

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

INSTITUTE OF DISTANCE LEARNING (IDL)

COLLEGE OF HUMANITIES AND SOCIAL SCIENCES

KNUST

**GREEN SUPPLY CHAIN ORIENTATION AND FIRM PERFORMANCE IN THE
COCOA PROCESSING INDUSTRY: EVIDENCE FROM PBC LIMITED**

BY

RUTH OTOO

(PG9279821)

**A THESIS SUBMITTED TO THE DEPARTMENT OF SUPPLY CHAIN AND
INFORMATION SYSTEMS INSTITUTE OF DISTANCE LEARNING, KWAME
NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY IN PARTIAL
FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF
SCIENCE IN LOGISTICS AND SUPPLY CHAIN MANAGEMENT**

NOVEMBER, 2023

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DECLARATION

I hereby declare that this submission is my own work towards the MSc Logistics and Supply Chain Management degree and that, to the best of my knowledge and belief, it contains no material previously published by another person nor material that has been accepted for the award of any other degree of the University, except where due acknowledgment has been made in the text.

Candidate;

Ruth Otoo (PG9279821)

Student Name

Signature

Date

Certified by

Dr. Abdul Samed Muntaka

Supervisor

Signature

Date

Certified by

Prof. David Asamoah

Head Of Department

Signature

Date

DEDICATION

I dedicate my dissertation work firstly to Almighty God for his grace and helping me complete this program successfully. I also dedicate this work to my family and many friends.

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I would like to thank God for the completion of this research.

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ABSTRACT

The cocoa processing industry plays a significant role in global supply chains, and as environmental concerns rise, the integration of sustainable practices becomes imperative. This study examines the effect of Green Supply Chain Orientation (GSCO) on firm performance within the cocoa processing industry. This study aims to assess whether a higher level of GSCO is associated with superior performance outcomes. The study collects primary data using structured questionnaires administered to 250 respondents out of which 220 respondents completed the questionnaires. Through a comprehensive analysis of primary quantitative data from PBC Limited, it was observed that PBC Limited in the cocoa processing industry has embraced a higher-than-average level of Green Supply Chain Orientation. This suggests a growing commitment within the firm towards environmentally conscious practices, including waste reduction, resource efficiency, and responsible sourcing.

Furthermore, the study revealed a positive and statistically significant relationship between GSCO and firm performance. The findings of this study underscore the importance of adopting a green supply chain orientation in the cocoa processing industry. As consumer preferences shift towards environmentally friendly products and regulatory pressures mount, businesses that prioritize sustainability throughout their supply chain not only contribute to a more sustainable future but also stand to reap significant economic benefits. It is recommended that conducting a longitudinal study to assess the long-term impact of Green Supply Chain Orientation (GSCO) on the firm performance of PBC Limited. By tracking changes in GSCO practices and firm performance over an extended period, the research can provide insights into the sustainability of positive outcomes.

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LIST OF ABBREVIATIONS

- GSCO - Green Supply Chain Orientation
- NRBV - Natural resource-based view
- PBC - Produce Buying Company Limited
- GSCM - Green Supply Chain Management

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CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

In recent times, the global business environment has been characterised by intense competition making companies invest many resources into research and development which can improve their transportation and logistics activities to attain optimal operational results

(Ahmed, Najmi, and Khan, 2019; Balon, 2020). The concept of Green Supply Chain Orientation (GSCO) which was unveiled as a result of research and development has gained gain more currency in the field of practice as it has been noted to be a key initiative that enhances environmental benefits and sustainability in firms (Sarkis and Zhu, 2018; Khan, Ahmed, and Najmi, 2019).GSCO is known to incorporate environmental thinking into supply chain management, through the design of products (Kannan *et al.*, 2014), sourcing and selection of materials (Govindan *et al.*, 2013; Hashemi *et al.*, 2015), manufacturing process (Zhu and Geng, 2013), and final delivery of the product (Cucchiella *et al.*, 2015).

According to Mirhedayatian *et al.* (2014), GSCM practices are directed toward boosting EP, given that GSCM makes chances to minimize greenhouse emissions and solid waste; therefore, the evaluation of GSCM is important for any firm's performance. Sharma *et al.* (2017) asserted that companies are taking steps to be more eco-conscious and greener within their trade objectives. It is deemed as a contemporary method in the twenty-first century to achieve efficiency, corporate profits, brand image, and market share as well as environmental concerns, and it is increasingly becoming important in managing the current trade.

Meanwhile, the contribution of Ghana's cocoa processing industry to national development cannot be understated. On the backdrop of this situation, the onus, therefore, lies on the Ghanaian cocoa processing industry to consider going "green" via the adoption of GSCM to offset a higher percentage of this operational cost, while at the same time enhancing

environmental, social, and economic performance (Afum *et al*, 2020). This study focuses on cocoa processing industry as they contribute significantly to environmental challenges such as wastage, water pollution, air pollution, and climate change (Kraus *et al*, 2020; Ghosh *et al*, 2022).

1.2 Problem Statement

The Cocoa processing industry in Ghana has over the years contributed significantly to the economic growth of the country. Following recent government policies and international regulations toward going green in production, Ghanaian cocoa processing industry just like several firms globally has made frantic efforts to join the train as they have been perceived to be a major contributor to environmental pollution. Thus, pressure from relevant stakeholders has been instrumental in shaping efforts to practice Green Supply Chain Orientation (Kassinis and Vafeas, 2006; Ahmed, Najmi, and Khan, 2019). Some authors (Zhu *et al*, 2013; Zhang and Yang, 2016; Sarkis and Zhu, 2018; Ahmed, Najmi, and Khan, 2019) have also suggested that processing firms are noted to adopt green initiatives to enhance their environmental, operational and financial performance.

