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IMPACT OF SUSTAINABLE SUPPLY CHAIN MANAGEMENT PRACTICES ON ENVIRONMENT PERFORMANCE: THE MODERATING ROLE OF DYNAMIC CAPABILITY

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DECLARATION

I hereby declare that this thesis is the result of my original work towards the MSc. in Logistics and Supply Chain Management, and that to the best of my knowledge, it neither contains material published by another person nor materials which have been accepted for the award of any other degree of the University, except where due acknowledgments have been made in the text.

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DEDICATION

I dedicate this Thesis to the Glory of God who enabled me to complete it through his unmerited favours and grace. I also dedicate it to my wonderful parents, husband and children for their constant encouragement and support throughout the preparation of this Thesis. May the good lord continue to bless them and keep them safe in his care.

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ABSTRACT

The Agenda 2030 influx and the Paris Accord on Climate Change have led to upscale of research into Sustainable Development with emphasis on Sustainable Supply Chain Management (SSCM). The main objective of the study is to examine the impact of sustainable supply chain management practices on environment performance and the moderating role of dynamic capability with a focus on manufacturing companies in the Accra metropolis of Ghana. The study adopted both a descriptive and explanatory research designs. The study adopted structured questionnaire. SPSS version 26 was used to perform the statistical analyses. Specifically, correlation, regression, mean and standard deviations analyses were performed. The results indicated that, sustainable supply chain management practices had significant effect on environmental performance. The results also indicated that, dynamic capability had significant effect on environmental performance. Moreover, the results indicated that, dynamic capability significantly moderate the relationship between sustainable supply chain management practices and environmental performance. The study conclude that sustainable supply chain management practices and dynamic capability significantly predict environmental performance. The study recommends that, for effective sustainable supply chain management practices, management should encourage effective internal environmental management practices such as cross-functional collaboration for environmental improvement. Also, there should be regular inspections and maintenance of environmental protection facilities and equipment. The management should also encourage eco-designing; thus, they should use life cycle analysis to evaluate the environmental friendliness of products. There should as well be establishment of recycling system for waste products. Moreover, the managers should promote green purchasing, thus, they should select their suppliers using the environmental criteria.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURE

LIST OF ABBREVIATIONS

CGCA	Controller General of Communication Accounts
CSR	Corporate Social Responsibility
DC	Dynamic Capability
ERP	Enterprise Resource Planning
GSCM	Green Supply Chain Management
IE	Internal Environment
IEM	Internal Environmental Management
IES	Internal Environmental System
ISO	International Organization for Standardization
LSR	Logistics Social Responsibility
MO	Market Orientation
PLS	Partial Least Square
RBV	Resource Based View
RBVT	Resource Based View Theory
RIP	Radical Innovation Performance
ROI	Return on Investment
SandP/EGX and ESG	Egyptian Corporate Responsibility Index
SC	Supply Chain
SCM	Supply Chain Management
SDGs	Sustainable Development Goals
SME	Small and Medium Enterprise
SPSS	Statistical Package for Social Science
SSCM	Sustainable Supply Chain Management
SSCP	Sustainable Supply Chain Practices

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The influx of Agenda 2030 and the Paris Accord on Climate Change has sparked increased research in the realm of Sustainable Development, particularly focusing on Sustainable Supply Chain Management (SSCM). Sustainability entails the process of maintaining well-being over an extended, potentially indefinite timeframe. While it primarily addresses the environmental aspect of the triple bottom line, it's crucial to distinguish between the concepts of environment and sustainability (Wang and Dai, 2017; Mann and Kaur, 2019). Brundtland and her colleagues (Brundtland, 1987 as cited in Kuhlman and Farrington, 2010) grappled with a fundamental question: How can the global pursuit of enhanced well-being be harmonized with the finite availability of ecological resources and the looming threats of environmental deterioration? They conveyed their viewpoint through the concept of sustainable development, which is characterized as a type of progress that fulfills the requirements of the present generation while ensuring the ability of posterity to satisfy their own needs. Thus, while environmental concerns hold significance, the underlying argument centers on human welfare, within the context of inter-generational fairness. Sustainability has become increasingly integrated into modern supply chain management practices. Sustainable supply chain management expands the traditional supply chain framework to include environmental and social considerations, striving to encompass all facets of sustainability when structuring and refining supply chains (Bai and Sarkis, 2010; Gold et al., 2010). While the incorporation of sustainability principles into supply chains is a relatively recent development, it has been advancing for more than a decade and is gaining worldwide recognition (Gopalakrishnan et al., 2012). Sustainable supply chain management is rooted in the cultivation of

various capabilities, including waste reduction, eco-friendly product design, collaborative technology initiatives in emerging economies, responding to escalating energy costs, managing finite resources, addressing climate change, reducing emissions across various forms (liquid, solid, and gaseous), and enhancing overall quality of life (Chaabane et al., 2011).

A dynamic capability denotes to a firm's capacity to drive internal change and adapt to shifts in the business environment. This adaptability is achieved by reshaping and transforming the organization's pool of resources, which can involve creating, expanding, or modifying these resources (Eisenhardt and Martin, 2000; Penrose, 1959; Zahra, Sapienza and Davidsson, 2006). However, companies may exhibit varying degrees of dynamic capabilities, which serve as the foundation for reconfiguring their operational functions such as marketing, sales, customer engagement, and service capabilities. Through the reconfiguration of these operational capabilities, dynamic capabilities play a pivotal role in establishing sustainable competitive advantages and can indirectly generate rent in the process. Supply chain cooperation or collaboration coordinates buyer-supplier operations to ensure that each aspect enhances supply chain efficiencies such as price reduction, an increase of delivery quality, greater use of funds or supply and effective response to enterprise modifications (Tsou, 2013).

This illustrates that every phase within the supply chain, spanning from procuring raw materials and product manufacturing to the disposal of used products, has ecological repercussions (Azapagic, 2004). Consequently, organizations ought to be assessed not solely based on their supply chain's influence on conventional financial metrics but also on how their supply chain affects sustainability and socio-ethical aspects. Furthermore, the practice of sustainable supply chain management involves the integration of sustainability concepts into the market. However,

current approaches exhibit certain limitations in their capacity to provide a comprehensive solution (Mahler, 2007; Pagell and Wu, 2009; Gopalakrishnan et al., 2012).

Several studies (Gattiker et al., 2014; Wang and Dai, 2017; Sintaasih et al., 2019; Mann and Kaur, 2019) have expressively indicated that sustainable supply chain management comprises of social, environmental and economic factors which collaboratively relate to performance which is also consistent with Pagell and Shevchenko (2014) who indicated that that SSCM involves the arrangement, coordination and control of economic, social and environmental matters linking to purchasing and consumption of product and services.

Wang and Dai (2017) delved into the impact of sustainable supply chain management on company performance within China. Their results revealed that sustainable supply chain management practices exert a positive influence on a company's performance. Moreover, Wang and Dai (2017) emphasized that the dimensions of supply chain management practices encompassing environmental, social, and economic aspects significantly contribute to overall performance. Similarly, Baah and Jin (2019) conducted an assessment of sustainable supply chain management within organizations operating in the logistics sector. Their research unveiled a noteworthy connection between sustainable supply chain management, competitive advantage, and organizational performance. Furthermore, the study underscored that distinctive edge plays a substantial role in influencing an organization's performance. Essentially, the advantage gained from competitiveness has a substantial impact on the integration of sustainable supply chain management and, consequently, on an organization's overall performance.

Handy et al. (2018) explored the relationship between sustainable supply chain management and company performance, discovering that sustainable supply chain management indeed influences company performance. Besides, Tchaikovsky (2017) examined the relation between supply chain management sustainability and pressures from stakeholders on performance of the business sustainability. The study found significant relation between sustainable supply chain management and performance on business sustainability, and between pressure on the stakeholder and performance of the corporate sustainability. The relation between sustainable supply chain management and the performance of the corporate sustainability with pressure on the stakeholders as a mediator demonstrated the insignificant on the relation effect.

1.2 Problem Statement

This study offers unique contribution to empirical knowledge with respect to sustainable supply chain and environmental performance. Although several studies (Gattiker et al., 2014; Wang and Dai, 2017; Sintaasih et al., 2019; Mann and Kaur, 2019) have been conducted on the relationship between sustainable supply chain and performance, the moderating effect of dynamic capability on this this relationship is not known.

The significance of sustainable supply chain management practices cannot be overstated. This stands as the primary empirical gap that this study aims to address. Furthermore, Sustainable Supply Chain Management (SSCM) involves the amalgamation and alignment of economic, environmental, and social practices across the supply chain process, with the aim of improving a company's economic, environmental, and social performance throughout the entirety of the supply chain journey (Ho and Choi, 2012). Given that the supply chain encompasses all the distinct phases

in which resources are employed to meet customer demand, continuous monitoring of the supply chain network becomes imperative. As indicated in previous research (Ortas et al., 2014; Baah and Jin, 2019; Mann and Kaur, 2019), there is a compelling need to reassess the connections between sustainable supply chain management and operational performance. This is because existing empirical examinations on this subject have yielded mixed and inconclusive findings.

Moreover, the moderating role of management commitment on the relationship between sustainable supply chain management and operational performance. Most of the previous studies (Mann and Kaur, 2019; Wang and Dai, 2017) either focused on sustainable supply chain and operational performance or organizational commitment and operational performance (Sintaasih et al., 2019). Again, earlier research (Gattiker et al., 2014) focused on service and mining sectors leaving a significant gap in the manufacturing sector. Considering the ongoing argument the current study will examine the impact of sustainable supply chain management practices on environment performance and the moderating role of dynamic capability with a focus on manufacturing companies in the Accra metropolis of Ghana.

1.3 Objectives of the Study

The primary objective of the study is to examine the impact of sustainable supply chain management practices on environment performance and the moderating role of dynamic capability with a focus on manufacturing companies in the Accra metropolis of Ghana. In this light the following specific objectives will guide the study:

1. To assess SSCM practices in manufacturing outfits
2. To examine environmental performance in manufacturing outfits

3. To examine the effect of SSCM practices on environmental performance in manufacturing outfits
4. To examine the moderating effect of dynamic capability on the relationship between SSCM practices and environmental performance in manufacturing outfits

1.4 Research Questions

1. What are the SSCM practices in manufacturing outfits?
2. What is the environmental performance in manufacturing outfits?
3. What is the effect of SSCM practices on environmental performance in manufacturing outfits?
4. What is the moderating effect of dynamic capability on the relationship between SSCM practices and environmental performance?

1.5 Significant of the Study

This study offers significant contributions to the manufacturing sector where the current study is conducted. Specifically, it would help the sector and other players to achieve cost savings by applying the findings of this research through the integration of sustainable supply chain management. Besides, the study would help related industries to implement effective supply chain management practices which would help increase their competitiveness in the business environment. Again, policy makers, regulators and practitioners in the manufacturing sector would use the recommendations and findings of the study as a guide in conducting sustainable supply chain activities in the industry. Last but not the least, the present study will add to exiting stock of knowledge and also serve as a guide to future researchers.

1.6 Research Methodology

This study utilized both descriptive and explanatory research designs to examine the impact of sustainable supply chain management practices on environment performance and the moderating role of dynamic capability with a focus on manufacturing firms in the Accra metropolis of Ghana. The target population for the research shall comprise of the business owners and supply chain managers of the manufacturing companies. Primary data were the main source of data for the study. Structured questionnaire would be used to elicit for primary data. Around 150 respondents would be used for the study and each respondent would be selected randomly. All the constructs in the study would be measured on 5-point Likert scale. SPSS version 23 would be used to perform the statistical analyses. Specifically, correlation regression, mean and standard deviations analyze would be performed.

1.7 Scope of the study

The main scope of the study is to examine the impact of sustainable supply chain management practices on organization performance evidence from developing economy with a focus on production companies in the Accra metropolis of Ghana. In terms of its conceptual framework, this study will center on examining the impact of each dimension (social, economic, and environmental) of sustainable supply chain management practices on operational performance within the Accra metropolis of Ghana. In terms of time, the current study is limited to the practices within the last five years.

1.8 Limitations of the Study

The research anticipates limitations in terms of data collection, research design, and sample size. Due to fear of victimization some respondents may refuse to participant in the study. As a result, fewer than estimated number of respondents may participate in the study. These will affect the quality of information and limit the generality of the key findings. Considering the size of the Ghanaian manufacturing industry, only 150 respondents would be targeted. Moreover, the study will use quantitative research approach although mixed method research would have been more insightful but time and financial resources would not permit such as study.

1.9 Organization of the Study

The study was organized into five chapters. Chapter one provided an introduction to the research's background and objectives. Chapter two encompassed the literature review. Chapter three detailed the methodology employed for conducting the study, including data collection, analysis procedures, and report presentation. Chapter four was dedicated to data analysis and interpretation, while Chapter five encapsulated the findings, drew conclusions, and provided recommendations based on the study's outcomes.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter offers a comprehensive review of related works on sustainable supply chain management, dynamic capability and environmental performance. It is structured into several sections, including conceptual review, theoretical review, empirical review, the development of a conceptual framework, and the formulation of hypotheses.

