies includes:

Attia (2017) aimed to investigate the influence of sustainable supply chain management (SSCM) on the performance of manufacturing firms in Belgium. The research utilized a survey approach involving 230 manufacturing companies. The data collected were analyzed using structural equation modeling (SEM) analysis. The results of Attia's study indicated a positive impact of SSCM on organizational performance among the surveyed manufacturing firms in Belgium. However, one limitation of the study was the absence of an exploration into potential mediator or moderator variables that could provide more nuanced insights into the relationship between SSCM and organizational performance. The study recommended that future research should delve into examining IT adoption as a potential moderator variable to better understand the dynamics at play in the relationship between sustainable supply chain management and organizational performance.

Choi and Hwang (2018) sought to model the relationship between green supply chain management, collaboration, and green performance in the context of manufacturing firms in Japan. The research involved a survey of 421 firms and employed IBM SPSS 18 for data analysis. Choi and Hwang's findings indicated a positive impact of green supply chain management on green performance, with collaboration serving as a moderator in this relationship. A limitation of the study was its exclusive focus on the manufacturing sector, potentially limiting the generalizability of the findings. The authors recommended that future research should explore other potential moderators to gain a more comprehensive understanding of the relationship between green supply chain management and performance.

Choi et al. (2016) aimed to evaluate the connection between sustainable procurement practices and financial performance within Japan's pharmaceutical industry. Quantitative analysis of survey data was employed in the research. The study's findings suggested a positive influence of sustainable procurement on the financial performance of pharmaceutical companies in Japan. One limitation was the omission of mediator or moderator variables in the analysis. The study therefore recommended that future studies should incorporate third variables to explore potential moderating or mediating factors influencing the relationship between sustainable procurement and financial performance.

Das (2018) investigated the impact of sustainable supply chain management on both environmental and social performance. The research involved a survey of 130 firms, and regression analysis was utilized for data analysis. Das found that sustainable supply chain management had a positive impact on both environmental and social performance.

However, the study neglected to explore the overall organizational performance impact of sustainable supply chain management. It was recommended that future research should broaden its scope to include an examination of the overall organizational performance influenced by sustainable supply chain management.

Haris et al. (2018) aimed to identify the drivers of green supply chain practices and their impact on performance in the manufacturing sector in Malaysia. The research involved a

survey of 238 firms, and PLS-SEM analysis was employed. The study's findings suggested that green supply chain practices contributed positively to overall performance among the surveyed manufacturing firms in Malaysia. However, a limitation of the study was the exclusion of top management support as a variable in the analysis. The study however recommended that future studies should include top management support as a variable to gain a more comprehensive understanding of the drivers and impact of green supply chain practices on performance.

Kumar et al. (2018) aimed to investigate the impact of sustainable supply chain management (SSCM) practices on green performance in the manufacturing sector in India. Additionally, the study sought to explore the moderating role of top management commitment in this relationship. The study adopted a quantitative survey involving 265 manufacturing firms. The data collected were analyzed using moderated regression analysis with SPSS. The study revealed that sustainable supply chain management practices had a positive influence on green performance in the manufacturing sector. Furthermore, the presence of top management commitment was found to strengthen this relationship. The study's single-country context may limit the generalizability of its findings. The study therefore suggested testing the model in other country contexts to enhance the generalizability of the findings. They also recommended collecting longitudinal data to assess how these relationships evolve over time.

Zhou et al. (2019) aimed to explore how top management commitment moderates the relationship between sustainable supply chain management practices and environmental performance in the automotive industry in China. A survey approach involving 389 automotive firms was employed. Structural equation modeling (SEM) analysis using AMOS was used for data analysis. The study found that sustainable supply chain management practices positively influenced environmental performance, and this relationship was enhanced by the presence of top management commitment. The study acknowledged limitations, including the exclusive focus on the automotive industry and the use of subjective measures for performance. The authors recommended replicating the study in other manufacturing industries to validate the generalizability of their findings.

Additionally, they suggested using more objective measures to assess environmental performance.

Lee et al. (2020) set out to examine the role of top management commitment in the link between green supply chain management and sustainability performance in the manufacturing sector in Malaysia. A survey of 178 manufacturing firms was conducted, and a Hayes PROCESS macro was employed to test a moderated mediation model. Lee et al. found that top management commitment positively moderated the relationship between green supply chain management and sustainability performance. The study did not compare different types of manufacturing industries within its scope. Lee et al. recommended further segmentation of the analysis by manufacturing sub-sector to gain more nuanced insights. This could provide a more detailed understanding of how top management commitment influences the relationship between green supply chain management and sustainability performance across different manufacturing industries.

Park et al. (2017) aimed to analyze the influence of sustainable purchasing on both environmental and economic performance within the context of manufacturing firms in South Korea. The study also investigated the moderating effect of top management commitment on this relationship. The study involved a survey of 289 manufacturing firms, and the researchers employed moderated regression analysis to analyze the data. The study found that sustainable purchasing practices positively impacted both environmental and economic performance. Importantly, the presence of top management commitment was identified as a key factor that enhanced this positive relationship. However, the study had limitations, including the omission of the social dimension of sustainability in the analysis, and the restriction to a single-country context, potentially limiting generalizability. The authors recommended incorporating the social dimension of sustainability in future research and suggested testing the model in other countries to enhance the external validity of the findings.

Zhang et al. (2021) sought to examine the moderating role of top management commitment in the relationship between green supply chain practices and green performance within the

context of the textile industry in China. The research involved a survey of 378 textile companies, and hierarchical moderated regression analysis was used for data analysis. The study found that top management commitment positively moderated the link between green supply chain practices and green performance in the textile industry. The study was limited by its exclusive focus on one industry and the use of subjective measures of performance. The study recommended testing the model in other industries to validate the generalizability of the findings and suggested using objective performance indicators to enhance the robustness of the analysis.

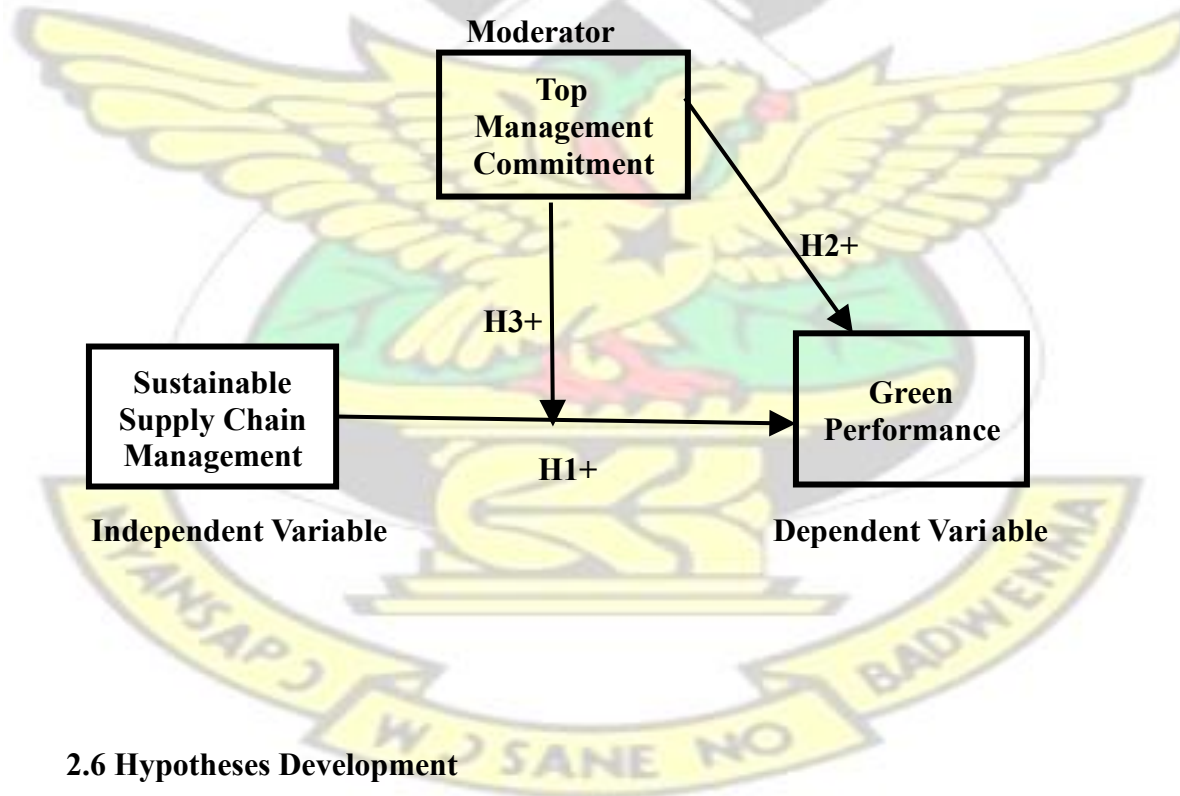
Singh et al. (2020) investigated the influence of green procurement and top management commitment on environmental performance within the Indian mining sector. A survey approach involving 265 mining firms was utilized, and structural equation modeling (SEM) analysis was conducted through AMOS. The study revealed that green procurement positively influenced environmental performance, and this relationship was further amplified by top management commitment. However, the study was limited to the mining sector, and it solely examined environmental performance. The study recommended testing the model in other sectors to assess its generalizability and suggested incorporating economic performance dimensions in future research.