Earlier studies conducted on Green Supply Chain Orientation and performance had arrived at inconclusive results, thus both positive and negative relationships have been found between GSCM and performance. Authors including (Lee *et al*, 2013, 2015; Lai *et al*, 2012, Dou *et al*, 2013; Zhu *et al*, 2013; Chiou *et al*) found positive relationships between GSCM and performance in their study. On the contrary, authors such as (Zhu and Sarkis, 2004; Zhu *et al*, 2005) however found a negative relationship between GSCM and performance. Though GSCM is associated with performance (Qui *et al.*, 2020; Kraus *et al.*, 2020; Mahto *et al.*,

2020), there is not yet any evidence of a study conducted in Ghana which focuses on the GSCM-performance relationship. This study hence ought to be considered to bridge the gap in the literature and proffer empirical solutions to the cocoa processing industry in Ghana.

1.3 Research Objectives

The general objective of the study was to examine the effect of Green Supply Chain Orientation (GSCO) on the firm performance of cocoa processing industry in Ghana.

The specific objectives of the study included:

- i. To assess the levels of GSCO at the selected cocoa processing firm.
- ii. To assess the levels of firm performance at the selected cocoa processing firm.
- iii. To determine the relationship between GSCO and firm performance at the selected cocoa processing industry firms.

1.4 Research Questions

- i. What is the level of GSCO at the selected cocoa processing firm?
- ii. What is the level of firm performance at the selected cocoa processing firm?
- iii. What is the nature of the relationship between GSCO and firm performance at the selected cocoa processing firm?

1.5 Significance of the Study

Undertaking this study to examine the green supply chain orientation (GSCO) on firm performance of cocoa processing firms will be benefit stakeholders such as managers, researchers, and policy makers.

This study will be of much benefit to managers in the Cocoa processing company as findings of the study will inform managers on the effects of green supply chain management on firm

performance and come up with a strategic policy which will ensure cocoa processing company gain competitive advantage and hence lead to an improvement in the firm performance.

Also, findings of this study will influence policy makers to understand the impact of GSCO on the performance of cocoa processing firms. Understanding the impact of GSCO on businesses will enable policy makers to put in place legislation which will compel other processing and manufacturing firms to be environmentally cautious.

The study will as well be of importance to managers in different sectors or industries as well as the public sector as findings of the study will project the impact of the GSCO on firm performance so they can strategize the positions of their firms with respect to having regards for the environment to achieve a sustained competitive advantage.

Findings of this study will also enrich existing literature on green supply chain management and firm performance and serve as a guide to researchers and students who wish to undertake studies related to this present study.

1.6 Summary of Methodology

This study adopted an explanatory research design which is linked to the quantitative research methodology. The study dwells on the explanatory research design as it is known to be suitable research design for studies which seek to establish relationships (Saunders *et al* 2007). The study also relies on the positivism epistemological philosophy which is linked to the objectivism ontological position. Further, the study made use of primary data which is mainly cross-sectional data as the study uses data collected within a one-time period (Bryman & Bell, 2015; Creswell, 2009). The primary data was collected with the aid of close-ended questionnaires which was administered to 250 respondents in the manufacturing industry. The unit of analysis considered in this study is the firm as we focus extensively on cocoa processing

firms. Considering the limited time to execute the study, the researcher adopted the convenience sampling technique to sample respondents in the manufacturing industry to provide relevant information. Data collected from the respondents was coded into an Excel spreadsheet and then later transported into Statistical Package for Social Sciences (SPSS) software for further analysis. The researcher used the SPSS as it is known to be robust to handle large quantitative data. The researcher has adequate knowledge in using the SPSS for conducting scientific analysis and deducing meanings from the result.

1.7 Scope of the Study

The study focuses on examining the impact GSCO have on the firm performance of cocoa processing industry. The study considers the cocoa processing industry in Ghana which implies that unit of analysis is at the firm level. GSCO is conceptualised from the perspective green purchasing, investment recovery, eco-design, cooperation with customers, internal environmental management as suggested by Zhu *et al* (2010) who used same constructs in conceptualising GSCO. While firm performance is conceptualised from an environmental (Chien 2014), operational (Zhu *et al*, 2005) and financial (Beyene, 2015) perspectives.

1.8 Limitations of Study

This study uses a quantitative research method which does not give respondents the chance to share their subjective views on the topic under discussion as it considers an objective view where all respondents provide their responses on questions asked based a Likert scale of 1 to 5. As the study relies on questionnaires which requires that data is collected in a one-time period, the study does not make use of longitudinal data which spans for years and could have given much insight into how GSCO has enhanced firm performance for a specific number of years. Despite these limitations, the findings of the study could still be generalised.

1.9 Organisation of the Thesis

This study adopts a five-tier structure to ensure the study is properly organized. Chapter one of this study focuses on projecting the problem under discussion by giving a proper background that brings forth the key ideas better. The chapter also emphasizes what the objectives of the study are and the benefits to be derived from undertaking such a study, key limitations of the study. In Chapter two of this research, an extensive literature review was conducted to have a full grasp of the key concepts under study as well as detailing relevant underpinning theories which strengthen the discourse. Chapter three of the study focused on the methods adopted in undertaking this research and also make known the sampling techniques and sampling size to be adopted in the study. The chapter also made known the appropriate data analysis strategy and tool which is relevant to breaking down data obtained from the field into meaningful constructs. In Chapter four, the data analysis techniques and discussion of results obtained was the main focus of the chapter while discussing the results in line with the previous study. The concluding chapter of this study (Chapter five) focused on concluding the entire research by juxtaposing the objectives set out in the study with the findings obtained and making compelling recommendations that tackle the problems identified.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter focuses on reviewing relevant literature on green supply chain management, and performance. Reviewing literature which is relevant to the topic under discussion solidifies the researcher's understanding of the variables being discussed in this study. The chapter as well considers empirical review which is necessary to serve as a guide in the subsequent chapters. Theories that underpin the study are carefully considered and juxtaposed to the context of the discussion to aid explanation.