2.1 Conceptual Review

2.1.1 Sustainable Supply Chain Management

Sustainable supply chain management (SSCM) as emphasized by Ahi and Searcy (2013), involves the deliberate incorporation of economic, environmental, and social considerations into a company's internal systems. It also entails the development of collaborative supply chains. In practical terms, SSCM encompasses the effective and efficient management of material, finances, data and resources related to the purchasing and transportation of products and services. This is done to satisfy the needs of stakeholders while simultaneously enhancing the profitability and competitiveness of enterprises (Tundys, 2020). Carter and Rogers (2008), described sustainable supply chain management as the deliberate coordination of a firm’s core business processes. This coordination aims to enhance extended economic outcomes of companies and the supply chains to which they belong. Simultaneously, it endeavors to integrate and attain the organization's clear and well-planned social, environmental, and economic goals. Giunipero et al. (2012 define sustainable supply chain management as the degree to which environmental, social, and economic values are taken into account during the selection, evaluation, and management of supply chains.

Suomela (2017) defines SSCM as the management of resources, data and financial transactions that takes into account not only the collaboration between supply chain companies, but also the objectives set by customers and stakeholders in the three aspects of sustainability: economic, environmental and social. Sustainable supply chains involve the development and maintenance of well-managed, resource-intensive production and logistics systems, as well as internal and national controls over sourcing, processing and distribution processes (Kim and Rhee, 2012). According to Koberg and Longon (2019), SSCM involves overseeing financial, data, and resource flows while aligning the actions of supply chain participants with sustainability objectives driven by client and stakeholder needs. Pagell and Wu (2009), on the other hand, define it simply as management decisions and actions aimed at the smooth functioning of the supply chain from an SCM perspective in order to create a truly sustainable supply chain.

According to Victoria et al. (2015), Supply Chain Management (SCM) covers the whole supply chain lifecycle, spanning from product design and development, material selection (including material extraction and agricultural production), manufacturing, packaging, transportation, storage, distribution, consumption, return, and disposal, including recycling, remanufacturing and waste management, and involves the integration of environmentally and economically sound approaches. Sustainable supply chain management has gained significant attention in research circles (Kumar et al., 2020) as it has been shown to contribute significantly to supply chains that are more environmentally and socially responsible. Supply chain management (SCM) involves the coordination of material and product flow both within a company and with business partners. SCM encompasses the management of data exchange and monetary transactions (Beske and Seuring, 2014). The supply chain represents a series of processes across the product journey, involving

various operational aspects. Its primary aim is to meet the demands of customers with products and services (Ayers and Odegaard, 2017).

SSCM addresses an organization's supply chain and logistics network, taking into account costs, risks and environmental waste. Supply chain sustainability is increasingly seen by managers as a key factor in achieving long-term profitability (Kaufmann and Carter, 2010; Mefford, 2011), replacing economic cost, effort and speed as the main factors. Forward-thinking organizations view sustainability not merely as a means to attain social objectives, but also as a pivotal driver of distinctive edge and a fundamental element for long-term survival (Yang et al., 2010; Ho and Choi, 2012). As a result, sustainable supply chain management entails the seamless assimilation and harmonization of economic, environmental, and social practices throughout the supply chain. Its aim is to enhance a company's economic, environmental, and social performance (Ho and Choi, 2012). The supply chain consists of different stages in which resources are employed to fulfill customer requirements. In essence, adopting sustainability as a corporate culture provides opportunities for cost reduction, innovation in new product development, prevention of long-term issues, and gaining a competitive edge. A sustainable supply chain is an essential component of corporate sustainability (Curkovic and Sroufe, 2011).

Internal Environmental Management: The internal environment refers to the overall vision of an organisation that determines the degree of effectiveness of all the resources it works with, as well as its current strengths and weaknesses or those expected in the near future (Al-Rawashdeh (2019). Hubeis and Najib, (2014) also refer to the organisational environment that exists in traditional organisations and directly and concretely affects the company. In Khattab et al. (2015) Internal

environmental management practices is to be implemented (SCM components) depend on the external environment (representation of the organisation as an open system). In the field of environmental management, it is argued that practices to be implemented (SCM components) depend on both the external environment (representation of the organisation as an open system) and the internal environment (management components). Furthermore, IE management includes green information, green processes and green resources throughout an organisation's supply chain, so that SCM can demonstrate environmental improvement (Braam, de Weerd, Hauck and Huijbregts, 2016).

The establishment of an internal environmental management system (IEM) in an organization is considered a powerful force and impetus for improvement, especially through the introduction of state-of-the-art technologies, measures and programmes (Rose, 2016). Environmental excellence can only be achieved when top management is fully committed, consistently applies the law and ensures that environmental issues are taken into account. Furthermore, (Feng et al., 2018) argue that GSCM practices are positively influenced by management leadership and organisational support; Ma et al. (2020) argue that environmental competencies emerge early in the process and product development, and top management's involvement in the implementation strategy and its key role in ensuring a green life cycle approach plays an important role; Geng et al. (2017) examined the relationship between firm performance and the return on investment of environmental systems; these researchers hypothesised that the precise positioning of an internal environmental system (IES) is directly proportional to a company’s economic and environmental performance in terms of economic and competitive impact. IES needs support and encouragement from top management. Internal management is a key success factor in helping companies adopt

environmentally sustainable practices. Companies are motivated to go green by pressure from employees and encouragement and support from top management. In turn, perceptions of environmental risks can foster positive changes in the implementation of green practices (Luthra et al., 2016).

Green Purchasing: green purchasing is a new approach to green sourcing. Chin et al. (2015) consider green purchasing as a strategic element to reduce waste and apply environmental criteria in the selection of materials. Green purchasing aims to reduce the adverse environmental impacts associated with production processes and transportation through the utilization of sustainable materials that are recyclable and reusable. Green procurement holds significant importance in mitigating the adverse environmental consequences associated with production, utilization, and recycling processes (Dubia et al., 2013). Green purchasing is essentially defined as the practice of acquiring environmentally friendly products while refraining from purchasing items that have detrimental effects on the environment. It is also a green product that meets consumers' needs in an environmentally friendly way and contributes to a sustainable world (Green et al., 2012). Green purchasing is concerned with the environmentally friendly production and reuse of green goods and working with suppliers. In Kattab et al. (2015) Green purchasing is the procurement function that focuses on sourcing materials from suppliers to meet an organisation’s needs to produce a product or service. Purchasing involves specific tasks such as choosing of a supplier, material selection, subcontracting, negotiation, procurement, supply management, inventory and material control and some involvement in planning.

Green purchasing can be can be characterized as a set of activities aimed at ensuring that procured products and materials align with the environmental goals defined by the purchaser. These goals typically involve waste reduction, the encouragement of recycling and reuse, and the adoption of alternative materials (Eltayeb et al., 2010). Globally, green purchasing has garnered substantial attention, leading companies to assess the environmental performance of their partners as a crucial factor in their purchasing decisions (Zhu and Sarkis, 2007). Some authors have gone a step further and examined the environmental performance of secondary suppliers. Green purchasing is related to environmental awareness and influences the decision to purchase materials that can be recycled, reused or have already been recycled (Zhu et al., 2012; Dornfeld et al., 2013). The importance of green procurement marketing for companies and the key elements of green procurement are 1) organisational structure, 2) supplier selection models, 3) key factors and criteria influencing supplier selection and 4) building positive buyer-supplier relationships (Giusti, 2009; Kannan et al., 2014). Ideally, companies should implement more green purchasing practices such as choosing of a supplier, supplier enhancement, cooperation and assessment (Foo et al., 2019). Although external stakeholders (suppliers) are naturally involved in green procurement, in practice communication and collaboration between buyers and suppliers is not always necessary, especially when suppliers and buyers are small businesses (Lam et al., 2015).

Customer Cooperation: In today's world, companies need to move beyond traditional thinking, treat customers as strategic partners and collaborate on environmental issues (Saeed et al., 2018). GSCM practices can help improve an organisation's performance, but to fully reap the benefits of a GSCM programme, it is necessary to engage multiple stakeholders. Building strong working relationships with stakeholders is labour intensive (Albino et al., 2014). Al-Qattab et al. (2015)

defined as supply chain collaboration that leads to coordinating with partnerships in the production and distribution of products and services, and reducing overhead expenditures. According to Munir and Wang (2020) customer cooperation covers everything from ecodesign to distribution and packaging collection to recycling, ideas and suggestions (Sarkis et al., 2011). This requires building long-term relationships with customers and simplifying processes. Working with customers includes developing environmentally friendly production processes, manufacturing sustainable products and environmentally friendly packaging (Zhu et al., 2008a). Customer cooperation is initiated to stimulate contemplation regarding both products and processes by involving customers. This participation serves to yield collaborative insights and recommendations (Sarkis et al., 2011).

Customers are considered the most important foundation for the existence and continuation of a company. Companies must therefore work with customers to create products and services that aligns with their needs and requirements. Also, in order for a company to make a profit through the sale of products, customers and the supply chain need to cooperate in the development and distribution of goods and services in the chain in order to reduce overhead costs and meet customer needs (Al Khattab, 2015). There is no doubt that the concept of customer engagement applies to all efforts to develop and improve environmentally sustainable operations and create environmentally sustainable products (Pishdar et al., 2014). Supplier engagement is critical to the success of a company's environmental initiatives. Supplier reliability is critical to deliver the products and services customers want, consistently and on time, taking into account all aspects of quality, price and environmental impact (Feng et al. 2018; Weerawardena et al. 2019; Kong et al. 2020). Environmental audit is an umbrella term for different types of audits that aim to identify

gaps in environmental compliance and implementation of environmental management systems and take appropriate corrective action. Its role is therefore similar to that of an audit. Usually, there are two main classifications of environmental audits. Compliance audits and management system audits.

Eco-design: Eco-design is a tool employed in both manufacturing and service sectors to enhance product sustainability. It achieves this by incorporating environmental considerations during the design phase, where the products' potential environmental impact is most influential (Sanye-Mengul et al., 2014). Eco-design can be used for many different purposes depending on the stage of a product's life cycle it is intended to improve (Sanye-Mengul et al., 2014; Schafer and Lower, 2021), and can be defined as a practice by product designers to reduce environmental impacts throughout a product's life cycle. It can contribute to climate change mitigation by assisting in curbing greenhouse gas discharges and achieving specific objectives among the 17 Sustainable Development Goals (SDGs) set by the United Nations in 2015. Eco-design refers to design practices that aim to create environmentally efficient products and processes. Eco-design is a constituent of overall safety management practices and is known by various names, including eco-design, green design, life-cycle design, clean design, and sustainable design (Wakulele et al., 2016).

According to Srivastava (2007), the main objective of eco-design is waste reduction; according to Salami (2008), eco-design is a decision-making process. According to him, it can be used to understand how decisions affect the production of environmentally friendly products. Environmental issues are often ignored when designing products and processes. Environmental

considerations are not taken into account when creating new products (Chien, 2014). Most companies today believe that eco-design can reduce the overall cost of the production process (Johansson and Winroth, 2009). Eco-design can significantly reduce environmental impact: Mohanty and Prakash (2013) state that ecodesign aims to create a sustainable society from existing resources. They also describe three main objectives of eco-design: to minimise the use of non-renewable resources, to sustainably manage renewable resources and to reduce pollutant emissions.

Eco-design entails minimizing a product's environmental footprint during its developmental stage, while still upholding essential product attributes like performance and cost-effectiveness throughout its whole lifespan. This spans from the procurement of raw resources to production, usage and eventual disposal (Gottberg et al., 2006; Eltayeb, 2009; Dornfeld et al., 2013). Eco-design is an essential part of an environmentally sustainable supply chain as it determines all aspects of a product, such as raw materials used, energy consumption and the amount of waste generated. It can be said that product design has an environmental impact at all stages of the supply chain, from production to consumption and disposal. It is therefore important to consider environmental issues at an early stage of product development (Eltayeb, 2009). The characteristics of a product and its raw materials determine how much energy is needed to use it, what waste is produced and how it is disposed of. Green design or eco-design refers to the development of sustainable, energy-efficient products that are free of harmful materials and can be easily disassembled and reused (Gottberg et al., 2006). It offers opportunities to reduce waste and increase resource efficiency by changing the size, durability and recyclability of products (Gottberg et al., 2006).

Investment Recovery: investment recovery is a strategic approach that encourages the sale of excess materials, the minimization of energy utilization by machinery and equipment, and the recycling of waste (Khan and Qianli, 2017). Investment recovery is considered to close the systemic loop in the supply chain and is viewed as the ability of factories to generate waste, sell surplus materials and obsolete equipment (Meng et al., 2018). Munir and Wang (2020) define investment recovery as a measure of green practices that includes all the benefits of investments that were previously considered waste. ROI gives companies the opportunity to extract more value from their resource investments by selling surplus and recycled materials. Ultimately, a company that takes this step becomes more environmentally friendly by reducing, reusing and recycling materials (Meng et al., 2018). According to Al Kattab et al. (2015), the return on investment is that waste production can be significantly reduced through efficient and appropriate material sourcing and recycling.