Tan et al. (2022) aimed to assess the moderating role of top management commitment in the relationship between sustainable supply chain practices and firm sustainability performance, focusing on automotive suppliers in Malaysia. A survey involving 139 automotive supplier firms was conducted, and moderated mediation analysis was employed. The study found that top management commitment enhanced the positive link between sustainable supply chain practices and sustainability performance among automotive suppliers in Malaysia. The study was limited by its focus on a single industry (automotive suppliers) and the use of cross-sectional data. Tan et al. recommended extending the study to other industries and sectors to enhance its generalizability. Additionally, they suggested gathering longitudinal data to provide a more dynamic understanding of these relationships over time.

Sodhi and Tang (2019) analyzed the role of top management commitment in the relationship between sustainable procurement and both environmental and economic performance in the electronics industry in Singapore. A survey approach involving 295 electronics companies was employed, and moderated regression analysis was conducted. The study revealed that sustainable procurement positively influenced both environmental and economic performance, with top management commitment enhancing this relationship. However, the study was limited to a single industry (electronics) and did not examine the social performance dimension. The study suggested that, firms should incorporate the social performance dimension in future research to provide a more comprehensive understanding of sustainable procurement's impact.

2.5 Conceptual Model

This section presented the conceptual framework depicting the direct and moderation effect of the study variable relationship between. Refer to figure 2.1 below.



2.6 Hypotheses Development

2.6.1 Sustainable Supply Chain Management and Green Performance

Previous study has demonstrated that, the concept of green performance can alter existing organizational paradigms and that, individuals in organizations play a significant role in

the transition process (Rao and Holt, 2018; Mainieri et al., 2018;). Firms are more likely to accomplish the green performance objective, according to Fergusson and Langford (2016), if their managers place a high value on and demonstrate concern for environmental protection and improve their level of sustainable procurement practices. Sustainable packaging effectively contains and protects products during movement across the supply chain. Reverse logistics is another sustainable supply chain approach. According to De Brito (2016), reverse logistics ensures that, the value added to products is used and reused (effectively and efficiently).

Since purchasing is at the start of the value chain, a company's environmental initiatives will not be successful unless its environmental objectives are integrated with purchasing activities. Prior studies suggest that, sustainable purchasing can support a company's overall environmental initiatives and green performance objectives (Carter et al., 2020; Tornjanski and Cudanov, 2017). Sustainable supply chain management (SSCM) practices are focused on integrating sustainability considerations into all aspects of the supply chain, from procurement and transportation to production and distribution. Green performance, on the other hand, is focused on measuring and improving a company's environmental impact.

The hypothesis that links SSCM and green performance is that implementing sustainable practices throughout the supply chain can lead to improved green performance. This is based on the idea that by integrating sustainability considerations into all aspects of the supply chain, companies can reduce their environmental impact and improve their overall environmental performance. There are several specific hypotheses that have been proposed to support the link between SSCM and green performance (Rao and Holt, 2018; Mainieri et al., 2018). The study hypothesizes that,

H1: Sustainable supply chain management practices positively and significantly relate with green performance.

2.6.2 Top Management Commitment and Green Performance

Top management commitment refers to the level of support and dedication from senior leaders within an organization towards sustainability and environmental initiatives. Green

performance, on the other hand, refers to a company's ability to measure and improve its environmental impact while maintaining its economic performance. The hypothesis linking top management commitment and green performance is that, companies with strong top management commitment towards sustainability are more likely to have better green performance. This hypothesis is based on the idea that top management plays a crucial role in shaping organizational culture and values, and their commitment to sustainability can drive changes in organizational behavior that lead to improved environmental performance.

Companies with strong top management commitment towards sustainability are more likely to report on their environmental performance and set targets for improvement, leading to improved environmental performance. Top management commitment towards sustainability can lead to improved stakeholder engagement and support, including from customers, investors, and employees, which can in turn drive improved environmental performance. To achieve green performance, management of firms need to be committed to sustainable procurement practices (Nanath and Pillai, 2017). Top management commitment is the sincere dedication by firms' management to the operations and procedures of firms (Lam and Van de Voorde, 2019).

Prior studies have emphasized the need for managerial support to sustainable supply chain management practices (Sancha and Wong, 2019; Thomsen, 2019; Nanath and Pillai, 2017). However, very little research has been done on how top management affects the relationship between sustainable procurement and green performance. The significance of senior management commitment in achieving green procurement has been highlighted extant literature. Due to a lack of senior management commitment and support for sustainable procurement practices and activities, it is difficult for businesses to achieve green performance (Zhu et al., 2018).

According to Yen and Yen (2017), a company's commitment to the environment necessitates that, senior management increase staff members' proficiency in environmentally friendly procurement practices, hence, improved green performance. However, due to a lack of green commitment and support for green competence, businesses

are unable to meet the green performance aim in the competitive business environment (Zhu et al., 2018). The current study uses Ha et al. (2019) metrics to assess the amount of green commitment to enhance green competence and ultimately achieve green performance to bolster the claim. Overall, the hypothesis is that strong top management commitment towards sustainability is linked to better green performance, which can lead to a range of benefits for companies and the environment. The study therefore hypothesizes that;

H2: Top management commitment relates positively with firm's green performance.

2.6.3 Moderating Role of Top Management Commitment between Sustainable Supply Chain Management and Green Performance

In today's dynamic and increasingly globalized business environment, sustainable practices are transitioning from being mere corporate buzzwords to critical strategic imperatives. Firms are under mounting pressure from stakeholders - ranging from consumers, regulatory bodies, to investors - to align their operational activities with sustainability standards. In this backdrop, the realm of Sustainable Supply Chain Management (SSCM) has gained remarkable traction. The heart of SSCM lies in integrating environmental considerations into supply chain operations, spanning sourcing, manufacturing, distribution, and disposal.

However, the successful implementation of these practices and the realization of green performance outcomes is often contingent upon various organizational factors. One such determinant, often underscored yet pivotal, is the commitment of top management. This study aims to delve into the moderating role of top management commitment in the relationship between Sustainable Supply Chain Management and Green Performance, particularly in the context of the Ghanaian manufacturing sector.

Studies have shown that, management commitment and support towards sustainability plan is critical to achieving green performance (Zhu et al., 2018). The ability to reduce carbon footprint and provide value to consumers in an environmentally friendly manner is demonstrated by senior management commitment and support for sustainability in logistics and supply chain. Growing environmental awareness and consumer demand for green products have heightened the need for top management involvement and support in the

implementation of green technology and practices (Sancha et al., 216). To accept and manage sustainability issues and achieve green performance, a company's top management commitment is crucial (Guoyou et al., 2016). Similar to how top management involvement is crucial for achieving and adapting green process innovation (Guoyou et al., 2016). A recent study found that, the higher the level of senior management support and commitment for sustainable supply chain management, the higher it moderates its relationship with green performance for firms. The study therefore hypothesizes that:

H₃: Top management commitment positively moderates the relationship between sustainable supply chain management and green performance.