2.2 Conceptual Review

Conceptual review, a fundamental component of research, involves a comprehensive examination and synthesis of existing theories, models, and concepts related to a specific topic. Its significance lies in establishing a robust theoretical framework for research endeavors, guiding the selection of methodologies, and aiding in the identification of gaps or inconsistencies in the current literature. By offering a critical analysis of prior work, conceptual reviews inform researchers' decisions on study design and hypothesis development, fostering a deeper understanding of the subject matter. Furthermore, these reviews prevent redundancy, contribute to the scholarly conversation, and provide a context for new research within the broader academic landscape, ultimately enhancing the credibility and relevance of the undertaken research.

2.2.1 Overview of Green Supply Chain Orientation (GSCO)

Several authors such as (Teixeira *et al.*, 2016; Zhu *et al.*, 2016; Sharma *et al.*, 2017) have considered Green Supply Chain Orientation (GSCO) as a construct which incorporates processes that theoretically mitigate the tendency of an environmental hazard occurring in industrial enterprises during the processing phase of a finished product. The environmental effects of supply chain processes are dramatically impacted by GSCO, which theoretically increases the organizations' sustainability efficiency. Some scholars (Xing *et al.*, 2016; Laari *et al.*, 2017; Scur and Barbosa, 2017; Sharma *et al.*, 2017; Tramarico *et al.*, 2017) have argued that the bulk of GSCO studies concentrate on different subjects, ranging from GSCO activities to organisational research. Nevertheless, it is worth mentioning that the GSCO concept was introduced quite recently and helps in explaining the reason there is inconclusiveness in studies conducted on GSCO. Thus, related theories which explain the GSCO concept are still in the developmental stage to enhance the implementation of GSCO practices successfully (Kusi-Sarpong *et al.*, 2016). Other scholars including (Hervani *et al.*, 2005; Kuei *et al.*, 2015; Laari *et al.*, 2016; Sharma *et al.*, 2017) suggest that the main aim of Green Supply Chain Orientation is geared towards reducing adverse environmental effects including deforestation, excessive use of energy and inappropriate disposal of goods. As a realistic way to follow an environmentally based approach, GSCO practices have been established (Green *et al.* 2012a). It is possible to interpret them from four distinct viewpoints. The first view is risk-related. According to Cousins *et al.* (2004), the higher the expected loss probability for the company, the greater the possibility that the company will respond in a way to reduce the loss risk.

Green strategies for supply chain management compel companies to make green acquisitions. Such green buying will increase the economic efficiency of the company as well as these strategies and green purchasing will improve environmental performance (Green *et al.* 1998).

If green products are purchased by companies, so they also manufacture green products. In addition, research show that GSCO practices consist of green sourcing, eco-design, customer collaboration and investment recovery are the key factors in evaluating organizations' GSCO practices to improve their efficiency (Jabbour *et al.* 2014).

In this study, the researcher adopted the most commonly used and highly cited set of internal and external GSCO practices devised by Zhu *et al.* (2004; 2013). Other studies from different parts of the world have also used these sets of practices (Chandra, 2009; De Sousa Jabbour *et al.*, 2017; Vanelle, 2017). Internal practices comprise those that can be designed, planned, and implemented within the firm while external practices depend on some cooperation from external parties such as suppliers and customers (Zhu, Sarkis & Lai, 2013). Internal Environmental Management (IEM) and Eco-design (ECO) combine to form internal GSCO practices, while green purchasing (GP), cooperation with customers (CC), and investment recovery (IR) are part of the external GSCO practices.

2.2.2 Dimensions of Green Supply Chain Management

In this study, the researcher adopted the most commonly used and highly cited set of internal and external GSCO practices devised by Zhu *et al.* (2005; 2013). Other studies from different parts of the world have also used these sets of practices (De Sousa Jabbour *et al.*, 2017). Internal practices comprise those that can be designed, planned, and implemented within the firm while external practices depend on some cooperation from external parties such as suppliers and customers (Zhu, Sarkis & Lai, 2013). Green *et al.* (2012) suggested that GSCO practices should include internal environmental management, eco-information systems, ecopurchasing, cooperation with customers, eco-design and investment recovery.

2.2.2.1 Green-purchasing

The adoption of green purchasing is one of the commonly accepted dimensions of GSCO practice as it is important to procure products from the firms that are also implementing GSCO practices (Ali, Bentley & Habib, 2017). Green-purchasing may be defined as integrating environmental problems and concerns into the procurement process (Rao and Holt, 2005). Choosing the right supplier has a significant effect in realizing a company's environmental goals and a key strategic route for firms to reduce environmental impact on operations (Tseng and Chiu, 2013; Ali, Bentley & Habib, 2017). However, selecting the suitable supplier is not enough by itself to improve environmental performance. Once a suitable supplier has been selected, the supply process must be managed by adopting a strategic and collaborative understanding with the suppliers. In addition to the selection and management of the supplier, it is also important to assess whether the supplier meets the environmental criteria of the firm (Paulraj, 2011).

Green purchasing strategies arguably revolve around two key components, the evaluation of suppliers' environmental performance and mentoring to assist suppliers improve this performance. Green purchasing research has traditionally focused upon this evaluative element, with authors such as Noci (2000) detailing the range of tools and techniques in place to assess the environmental behavior of suppliers to aid in supplier selection. Often organizations urge suppliers to develop their own in-house environmental management systems, and may request that a supplier accredits to an environmental management standard such as ISO 14001 (Rao & Holt, 2015).