Investment recovery is considered to contribute to closing the loop of supply chain systems and is seen as the capacity of manufacturing companies to reuse and recycle materials, sell surplus inventory and obsolete equipment (Feng et al., 2018). This includes the ability of companies to take steps to reduce, reuse and recycle materials used, leading to environmentally friendly alternatives (Feng et al, 2018). Logistics is also about dealing with returns, substandard products, production waste and obsolete consumables. These ROI practices should lead to higher profits for manufacturers (Feng et al., 2018). Khan and Qianli (2017) validated the favorable correlation between eco-design, green information systems, green environmental management, and return on investment (ROI). Waste reduction and resource utilisation are influenced by the positive and

important role of collaboration between all funders. Kong et al. (2020) claim that media-efficient ROI not only reduces recycling and reuse, but also generates more revenue through the sale of surplus resources and discarded products; Khan and Qianli (2017) also claim that this factor is related to financial performance and ROI and linkages, but the researchers claim that this ROI factor does not affect environmental performance. Competitiveness is defined as "a state of intense struggle due to the presence of many competitors and the lack of additional growth opportunities" (Weerawardena et al., 2019).

2.1.2 Dynamic Capability

Dynamic capabilities represent an organisation's ability to evolve constructively in response to changes in the environment (Hayter and Cahoy, 2016). Dynamic capabilities focus on adapting to changes in a dynamic environment by adjusting the resource base, thus proposing a dynamic rather than static theory of the organisational resource base (Scilke et al., 2017). According to Sivusuo (2019), dynamic capability refers to an organization's capacity to respond to shifts in the environment and update its knowledge base by adjusting its resource base. The term capability refers to an organisation's capacity to utilise existing knowledge and skills; Zahra et al. (2006) argue that capability pertains to the capacity to alter organisational resources and processes in ways deemed necessary by key decision-makers. Dynamic capabilities enable organisations to transform specific tasks into the capacity to address long-term sustainability challenges (Bareto, 2010; Helfat and Winter, 2011; Beske, 2012). They enable organisations to transform specific tasks into the capacity to effectively and dynamically manage sustainability challenges (Helfat and Winter, 2011).

Dynamic capabilities enable organisations to innovate in that they design appropriate activities and determine their impact on achieving organisational goals (Thiel, 2010). According to (Helfat, 2007; Ramon et al., 2018), dynamic capability mirrors an organization's capacity to secure new innovative competitive advantages through specific interdependencies and market positioning. Dynamic capability refers to the process by which a firm or organisation deploys specific resources to adapt to dynamic market changes, and dynamic capability refers to the allocation of resources during the product life cycle, i.e. market expansion, impact, differentiation, growth and potential losses (Khaliq and Saeed, 2015; Cyfert and Krzakiewicz, 2016). Hart and Dowell (2010) define dynamic capability in CSR management as a firm's ability to respond to rapidly changing CSR expectations by deliberately changing operational capabilities to achieve economic, environmental and social benefits. Capability is defined as follows.

Dynamic capabilities are central to the selection, cultivation and relevance of traditional capabilities (Teece, 2017). The ability of managers to create, reinforce and change practices explains the connection between the quality of management decisions, strategic change and organisational performance (Helfat and Martin, 2015). Pavlou and El Sawy (2011) argue that dynamic capabilities are a tool that helps managers cope with a turbulent environment by helping to expand, change and transform existing capabilities into new capabilities that are better suited to the environment. Rufaidah and Sutisna (2015) argue that "dynamic capabilities are those that identify (detect) opportunities and threats, develop (learn/transform) new ways to exploit opportunities, and create (generate) new systems to ensure that regenerative capabilities are defined within them". Competitiveness is defined as the stable behaviour of a firm that improves

and integrates its capabilities and resources in response to dynamic markets in order to maintain competitive advantage and is used as a moderating variable (Dadashinasab and Sofian, 2014).

2.1.3 Environmental Performance

Environmental performance encompasses the results of an organization's strategic endeavors to diminish the environmental consequences of pollution (Walls et al., 2012). According to Younis et al. (2016), eco-efficiency can be defined as a firm’s capability to lower discharges of air, wastewater, and solid waste, decrease the utilization of dangerous and harmful substances, and diminish environmental harm. Jabbar and Amid (2014) describe eco-efficiency as an organization's conduct of its operations in a manner that generates positive environmental effects; El Saadany, Jaber and Bonney (2011) define environmental performance as the amount of air emissions generated by industrial companies, and define eco-efficiency as the actions taken to reduce climate impacts (Mutie, 2021).

Environmental performance is defined as the reduction in the use of non-renewable and hazardous materials, the implementation of various innovative systems such as ISO 14001 and Six Sigma, the reduction of pollutants, appropriate mechanisms for wastewater treatment and effective recycling initiatives within the organisation. All these contribute to a healthy external environment. Environmental performance 'focuses on minimizing the utilization of harmful materials, lessening the occurrence of environmental incidents, enhancing a company's environmental performance and reducing the release of air pollutants, wastewater and solid waste' (Diab et al., 2015). Hendayani et al. (2022) define effectiveness as the measurable fulfillment of environmental management controls related to environmental aspects, environmental goals and environmental

objectives. On the other hand, Ari Retno (2010) argues that environmental performance signifies the extent to which a company is committed to environmental protection.

Perman and Soediantono (2022) define environmental performance as one of the actions taken by a firm to improve or reduce the impact of environmental damage (Fernando and Wah, 2017).
As per Younis et al. (2016), environmental performance denotes a company's capacity to diminish emissions of air, wastewater, and solid waste, curtail the utilization of dangerous and harmful substances, and minimize environmental incidents. It encompasses the outcomes of an organization's strategic initiatives aimed at mitigating environmental harm (Walls et al., 2012).It is defined as 'an organization's capability to decrease the environmental repercussions of its operations'. The environmental performance of an organisation is a derived concept and part of the overall performance of the organisation. Environmental performance refers to an organisation's performance in relation to the environmental impact of the goods it purchases, which are derived from activities with a lower environmental impact (Preuss, 2009).

Environmental performance refers to the suitability, biodegradability, design and disposal of products purchased or supplied by an organisation. It is about the extent to which the products purchased or supplied create value for the organisation and its customers. Environmental efficiency is about minimising the use of non-renewable and renewable materials, using resources, energy and water efficiently, eliminating defects and waste, and maximising sustainability. In addition, environmental efficiency is reflected in the extent to which an organisation buys and supplies reusable and recyclable products and materials, minimises packaging, reuses materials as much as possible after use, and minimises pollution (Meehan and Bryde, 2011).

2.2 Theoretical Review

2.2.1 Resource Based View Theory

The resource-based view theory (RBVT) provides an important framework for explaining and predicting key business outcomes (Barney and Clark, 2007). As per Peterf and Barney (2003), an organization's competitive advantage is defined by its capacity to create greater economic value, which translates into profitability, within a product market when compared to its closest competitors. For long-term success in the supply chain domain, a firm must consistently create more economic value than its immediate competitors in the same industry and ensure that other firms cannot easily replicate the advantages of its strategy, as highlighted by Barney and Clark (2007).

The Resource-Based View (RBV) has garnered substantial focus when elucidating supply chain practices. At its core, RBV revolves around key concepts like resources, capabilities, and strategic assets. RBV asserts that strategic resources such as core competencies, network flexibility, and absorptive capacity are the factors that account for disparities in firm performance. The paper posits that firms with unique resource mobilisation capabilities can gain advantages over competitors lacking these capabilities. With fewer resources and capabilities, as well as core capabilities and skills, firms can gain market advantage and sustainable competitive advantage (Knudsen, 2003).

According to the RBV, integration through investment in specific assets enables partner firms to create competitive advantages because they are rare, valuable, irreplaceable and difficult to replicate. Another reason for collaboration in the supply chain is the complementarity of resources

and the demand for specific resources. Through strategic investments in related resources, the sharing of core competencies, and the integration of scarce yet complementary resources and skills, supply chain professionals have the capacity to craft distinctive products, services, and technologies. By embracing effective supply chain practices, companies can concentrate on honing their core strengths, cultivating unique capabilities, and capitalizing on economies of scale and knowledge accumulation, as emphasized by Hunt and Davis (2012). Much of the literature on resources and performance in supply chain management assumes that sustainable competitive advantage is relied on the intrinsic value of valuable, rare, unique and irreplaceable resources.

These resources include tangible assets (the company's logistics network) and intangible assets (knowledge sharing). The reasons explaining why supply chain practices can serve as a foundation for sustainable competitive edge are as follows: Supply chain practices represent assets that have the potential to augment competitive advantage. Moreover, they can expedite the procurement of vital resources within factor markets (Carter, Kosmol, and Kaufmann, 2017). Furthermore, investments in raw materials and modular production equipment are regarded as crucial assets that can enhance the competitiveness of textile firms. Good supply chain practices are seen as an important factor in improving supply chain sustainability. The theory has also helped to provide a framework for understanding the connection between supply chain practices and sustainable supply chain performance.

2.2.2 Institutional Theory

Institutional theory serves as a theoretical framework that enables researchers to pinpoint and explore various factors, including culture, social context, regulations (including legal frameworks),

traditions, historical influences, economic incentives, and other elements that contribute to the sustainability and legitimacy of organizational practices. It is crucial to acknowledge the function of resources in this context (Baumol et al., 2009; Brunton et al., 2010). Here, legitimacy refers to the acknowledgment of sustainable practices as relevant and suitable as per stakeholders (DiMaggio and Powell, 1983). Over time, institutional theory has primarily centered on the manner in which groups and organizations construct and uphold their status and legitimacy by adhering to the regulations, norms, and socio-cultural boundaries within the organizational context (DiMaggio and Powell, 1983, 1991; Meyer and Rowan, 1991; Scott, 2007). According to institutional theory, external influences such as social, political, and economic pressures shape company approaches and structural choices as firms aim to adopt practices considered valid or seek to justify their actions in the eyes of stakeholders (North, 1990; Jennings and Zandbergen, 1995). In the context of environmental sustainability, institutional theory suggests that shifting societal values, technological advancements, and regulatory changes impact sustainable environmental practices (Rivera, 2004; Ball and Craig, 2010) as well as environmental management (Hoffman and Ventresca, 1999; Brown et al., 2006; Fowler and Hope, 2007; Tate et al., 2010). The primary drivers for changes in environmental standards are supply chain companies (Hall, 2001) and government regulations (Rivera, 2004).

Institutional theory distinguishes three causes of isomorphism in organisational strategies, structures and processes: coercive, normative and mimetic (DiMaggio and Powell, 1983). Coercive results from the influence of powerful individuals (in this case in the milk supply chain). Coercion has a significant role in advancing environmental conservation and, consequently, sustainability (Kilbourne et al., 2002). Regulatory pressure ensures compliance because

organisations are perceived as thinking rationally (Sarkis et al., 2011). Ball and Craig (2010) argue that regulatory pressure promotes environmental awareness within firms and argue that new social norms (e.g. ethical values, green thinking, etc.) and institutional research are needed to understand how organisations respond to environmental challenges. Regulatory incentives thus influence compliance with social obligations based on the needs of society or on what organisations or individuals should do (March and Olsen, 1989). Isomorphic imitation unfolds as firms endeavor to mimic the actions of prosperous competitors in their sector to secure credibility and replicate their achievements (Aertsetal, 2006; Sarkisetal, 2011), e.g. providing organic milk only to supermarkets.

2.3 Empirical Review

2.3.1 Sustainable Supply Chain Management and Environmental Performance

Baah and Jin (2019) aim to explore the impact of sustainable supply chain management (SSCM) on the performance of a logistics organization. A quantitative approach was used to examine and interpret the data. The research's target population primarily consisted of managers from logistics firms operating in Ghana. During the implementation of the study, 190 questionnaires were distributed to managers of logistics organisations in Ghana. Data analysis indicated that SSCM has a significant positive impact on competitive advantage and organisational performance. Furthermore, the study showed competitive advantage also exerts a substantial influence on organizational performance.. The research revealed that organisations that have implemented SSCM in their supply chains perform better.

Mann and Kaur (2019) studied the impact of sustainable supply chain management (SCSM) on the financial performance of Indian companies. Data from the 100 largest listed companies in terms of market value were used for empirical analysis. Content analysis was used to analyse the principle of 'sustainability across the life cycle of products and services'. Hierarchical linear regression was applied for hypothesis testing. The results indicated that both aspects of SSCM - sustainable sourcing and resource utilisation - have a significant positive impact on a company's financial performance.

Hamdy et al. (2018) examined the influence of sustainable supply chain management practices on the performance of Egyptian organizations. A well-defined sample was carefully chosen for the study, comprising solely of directors and workers from the supply chain and ERP departments of Egyptian organizations listed in the SandP/EGX and ESG index. The sample was representative of companies listed on the EGX100 index. The survey comprised three parts: (1) company and respondent profiles, (2) level of sustainable supply chain management practices and (3) company performance. A total of 72 companies were identified. It can be inferred that the implementation of Sustainable Supply Chain Management (SSCM) practices exerts an influence on a company's overall performance.