CHAPTER THREE METHODOLOGY AND PROFILE OF STUDY AREA 3.0

Introduction

This chapter looked at the methodology adopted by the study. It included the research strategy, research design, population, sampling procedures, data collection tools, data analysis and research ethics.

3.1 Research Strategy

Research strategies primarily fall into two main categories: qualitative and quantitative. In the realm of quantitative research, data is often represented numerically. As Bryman (2009) notes, this approach not only prioritizes exact measurements but also the mathematical or statistical examination of data obtained from tools like surveys and questionnaires. This method often employs computational resources to modify previously gathered statistical information.

Conversely, qualitative research is characterized by its interpretive and naturalistic approach. Denzin and Lincoln (2000) describe it as a method that seeks to understand phenomena within their natural environments. Similarly, Creswell (2012) suggests that qualitative research delves into understanding the significance individuals or groups attribute to specific societal or human issues. For the study in question, the chosen method was quantitative research.

3.2 Research Design

There are various options available to a researcher in choosing a survey, experiment, or a case study (Yin, 2003). This in respect helps achieve the generality of responses. The current study therefore adopted a survey strategy. Again, there are different approaches to a given study, namely; descriptive, explanatory and exploratory approaches.

Descriptive study design, according to Bryman (2019), is the systematic collection of data in standardized form from a defined population or sample to help determine the scope and the extent of the research variables, including sustainable supply chain management, green performance, and top management commitment. Again, the descriptive statistics was used to test the means and the standard deviations of the responses.

Further, an exploratory design is a research method used to investigate a problem or phenomenon that isn't well-defined or understood. It's often the preliminary stage in a research process, serving as a foundation for more conclusive research and data collection. This design is particularly useful when researchers aim to gain an initial understanding of a subject to then conduct more specific studies in the future.

Also, the explanatory design is that type of research which determines the cause-and-effect between the variables of a given study. The current study therefore adopted both descriptive and explanatory research designs in collecting and analysing the research data. In other words, the explanatory design examines the relationship between sustainable supply chain, green performance, and top management commitment.

3.3 Research Population

Polit and Beck (2014) define "population" as the total set of items, individuals, or subjects under investigation, whereas a "sample" is a smaller segment or subset chosen to represent that entire population. In the context of this study, the population encompasses manufacturing companies within the Greater Accra Metropolis.

3.4 Sample Size and Sampling Technique

Sampling is a method of selecting individuals or a subset of the population to make statistical inferences and estimate population characteristics (Bryman, 2019). Saunders et al. (2009) classifies probability and non-probability sampling techniques in detail. When utilizing probability sampling techniques, the likelihood of selecting each example from the population is known and often equal for all members. However, with non-probability sampling techniques, it is impossible to determine the likelihood that a certain member will be selected from the total target population (Berman, 2019).

In this study, both convenience sampling and purposeful (judgmental) sampling techniques were used as non-probability sampling approaches. Firstly, since the study's focus was sustainable supply chain management, only top and middle line managers were given the chance to respond to the questionnaire. This is done for them to offer a more reliable input to the study. Purposive sampling, according to Neuman (2006), enables you to apply your judgment to choose samples that will most effectively assist you reach your goals and respond to your research question(s). Following that, introductory letters were written to a range of manufacturing companies using the convenience sample method, and those that responded favorably were included in the study (Saunders et al., 2009). Accordingly, the

current study adopted convenience sample technique to select a sample size of 110 manufacturing firms.

3.5 Types and Sources of Data

Data, according to Polit and Hungler (1999), is any information gathered during the study process or the research study. Secondary data information is a synthesis of published and unpublished documents related to primary research, and it includes the primary research's logical framework (McRiam et al., 2009; Sçkaran, 2003). The term "primary data" refers to information that can be obtained from sources such as systematic observation, material from archives, the answers to questions, in-depth interviews, and a case study that was assembled (Jankuwics, 2002). Other studies posit that, primary data is the original and unique material gathered by the researcher directly from a source. There are various tools/instruments for collecting and gathering primary data, including observation, surveys, questionnaires and interviews, experimentation and among others. For this study, primary sources were used to elicit data.

3.6 Data Collection Method

Data collection instruments are the tools that are used to collect data for a given research. There are various types of data collection instruments, namely; questionnaires, interviews, surveys, observations, and experiments. A structured questionnaire was used to collect the data for this study, and Saundçrs çt al. (2009) indicated that this method has been predominately used in business and management research. In a question-and-answer session, each participant is asked to respond to the same set of questions in a predetermined order (deVaus, 2002). The classification of questions by Saundçrs et al. (2009) is into two categories: questions that are self-administered and questions that are intervieweradministered. There were four set of sections in the questionnaire. The Section A is the Profile of the Study, Sustainable supply chain management was addressed in Section B, The Section C addressed the measures of Green Performance, while Section D represented Top Management Support. The questionnaires were administered online with the help of a google form. The measurement items for the variables are presented on Table 3.1 below.

Table 3.1: Summary of Measurement Items

Variable	Number of Measurement Items	Source
Sustainable Supply Chain Management	10	Choi and Hwang (2019)
Green Procurement	5	Mushtag et al. (2019)
Top Management	6	Jayashree et al. (2016)

Source: Author's Own Construct (2022)

3.7 Data Analysis Method

Bernard (1998) defines data analysis as the process of methodically identifying patterns in observations that have been recorded and developing hypotheses to explain those patterns. The PLS and SPSS were used analyse the data collected. The demographics of the respondents were presented first, but the data analysis was set up in accordance with the precise goals of the study. Gender, age, education level, work experience, managerial position, and staff position were the demographic factors of respondents considered in the analysis. After EFA, correlation, and regression statistics, a structural equation modeling (SEM) analysis of the hypotheses was conducted.

3.8 Validity and Reliability Tests

Validity and reliability are the essential traits in quantitative research that reflect quality and rigor in research design, according to Saunders et al. (2009). How validity and reliability have been evaluated will be clear from a well-written research paper. In quantitative research, validity refers to the veracity and accuracy of the data and conclusions that are generated. Additionally, it includes the ideas being investigated, the subjects being examined, the methods used to gather the data, and the conclusions drawn (Saunders et al., 2009). There are numerous sorts of validity, and each one helps to increase the research's overall credibility. Furthermore, Sauders et al. (2009) define reliability as the consistency and dependability of a measuring tool, i.e., it is a measure of the extent to which it consistently provides the same results over time, across similar

groups, regardless of who administers it. It should be noted that, both the Cronbach's alpha and composite reliability were used to assess the reliability of the study variables while confirmatory factor analysis (CFA) and Average Variance Extracted (AVE) were also used to assess the validity of the study variables.

3.9 Research Ethics

Research ethics refers to the moral principles that guide researchers to conduct their research honestly and with integrity (Resnik, 2019). It seeks to ensure researchers protect the rights, safety, dignity, and wellbeing of all those involved in research, including participants and other researchers. Firstly, before conducting the study, the researcher consulted the selected companies to seek their consent and approval. Again, as part of the ethical issues, the respondents were not forced to engage in the research study under any circumstances.

3.10 Profile of the Manufacturing Sector

Accra, the capital of Ghana, stands as a bustling economic epicenter, home to a rich tapestry of manufacturing sectors. These sectors range from food processing and textiles to chemicals, electronics, pharmaceuticals, beverages, plastics, and beyond. Such variety underscores Accra's significance as a central node for myriad industries, addressing both local and global needs. While the city boasts the presence of large-scale corporate entities, it's the small and medium-sized businesses (SMEs) that notably steer its manufacturing pulse. This blend of business scales fosters a vibrant environment where traditional giants and budding ventures thrive side by side.