According to Lee (2008), a buying organization with an environmental supply chain initiative will pay attention to environmental practices of their suppliers, especially the small and medium-sized enterprises. In order to ensure that suppliers meet their environmental objectives, the buying firm may deploy collaboration-based activities that include training, environmental

information sharing and joint research. Other organizations may adopt a less collaborative approach by simply demanding that their suppliers adopt environmental systems such as ISO 14001. According to Heras-Saizarbitoria *et al.* (2011) and Vachon (2007), external motivators and particularly, customer pressure are key drivers of the adoption of ISO 14001. Other aspects of green purchasing that have been discussed in the literature include the facilitation of recycling, reuse and resource reduction (Large and Thomsen, 2011; Diabat and Govindan, 2011). There is also evidence that some organizations adopt a compliance and evaluative approach to the GSCO practices of their suppliers. This involves evaluation of suppliers based on environmental criteria and a requirement for suppliers to develop and maintain some form of environmental management system (EMS) (Sarkis, 2012; Zhu *et al.*, 2005; Large and Thomsen, 2011; Min and Galle, 2001).

2.2.2.2 Investment recovery

Investment recovery, which is just another dimension, comes forward as one of the most frequently investigated dimensions in GSCO studies. Investment recovery means the sales of superfluous tools (stocks, production equipment, waste), and the improvement of asset utilization. According to Zhu and Sarkis (2005). Investment recovery is a traditional business practice where excess inventories/materials or the scrap/used materials are resold. Even though investment recovery may not be the most sustainable practice, it does lengthen the life of the product or material where it can be recycled into other products or materials (Zhu *et al.*, 2007). Besides the financial benefits, these methods also have a positive impact on the environment, which is cited for example in the works of Zhu *et al.* (2008) and Chen *et al.*

(2012). According to a survey on the Hungarian automotive industry, the trends of

Hungarian supplier networks tend to follow the global trends, which means multi-layered (34 layers) networks “dominated” by international primary supplier companies. Hungarian companies tend to figure as second-, third- or even lower supplier levels.

Zhu *et al.*, (2007) described investment recovery as the sale of excess inventories, scrap and used materials, and excess capital equipment. Investment recovery can be seen as the utilisation of idle resources for better purposes (Jabbour *et al.*, 2015), closed loop of reuse and recycle of by-products. In this way an organisation can reuse or remanufacture products economically while reducing its negative impact on environment. The objective of investment recovery is to recover the highest value from obsolete, end-of-life products and surplus items (Ayres *et al.*, 1997). Investment recovery includes ways to reduce the generation of waste and adopt the best form of waste disposal based on cost-benefit, considering, for example, the sale of excess stock/material, the sale of scrap, partnerships with recycling sites, setting up a recycling system or a reverse logistics system (Franco, 2014). Recovery typically happens at the end of the supply chain cycle, also known as the method of “closing the loop” (Zhu, Sarkis, Cordeiro, & Lai, 2008). Zhu and Sarkis (2005) further commented that investment recovery may increase a product’s life as the product can be recycled into other usable materials. To recover expenses, excess inventory or materials, scrap, used materials and equipment are sold when new items are purchased. Therefore, collaboration with suppliers is essential to ensure new products are designed in an environmentally sound way.

2.2.2.3 Cooperation with Customers

Customer cooperation (CC) refers to the extent of collaboration with a supply chain partner who eagerly contributes towards green practices, procedures, packaging, and recycling in achieving sustainability objectives in environmental supply chains (Burki, Ersoy & Najam,

2019). In today's environment, businesses need to go beyond traditional thinking and acknowledge customers as strategic partners for collaborations on greening issues. Customer cooperation is critical because it helps in developing a reliable sustainable compliance system (Lam, Van de Voorde & Green, 2020). Cooperation effort between focal company and supplier is the main ingredient of GSCO to facilitate supply-side environmentally and socially responsible activities. Cooperation in terms of environmental is an approach that helps firms to develop and support the environmental prowess of their supply partners (Klassen & Vachon, 2003; Chin *et al*, 2015). According to Paulraj (2011), environmental collaboration includes cooperating with suppliers to achieve environmental objectives and improve waste reduction initiatives, providing suppliers with design specification that include environmental requirements for purchased items, encouraging suppliers to develop new source reduction strategies, working with suppliers for cleaner production and helping suppliers to provide materials, equipment, parts and services that support organizational goals. Besides, top management plays a critical role in affecting the scope of an organizational sustainability practices. Accordingly, environmental cooperation is one of the initiatives responses to environmental problems, focuses on environmental protection, and promotes coordinated development of economic and environment perspectives (Li, 2011). Tseng *et al*. (2015) argued that firms are unlikely to perform well if GSCO is practiced in isolation. To mitigate ever increasing environmental concerns of various stakeholders, a firm should pay attention to external partners of the supply chain along with internal business operations (Laari *et al.*, 2016). Downstream buyers or customers are essential to help reduce environmental impact of the organisation and cooperation with customers significantly determines organisations productivity. Cooperating with customers helps customers understand a company's intention of GSCO practices and the company can also better understand customer expectation and requirements. In addition, this can help improve customer satisfaction, because of having close

contact with customers and local organisations, organisations have greater opportunities in understanding, encouraging and collaborating with customers for environmental practices. The GSCO practices proposed by Zhu *et al.* (2007) were implemented in Chinese companies by (Huang *et al.*, 2012; Huang *et al.*, 2015). These practices have won some recognition and were adopted by some later studies including Lee *et al.* (2012) and Laosirihongthong *et al.* (2013).