Esfahbodi et al. (2016) investigated and compared the environmental impacts and costs of SSCM implementation in emerging economies. Using this productive approach, data were gathered from a group of managers within companies located in both China and Iran. A questionnaire was circulated among a specific group of managerial roles, including plant managers, logistics managers, operations managers, purchasing managers, supply chain managers, sales managers,

technical managers, and industrial waste managers, among others to assess the environmental impact of controller general of communication accounts (CGCA). The findings indicated that supply chain management practices, particularly those related to sustainable production, exert a noteworthy and favorable influence on the environmental performance of manufacturing companies in two emerging economies. The study's conclusion is that implementing sustainable supply chain practices can enhance the environmental performance of the two chosen production companies, thus resulting in improved environmental outcomes.

Ahmadin et al. (2017) introduced a model for comprehending the elements influencing sustainable supply chain management (SCM) practices within the petroleum industry. This model explains the external and internal factors that can influence SCM implementation. There are few studies that focus on different aspects of SCM in the petroleum industry. Carter and Easton (2016) offer an in-depth exploration of the pertinent literature. Sustainable Supply Chain Management (SSCM) has found its place in prominent logistics and supply chain management journals for over 20 years. The findings show that the field of sustainability and employment management has evolved from a single social and environmental perspective and research using a CSR perspective to sustainability perspectives such as the 'triple bottom line' to the beginning of convergence and the development of sustainability and employment management as a theoretical framework. Although SSCM has become theoretically richer and methodologically more rigorous, there is still much room for improvement in theory, methodology and the role of governance in future research.

Sharma and Single (2021) attempt to develop an alternative methodology to help organisations implement sustainable supply chain practices (SSCP) by managing functional composition and

organisational performance. The study revealed a positive correlation between sustainable supply chain practices and the long-term performance of organizations. Furthermore, functional components were found to play an important role in mediating the relationship between sustainable supply chain practices and long-term organisational performance.

Paulraj et al (2017) analysed the connection between organisational motivation, SSCM practices and organisational performance. The findings showed that moral attitude and motivation are key factors and that organisations with high moral commitment perform better than organisations with unethical motivation. Wang and Dai (2016) found that sustainable supply chain management (SSCM) practices have made a significant contribution to empirical research on the impact of SSCM on organisational performance in China. The findings showed that companies' SSCM practices had a positive impact on their environmental and social performance. Furthermore, environmental and social performance correlated positively with economic performance.

2.3.2 Dynamic Capability and Environmental Performance

Hernández-Linares conducted an analysis to explore the individual impacts of the four aspects of the dynamic capabilities component (perception, learning, integration, and coordination) on firm performance and examined how market orientation (MO) functions in this context. Our findings, drawn from a sample of 509 Spanish SMEs, indicate that SME performance is influenced unequally by various dimensions of DC. Furthermore, Our discovery suggests that market orientation significantly influences the connection between perceived and acquired competencies and firm performance.

Costa et al. (2020) assessed DC in the context of the not-for-profit sector, and examined the relationship between DC and the performance of these organisations. Data from 169 Brazilian nonprofit organisations were analysed using confirmatory factor analysis. The results show that adaptive capacity, absorptive capacity, mobilising capacity and innovative capacity determine the development performance of nonprofit organisations and that the performance of these organisations can be assessed through control mechanisms and growth dimensions. Furthermore, collaborative development has a direct and substantial influence on the performance of the examined organizations.

Chiu et al. (2016) constructed a structural model to examine the connection between four categories of dynamic capabilities and radical innovation performance (RIP) within well-founded organizations. To assess their proposed hypotheses, they employed a structural equation model, utilizing data from 500 large Taiwanese manufacturing firms. The outcomes reveal consistent and structural positive correlations between the four types of dynamic capabilities and RIP. The study concludes that systematically enhancing dynamic capabilities can enhance the radical innovation performance of established firms.

Park and Kim (2013) evaluate dynamic capabilities and new product development performance in Korean high-tech SMEs. Based on the literature review, they identified resources and activities (e.g. organisational relaxation, innovation and knowledge search) that contribute to improving firms' dynamic capabilities. Data were collected through a questionnaire involving 241 South Korean SMEs. The empirical results reveal that knowledge restructuring, which reuses existing technological resources, contributes to dynamic capabilities, while lack of organisational resources

is not significantly related to dynamic capabilities. Research activities such as network work, external knowledge seeking and academic engagements had a negative impact on dynamic competence. Perceived competence, the ability to search for opportunities and the ability to change, which support dynamic competence, were shown to positively affect new product development outcomes at the collective and global level, but not at the individual level.

Sukaris et al. (2019) investigated the impact of factors such as middle management awareness, control and restructuring on the growth of continuous improvement. The research used a quantitative research design. The core data in this study was collected via a Likert scale. ranging from 1 to 5. As the sampling method used was a satisfactory sample, 26 middle managers participated in the study, the survey was conducted at PTS Private by Gresik, and the survey was conducted among middle managers involved in business processes. The results confirmed that the original middle managers' variables had a significant positive effect on continuous improvement growth, the middle managers' variables had no effect on continuous improvement growth, and the reconstructed middle managers' variables had no significant effect on continuous improvement growth.

Masnan et al (2018) analysed the export performance of Malaysian manufacturing SMEs, which represent the majority of all Malaysian firms. To obtain the objectives of the study, they examined the impact of dynamic capability and perceived international capability on SME export performance using the partial least squares (PLS) method. To improve their trade performance, SMEs need adaptive and perceptual capabilities that act as catalysts to respond quickly to changes in foreign markets. The dynamic capabilities proposed in this research include the internal and

external capabilities that SMEs need to adapt to changes in customers and technological capabilities.

2.3.3 Dynamic Capability as a Moderator on the relationship between SSCM and Environmental Performance

Kirci and Seifert (2015) analyse internal capabilities that enable firms to realise more environmentally sustainable supply chains based on dynamic capabilities for discovery, innovation and change. We will develop a comprehensive framework that focuses on internal and external capabilities at three levels of the organisational structure. An example of the application of this concept is Nestlé's Zero Waste initiative. We argue that the activities of each actor in the supply chain are determined by internal processes and procedures, and conclude that internal and external capabilities related to transparency and information integration are important for a company's environmental sustainability efforts.

Gruchmann and Seuring (2018) examine logistics social responsibility (LSR) and its relationship to dynamic capability theory aiming to shed light on how logistics firms can enhance the implementation of LSR practices. Their analysis drew from existing theories within the domains of logistics management, supply chain management (SCM), and sustainable supply chain management (SSCM), leading to a conceptualization of LSR within the context of dynamic capabilities. In light of the ongoing scholarly discourse regarding the direct relationship between dynamic capabilities and competitive advantage, coupled with the necessity for dynamic capabilities to exhibit diversity, the conceptualization of LSR in terms of dynamic capabilities introduces a fresh perspective to this debate. Concerning the pursuit of sustained competitive

advantage, the current uniformity in logistics services might hinder the attainment of long-term sustainable advantages, necessitating more advanced logistics capabilities. Hence, it becomes crucial to comprehend and leverage the cause-and-effect connections among diverse logistics resources and capabilities to attain distinctive and sustainable advantages. This comprehension enables logistics firms to advance their LSR practices even further.

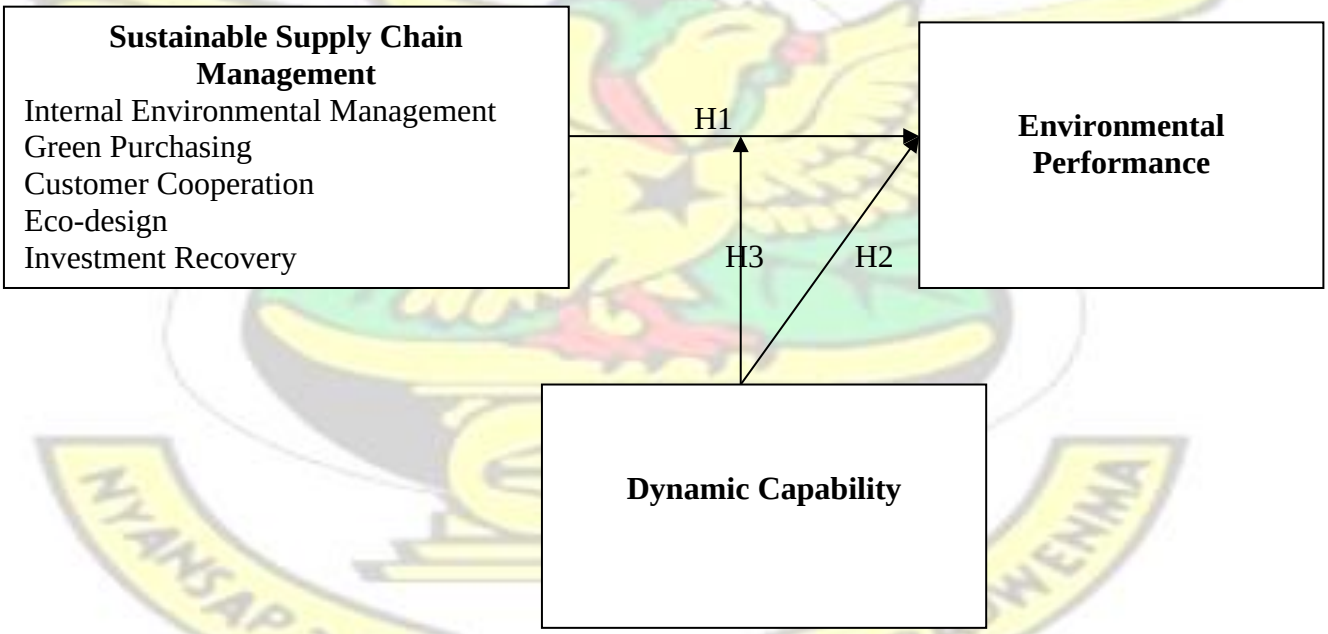
Hong et al. (2018) conducted an analysis to examine how Sustainable Supply Chain Management (SSCM) practices influence both supply chain (SC) dynamic capabilities and firm performance, encompassing economic, environmental, and social aspects. Their research precisely focused on understanding the mediating role of SC dynamic capabilities in the relationship between SSCM practices and firm performance. The results revealed that SSCM practices exert a significant and positive influence on SC dynamic capability as well as on all three aspects of performance: economic, environmental, and social. Notably, SC dynamic capability was found to positively impact environmental performance but did not exhibit a similar effect on economic and social performance. Additionally, the analysis unveiled that SC dynamic capability partially mediates the connection between SSCM practices and firm performance.

Beske et al. (2013) explored the manner in which Sustainable Supply Chain Management (SSCM) practices empower organizations to retain command over their supply chains and achieve a competitive edge by harnessing dynamic capabilities. To conduct their investigation, the study encompassed a thorough literature review, involving an examination of the material within 52 articles from reputable English-language journals that underwent peer review and focused on sustainable food supply chains. In addition, specific DC factors for supply chains in sustainability-

oriented industries, such as knowledge sharing and supply chain transformation, were identified. The food industry was then analysed against SSCM and DC criteria to understand the strategies used in these trade markets. The findings indicate that sustainable practices and DC are being applied in the supply chain to improve traceability and meet customer requirements.

2.4 Conceptual Framework

As showed in the Figure 2.1 there are three main hypotheses that are to be tested empirically. These hypotheses include, the relationship between sustainable supply chain management and environmental performance, the relationship between dynamic capability and environmental performance and the moderating role of dynamic capability on the relationship between sustainable supply chain management and environmental performance.



Source: (Hamdy et al., 2018)

Figure 2.1 Research Framework

2.4.1 Sustainable Supply Chain Management and Environmental Performance

The first assumption of the study is that sustainable supply chain management significantly influence environmental performance. This result is empirically supported. Thus, the industry can decide which aspects to focus on to improve sustainability by developing effective strategies to achieve long-term sustainability based on the triple bottom line (Karmaker et al. 2023). Environmental practices in supply chain management support and encourage resource reduction, cleaner technologies, improved logistics and emission reductions, which logically contribute to improved environmental and operational performance (Baliga et al., 2019). Existing literature shows that green procurement, return on investment and eco-design use a range of strategies, such as reuse, recycling, refurbishment, renovation and repair, to ensure reduced environmental impact (Panigrahi et al., 2018). Designing products for recycling, reuse and reduced energy/resource consumption, leading to better use of materials and less waste in the manufacture of products, are implications of ecodesign in the supply chain leading to improved EP (Jabbour et al., 2015; Nyagadza, 2022).

Environmental practices in the supply chain are considered important for achieving good environmental and operational sustainability performance (Baliga et al., 2019). Internal environmental management has a positive and significant impact on environmental performance, while green procurement has a negative impact on environmental performance. Studies conducted in different countries (Jabbour et al., 2015) found a significant positive relationship between GSCMPS and environmental performance. Verma (2014) found that ecodesign not only reduces the amount of energy, water and other resources used to produce a product, as well as emissions

from the manufacturing process, but also increases benefits and reduces costs (Acquah et al., 2020), eco-designs enables companies to source materials that meet requirements, which includes working with suppliers to find environmentally friendly materials and components (Abdallah and Al-Ghwayeen, 2019).