Being strategically positioned, Accra offers manufacturing entities a prime gateway to essential resources. Its integrated transport network, including major ports and flight routes, ensures seamless logistics for goods and materials. Furthermore, as Ghana's capital, Accra is a magnet for skilled professionals and ancillary services. Its pivotal location not only serves the domestic markets but also acts as a launchpad for international trade. Thanks to its proximity to key transport hubs and established trade channels, the city streamlines the export and import of products. Critical to this is Accra's advanced infrastructure, encapsulating dependable electricity, telecommunication systems, and transport avenues,

which are indispensable for sophisticated manufacturing operations and for meshing with global supply chains.

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CHAPTER FOUR DATA PRESENTATION, ANALYSIS AND DISCUSSION OF RESULTS

4.0 Introduction

This chapter delves into the outcomes of the data analysis, encompassing the interpretation of results and their implications for the study. The analysis kicks off by examining the response rate and the demographics of the respondents. This is followed by descriptive statistics, highlighting the mean, standard deviation, skewness, and kurtosis. Subsequent to that, the chapter delves into the measurement model analysis to ensure the precision and reliability of the data. This analysis includes elements like Cronbach Alpha, Composite reliability, Average Variance Extracted (AVE), cross loadings, and multicollinearity. Following this, the chapter explores the actual model testing which comprises correlation analysis, linear regression, and moderated hierarchical regression, all supported by a table detailing the hypotheses. The concluding section delves into a comprehensive discussion of the findings, comparing them with previously reviewed literature. All analyses were executed utilizing tools such as SmartPLS4 and IBM SPSS version 23.

4.1 Response Rate

Out of the target sample of 110, all questionnaires were duly filled and returned, leading to a perfect response rate of 100%. Citing Mugenda & Mugenda (2013), a response rate of 50% is considered decent, 60% is viewed as satisfactory, and anything above 70% is classified as exceptionally high. Given these benchmarks, the response rate for this study is outstandingly high and can be considered very credible.

4.2 Demographics of the Respondents and Background of Firms

This segment outlines the demographic details of the survey participants, offering insights into the profile of the companies they represent. Key information gathered from the respondents encompasses aspects like gender, age, managerial rank, years of work experience, academic qualifications, and their specific roles in the company. As pointed out by Hitka and Baláiová (2015), the characteristics of those responding to a survey can notably influence the answers they provide. Hence, it's crucial for the investigator to consider these demographic attributes and assess their possible impact on the study's results.

Table 4.1: Demographics of Responses

Variables		Frequency	Valid Percentage
Gender	Male	58	52.7
	Female	52	47.3
Age	20 to 30	17	15.5
	31 to 40	23	20.9
	41 to 50	59	53.6
	50 or more	11	10.0
Work Experience	0-5 years	21	19.9
	6-10 years	32	29.9
	above 10 years	57	58.2
Educational Background	HND/Degree	48	43.6
	Masters	39	35.5
	Professional	17	15.5
	Other	6	5.4
Managerial Level	Top management	53	48.2
	Line Manager	27	24.5
	Supervisor	30	27.3
Position	Supply Chain Manager	51	46.4
	Logistics Manager	37	33.6
	Operations Manager	22	20.0
Total		110	100

Source: Field data, 2022

Out of a sample size of 110 respondents, 58 individuals, representing 52.7 percent were males while 52 individuals, representing 47.3 percent were also female. This result indicates that, more males took part in the study than females. It could also suggest that, more males work in manufacturing firms than females. Preferably, due to the nature of the work. It is further noted that, the proportionate difference in the responses is unsubstantial and unbiased, hence, justifiable to be used for the analysis.

Out of the 110 responses, 17 individuals, representing 15.5 percent were between 20-30 years old; 23 individuals representing 20.9 percent were within the ages of 31-40 years old; 59 individuals were within the ages of 41-50 representing 53.6 percent while 11 individuals were also above 50 years, representing 10 percent. This result indicates that, even though, the majority of respondents were between the ages of 41 and 50, no significant research is studied to determine how this age distribution affected the outcomes. The replies are thought to be evenly distributed throughout the age categories because there is a good representation from all age groups.

On the experience of the respondents, out of the 110 responses, 21 individuals have less than 5 years working experience, representing 19.9 percent; 32 individuals also have 6 to 10 years working experience, representing 29.9 percent while 57 individuals, representing 58.2 percent. This result shows that, majority of the respondent are experienced on the job.

Out of 110 responses, 48 individuals, representing 43.6 percent have either a Diploma or first Degree; 39 individuals also have second Degree (Masters), representing 35.5 percent; 17 individuals, representing 15.5 percent have professional qualification and 6 individuals also have other academic qualifications, representing 5.4 percent.

4.2.5 Managerial Level

Out of the 110 responses, 53 persons, representing 48.2 percent are top managers; 27 individuals are also line managers, representing 24.5 percent while 30 individuals, representing 27.3 percent. The result shows that, the respondents are key stakeholders and critical to the adoption of sustainable supply chain practices, hence, their responses are considered relevant to the analysis.

4.2.6 Position held by Respondents

Out of the 110 responses, 51 individuals are Supply Chain Managers, representing 46.4 percent; 36 of them, representing 33.6 percent are also Logistics Managers and 22 individuals, representing 20 percent. By implication, the adoption and implementation of green and sustainable supply chain is critical to the firms, since these individuals are part of the strategic decision makers.

4.3 Reliability and Validity Test

The process of reliability analysis is used to evaluate the consistency of the variables, while validity analysis is implemented to determine how accurately the variables represent their respective constructs. To gauge the reliability of the constructs, this study employed both the Cronbach alpha value and composite reliability. These metrics determine the steadfastness with which the variables are measured. Based on Hair et al. (2013), a benchmark value of 0.7 is considered acceptable for gauging variables. For this study, sustainable supply chain practices were assessed using 10 measurement items. Additionally, 6 items were utilized to evaluate both top management commitment and green performance.

To determine the validity of the gathered data, confirmatory factor analysis was first carried out to ascertain the factor loadings of each item related to its underlying variable. For an item to be deemed valid, it should have a loading greater than 0.50. Moreover, to measure convergent validity, the study used the average variance extracted value (AVE). As proposed by Hair et al. (2013), these values should surpass the threshold of 0.5.

To analyze discriminant validity, the study implemented the Fornell-Larcker criterion. Here, the correlation of an item with itself must be higher than its correlation with other variables.

Table 4.2 Cronbach Alpha, Composite Reliability, and Average Variance Extracted

Construct	Number of items	Cronbach Alpha (CA)	Composite Reliability (CR)	AVE
Sustainable Supply Chain	10	0.904	0.920	0.537
Top Management Commitment	5	0.830	0.876	0.542
Green Performance	6	0.840	0.882	0.556
Total	22			

Source: Field data, 2022

Table 4.2 presents the metrics for Cronbach Alpha, Composite Reliability, and AVE for the study's variables. The sustainable supply chain registered a Cronbach Alpha of 0.904 and a composite reliability of 0.920. Meanwhile, top management commitment scored a Cronbach Alpha of 0.830 and a composite reliability of 0.876. Additionally, green performance yielded a Cronbach Alpha of 0.840 and a composite reliability of 0.882. Given these scores, it's evident that all three variables surpassed the 0.70 benchmark, indicating robust internal consistency. Thus, the study's data is deemed reliable.

In terms of the Average Variance Extracted (AVE), the results were as follows: Sustainable Supply Chain at 0.537, Top Management Commitment at 0.542, and Green Performance at 0.556. With all three variables exceeding the 0.50 benchmark, it suggests that the items designed to measure each variable effectively represent their respective latent variables.

This confirms the presence of convergent validity in the study.

Table 4.3: Fornell - Larcker Criterion

Construct	SSC	TMC	GP
Sustainable Supply Chain	0.782		
Top Management Commitment	0.646	0.733	
Green Performance	0.777	0.634	0.796

Source: Field data, 2022

The study utilized the Fornell-Larcker Criterion to evaluate discriminant validity. While convergent validity assesses the accuracy with which latent variables reflect their primary variables, discriminant validity ensures that these latent variables don't measure other variables more than their own intended variables. According to the Fornell-Larcker criterion, the square root of each variable's AVE should have a stronger self-correlation than correlations with other latent variables.