2.2.2.4 Eco-design

Eco-design (ED), also called ‘design for the environment’, refers to the extent to which firms generate products and/or production processes that have minimal impact on the natural environment (Zhu *et al.*, 2008). It is a long-term pollution prevention strategy that considers the design of products for easy disassembly, remanufacturing or recycling (Tukker *et al.*, 2001), and involves various green activities over the product life cycle, including environment-friendly disposal. An eco-design strategy can offer firms several advantages over their competitors through the production of more durable products and the design of products or production processes with less energy consumption. The successful implementation of these practices requires investment in developing infrastructures such as technology and human resources, as well as close collaboration with customers and suppliers (Vachon and Klassen, 2006; Vachon, 2008).

The importance of eco-design was identified by Buyukozkan and Cifci (2012) when they revealed that about 80 percent of product related impacts on the environment can be influenced during design. Eco-design practices fall into two main categories – product-related design and packaging-related design. With respect to product design, Min and Galle (2001) suggested that cost saving opportunities at the beginning of the supply chain tend to be greater and that buying organizations need to actively seek for opportunities to utilize recycled and reused components.

However, Wu *et al.* (2011) stressed that the environmental impacts of a product occur at all stages of its lifecycle and they identified lifecycle assessment as a commonly used attribute of GSCO. Building on the theme of lifecycle impacts, Field and Sroufe (2007) noted that one of the sources of recycled materials is postconsumer waste while Zhu *et al.* (2005) suggested that it is possible to sell or reuse products or their contents. The implication is that it is important for organizations to ensure that their products comprise contents that can be reused or recycled. This study measured product related eco-design by the proportion of the focal firm's products that contain recycled or used materials, the use of lifecycle assessment to evaluate the environmental load of products, and ensuring that recyclable or reusable contents are designed into the products. With respect to packaging-related eco-design, a discussion of GSCO practices by Zhu *et al.* (2005) suggested that organizations and their suppliers should collaborate to ensure that they use green packaging for their products. Other studies have identified elements of green packaging to include ensuring that packaging is reusable and recyclable (Large & Thomsen, 2011; Carter and Carter, 1998), minimizing waste by reducing packaging (Walker *et al.*, 2008), and avoidance of hazardous material (Buyukozkan & Cifci, 2012).

2.2.2.5 Internal Environmental Management (IEM)

The internal environmental management (IEM) factor includes the operational activities and practices of management within the organization through top management vision, middle management involvement, and spreading across all organizational members through the establishment of cross-functional teams (Yildez Çankaya & Sezen, 2019; de Sousa Jabbour *et al.*, 2013; Dues, Tan, & Lim, 2013; Koh, Gunasekaran, & Tseng, 2012; Zhu, Sarkis and Lai,

2007; Zhu *et al.*, 2010; Zhu, Sarkis, Lai, 2008; Azevedo *et al.*, 2011, 2012). Generally speaking, ecological initiative activities involve the large amount of fixed capital and changing systems such as installing a new machinery, tools, equipment, and redesigning objectives because it encourages the internal team to understand its role and responsibilities (Balon, Sharma and Baruna, 2016; Gavronski *et al.*, 2011; Li, 2011; Lun, 2011; Zhu *et al.*, 2011). Proactive companies focus on the IEM as a foundation for the whole GSCO change process. Besides the environmental management systems, some companies apply total quality environmental management, which is a result of integrating environmental concerns into the total quality management philosophy (Ahmed, 2001; Eltayeb, Zailani, & Ramayah, 2011; Zhu *et al.*, 2005; Zhu & Sarkis, 2006; Chan & Lau, 2001; Vachon & Klassen, 2007).

2.2.3 Performance

The concept has been surprisingly poorly defined and used in the literature, while efficiency is of concern to researchers in every field of management and important for the sustainability and success of businesses (Richard *et al.* 2009). In order to achieve priorities and targets, Lebas (1995) describes efficiency as the potential for the possible efficient execution of acts. The researchers would consider the success of manufacturing companies from an environmental, organizational and financial viewpoint in this report. Writers, like (Klassen & McLaughlin, 1996; Huo, 2012), have proposed that the financial influence of the GSCO activities of an organization is concerned with operating efficiency.

One of the principal measures of this analysis is the financial performance of companies. It is worth noting that the combination of profitability, growth, liquidity, productivity, size and leverage are all calculated accurately as financial performance metrics (Carton & Hofer,

2006). Output can be calculated with one or a mixture of both of these metrics, according to Kraus *et al.* (2012), and hence perceived financial, perceived non-financial, and archival financial indicators.

In an evolving human perspective, environmental protection refers to the long-term conservation of valued environmental capital (Ugochukwu *et al.*, 2008). Similarly, Callicot and Mumford (1997) expressed ecological resilience as “the fulfillment of human desires without considering the well-being of ecosystems”. The focus of the concepts is on problems in the natural world from which materials are sourced to begin the operation of the supply chain (Sutton, 2004; Ugochukwu *et al.*, 2008; Morrelli, 2011; Callicot and Mumford, 1997). Saeed *et al.* (2018)'s view with respect to environmental sustainability is that it is necessary to align leading suppliers and customers to ensure that environmental sustainability is strengthened.