Manufacturers and suppliers can use more environmentally friendly materials to meet environmental requirements, enabling companies to improve their environmental profile (Abdallah and Al-Ghwayeen, 2019). GSCMPS are used to meet environmental goals and improve a company's reputation (Jassim et al., 2019). Of all the GSCMPS, material sourcing is the most important as it measures the effectiveness of the firm's environmental management (Jassim et al., 2019). Environmental practices in SCM affect environmental, operational and financial performance (Mitra and Datta, 2014; Baliga et al., 2019). SCM is an important strategy to increase customer demand for environmentally friendly products. The practice helps companies understand and meet customers' environmental requirements. Eco-design involves designing products according to environmental standards throughout their life cycle. This style of design provides products that can be remanufactured, manufactured and consumed with minimal energy consumption and allows products to be reused and recycled (Younis et al., 2016) Afum et al (2020a) and Acquah et al (2021) argue that eco-innovation as a concept not only contributes to the environmental performance of companies, but also has an indirect positive impact on their financial performance. From the presentation herein, the study hypothesizes that:

H1: Sustainable supply chain management will positively and significantly affect environmental performance

2.4.2 Dynamic Capability and Environmental Performance

The second assumption of the study is that dynamic capability significantly influence environmental performance. This result is empirically supported. Thus, research on environmental issues shows that companies can position themselves as 'green' and achieve competitive advantage if they voluntarily and proactively integrate environmental goals and strategies into their business model (Pieroni et al., 2016; Hoffmann et al., 2016), and take advantage of new strategic opportunities arising from the need for environmental excellence (Da Giau et al., 2016). To achieve environmental excellence, organisations need to change existing processes, respond to the needs of internal and external stakeholders and develop new capabilities to address environmental challenges (Pace, 2016; Hoffmann et al., 2016). Faced with such complex sustainability challenges, companies cannot simply make additional changes to their operations (Oliveira-Dias et al., 2022). To ensure good environmental performance, companies need to engage key stakeholders in their strategies and address issues related to environmentally friendly products, reduction of non-renewable and polluting resources and environmental regulations (Boronat-Navarro and Garcia-Joerger, 2019; Eikelenboom and De Jong, 2019).

Teece (2007) distinguishes three types of dynamic capabilities: sensing, seizing and reconfiguring. Sensing is necessary to recognise environmental problems and their underlying environmental needs and to gather information about possible solutions, taking into account customer needs, supplier requirements, competitor actions, changing regulations and potential technological options (Oliveira-Dias et al., 2022) external resources that firms can use to find innovative and cost-effective solutions to environmental problems (e.g. reducing material consumption in products and processes, using more environmentally friendly materials, designing products that

are easier to disassemble and reuse, increasing energy efficiency in production processes, reducing pollution, etc.). The greater the diversity, the greater the potential impact on a firm's environmental performance (Dangelico et al, 2017; Mousavi et al., 2018). Seising is the ability to mobilise resources and capabilities to exploit opportunities, including creating value from opportunities through new management and service delivery processes (Oliveira-Dias et al., 2022).

Reconfiguring is the ability of a firm's organisational structures and processes to adapt to environmental change and refers to the continuous improvement and organisation of resources to sustain them (Mousavi et al., 2018). Reconfiguring also refers to making processes related to environmental and social issues more transparent to stakeholders (Amui et al., 2017). According to Dangelica et al. (2017), reconfiguring includes the creation of new environmental departments, the involvement of environmental experts and radical changes in supply chain relationships. Wu et al. (2013) point to the importance of building these capacities by conducting audits and risk analyses that focus on the causes of environmental impacts and by implementing standardised environmental management systems such as Duarte's ISO 9000 and ISO 14001. Alonso et al. (2020) conclude that dynamic performance can be an excellent tool to reallocate resources to improve environmental performance. From the presentation herein, the study hypothesizes that:

H2: Dynamic capability will positively and significantly affect environmental performance

2.4.3 Dynamic Capability as a Moderator on the relationship between SSCM and Environmental Performance

Previous research on dynamic capabilities has shown that they have a positive and significant impact on firm performance. Eriksson (2014) goes on to explain that dynamic capabilities provide

a competitive advantage, which in turn contributes to improved industry performance. Verma (2014) states that dynamic capabilities are a relatively new concept, that they have a significant impact on sustainable performance and that there is little research on how they affect performance. The results of the study showed that dynamic supply chain capabilities have a positive impact on sustainable performance of companies and new products. In addition, other researchers have examined this relationship along several specific dimensions and found that strategic collaboration capability contributes to a firm's sustainable advantage; SSCM helps to achieve short-term competitive advantage, which can be enhanced by developing dynamic capabilities.

The combination of SSCM and dynamic capabilities is limited in terms of empirical research (Eriksson, 2014). Customer focus and participation in SSCM practices provide all types of information (Dangol and Kos, 2014) and to some extent support dynamic capabilities and improve sustainable performance. In addition, Reefke and Sundaram (2017) analysed that the promotion and dissemination of business opportunities in global supply chains suggests that firms can acquire knowledge and resources from different members of the chain and thus improve their capabilities (Tajbakhsh and Hassini, 2015). Handika and Ekananda (2019) state that trust in supply chain partners is considered crucial for dynamic firm capabilities. Luthra and Haleem (2015) find that SSCM practices are not necessarily a source of competitive advantage. Dubey et al. (2017) further argue that SSCM can affect a firm's competitiveness by moderating linkages. In terms of the resource base perspective, dynamic capabilities often moderate sustainable resources and can improve performance (Yao et al., 2015).

Guiffrida et al. (2011) further suggest that dynamic learning capabilities can more effectively moderate the impact of SSCM on performance. Furthermore, other researchers have investigated the relationship between sustainable supply chain management, dynamic capabilities and firm performance (Reefke and Sundaram, 2017). These researchers based their study on dynamics and suggested that supplier relationships have a positive impact on production flexibility and product optimisation, thus improving sustainable performance. They also confirmed that dynamic capabilities have a combined effect on supplier relationships and business performance. From the presentation herein, the study hypothesizes that:

H3: Dynamic capability will significantly moderate the relationship between sustainable supply chain management and environmental performance

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter offers a glimpse into the research methodology employed in this study. It is structured into several sections, including the research design, the study's target population, the techniques and sample size used for sampling, the methodology for data collection, the instruments utilized for data collection, the approach to data analysis, reliability and validity testing, and considerations of ethical research practices.

3.1 Research Design

The research utilized descriptive and explanatory design for the study. Research design discusses the structure, the plan, and methods the researcher applied in the study to meet the set objectives. The study conducted is a qualitative study. According to (Burns and Grove, 1993), objectives and

systems utilized when collecting data for the assessment of effects and causes among variables is known as quantitative research design. In assessing the impact of sustainable supply chain management practices on environmental performance and the moderating the role of dynamic capability with a focus of production companies in the Accra metropolis of Ghana, the researcher will adopt explanatory design. The survey employed a sample to solicit required information that was used to construct questions for respondents to answer (Polit and Hungler, 1993; Mouton, 1996). In ensuring effective estimation of the study's objective that is the impact of sustainable supply chain management practices on environmental performance and the moderating the role of dynamic capability in Accra metropolis using numerical measures, the researcher will utilize the quantitative approach.

3.2 Population of the study

Population refers to a sizable group of individuals, elements, objects, or variables who possess similar characteristics (Burns and Grove, 1993). The entire employees and management of production companies in the Accra city of Ghana constituted the study's population. The population of the research comprises of the administrative manager, accounting and financial manager, supply chain manager, assistant supply chain manager and supply chain officer. The study estimates 15 production companies and 1000 target population. The researcher chose the study setting due to data availability and convenience.

3.3 Sample and Sample size

Sampling entails the selection of a designated number of elements from a larger population to serve as a representative sample of that population. In this study, the researcher intended to gather

information from the selected sample. The study's designated sample size was 150, chosen to align with the study's objectives. Pallant (2007) contends that researchers commonly consider using a sample size of 30 or more as scientifically acceptable for analysis, irrespective of the data's presentation quality. Schneider and Cooper (2015) suggest that the quality of analyzed data is not contingent upon its size, whether large or small. The study made used of stratified sampling technique to gather respondents' views for further studies. This sampling technique was used in order to ensure each subgroup within the population receives proper representation within the sample. Also, stratified sampling provides better coverage of the population since the researcher has control over the subgroups in order to ensure all of them are represented in the sampling.

3.4 Data Collection Method

Processes used by researchers to gather data for a research work is termed as data collection process. Primary data was selected to align with the study's nature and objectives. The researcher developed questionnaires to aid respondents in delivering high-quality responses, thereby facilitating effective research conduct. Survey questionnaires were used in gathering the data from the field. Self-administered questionnaires were the data collection instrument used by the researcher. Questionnaires were the primary tool used for collecting data in this study.

3.4.1 Data Collection Instrument

Structured questionnaires were employed as the data collection instrument for the study. Data collected through questionnaires helped the researcher to conduct interviews by using them as guidelines. Interviews are comparative to standard questionnaires and hence they provide detailed information on the research more than any other method used (Burns and Grove, 1993). Based on

the objective of the study, which intended to examine sustainable supply chain management practices and environmental performance with the moderating role of dynamic capability, structured questionnaires were effective in gathering data. The researcher derived questions used to design questionnaires from previous studies conducted by the researchers. The research instruments were adopted and modified from previous works. For instance, with sustainable supply chain management the researcher used 5 dimensions thus, internal environmental management, eco-design, green purchasing, investment recover and customer cooperation which were adopted from the works of Wang et al. (2017); Hamdy et al. (2018). Also, the measurement for dynamic capability was adopted from the works of Chukwuemeka and Onuoha (2018). Again, the measurement for environmental performance was adopted from the works of Zhu et al. (2004); Daily et al. (2007); Wang and Jun (2017).

3.5 Data Analysis

The study solely focused on the analysis and hence the researcher was able to analyzed information by using numerical quantities. The raw data underwent analysis and interpretation to improve readability for the respondents. As per Sullivan (2001), extensive data is condensed during analysis to maintain engagement and save time. The impact of sustainable supply chain management practices on environmental performance with the moderating role of dynamic capability is assessed through a survey. To enhance data analysis, several techniques were employed, including data reduction, organization, refinement, selection, focus, and summarization. The raw data was inputted into Statistical Package for Social Sciences (SPSS) version 23.0 and Microsoft Excel, enabling the extraction of pertinent and precise information. The process of data analysis ensured

completeness, accuracy, and consistency. Both descriptive and inferential statistical methods were utilized in this research.

3.6 Reliability of the Data Collection Instrument

The capacity of a research tool to consistently measure a design to a specified degree is known as reliability, as stated by Polit and Hungler (1993). Reliability simply entails guaranteeing that questionnaires are devoid of errors and exhibit impartiality. According to Li et al. (2009) structured questionnaires were compared with main questions to prevent bias data collection and therefore, supervisor assisted researcher in the study through criticizing the study and also giving them more guidelines to make the work successful. Convenient, private and a comfortable environment will be used for gathering data for the study.

3.7 Validity of the Data Collection Instrument

Validity refers to the extent to which a tool accurately assesses exactly what it is designed to evaluate, as stated by Polit and Hungler (1993). The researcher employed questions on sustainable supply chain management practices, environmental performance and dynamic capability developed by other researchers to achieve validity in the study. Content validity refers to an instrument's capacity to measure the factors required for a study. Content validity was also considered. To make reading among respondents more understandable, the researcher used simple language for the questionnaires. Data gathering was facilitated due to the fact that the researcher was always available to make clarifications for respondents when demanded (Burns and Grove, 1993). Conceptual framework was satisfied since questions were derived from various literatures.

Again, questionnaires were designed to align with the framework, thereby contributing to its refinement via a thorough literature review.

3.8 Ethical Considerations of the Study

Researchers conduct researches in a suitable way such that they do not go against the ethics of human and society as well. The researcher subsequently employed the following strategies to ensure that ethical concerns were duly addressed prior to conducting the study. The questionnaires underwent meticulous scrutiny and validation to preempt any potential embarrassments or inconveniences when they were distributed to the participants. Strict anonymity and confidentiality were ensured among respondents and hence they were given maximum security since their identities were not required on the questionnaires. The collected information is intended solely for academic purposes, and as such, the researcher is committed to safeguarding the data from falling into the hands of any third party. Questionnaires given to participants were distributed to respondents who had volunteered to take part in the study and were not forcefully imposed on respondents. Researcher issued forms to respondents to make them indicate their consents before they were given the questionnaires. The questionnaires were administered to through objective and circumspect approach.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSIONS

4.0 Introduction

This section unveils the outcomes derived from the field data concerning the impact of sustainable supply chain management practices on environment performance and the moderating role of dynamic capability with a specific emphasis on manufacturing companies in the Accra metropolis of Ghana. The analyses were performed with the aid of the statistical software called SPSS version 26. The following analyses were performed frequency and percentages, means and standard deviations, reliability and validity test, correlation matrix and regression analysis.