Table 4.3 illustrates that the Sustainable supply chain posted a self-correlation coefficient of 0.782, and correlated at rates of 0.646 with top management commitment and 0.777 with green performance. Meanwhile, top management commitment correlated at 0.733 with itself and showed correlations of 0.646 and 634 with the Sustainable supply chain and green

performance, respectively. Lastly, green performance correlated at 0.796 with itself, and at 0.777 and 0.634 with the Sustainable supply chain and top management commitment, respectively. These results confirm that each variable correlates more strongly with itself than with the other variables, establishing the discriminant validity of each variable.

Table 4.4: Cross-Factor Loadings

Factor	Code	Variable	SSC	TMC	GP
1	SSC1	We design our products in such a way that hazardous materials and their production processes are avoided or minimized	0.876	0.785	0.450
2	SSC2	We offer our partners with design standards that include environmental criteria for bought goods.	0.810	0.729	0.421
3	SSC3	We develop goods with a life cycle assessment (LCA) in mind	0.718	0.707	0.559
4	SSC4	We design our products to maximize material and component reuse, recycling, and recovery.	0.797	0.774	0.582
5	SSC5	We develop our goods according to the principles of design for disassembly (DfD).	0.729	0.698	0.387
6	SSC6	We regularly verify that bought items adhere to environmental regulations.	0.798	0.697	0.374
7	SSC7	We constantly give vendors design specifications that include environmental criteria for goods bought.	0.848	0.759	0.490

8	SSC8	We regularly evaluate the environmentally friendly practices of suppliers prior to taking them on.	0.794	0.739	0.368
9	SSC9	We regularly evaluate suppliers' internal management for environmental compliance.	0.712	0.709	0.406
10	SSC10	We often collaborate with suppliers to achieve environmental goals	0.809	0.725	0.533
11	TMC1	Our managers provide the needed financial support for implementing environmental procurement practices	0.542	0.814	0.750
12	TMC2	Our managers provide workshops or forums for staff to improve their environmental behaviour	0.645	0.895	0.726
13	TMC3	Our managers provide the necessary incentives or reward to encourage environmental behaviour	0.610	0.839	0.796
14	TMC4	Sufficient training is provided to employees to environmental improvement efforts.	0.600	0.779	0.776
15	TMC5	Environmental protection objectives is inculcated into firm's vision statement	0.503	0.677	0.662
16	TMC6	The company empowers employees to be involved in the improvement of the environment	0.509	0.720	0.701

17	GP1	Over the last three years, our profitability has increased	0.792	0.499	0.886
18	GP2	In the last three years, our earnings per share have increased	0.765	0.512	0.774
19	GP3	Over the last three years, our sales growth rate has increased	0.739	0.427	0.747
20	GP4	Return on sales (ROS) growth has increased during the last three years.	0.686	0.484	0.812
21	GP5	Over the last three years, our market share has increased.	0.770	0.498	0.787
22	GP6	Return on investment (ROI) growth has increased during the last three years	0.719	0.464	0.819

Source: Field data, 2022

For Sustainable Supply Chain Practices, the items coded SSC1, SSC2, SSC3, SSC5, SSC6, SSC8 and SSC9 had scores of 0.876, 0.810, 0.718, 0.797, 0.729, 0.798, 0.848, 0.794, 0.712 and 0.809 respectively. This indicates that, SSC1 to SSC9 loaded highest correlation with itself than the correlation with other constructs, hence valid for the analysis.

For top management commitment, the items were coded TMC1, TMC2, TMC3, TMC4, TMC5 and TMC6 had scores of 0.814, 0.895, 0.839, 0.779, 0.677 and 0.720 respectively. It could be seen that, all the items loaded highest correlation with itself than the correlation with other constructs, hence, valid for the analysis.

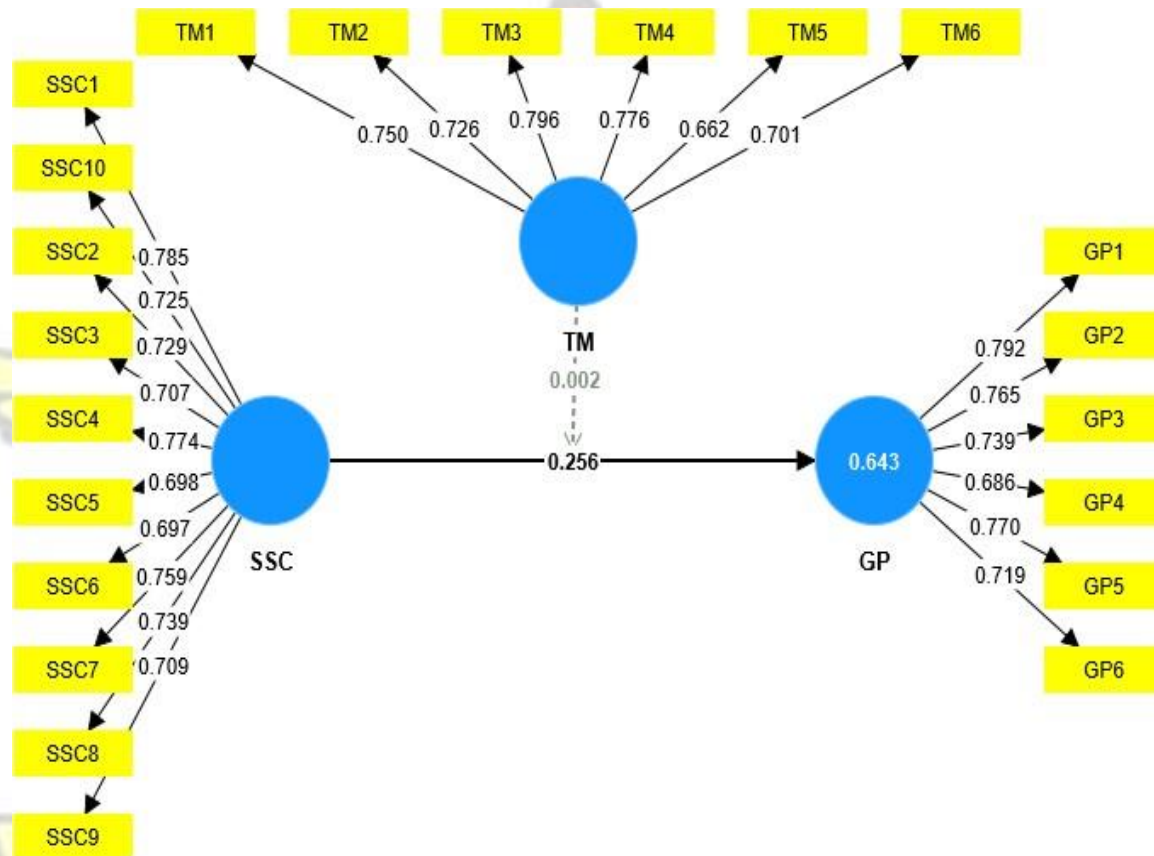
Also, the green procurement was coded GP1, GP2, GP3, GP4, GP5 and GP6 with highest scores 0.886, 0.774, 0.747, 0.812, 0.787 and 0.819 respectively. This again indicates that, the variables loaded highest correlations, hence, valid for the analysis.

4.3.1 Confirmatory Factor Analysis

Confirmatory factor analysis (CFA) is a method used to confirm the structure of various observed variables in relation to their latent constructs. This method enables researchers to examine whether there's a hypothesized connection between the observed data and their

underlying constructs. As depicted in Figure 4.1, every item intended to gauge sustainable supply chain, top management commitment, and green performance exhibited loadings greater than 0.5. This implies that these items accurately reflect their respective latent constructs, validating the data collected.