In measuring both financial and non-financial performance among manufacturing companies, previous studies have generally adopted objective and subjective measurement approaches. Objective measures are data based, while subjective measures are usually self-reported. In privately held enterprises, where there is the hierarchy of ownership is higher, disclosing private financial performance is extremely difficult. Bello *et al.* (2016) submit that subjective performance measures are appropriate and serve the same purpose as the objective measures. Prior studies (e.g., Pearce, Robbins, & Robinson, 1987) have also established the reliability of subjective, self-reported measures, while Venkatraman and Ramanujam (1986) have shown that both direct and indirect measures of performance are strongly correlated. Services studies (e.g., Anning-Dorson, 2017b; Bello *et al.*, 2016; Karpen, Bove, Lukas, & Zyphur, 2015; Meier & O'Toole, 2013) have used subjective measures. Perceived financial performance indicators have been used by several studies to assess firm performance (Dess *et al.*, 1997; Wiklund, 1999; Lumpkin and Dess, 2001; Wiklund and Shepherd, 2003; Madsen,

2007; Runyan *et al.*, 2008; Kraus *et al.*, 2012; Lechner and Gudmundsson, 2012; Messersmith and Wales, 2013) and the dimensions that were used to form the performance indicators were focused on manager's subjective views about a firm's profitability, growth, and market share as compared to its competitors. According to Al-Dhaafri *et al.*, (2016), Managers should make conscious efforts to plan organisational resources so that the desired level of performance can be achieved.

2.2.3.1 Environmental performance

Environmental performance in this research refers to the ability of the organization to reduce air emissions, effluent wastes and solid wastes, while decreasing the consumption of hazardous and toxic materials Zhu *et al.* (2008). According to interdisciplinary literature on corporate environmental performance, the natural environmental factors, the country's environmental rules and regulations, and the firm's environmental policies and practices have profound effects on the company's overall production value chain system and performance (Zhu *et al.*, 2005, 2007; Zhu *et al.*, 2011; Zhu, Geng, Lai, *et al.*, 2010; Sharma & Vredenburg, 1998). Particularly, environmental rules and regulations at state level, central level, and internationally have different effects on environmental performance (Zhu *et al.*, 2007; Zhu & Sarkis, 2006; Vizayakumar & Mohapatra, 1992). Therefore, it is necessary to assess the environmental performance of GSCO in the overall SC system of the industry.

There are two ways to measure the environmental performance, namely, operational performance measures (e.g., energy/resource utilization, emission reduction, and waste dumping) and management performance measures (e.g., environmental policies and measures, the approval rate of management systems, and improvement in social and community relations and corporate image; Chien & Shih, 2007; Chiou, Chan, Lettice, &

Chung, 2011; Giovanni & Vincenzo, 2012; Liang, Yang, Cook, & Zhu, 2006); Mishra, Pundir, & Ganapathy, 2014; Papadopoulos & Giama, 2007; Styles, Schoenberger, & Galvez- Martos, 2012).

Empirical studies found that the environmental performance rules have significant impacts on company's revenues, increase market share, and create abundant market opportunities in the competitive business environment, that is, entire value chain performance (Arena *et al.*, 2003; Garg & Deshmukh, 2006; Sheu & Talley, 2011; Russo & Fouts, 1997). Undertaking the Indian industries in the empirical setting, Bain *et al.* (2010) suggested that state-level government bodies such as the Karnataka State Pollution Control Board's new environmental policies help the organizations in regulating and tracking non-hazardous waste, preventing exploitation of informal recyclers, and encouraging recovery.

2.2.3.2 Economic performance

Economic performance is defined as per Green and Inman (2005) as the financial and marketing performance improvements resulting from implementing GSCO practices that enhance a firm's position when compared with the industry average. Financial improvement encompasses increased costs for material purchasing, decreased costs for energy consumption, decreased costs for waste discharge and decreased costs for environmental accidents.

In practice, firm's top-level executives and shareholders as well as business analysts of stock markets usually pay more attention to company's annual reports and financial health of the firm, which has a significant impact on company's share price in the stock market. It is also termed as a mirror of the firm's inside weaknesses and external strengths (Reddy, Nangia, & Agrawal, 2013). Adding this line to SC management literature, scholars have examined the relationship between corporate social performance and financial performance and the effects of SC

operations on financial performance of the industry since the 1970s (Ambec & Lanoie, 2008; Chen & Delmas, 2011; Margolis & Walsh, 2003; Orlitsky, Schmidt, & Rynes, 2003), whereas Walker *et al.* (2008) emphasized operating cost savings and logistics as crucial drivers for adopting GSCO practices.

A survey of this stream suggests that green subsidies, operational costs, market share, and green rules and regulations have profound effects on financial performance of the industry, especially when SC operational models have been greatly emphasized in the industry with a focus to minimize operational overhead costs and maximize the financial returns (Ambec & Lanoie, 2008). Using accounting information in the Indian context, Misra and Misra (2007) found that consumer durables and metal sectors have the highest financial risk, whereas fastmoving consumer goods, health-care, information technology, and oil and gas sectors have least financial risk. Recently, some scholars have examined the impact of government interventions such as green taxes and subsidies on the decision to implement GSCO practices (Giovanni & Vincenzo, 2012; Sheu & Chen, 2012). Using a sample of 126 automobile companies in China, Feng *et al.* (2018) report that because complementary effects between various internal and external factors are critical in practice, both environmental and operational measures lead to enhance the relationship of GSMC and financial performance. Adopting GSCO practices may improve corporate economic performance such as reducing product cost, improving sales and enhancing return on investment (Younis, Sundarakani, & O'Mahony, 2019).

2.2.3.3 Operational performance

Operational performance refers to the organizations' capabilities to more efficiently produce and deliver products to customers with improved quality and reduced lead times and, therefore,

improve its position within the marketplace (Melnik *et al.*, 2013). In the manufacturing industry, it is important to assess the operational performance of production systems, in order to minimize inventory cost, to control overhead production costs, and eventually to improve marginal profit. Because production value system is a complex chain involved by and with several inbound and outbound firms, it is a strategic choice of the manufacturing firm to design and implement efficient operational planning and engineering systems effectively. It is studied in the SC literature that a planned engineering system with expertise in the communication and management of various internal and external parties of the SC will produce good financial returns to firm's shareholders and also minimize the inventory waste and help the society environmentally (Balon, 2019).