4.1 Demographics

This section provides the background information of the respondents. This includes, sex, age, organisational level, job categories and years of working with the company.

Table 4.1: Demographic Information

Demographic	Frequency	Percentage
Sex		
Male	92	73.6
Female	33	26.4
Age		

<30 years	24	19.2
30-35 years	55	44.0
36-40 years	31	24.8
41-45 years	15	12.0
Organisational level		
Senior	27	21.6
Middle manager	64	51.2
Operations manager	34	27.2
Job categories		
Administrative manager	15	12.0
Accounting and financial manager	16	12.8
Supply chain manager	11	8.8
Assistant supply chain manager	27	21.6
Supply chain officer	39	31.2
Other	17	13.6
Years of working in this sector		
Less than 5 years	39	31.2
5 to 10 years	56	44.8
Above 15 years	30	24.0

Source: Field Data, 2023

The result in the Table 4.1 presents respondents demographic information. The study revealed that, 73.6% were males and the remaining 26.4 % were females. Moreover, the study revealed that, 19.2% were between the ages of 30 and below years, 44% were aged between 30 -35 years, 24.8 % were aged 36-40 years and the remaining 12% were aged between 41-45 years. Meanwhile, 21.6% were senior managers, 51.2% were middle managers and the remaining 27.2% were operation managers. Nonetheless, 12% were administrative manager, 12.8 % were accounting and financial managers, 8.8% were supply chain manager, 21.6% were assistant supply chain managers and 31.2% were supply chain officers. Lastly, 31.2% had worked with the sector less than 5 years, 44.8 % had worked 5 to 10 years and 24% had worked above 15 years.

4.2 Sustainable Supply Chain Practices

This section presents the descriptive statistics results on sustainable supply chain practices. Five(5) dimensions were used in measuring the construct, these are; internal environmental management,

eco-design, green purchasing, investment recovery and customer cooperation. The Five-point Likert scale was used in measuring the respondents' level of agreement. Where 1=strongly disagree, 2=disagree, 3=neutral, 4=strongly agree.

Table 4.2: Sustainable Supply Chain Practices

Statements	Min	Max	Mean	Std. D
Internal Environmental Management				
Our company has support for protection from mid-level manager	1.00	5.00	3.6720	1.14142
Our company has cross-functional collaboration for environmental improvement	1.00	5.00	3.8560	1.03724
Our company has promotion and implementation of environmental laws and regulations	1.00	5.00	3.3440	1.23852
Our company regularly inspects and maintains environment protection facilities and equipment	1.00	5.00	3.8960	1.08378
Our company has environmental laws and regulations for staff education and publicity to raise environmental awareness	1.00	5.00	3.4400	1.14582
Eco-design				
Our company use life-cycle analysis to evaluate the environmental friendliness of products	1.00	5.00	3.2400	1.31001
Our company has design products to reduce the use of raw materials or energy	1.00	5.00	3.3280	1.28751
Our company has design products for recycling or reuse	1.00	5.00	3.3920	1.40790
Our company has establish the recycling system of waste products	1.00	5.00	3.8960	1.11315
Green Purchasing				
Our company suppliers are selected using environmental criteria	1.00	5.00	3.5760	1.13780
Our company has eco-labeling of purchased products	1.00	5.00	3.9360	1.08319
Our company cooperates with suppliers for environmental objectives	1.00	5.00	3.6240	1.27421
Our company has environmental audit for suppliers' internal management	1.00	5.00	3.9760	1.01174
Investment Recovery				
Our company has investment recovery system	1.00	5.00	3.8560	1.14091
Our company has sale of scrap and used materials	1.00	5.00	3.9360	.89572
Our company has sale of excess capital equipment	1.00	5.00	3.9440	.87348
Customer Cooperation				
Our company cooperates with customers for environmentally friendly design	1.00	5.00	3.9200	1.13308
Our company cooperates with customers for cleaner production	2.00	5.00	4.0240	.96272

Our company cooperates with customers for green packaging	1.00	5.00	3.7760	1.00694

Source: Field Data, 2023

The results for sustainable supply chain management practices using five dimensions namely internal environmental management, green purchasing, customer cooperation, eco-design and investment recovery. The result indicated with internal environmental management, the respondents were not sure that, their company has support for protection from mid-level manager (M=3, SD=1). Again, the respondents were not sure that, their company has cross-functional collaboration for environmental improvement (M=3, SD=1). Furthermore, the respondents were not sure that, their company has promotion and implementation of environmental laws and regulations (M=3, SD=1). Also, the respondents were not sure that, their company regularly inspects and maintains environmental protection facilities and equipment (M=3, SD=1). Again, the respondents were not sure that, their company has environmental laws and regulations for staff education and publicity to raise environmental awareness (M =3 SD=1).

Moving on with eco-design, the respondents were not sure that, their company use life cycle analysis to evaluate the environmental friendliness of products (M=3, SD=1). Again, the respondents were not sure that, their company has design products to reduces the uses of raw materials or energy (M=3, SD=1). The respondents were not sure that, their company design products for recycling or reuse (M=3, SD=1). The respondents were not sure that, their company has establish the recycling system of the waste products (M=3, SD=1). With regards to green purchasing, the respondents were not sure that, their company suppliers are selected using environmental criteria (M=3, SD=1). Furthermore, the respondents were not sure that, their company has eco-labeling of purchased products (M=3, SD=1). The respondents were not sure

that, their company cooperates with suppliers for environmental objectives (M=3, SD =1). Lastly, the respondents were not sure that, their company has environmental audit for suppliers internal management (M=3, SD=1). Concerning investment recovery, the respondents were not sure that, their company has investment recovery system (M=3, SD=1). The respondents were not sure that, their company has sales of scrap and used materials (M=3, SD=1). The respondents were not sure that, their company has excess capital equipment (M=3, SD=1).

Lastly with customer cooperation, the result reveled that, the respondents were not sure that, their company cooperates with customers for environmentally friendly design (M=3, SD=1). The respondents agreed that, their company cooperates with customers for cleaner production (M=4, SD=1). The respondents were not sure that, their company cooperates with customers for green packaging (M=3, SD=1). The implication of the results is that, using the dimensions as proxies of sustainable supply chain management practices, majority of the respondents were not sure there were such practices in their company. For instance, whether there is the use of laws and regulations for staff education. Also, whether there is the use of promotion and implementation of environmental laws and regulation. Moreover, whether there is the use of life cycle analysis for evaluation. Again, whether there is the use of design products in order to reduce the use of raw materials or energy. Lastly, whether there is the use of environmental audit for suppliers.

4.3 Dynamic Capability

This section presents the descriptive statistics results on dynamic capability. The Five-point Likert scale was used in measuring the respondents' level of agreement. Where 1=strongly disagree, 2=disagree, 3=neutral, 4=strongly agree.

Table 4.3: Dynamic Capability

Statements	Min	Max	Mean	Std. D

Our company quickly understand new opportunities to serve our clients	1.00	5.00	3.6640	1.07721
Our company is very good at observing and anticipating technological trends	1.00	5.00	3.4240	1.21989
Our company regularly check the quality of our functional capabilities in comparison with the competition	1.00	5.00	3.8480	1.14340
Our company frequently acquire knowledge about technologies and market trends from external sources	1.00	5.00	3.3520	1.23951
Our company strategically identify and acquire external knowledge (e.g., market, technology) very quickly	1.00	5.00	3.2240	1.18365
Our company the capabilities to effectively develop novel ideas with the potential to impact on product development	1.00	5.00	3.3920	1.20413
Our company effectively transformed available knowledge into new resources (e.g., new organization structure, new technical equipment)	1.00	5.00	3.4000	1.51338
Our employees bring about changes that are outside the available capabilities	1.00	5.00	4.0000	1.01600
Our workers effectively identify priced capability elements, connect, and combine them in new ways	1.00	5.00	3.5440	1.26685

Source: Field Data, 2023

The result on dynamic capability has been presented in the Table 4.3. The result revealed that, the respondents were not sure that, their company quickly understands new opportunities to serve client (M=3, SD=1). The respondents were not sure that, their company is very good at observing and anticipating technological trends (M=3, SD=1). Also, the respondents were not sure that, their regularly check the quality of our functional capability in comparison with the competition (M =3, SD-1). The respondents were not sure that, their company frequently acquire knowledge technologies and market trends from external sourcing (M=3, SD=1). The respondents were not sure that, their company strategically identity and acquire external knowledge (M=3, SD=1). Moreover, the company capabilities to efficiently develop novel ideas with the potential to impact on product development (M=3, SD=1). The respondents were not sure that, their company effectively transformed available knowledge in to new resource (M=3, SD=1). The respondents agreed that, their employee bring about changes that are outside the available capability (M=4,

SD=1). The respondents were not sure that, their workers effectively identify priced capability element, connect and combine them in new ways (M=3, SD=1). The implication of the result with regard to dynamic capability majority agreed that the employees bring about changes that are outside the available capabilities. Meanwhile, majority neither agreed nor disagreed that, their firm uses capabilities to efficiently develop novel. Also, whether there is observation and anticipation of trends in technology. Again, whether there is frequently acquire knowledge in technologies.

4.4 Environmental Performance

This section presents the descriptive statistics results on environmental performance. The Five-point Likert scale was used in measuring the respondents' level of agreement. Where 1=strongly disagree, 2=disagree, 3=neutral, 4=strongly agree.

Table 4.4: Environmental Performance

Statements	Min	Max	Mean	Std. D
Our company has reduced in air emission/waste water/solid waste.	2.00	5.00	3.9920	1.08134
Our company has decreased in consumption of hazardous/harmful/toxic materials.	1.00	5.00	3.6800	1.30508
Our company has reduction in energy consumption.	1.00	5.00	3.9360	1.04530
Our company has decrease in frequency for environmental accidents.	1.00	5.00	3.9600	1.05035
Our company has improved in the compliance to environmental standards.	1.00	5.00	3.9840	.80306
Our company has improved in the ability of reuse/recycle.	1.00	5.00	3.9840	.71824
Our company has improved a firm's environmental situation	1.00	5.00	4.0400	1.15981

Source: Field Data, 2023

The result on environmental performance has been presented in the Table 4.4. The result revealed that respondents were not sure that, their company has reduces in air emission /waste water /solid waste (M=3, SD=1). The respondents were not sure that, their company has decreased in consumption of hazardous material (M=3, SD=1). The respondents were not sure that, their

company has reducing in energy consumption (M=3, SD=1). The respondents were not sure that, their company has decrease in frequency for environmental accidents (M=3, SD=1). The respondents were not sure that, their company has improved in the compliance to environmental standards (M=3, SD=1). The respondents were not sure that, their company has improved in the ability of reuse /recycle (M=3, SD=1). Lastly, the respondents agreed that, their company has improved a firms environmental situation (M=4, SD=1). The implication of the result with regard to environmental performances, majority there is improve environmental situation. Meanwhile, majority neither agreed nor disagreed their firm practice environmental performance. For instance, whether there is improvement in the reuse/recycling ability, whether there is improved compliance with environmental standards. Also, whether there is reduction in the consumption of energy.

4.5 Reliability and Validity Test

The reliability and validity test of the measurement constructs have been presented using the Cronbach alpha and factor analysis respectively.

4.5.1 Reliability and Validity Test on Sustainable Supply Chain Management

The result on the reliability and validity test on sustainable supply chain management has been presented in the Table 4.5. According to Hair et al. (2010), a measurement instrument is said to be valid and reliable when the factor analysis is 0.5 or better and a Cronbach alpha score is 0.7 or better respectively. The factor analysis for the construct ranges from 0.508 to 0.820. While, the Cronbach alpha score is 0.882. Hence the construct is valid and reliable.

Table 4.5: EFA on Sustainable Supply Chain Management

	Factor Loading
Our company has support for protection from mid-level manager	.508

Our company has cross-functional collaboration for environmental improvement	.616
Our company has promotion and implementation of environmental laws and regulations	.601
Our company regularly inspects and maintains environment protection facilities and equipment	.820
Our company has environmental laws and regulations for staff education and publicity to raise environmental awareness	.740
Our company use life-cycle analysis to evaluate the environmental friendliness of products	.554
Our company has design products to reduce the use of raw materials or energy	.602
Our company has design products for recycling or reuse	.576
Our company has establish the recycling system of waste products	.773
Our company suppliers are selected using environmental criteria	.704
Our company has eco-labeling of purchased products	.761
Our company cooperates with suppliers for environmental objectives	.654
Our company has environmental audit for suppliers' internal management	.870
Our company has investment recovery system	.664
Our company has sale of scrap and used materials	.730
Our company has sale of excess capital equipment	.622
Our company cooperates with customers for environmentally friendly design	.584
Our company cooperates with customers for cleaner production	.648
Our company cooperates with customers for green packaging	.728
Eigenvalue	7.134
% of Variance	37.547
Cronbach Alpha	0.882
KMO=0.772; Chi-Square=1406.085; df=171; Sig.=0.000	

Extraction Method: Principal Component Analysis.
a. 6 components extracted.