Figure 4.1: Confirmatory Factor Analysis



4.4 Descriptive Statistics

Descriptive statistics are used to report the scores of individual variables that measure the main constructs of the study. Responses were gathered using a Likert scale spanning from 1 to 7 to determine the level of agreement. This scale is then used to evaluate the prevalence of variable indicators within the manufacturing sector.

4.4.1 Top Management Commitment

Top management commitment is the sincere dedication by firms' management to the operations and procedures of firms (Lam and Van de Voorde, 2019). Top management support for sustainable supply chain management implies that, a company will make the necessary steps to create and implement the operational and administrative frameworks needed for sustainable supply chain (Burki et al., 2016). Here, six (6) measurement items were adopted from Jayashree et al. (2016) to operationalize top management commitment (TMC). The statistical results of "TMC" are presented in Table 4.6 below.

Table 4.5: Descriptive Statistics Results for Top Management Commitment

Items	Min	Max	Mean	S.D
(1) Our managers provide the needed financial support for implementing environmental procurement practices	3	7	5.755	0.946
(2) Our managers provide workshops or forums for staff to improve their environmental behaviour	2	7	5.609	1.054
(3) Our managers provide the necessary incentives or reward to encourage environmental behaviour	3	7	5.636	1.150
(4) Sufficient training is provided to employees to environmental improvement efforts.	2	7	5.664	0.897
(5) Environmental protection objectives is inculcated into firm's vision statement	3	7	5.700	1.014
(6) The company empowers employees to be involved in the improvement of the environment	3	7	5.736	0.960
Composite Score	2.67	7	5.683	1.004

Source: Field data, 2022

Table 4.6 presents the descriptive statistics for top management commitment. The average score for top management commitment, as indicated by the composite mean, is 5.683, with

a standard deviation of 1.004. This suggests that on the 7-point Likert scale, the majority of top managers who participated in the study exhibit strong support or commitment to the adoption of sustainable supply chain practices.

4.4.2 Sustainable Supply Chain Practices

Sustainable supply chain practices in this study are characterized as per El-Kassar and Singh (2019) as the interchange of goods, data, and finances between businesses. This also encompasses their collaborations throughout the supply chain while factoring in economic, ecological, and social objectives that align with stakeholder and client expectations. The study utilized ten (10) metrics derived from Choi and Hwang (2019) to delineate sustainable supply chain practices. The associated statistics for these practices can be seen in Table 4.7.

Table 4.7: Descriptive Statistics Results for Sustainable Supply Chain Practices

Items	Min	Max	Mean	S.D
(1) We design our products in such a way that hazardous materials and their production processes are avoided or minimized	3	7	5.645	1.058
(2) We offer our partners with design standards that include environmental criteria for bought goods.	1	7	5.445	1.359
(3) We develop goods with a life cycle assessment (LCA) in mind	2	7	5.609	1.207
(4) We design our products to maximize material and component reuse, recycling, and recovery.	2	7	5.601	1.230
(5) We develop our goods according to the principles of design for disassembly (DfD).	1	7	5.536	1.255
(6) We regularly verify that bought items adhere to environmental regulations.	2	7	5.655	1.156
(7) We constantly give vendors design specifications that include environmental criteria for goods bought.	2	7	5.673	1.063
(8) We regularly evaluate the environmentally friendly practices of suppliers prior to taking them on.	1	7	5.600	1.114

(9) We regularly evaluate suppliers' internal management for environmental compliance.	1	7	5.655	1.107
(10) We often collaborate with suppliers to achieve environmental goals.	3	7	5.564	1.124
Composite Score	1.8	7	5.598	1.167

Source: Field data, 2022

Table 4.6 shows the descriptive statistics for sustainable supply chain practices. Based on the data, manufacturing companies in the Greater Accra region appear to highly implement sustainable supply chain practices. This is supported by a composite mean of 5.598 and a standard deviation of 1.167 on a scale of 7.

4.4.3 Green Performance

Follows and Tan (2021) argue that individuals display green or eco-conscious behavior when they engage in environmentally-friendly actions or choose only eco-friendly products. Additionally, according to Nuryanto et al. (2020), green performance pertains to the efficient use and recycling of resources and the reduction of pollution, waste, and emissions. Mushtaq et al. (2019) have identified six (6) specific metrics to evaluate green performance. These statistical insights can be found in Table 4.8.

Table 4.8: Descriptive Statistics Results for Green Performance

Items	Min	Max	Mean	S.D
(1) Over the last three years, our profitability has increased.	3	7	5.873	0.885
(2) In the last three years, our earnings per share have increased	3	7	5.827	0.999
(3) Return on investment (ROI) growth has increased during the last three years.	3	7	5.645	0.978
(4) Over the last three years, our sales growth rate has increased	1	7	5.736	1.109
(5) Return on sales (ROS) growth has increased during the last three years.	3	7	5.691	0.97

(6) Over the last three years, our market share has increased.	3	7	5.791	1.019
Composite Score	2.67	7	5.761	0.993

Source: Field data, 2022

Table 4.8 presents the descriptive statistics for green performance. The data indicates that the typical participating firm demonstrates a commendable level of green performance, as evidenced by a composite mean of 5.761 and a standard deviation of 0.993 on a 7-point Likert scale.

4.5 Structural Equation Modeling

To assess the path coefficients and the moderating relationships among the variables, the PLS Structural Equation model was utilized. A bootstrap sample of 5000 was employed to determine the path coefficients for the study's framework.

Table 4.9: Structural Equation Modelling (SEM) Results

Path	Coefficient	Mean	Std Dev	t-value	p-value
SSC→GP	0.255	0.285	0.079	3.217	0.001
TMC→GP	0.616	0.598	0.091	6.745	0.000
SSC × TMC→GP	0.002	0.008	0.067	0.037	0.971

Source: Field data, 2022

Table 4.9 outlines the results from the structural equation model examining both direct and moderating relationships among the variables.

From the data, there's a notable positive correlation between sustainable supply chain and green performance, with a path coefficient outcome of $\beta = 0.255$, $t = 3.217$, $p < .01$. This suggests that a one-unit increase in sustainable supply chain leads to an augmentation of 0.225 units in green performance. The t-value of 3.217 further validates this relationship,

and a p-value less than 0.01 reinforces H1, positing that a sustainable supply chain significantly boosts green performance.

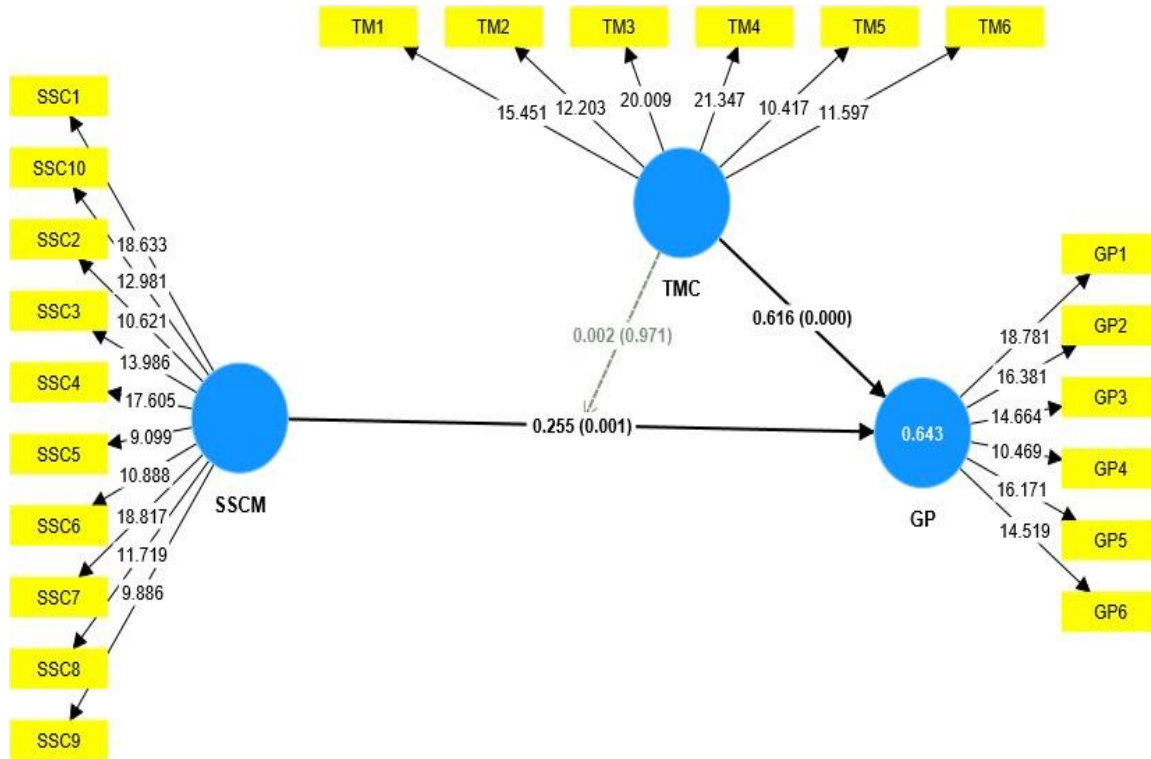
Moreover, Table 4.9 reveals a significant and positive association between top management commitment and green performance. Specifically, with a path coefficient of $\beta = 0.616$, $t = 6.745$, $p < .01$, a one-unit rise in top management commitment results in a 0.616-unit surge in green performance. These findings bolster H2, suggesting a notable and positive influence of top management commitment on green performance.