To manage the operation systems effectively, the approach of GSCO is one way to reach the firm's operational goals as well as to meet the government's environmental regulations and thereby partake in sustainable development goals of the country (Bai & Sarkis, 2010; Benjaafar *et al.*, 2002; Power, 2005; Zhu, Geng, Fujita, *et al.*, 2010; Wood, 1997). It is important that the efforts and commitment made by the production and operations management society are stimulating and contribute to the rapid transformation of manufacturing applications in the industry (Khiewnavawongsa, 2011; Rao & Holt, 2005). In the literature, several studies have examined the factors affecting the operational processes including the GSCO implementation. Gunasekaran *et al.* (2001) and Venkataramanaiah (2008) and other colleagues suggested that the operational level includes cost per operation hour, information carrying cost, capacity utilization, total inventory, supplier rejection rate, quality of delivery documentation, efficiency of purchase order cycle time, frequency of delivery, driver reliability for performance, quality of delivered goods, and achievement of defect-free delivery types of performance metrics. As long as GSCO practices will result in financial or operational returns to the industry, cocoa processing firms will show interest towards a better, new engineering systems, to improve

production levels by minimizing the production overhead costs and by meeting the government's regulations on sustainability and environmental conditions (Bowen, Cousins, Lamming, & Faruk, 2001). Dues *et al.* (2013) focused on the removal of waste in all operational processes like overproduction, unnecessary inventory and motion, delay, lead time, logistics, inappropriate processing, and defects. For example, in the case of the automobile industry, there are several innovation models to meet the green standards of the state and produce fuel-efficient models such as e-bikes (Figueira *et al.*, 2012; Browne & Tibrewala, 1979; Piecyk & McKinnon, 2010). This is relevant to production technologies and approaches including the JIT (Golhar & Stamm, 1991; Nehete, Narkhede, & Mahajan, 2011).

2.3 Theoretical Framework

A theoretical framework in research serves as a conceptual scaffold that outlines key theories, principles, and variables relevant to a study. It provides a structured foundation for understanding the relationships between different components of a research inquiry. Theoretical frameworks are crucial as they guide researchers in developing hypotheses, designing methodologies, and interpreting findings. By integrating existing theories, the framework helps researchers contextualize their work within established knowledge, identify gaps, and contribute meaningfully to their field. Essentially, a well-defined theoretical framework enhances the coherence and rigor of research, fostering a deeper understanding of the phenomena under investigation and facilitating the communication of results to the academic community.

2.3.1 Resource Based View Theory

The resource-based view (RBV) was developed by Edith Penrose (1959) who argued that the internal resources of a firm have a profound impact on the growth of the firm. A resource is

“anything which could be thought of as a strength or weakness of a given firm”. The resources a firm possesses can provide a source of competitive advantage (Barney 1991). The extension of the RBV to the natural-resource-based view (NRBV) is widely used in explaining why firms adopt ESCM. The NRBV posits that strategy and competitive advantage can be created from capabilities facilitating environmentally sustainable economic activities (Hart 1995). Hart argues that for a resource to be valuable, rare, inimitable and nonsubstitutable, it must possess three characteristics: it must be causally ambiguous, socially complex and firm specific. However, the requirement for firm-specificity has been challenged.

The relational view posits that organisational capabilities can be developed beyond organisational boundaries by combining resources existing in different supply chain members (Dyer & Singh 1998). These resources are causally ambiguous and socially complex and thus difficult for competitors to imitate (Shi *et al.* 2012). The relational view has been combined with the NRBV (Vachon & Klassen 2008; Shi *et al.* 2012) to argue that environmental management in the supply chain can create competitive advantage. For example, environmental collaboration can lead to the development of knowledge-sharing routines and the development of the capability to integrate external resources (Vachon & Klassen 2008). Thus, the RBV is often used to explain more strategic motivations of GSCO adoption, such as why firms operating within the same context (market or industry) pursue different GSCO strategies despite experiencing similar institutional pressures (Testa & Iraldo 2010).

The development of resources and capabilities can be exemplified through improvements in a variety of productivity metrics (Sarkis *et al.* 2011). Furthermore, the resulting improvement in image and reputation can be considered a significant resource (Sarkis *et al.* 2011). However, Shi *et al.* (2012) point out that it is still unclear how the specific types of GSCO translate into a firm’s strategic resources, which will eventually lead to competitive advantage and improve productivity.

2.4 Empirical Evidence

2.4.1 Levels of GSCO at the Selected Cocoa Processing Firm

Increasing competition and stricter regulations on the environment and public pressure are forcing companies to include environmental factors in their strategic planning and to establish corporate environmental strategy (Zhu *et al.*, 2008; Kumar *et al.* 2012; Kumar *et al.*, 2018).

To gain strategic advantages, it has become necessary to change traditional supply chain (Dileep More and Babu, 2008). With the strong desire for more significant economic achievements, enterprises are eager to seek new opportunities to link up globally. GSCO has become an attractive platform for them and has been recognized as a management response from manufacturers to improve their production processes and reduce their damage to the environment (Zhu *et al.* 2008). GSCO requires a significant enhancement in processes and products in order to satisfy the stricter regulations (Hsu and Hu, 2008). Therefore, green performance assessment became an important issue for all companies (Kazancoglu, Kazancoglu, and Sagnak, 2018).