4.5.2 Reliability and Validity on Dynamic Capability

The result on the reliability and validity test on dynamic capability has been presented in the Table 4.6. According to Hair et al. (2010), a measurement instrument is said to be valid and reliable when the factor analysis is 0.5 or better and a Cronbach alpha score is 0.7 or better respectively. The factor analysis for the construct ranges from 0.691 to 0. 849. While, the Cronbach alpha score is 0. 893. Hence the construct is valid and reliable.

Table 4.6: EFA on Dynamic Capability

	Factor loading

Our company quickly understand new opportunities to serve our clients	.780
Our company is very good at observing and anticipating technological trends	.691
Our company regularly check the quality of our functional capabilities in comparison with the competition	.824
Our company frequently acquire knowledge about technologies and market trends from external sources	.809
Our company strategically identify and acquire external knowledge (e.g., market, technology) very quickly	.754
Our company the capabilities to effectively develop novel ideas with the potential to impact on product development	.782
Our company effectively transformed available knowledge into new resources (e.g., new organization structure, new technical equipment)	.723
Our employees bring about changes that are outside the available capabilities	.798
Our workers effectively identify priced capability elements, connect, and combine them in new ways	.849
Eigenvalue	5.037
% of Variance	55.967
Cronbach Alpha	0.893
KMO=0.708; Chi-Square=730.961; df=36; Sig.=0.000	

Extraction Method: Principal Component Analysis.
a. 2 components extracted.

4.5.3 Reliability and Validity on Environmental Performance

The result on the reliability and validity test on environmental performance has been presented in the Table 4.7. According to Hair et al. (2010), a measurement instrument is said to be valid and reliable when the factor analysis is 0.5 or better and a Cronbach alpha score is 0.7 or better respectively. The factor analysis for the construct ranges from 0.631 to 0.926. While, the Cronbach alpha score is 0. 889. Hence the construct is valid and reliable.

Table 4.7: EFA on Environmental Performance

	Factor loading
Our company has reduced in air emission/waste water/solid waste.	.844
Our company has decreased in consumption of hazardous/harmful/toxic materials.	.796
Our company has reduction in energy consumption.	.926
Our company has decrease in frequency for environmental accidents.	.858
Our company has improved in the compliance to environmental standards.	.844
Our company has improved in the ability of reuse/recycle.	.678
Our company has improved a firm's environmental situation	.631

Eigenvalue	4.413
% of Variance	63.039
Cronbach Alpha	0.889
KMO=0.715; Chi-Square=672.874; df=21; Sig.=0.000	

Extraction Method: Principal Component Analysis.
a. 2 components extracted.

4.6 Correlation Matrix

This section presents the relationship that exists between the constructs used in the study.

Table 4.8: Correlation Matrix

	SSCM	Dynamic Capability	Environmental Performance
SSCM	1		
Dynamic Capability	0.132 (0.141)	1	
Environmental Performance	0.171 (0.056)	0.761** (0.000)	1

**. Correlation is significant at the 0.01 level (2-tailed).

The Table 4.8 presents the correlation matrix, the study revealed that sustainable supply chain management practices had significant correlation with environmental performance (r=0.171, p-value < 0.05). Also, the study revealed that dynamic capability had significant correlation with environmental performance (r=0.761, p-value < 0.05).

4.7 Regression Results

This section presents the regression results which addressed the objectives of the study.

Table 4.9: Multiple Regression

	Performance Model 1	Performance Model 2	Performance Model 3	Sig.	Collinearity	
	Beta(t-value)	Beta(t-value)	Beta(t-value)		Tolerance	VIF
Sustainable SCM	0.080(1.927)			0.056	1.000	1.000
Dynamic Capability		.535(12.997)		0.000	1.000	1.000

Interaction effect

DC * SSCM			.005(10.338)	0.000	1.000	1.000

Model Fitness			
R	0.171	0.761	0.682
R Square	0.029	0.579	0.465
Adjusted R Square	0.021	0.575	0.461
Durbin-Watson	1.428	1.361	1.334
df	1	1	1
F-statistics	3.712	168.922	106.874
Sig.	0.056	0.000	0.000

a. Dependent Variable: Environmental Performance

Table 4.9 presents the multiple regression results, three main hypotheses were tested in the study. The first hypothesis is to examine the relationship between sustainable supply chain management and environmental performance, the second hypothesis is to examine the relationship between dynamic capability and environmental performance, and the third hypothesis is to examine the moderating role of dynamic capability on the relationship between sustainable supply chain management and environmental performance. The results in the model 1 indicated that, 2.9% change in the dependent variable (environmental performance) is explained by the independent variable (sustainable supply chain management practices). Also, the study found that sustainable supply chain management practices had significant effect on environmental performance (β=0.080, T-value = 1.927, p-value < 0.05). The results in the model 2 also indicated that, 57.9% change in environmental performance is explained by the moderating role (dynamic capability) and found that, dynamic capability had significant effect on environmental performance (β=0.535, T-value = 12.997, p-value < 0.05). Lastly in the model 3, the results indicated that, 46.5% change in environment performance is explained by both independent and moderating variables. Again, the result revealed that, dynamic capability significantly moderate the relationship between sustainable supply chain management practices and environmental performance (β=0.005, T-value = 10.338, p-value < 0.05). The result implies that any variation in the dependent variable is

explained by the independent variables. Again, sustainable supply chain management practices and dynamic capability predict environmental performance of the selected companies.

4.8 Discussion of the Results

4.8.1 Sustainable Supply Chain Management and Environmental Performance

The results indicated that, sustainable supply chain management practices had a substantial impact on environmental performance. The research findings are acknowledged and substantiated through empirical evidence, the industry can decide which aspects to focus on to improve sustainability by developing effective strategies to achieve long-term sustainability based on the triple bottom line (Karmaker et al. 2023). Environmental practices in supply chain management support and encourage resource reduction, cleaner technologies, improved logistics and emission reductions, which logically contribute to improved environmental and operational performance (Baliga et al., 2019). Existing literature shows that green procurement, return on investment and eco-design use a range of strategies, such as reuse, recycling, refurbishment, renovation and repair, to ensure reduced environmental impact (Panigrahi et al., 2018). Designing products for recycling, reuse and reduced energy/resource consumption, leading to better use of materials and less waste in the manufacture of products, are implications of ecodesign in the supply chain leading to improved EP (Jabbour et al., 2015; Nyagadza, 2022).

Environmental practices in the supply chain are considered important for achieving good environmental and operational sustainability performance (Baliga et al., 2019). Internal environmental management has a positive and significant impact on environmental performance, while green procurement has a negative impact on environmental performance. Studies conducted

in different countries (Jabbour et al., 2015) found a significant positive relationship between GSCMPS and environmental performance. Verma (2014) found that ecodesign not only reduces the amount of energy, water and other resources used to produce a product, as well as emissions from the manufacturing process, but also increases benefits and reduces costs (Acquah et al., 2020), eco-designs enables companies to source materials that meet requirements, which includes working with suppliers to find environmentally friendly materials and components (Abdallah and Al-Ghwayeen, 2019).

A study conducted by Baah and Jin (2019) aimed to elucidate the impact of sustainable supply chain management (SSCM) on the performance of a logistics organization. Using a quantitative approach, the study revealed that SSCM has a significant positive impact on organizational performance and competitiveness. Furthermore, the research showed that organizational performance also has a significant effect on competitiveness. The research found that organisations that have implemented SSCM in their supply chains perform better.

Again, Mann and Kaur (2019) studied the impact of sustainable supply chain management (SCSM) on the financial performance of Indian firms. Data from the 100 largest listed companies in terms of market value were used for empirical analysis. Content analysis was used to analyse the principle of 'sustainability across the life cycle of products and services'. Hierarchical linear regression was used to test the hypotheses. The results showed that both aspects of SSCM - sustainable sourcing and resource utilisation - have a significant positive impact on a company's financial performance.

Moreover, Hamdy et al. (2018) explored how sustainable supply chain management practices influence the performance of organizations in Egypt. A substantiated sample was selected for the study. Only directors and workers of the supply chain and ERP departments of Egyptian organizations included in the SandP/EGX and ESG index participated in the survey, and the sample included companies corresponding to the EGX100 index. The questionnaire comprised three sections: (1) company and respondent profiles, (2) level of sustainable supply chain management practices and (3) company performance. A total of 72 companies were identified. In conclusion, SSCM practices have an impact on company performance.

Furtherance, Esfahbodi et al. (2016) investigated and compared the environmental impacts and costs of CGM implementation in emerging economies. Using this productive approach, data were gathered from a subset of managers within companies situated in both China and Iran. A questionnaire was distributed to various managerial roles, including plant managers, logistics managers, operations managers, purchasing managers, supply chain managers, sales managers, technical managers, and industrial waste managers, among others to evaluate the environmental impact of CGCA. The results showed that supply chain management practices, including sustainable production, have a positive and significant impact on the environmental performance of manufacturing companies in two developing countries. The study concluded that the implementation of sustainable supply chain practices can improve the environmental performance of the two selected manufacturing companies, thereby enhancing their environmental performance.

Also, Ahmadin et al (2017) presented a framework to understand the drivers of sustainable supply chain management (SCM) practices in the petroleum industry. This framework explains the external and internal factors that can influence SCM implementation. There are few studies that focus on different aspects of SCM in the petroleum industry. Carter and Easton (2016) present a structured review of the relevant literature. Sustainable Supply Chain Management (SSCM) has been published in prominent logistics and supply chain management journals for more than two decades. The findings show that the field of sustainability and employment management has evolved from a single social and environmental perspective and research using a CSR perspective to sustainability perspectives such as the 'triple bottom line' to the beginning of convergence and the development of sustainability and employment management as a theoretical framework. Although ESSM has become theoretically richer and methodologically more rigorous, there is still much room for improvement in theory, methodology and the role of governance in future research.

4.8.2 Dynamic Capability and Environmental Performance

The research findings also indicated that, dynamic capability had significant effect on environmental performance. The results are supported and empirically supported. For example, research on environmental issues shows that companies can position themselves as 'green' and achieve competitive advantage if they voluntarily and proactively integrate environmental goals and strategies into their business model (Pieroni et al., 2016; Hoffmann et al., 2016), and take advantage of new strategic opportunities arising from the need for environmental excellence (Da Giau et al., 2016). To achieve environmental excellence, organisations need to change existing processes, respond to the needs of internal and external stakeholders and develop new capabilities to address environmental challenges (Pace, 2016; Hoffmann et al., 2016). Faced with such

complex sustainability challenges, companies cannot simply make additional changes to their operations (Oliveira-Dias et al., 2022). To ensure good environmental performance, companies need to engage key stakeholders in their strategies and address issues related to environmentally friendly products, reduction of non-renewable and polluting resources and environmental regulations (Boronat-Navarro and Garcia-Joerger, 2019; Eikelenboom and De Jong, 2019).

Also, Hernández-Linares (2020) analysed the individual impacts of the four dimensions within the dynamic capabilities component (perception, learning, integration, and coordination) on firm performance, while also investigating the role of market orientation (MO) within this framework. Our findings, derived from a sample encompassing 509 Spanish SMEs, underscore that not all dimensions of dynamic capabilities (DC) hold equal significance for SME performance. Furthermore, we find that market orientation has a significant impact on the relationship between perceived and acquired competencies and firm performance.

Again, Costa et al. (2020) assessed DC in the context of the not-for-profit sector, and examined the relationship between DC and the performance of these organisations. Data from 169 Brazilian nonprofit organisations were analysed using confirmatory factor analysis. The results show that adaptive capacity, absorptive capacity, mobilising capacity and innovative capacity determine the development performance of nonprofit organisations and that the performance of these organisations can be assessed through control mechanisms and growth dimensions. Furthermore, development collaboration has a direct and significant impact on the performance of the organisations studied.

Also, Chiu et al. (2016) developed a structural model of the relationship between four types of dynamic capabilities and radical innovation performance (RIP) in established organisations. The suggested hypotheses were assessed utilizing a structural equation model with a dataset comprising 500 sizable Taiwanese manufacturing firms. The research findings show that the four types of dynamic capabilities and RIP are systematically and structurally positively correlated. The research asserts that the systematic development of dynamic capabilities can improve the TLP of existing firms.

Furthermore, Park and Kim (2013) evaluate dynamic capabilities and emerging product development performance in Korean high-tech SMEs. Based on the literature review, they identified resources and activities (e.g. organisational relaxation, innovation and knowledge search) that contribute to improving firms' dynamic capabilities. Data were gathered through a questionnaire administered to 241 South Korean SMEs. The empirical results indicate that knowledge restructuring, which reuses existing technological resources, contributes to dynamic capabilities, while lack of organisational resources is not significantly related to dynamic capabilities. Research activities such as network work, external knowledge seeking and academic engagement had a negative impact on dynamic competence. Perceived competence, the ability to search for opportunities and the ability to change, which support dynamic competence, were shown to positively affect new product development outcomes at the collective and global level, but not at the individual level.