Lastly, the investigation delved into the potential moderating impact of top management commitment on the tie between sustainable supply chain and green performance. The SEM results showcase a slight positive moderating effect from top management commitment.

The path coefficient is $\beta = 0.002$ with a t-value of 0.037, suggesting a minor increase in green performance for every unit of interaction between sustainable supply chain and top management commitment. However, given the t-value is below the 1.96 threshold and the p-value exceeds 0.5, there isn't significant support for H3. Thus, H3, which proposed that top management commitment would moderate the relationship between sustainable supply chain and green performance, is not confirmed.

Figure 4.2: Structural Equation Model





4.6 Hypotheses Confirmation

Based on the previously examined literature, this study formulated three hypotheses. The collected data was analyzed to validate or reject each hypothesis. Out of all the hypotheses, all were substantiated except for the moderating influence of top management commitment. A concise summary of the results for each hypothesis is showcased in Table 4.10.

Table 4.10: Hypotheses' Confirmation

Hypothesis	Path	t-value	Coefficient (p-value)	Decision
H1	SSC➔GP	3.217	0.255(p<0.01)	Supported
H2	TMC➔GP	6.745	0.616 (p<0.001)	Supported

H3	SSC×TMC→GP	0.037	0.002 (p >0.01)	Not Supported
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Source: Field data, 2022 **Note:** SSC=Sustainable Supply Chain; TMC=Top Management Commitment; GP=Green Performance

4.7 Discussion of Results

This section delves into the results in light of the previously reviewed literature and the theories employed for this research. A comprehensive discussion of the discoveries, in line with the study's objectives, is provided below.

4.7.1 The Relationship between Sustainable Supply Chain and Green Performance

Previous study has demonstrated that, the concept of green performance can alter existing organizational paradigms and that, individuals in organizations play a significant role in the transition process (Rao and Holt, 2018; Mainieri et al., 2018;). Firms are more likely to accomplish the green performance objective, according to Fergusson and Langford (2016), if their managers place a high value on and demonstrate concern for environmental protection and improve their level of sustainable procurement practices. Sustainable packaging effectively contains and protects products during movement across the supply chain.

Reverse logistics is another sustainable supply chain approach. According to De Brito (2016), reverse logistics ensures that, the value added to products is used and reused (effectively and efficiently). Since purchasing is at the start of the value chain, a company's environmental initiatives will not be successful unless its environmental objectives are integrated with purchasing activities. Prior studies suggest that, sustainable purchasing can support a company's overall environmental initiatives and green performance objectives (Carter et al., 2020; Tornjanski and Cudanov, 2017). Given the path coefficient results: $\beta = 0.255$, $t = 3.217$, $p < .01$, the study's results could be said to be consistent with the existing and prior literature.

4.7.2 Top Management Commitment and Green Performance

To achieve green performance, management of firms need to be committed to sustainable procurement practices (Nanath and Pillai, 2017). Top management commitment is the sincere dedication by firms' management to the operations and procedures of firms (Lam and Van de Voorde, 2019). Prior studies have emphasized the need for managerial support to sustainable supply chain management practices (Sancha and Wong, 2019; Thomsen, 2019; Nanath and Pillai, 2017). The significance of senior management commitment in achieving green procurement has been highlighted extant literature. Due to a lack of senior management commitment and support for sustainable procurement practices and activities, it is difficult for businesses to achieve green performance (Zhu et al., 2018).

According to Yen and Yen (2017), a company's commitment to the environment necessitates that, senior management increase staff members' proficiency in environmentally friendly procurement practices, hence, improved green performance. However, due to a lack of green commitment and support for green competence, businesses are unable to meet the green performance aim in the competitive business environment (Zhu et al., 2018). The result from the current study is consistent with the above extant literature, given the path coefficient results $\beta = 0.616$, $t = 6.745$, $p < .01$.

4.7.3 Moderating Role of Top Management Commitment

Several studies state that, management commitment and support towards green competence and a sustainability plan are difficult to be implement in a company (Zhu et al., 2018). The ability to reduce carbon footprint and provide value to consumers in an environmentally friendly manner is demonstrated by senior management commitment and support for sustainability in logistics and supply chain. Growing environmental awareness and consumer demand for green products have heightened the need for top management involvement and support in the implementation of green technology and practices (Sancha et al., 2016). To accept and manage sustainability issues and achieve green performance, a company's top management commitment is crucial (Guoyou et al., 2016).

Similarly, other studies show that, top management involvement is crucial for achieving and adapting green process innovation (Guoyou et al., 2016). A recent study found that, the

higher the level of senior management support and commitment for sustainable supply chain management, the higher it moderates its relationship with green performance for firms. Prior studies found that, top management. According to prior studies, top management commitment is a perfect moderator for implementing sustainable supply on green performance. These results, however, do not support the current findings, therefore rejecting H3 is ideal, given the path coefficient results $\beta = 0.002$, $t = 0.037$, $p > .001$. It could be seen that, the p-value stood at 0.971, thereby higher than the acceptable threshold of $p < 0.01$.



CHAPTER FIVE SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS 5.1

Overview

This chapter provides a recap of the discoveries, the final conclusions, and proposed recommendations.

5.2 Summary of Findings

The primary purpose of this research was to explore the connection between sustainable supply chain management and green performance, with a focus on the influencing role of top management commitment. In line with the study's aim, the subsequent findings are highlighted.

5.2.1 Sustainable Supply Chain Practices and Green Performance

The initial aim of the research was to investigate the connection between sustainable supply chain methods and green performance. The study revealed that manufacturing firms in Ghana extensively adopt and utilize sustainable supply chain management practices, as evidenced by the descriptive statistics. Furthermore, the inferential statistics highlighted that a notable positive relationship exists between sustainable supply chain and green performance. This outcome strongly affirms the hypothesis H1.

5.2.2 Top Management Commitment and Green Performance

Specifically, the second objective of the study sought to examine the relationship between top management commitment and green performance. Descriptively, the statistical results found that, top management are committed to the adoption and implementation of sustainable supply chain management practices. Again, the study found that, top management commitment has a positive and significant relationship with green performance among manufacturing firms in Ghana-Accra. This indicates that, for every unit of top management commitment, an increase of green performance is achieved. These results therefore lend significant support for H2.

5.2.3 Moderation Effect of Top Management Commitment

Lastly, the study sought to examine the moderation effect of top management commitment in the relationship between sustainable supply chain practices and green performance. Descriptively, the statistical results found that, top management are committed to the adoption and implementation of sustainable supply chain management. Again, the SEM output shows a positive moderation effect of top management commitment and the relationship between sustainable supply chain and green performance. This indicates that, for every unit of interaction between sustainable supply chain and top management commitment, there is an increase in green performance. However, the study showed an insignificant moderation effect of top management commitment on sustainable supply chain management and green performance, hence, H3 is rejected.

5.3 Conclusion

Based on the findings of the study, the following conclusion is arrived at.

First and foremost, the study concludes that, manufacturing firms in Ghana implement sustainable supply chain practices at a higher extent for their procurement activities. It could again conclude that, sustainable supply chain positively and significantly relates with green performance. Also, the study concludes that, top managers are committed towards the implementation of sustainable supply chain and that, top management commitment and green performance are positively and significantly related. It is again concluded that, manufacturing firms in Ghana achieve a higher level of green performance. More so, the study concludes that, top management commitment positively and significantly moderates the relationship between sustainable supply chain and green performance. Lastly, it could be said that, all the variables in the study are positively and significantly related.

5.4 Recommendations

Based on the findings and conclusion of the study, the following recommendations are proposed.

5.4.1 Recommendations for Management

Firstly, the study clearly illustrated a positive relationship between sustainable supply chain practices and green performance. This is not just a metric of environmental consciousness but also offers tangible benefits to businesses. Manufacturing firms in Ghana should intensify their focus on sustainable methodologies, integrating them deeply into their daily operations. This approach can boost corporate social responsibility, improve the company's public image, and provide potential long-term cost savings due to resource efficiency.

Secondly, the role of top management is not limited to passive endorsements. The involvement of top managers can accelerate the positive impacts of sustainable initiatives. Management should prioritize sustainability, dedicate resources towards it, create and support training programs, and weave sustainability into the very culture of the company, making it a core company value.

Thirdly, constant evolution is crucial to ensure that sustainable practices remain effective and relevant. Management should therefore set up regular review cycles for evaluating the efficacy of the sustainable supply chain practices. Develop mechanisms to gauge performance, potential areas of improvement, and to measure the influence on green metrics.

In addition, green performance, in today's world, is not just about environmental responsibility but also serves as a competitive edge. Management of firms should strategize to make green performance a cornerstone of marketing initiatives, partner collaborations, and stakeholder communications, turning it into a distinct competitive advantage.

5.4.2 Recommendations for Future Studies

To begin, while this study shed light on the role of top management, there's a need to delve deeper. Future research can segment various facets of top management commitment like resource dedication, vision crafting, or hands-on involvement, analyzing which aspects yield the most significant impacts.

Also, every region has its unique cultural, economic, and regulatory nuances influencing sustainable practices. Researchers could juxtapose Ghana's situation with other countries or regions, extracting insights on how various factors shape sustainable supply chain practices and their resultant green performance.

Again, this study honed in on top management commitment. However, numerous other factors can play a role. Future studies should consider investigations that integrate variables like technology adoption rates, the level of employee enthusiasm towards sustainability, or even how market demand for green products impacts sustainable supply chain initiatives. Further, positive outcomes are just one side of the story. It's equally vital to understand the obstacles faced. Future research endeavors should shed light on the challenges manufacturing firms in Ghana encounter when integrating sustainable supply chain practices. This perspective can help craft holistic strategies ensuring smoother implementation.

Conclusively, as the global landscape increasingly shifts towards sustainability, there's a pressing need for both businesses and academic researchers to continuously refine their understanding, strategies, and practices. The goal is to ensure that sustainability isn't just a buzzword but translates into tangible, positive outcomes for the environment, society, and businesses.

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APPENDIX A SURVEY QUESTIONNAIRE

I am currently enrolled as a postgraduate student at the Kwame Nkrumah University of Science and Technology's Department of Supply Chain and Information Systems in Kumasi. This survey instrument was created to assist me in conducting research on the following subject: **'Sustainable Supply Chain Management Practices and Green Performance: The Moderating Role of Top Management Commitment'**. Any information submitted will be used solely for academic purposes and will be held in the strictest confidence.

SECTION A: RESPONDENT'S PROFILE

For the following questions, kindly select by checking (✓) all that apply.

1. Gender ☐ Male ☐ Female
2. Age (years) ☐ 29 and below ☐ 30 to 39 ☐ 40 to 49 ☐ 50 or more
3. Level of Education ☐ Secondary school or related Certificate ☐ diploma/HND ☐ 1st Degree ☐ 2nd Degree or more
4. Working of experience ☐ 0-5years ☐ 6-10years ☐ 11-15years ☐ above 15years
5. Managerial level ☐ Supervisor ☐ line manager ☐ Top level
6. Position within the organisation ☐ Supply chain manager ☐ logistics managers ☐ operations manager ☐

SECTION B: SUSTAINABLE SUPPLY CHAIN MANAGEMENT PRACTICE

Please evaluate your firm's sustainable supply chain management practices on the following criteria on a scale of 1 to 7 (strongly disagree to strongly agree)

Strongly agree	Disagree	Somehow disagree	Indifferent/Not sure	Somehow agree	Agree	Strongly agree	
1	2	3	4	5	6	7	
Eco-design							
(1) We design our products in such a way that hazardous materials and their production processes are avoided or minimized	1	2	3	4	5	6	7
(2) We offer our partners with design standards that include environmental criteria for bought goods.	1	2	3	4	5	6	7
(3) We develop goods with a life cycle assessment (LCA) in mind	1	2	3	4	5	6	7
(4) We design our products to maximize material and component reuse, recycling, and recovery.	1	2	3	4	5	6	7
(5) We develop our goods according to the principles of design for disassembly (DfD).	1	2	3	4	5	6	7
Green procurement							
(6) We regularly verify that bought items adhere to environmental regulations.	1	2	3	4	5	6	7
(7) We constantly give vendors design specifications that include environmental criteria for goods bought.	1	2	3	4	5	6	7
(8) We regularly evaluate the environmentally friendly practices of suppliers prior to taking them on.	1	2	3	4	5	6	7
(9) We regularly evaluate suppliers' internal management for environmental compliance.	1	2	3	4	5	6	7
(10) We often collaborate with suppliers to achieve environmental goals.	1	2	3	4	5	6	7

SECTION C: TOP MANAGEMENT COMMITMENT

On a scale of 1 to 7, where 1=to a very small extent, 7=to a very great extent; Please, rate your present level of top management commitment and support to following statement

Strongly agree	Disagree	Somehow disagree	Indifferent/Not sure	Somehow agree	Agree	Strongly agree	
1	2	3	4	5	6	7	
(1) Our managers provide the needed financial support for implementing environmental procurement practices	1	2	3	4	5	6	7
(2) Our managers provide workshops or forums for staff to improve their environmental behaviour	1	2	3	4	5	6	7
(3) Our managers provide the necessary incentives or reward to encourage environmental behaviour	1	2	3	4	5	6	7
(4) Sufficient training is provided to employees to environmental improvement efforts.	1	2	3	4	5	6	7
(5) Environmental protection objectives is inculcated into firm's vision statement	1	2	3	4	5	6	7
(6) The company empowers employees to be involved in the improvement of the environment							

Source: Ha et al. (2019)

SECTION D: GREEN PERFORMANCE

Please evaluate your firm's green performance for the past three years of sustainable supply chain practices on the following criteria on a scale of 1 to 7 (strongly disagree to strongly agree):

Strongly agree	Disagree	Somehow disagree	Indifferent/Not sure	Somehow agree	Agree	Strongly agree	
1	2	3	4	5	6	7	
(1) Over the last three years, our profitability has increased.	1	2	3	4	5	6	7
(2) In the last three years, our earnings per share have increased	1	2	3	4	5	6	7
(3) Return on investment (ROI) growth has increased during the last three years.	1	2	3	4	5	6	7
(4) Over the last three years, our sales growth rate has increased	1	2	3	4	5	6	7
(5) Return on sales (ROS) growth has increased during the last three years.	1	2	3	4	5	6	7

(6) Over the last three years, our market share has increased.	1	2	3	4	5	6	7
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Thank You