Moreover, Sukaris et al. (2019) investigated the impact of factors such as middle management awareness, control and restructuring on the growth of continuous improvement. The study

employed a quantitative research design. The primary data used in this research was obtained using a Likert scale ranging from 1 to 5. As the sampling method used was a satisfactory sample, 26 middle managers participated in the study, the survey was conducted at PTS Private by Gresik, and the survey was conducted among middle managers involved in business processes. The results confirmed that the original middle managers' variables had a significant positive effect on continuous improvement growth, the middle managers' variables had no effect on continuous improvement growth, and the reconstructed middle managers' variables had no significant effect on continuous improvement growth.

4.8.3 Dynamic Capability as a moderator on the relationship between SSCM and Environmental Performance

Furthermore, the results indicated that, dynamic capability significantly moderate the relationship between sustainable supply chain management practices and environmental performance. The results are accepted and empirically corroborated. For instance, previous research on dynamic capabilities has shown that they have a positive and significant impact on firm performance. Eriksson (2014) goes on to explain that dynamic capabilities provide a competitive advantage, which in turn contributes to improved industry performance. Verma (2014) states that dynamic capabilities are a relatively new concept, that they have a significant impact on sustainable performance and that there is little research on how they affect performance. The results of the study showed that dynamic supply chain capabilities have a positive impact on sustainable performance of companies and new products. In addition, other researchers have examined this relationship along several specific dimensions and found that strategic collaboration capability

contributes to a firm's sustainable advantage; SSCM helps to achieve short-term competitive advantage, which can be enhanced by developing dynamic capabilities.

Further, Kirci and Seifert (2015) analyse internal capabilities that enable firms to realise more environmentally sustainable supply chains based on dynamic capabilities for discovery, innovation and change. We will develop a comprehensive framework that focuses on internal and external capabilities at three levels of the organisational structure. An example of the application of this concept is Nestlé's Zero Waste initiative. We argue that the activities of each actor in the supply chain are determined by internal processes and procedures, and conclude that internal and external capabilities related to transparency and information integration are important for a company's environmental sustainability efforts.

Again, Gruchmann and Seuring (2018) examine logistics social responsibility (SOL) and its relationship to dynamic capability theory to understand how logistics service providers can promote better implementation of SOL practices. Drawing on existing theories, the literature on logistics management, supply chain management (SCM) and sustainable supply chain management (SSCM) is analysed and LRS is conceptualised in relation to dynamic capabilities. Given the ongoing debate in the literature about the direct link between dynamic capabilities and competitive advantage and the necessary heterogeneity of dynamic capabilities, conceptualising LRS in terms of dynamic capabilities adds a new dimension to the debate. When it comes to long-term or sustainable competitive advantage, the current homogeneity of logistics services may prevent the achievement of long-term sustainable advantage and requires more sophisticated logistics capabilities. Hence, it is crucial to comprehend and harness the cause-and-effect

connections among various logistics resources and capabilities to attain distinctive and enduring advantages. This will enable logistics providers to enhance their Reverse Logistics and Circular practices.

Also, Hong et al. (2018) analysed the impact of SSCM practices on supply chain (SC) dynamic capabilities and firm performance (including economic, environmental and social performance), with a clear focus on the mediating effect of SC dynamic capabilities on the relationship between SSCM practices and firm performance. The results showed that SSCM practices have a significant positive impact on SC dynamic capability and on all three performance dimensions. SC dynamic capability has a positive impact only on environmental performance, but not on economic and social performance. Additionally, our assessment demonstrates that supply chain dynamic capability partially mediates the relationship between sustainable supply chain management practices and firm performance.

Moreover, Beske and colleagues (2013) delved into an exploration of how SSCM practices empower organizations to retain control over their supply chains and attain a competitive edge by harnessing dynamic capabilities. Their research entailed a thorough examination, incorporating a content analysis of 52 articles published in reputable English-language periodicals focusing on sustainable food supply chains. In addition, specific DC factors for supply chains in sustainability-oriented industries, such as knowledge sharing and supply chain transformation, were identified. The food industry was then analysed against SSCM and DC criteria to understand the strategies used in these trade markets. The research findings indicate that sustainable practices and DC are being applied in the supply chain to improve traceability and meet customer requirements.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter serves as the study's conclusion, aiming to evaluate the connection between sustainable supply chain management and environmental performance while underscoring the moderating influence of dynamic capabilities. Within this chapter, you will encounter a

comprehensive recapitulation of the research results, concluding observations, actionable suggestions, and promising directions for future investigation.

5.1 Summary of Findings

5.1.1 Sustainable Supply Chain Management and Environmental Performance

The results indicated that, sustainable supply chain management practices had significant effect on environmental performance. Meanwhile the research findings indicated that, most of the survey participants were uncertain about the existence of such practices in their company. For instance, whether there is the use of statutes and rules for staff education. Also, whether there is the utilization and enforcement of environmental laws and regulation. Moreover, whether there is the use of life cycle analysis for evaluation. Again, whether there is the use of design measures to minimize the consumption of raw materials or energy. Lastly, whether there is the use of environmental audit for suppliers.

5.1.2 Dynamic Capability and Environmental Performance

The results also indicated that, dynamic capability had significant effect on environmental performance. Again, most concurred that employees instigate changes that surpass the existing capabilities. Meanwhile, majority neither agreed nor disagreed that, their firm uses capabilities to efficiently develop novel. Also, whether there is observation and anticipation of trends in technology. Again, whether there is frequently acquire knowledge in technologies.

5.1.3 Dynamic Capability as a moderator on the relationship between Sustainable Supply Chain Management and Environmental Performance

Moreover, the research findings indicated that, dynamic capability significantly moderate the relationship between sustainable supply chain management practices and environmental performance. Again, the findings revealed that, majority there is improve environmental situation. Meanwhile, majority neither agreed nor disagreed their firm practice environmental performance. For instance, whether there is improvement in the reuse/recycling ability, whether there is improved compliance with environmental standards. Also, whether there is reduction in the consumption of energy.

5.2 Conclusion

The primary objective of the research is to examine the impact of sustainable supply chain management practices on environment performance and the moderating role of dynamic capability with a focus on manufacturing companies in the Accra metropolis of Ghana. The study employed both descriptive and explanatory research designs. The study used structured questionnaire. SPSS version 26 was used to perform the statistical analyses. Specifically, correlation, regression, mean and standard deviations analyses were performed. The findings revealed that sustainable supply chain management practices had a substantial impact on environmental performance. Additionally, the results demonstrated that dynamic capabilities also wielded significant influence over environmental performance. Furthermore, the findings highlighted that dynamic capabilities played a significant moderating role in the relationship between sustainable supply chain management practices and environmental performance. Hence, the study concluded that,

sustainable supply chain management practices and dynamic capability significantly predict environmental performance.

5.3 Recommendations

The following recommendations were made;

5.3.1 Practical Recommendation

The research suggests that to enhance sustainable supply chain management, management should foster efficient internal environmental management practices, including promoting cross-functional collaboration for environmental enhancements. Also, regular examinations and upkeep of environmental protection facilities and equipment should be in place. The management should also encourage eco-designing, thus, they should use life cycle analysis to assess the environmental sustainability of products. There should as well be establishment of recycling system for waste products.

Moreover, the managers should promote green purchasing, thus, they should select their suppliers using the environmental criteria. Again, they should cooperate with suppliers in order to achieve the environmental objectives. To establish investment recovery, managers should ensure that there are sales of scrap and used materials. Management should cooperate with customers for environmental conscious design and cooperate with customers for green packaging to promote cooperation between customers.

Furtherance, the study recommends that, management should ensure that the employees quickly understand new opportunities. Again, the managers should ensure regular check on quality of functional capability in comparison with competition. They should ensure their company

frequently acquires knowledge technologies and market trends from sourcing externally. Also, there should be effective transforming of available knowledge in new resources. Moreover, the study recommends that, managers should promote reduction in air emission/waste. They should also decrease the consumption of hazardous materials. They should ensure there is reduction in environmental accidents thereby promoting and introducing of safety and hazards precautions. Every companies aim is to make profit and become effective and efficiency with this competitive era. Managers are to put check and balances in place to help promote the aim and objectives of the organization. Any individual who fails to comply with the initiatives of the organisation should face the wrath of the management.

5.3.2 Policy Recommendation

There should be implementation of policies that will promote sustainability practices as well as set committees who will go into the various organisations to do check and balances. Any organisation that fails to comply with the sustainability initiatives should be penalized.

The government should initiate reinforce e-government services, tax reductions and subsidies, advancing in technology and digitization and restructuring regulation in order to achieve waste reduction, resource conservation and circular economy practices.

5.3.3 Areas for further studies

The primary objective of the research is to examine the impact of sustainable supply chain management practices on environment performance and the moderating role of dynamic capability

with a focus on manufacturing companies in the Accra metropolis of Ghana. The research employed both a descriptive and explanatory research designs. The research therefore suggests that, further studies should focus on using different research designs.

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APPENDIX

SURVEY QUESTIONNAIRE

Dear Respondent,

This questionnaire is part of a study that is aimed to examine the impact of sustainable supply chain management practices on environment performance and the moderating role of dynamic capability with a focus on manufacturing companies in the Accra metropolis of Ghana. Kindly select the right response from among alternative answers for each question by ticking in the appropriate box. You are assured of the confidentiality of this exercise because it will be solely used for academic purpose. Thank you for your contribution.

Please tick (√) one where multiple answers have been provided

Section A: Background Information

1. **Sex**

a. Male
b. Female

2. **Age**
   a. <30
   b. 30-35
   c. 36-40
   d. 41-45
   e. 46+

3. **Organisational level**
   a. Senior
   b. Middle manager
   c. Operations manager

4. **Job categories**
   a. Administrative Manager
   b. Accounting and financial manager
   c. Supply chain manager
   d. Assistant supply chain manager
   e. Supply chain officer
   f. Other (specify)……

5. **How long have you been working in this sector?**
   a. Less than 5 years
   b. 5 to 10 years
   c. 11 to 15 years
   d. Above 15 years

PART B: SUSTAINABLE SUPPLY CHAIN PRACTICES

Indicate your level of agreement or disagreement using the 5-point Likert scale with each of the following statement with regards to sustainable supply chain management practices. Where 1-strongly disagree; 2-disagree; 3-neutral; 4-agree; 5-strongly agree

Statements	**1**	**2**	**3**	**4**	**5**
Internal Environmental Management					
Our company has support for protection from mid-level manager					
Our company has cross-functional collaboration for environmental improvement					
Our company has promotion and implementation of environmental laws and regulations					
Our company regularly inspects and maintains environment protection facilities and equipment					
Our company has environmental laws and regulations for staff education and publicity to raise environmental awareness					

Eco-design					
Our company use life-cycle analysis to evaluate the environmental friendliness of products					
Our company has design products to reduce the use of raw materials or energy					
Our company has design products for recycling or reuse					
Our company has establish the recycling system of waste products					
Green Purchasing					
Our company suppliers are selected using environmental criteria					
Our company has eco-labeling of purchased products					
Our company cooperates with suppliers for environmental objectives					
Our company has environmental audit for suppliers' internal management					
Investment Recovery					
Our company has investment recovery system					
Our company has sale of scrap and used materials					
Our company has sale of excess capital equipment					
Customer Cooperation					
Our company cooperates with customers for environmentally friendly design					
Our company cooperates with customers for cleaner production					
Our company cooperates with customers for green packaging					

Wang et al. (2017); Hamdy et al. (2018)

PART C: DYNAMIC CAPABILITY

Indicate your level of agreement or disagreement using the 5-point Likert scale with each of the following statement with regards to dynamic capability. Where 1-strongly disagree; 2-disagree; 3-neutral; 4-agree; 5-strongly agree

Statements	**1**	**2**	**3**	**4**	**5**
Our company quickly understand new opportunities to serve our clients					
Our company is very good at observing and anticipating technological trends					
Our company regularly check the quality of our functional capabilities in comparison with the competition					
Our company frequently acquire knowledge about technologies and market trends from external sources					
Our company strategically identify and acquire external knowledge (e.g., market, technology) very quickly					
Our company the capabilities to effectively develop novel ideas with the potential to impact on product development					
Our company effectively transformed available knowledge into new resources (e.g., new organization structure, new technical equipment)					
Our employees bring about changes that are outside the available capabilities					
Our workers effectively identify priced capability elements, connect, and combine them in new ways					

Chukwuemeka and Onuoha (2018)

PART D: ENVIRONMENTAL PERFORMANCE

Indicate your level of agreement or disagreement using the 5-point Likert scale with each of the following statement with regards to environmental performance. Where 1-strongly disagree; 2-disagree; 3-neutral; 4-agree; 5-strongly agree

Statements	**1**	**2**	**3**	**4**	**5**
Our company has reduced in air emission/waste water/solid waste.					
Our company has decreased in consumption of hazardous/harmful/toxic materials.					
Our company has reduction in energy consumption.					
Our company has decrease in frequency for environmental accidents.					
Our company has improved in the compliance to environmental standards.					
Our company has improved in the ability of reuse/recycle.					
Our company has improved a firm's environmental situation					

Zhu et al. (2004); Daily et al. (2007); Wang and Jun (2017)