It is well known that proactive businesses, especially large business houses can achieve first mover benefits by adopting more sustainable practices, which in turn create competitive advantage that is hard for competitors to copy (Rao, 2005; Markley, 2007). As a result, Jain and Gupta (2016) have explored the status of GSCO implementation in SMEs in different countries such as China and Japan and found that the mode of implementation has been different in different countries. (Rao, 2002; Zhu *et al.*, 2005).

The main aims of GSCO are to decrease cost, minimize resource use and pollution through green production, increase market share, improve brand image and enhance financial performance by improving environmental and social performance (Dawei *et al.*, 2015). As companies focus on green initiatives, Green Supply Chain Orientation (GSCO) emerged as an

important corporate strategy (Zhu and Sarkis, 2006), in order to obtain competitive advantage and to enhance customer satisfaction (McKinnon *et al.*, 2015) as well as decreasing environmental impacts. Diabat *et al.* (2013) proposed that it was important for design, manufacturing, packaging, and delivery to conform to the environmental objectives for better GSCO performance.

Esty and Winston (2006) therefore explored SMEs considering to achieve 'eco-advantage' by considering how to integrate sustainability issues into their operations and achieve competitive advantage. How they adopt and innovate in terms of sustainability, the benefits which accrue, and the obstacles they face Companies started to apply GSCO to increase market share and profit, to mitigate environmental risks, to improve responsiveness through flexibility in the range of products (Murray, 2000) and therefore to achieve competitive advantage (Lee *et al.*, 2009). SMEs in Ghana just like large firms intend maximising their profit by gaining competitive advantage, therefore, it is expected that SMEs will adopt and increase their green efforts to enable them have a good environmental outlook by the public. There is a higher tendency SMEs will have a good score with respect to the levels or extent to which GSCO is performing owing to the fact that GSCO practices improve operational efficiency, reduce costs, and lessen adverse environmental impacts (Nejati *et al.*, 2017).

2.4.2 Levels of Firm Performance at the Cocoa Processing Firms

Performance assessment is critical to designing, planning, implementing, and monitoring the company's performance. It is regarded as a tool to assess the effectiveness and efficiency of the management and even to make comparisons between companies (Kazancoglu, Kazancoglu and Sagnak, 2018). Most companies are seeking to improve their performance in any way possible. The winning card can be held by those who endeavour to innovate, obtain and sustain performance. Thus, competing in a continuously changing environment is very necessary to

comprehend and monitor performance. financial profitability of a firm will enhance the returns of its employees, have better production units, and bring products of higher quality to its customers (Taouab and Issor, 2019).

According to Zhu and Sarkis (2004) and Rao and Holt (2005), GSCO focuses on improving environmental and financial performance, encompassing a wide range of aspects from environmental management to green design. Vachon and Klassen (2007) considered that environmental alignment and cooperation may support manufacturing and GSCO performance. Meanwhile, Green *et al.* (2012) emphasized that within GSCO, environmental performance should focus on decreasing pollutant levels, while economic performance should focus on the reduction of energy costs. Also developing the operational performance of an organization helps in gaining an advantage which increases the degree of organizational environmental awareness (Kazancoglu, Kazancoglu, and Sagnak, 2018).

Organizations practicing GSCO initiatives can meet the requirements of customers by providing eco-friendly products and services (Yu *et al.*, 2020), so as to achieve better customer acquisition (Al-Sheyadi *et al.*, 2019) and competitive advantage (Haiyun *et al.*, 2021). As a result of this, the researcher hypothesises that:

2.4.3 Relationship between Green Supply Chain Orientation and Performance

Effective practice of green supply chain programmes is expected to meaningfully impact on the financial outcomes of respective organisations. This is due to efficiency influences of green supply chain practices (Khidir and Zailani, 2009; Halldorsson and Kovacs, 2010; Shekari *et al.*, 2011; Seman *et al.*, 2012). A study by Seman *et al.* (2012, cited in Achuora, 2018) found out that, Malaysian cocoa processing firms which practice sound environmental management practices within their supply chain scored 85% in technical efficiency with good

financial and environmental performance compared to those without sound environmental management practices.

According to Rao and Holt (2005), they provided examples of establishments in South Eastern Asian with greater emphasis on Nestle in Philippines, PT Aryabhata in the Indonesia, Philip DAP in the Singapore, Nestle Jakarta and Seagate in Thailand, whose practice of GSCO have benefited from positive results, increased competitiveness and economic performance as the outcomes of green supply chain management. Zhu *et al* (2013) have also verified that a positive relationship exists between GSCO and firm performance for Chinese organisations, where their empirical study provided significant findings. However, Zhu *et al* (2013) generalized their findings from the context of Chinese organisations without being specific with specific industry or industries, considering the vast range of organisations involved in several business activities across China. The contention of Zhang *et al* (2017) which is inconsistent with assertions made presented via Rao and Holt (2005), and that of Zhu *et al* (2017) is that, emphasized on the straight influence of Green Supply Chain Orientation may not establish a complete impression of how Green Supply Chain Orientation enhances financial performance.

The findings of an empirical study undertaken by Feng *et al* (2017) in terms explored the influence of GSCO to financial performance, and mediating role of operational performance, established as a meaningful favourable influence amongst the two variables. The outcomes indicate that Green Supply Chain Orientation is an essential strategic tool for supply chain networks. This is favourably and meaningfully related to both operational and environmental performances. Much as a substantial number of researchers have proved significant influence on Green Supply Chain Orientation and financial performance (Klassen and McLaughlin, 1996; Rao and Holt, 2005; Seman *et al*, 2012; Feng *et al*, 2017), other research including

(Vachon and Klassen, 2008; Zhang *et al*, 2013), assert the influence amongst Green Supply Chain Orientation to that of financial performance is indecisive. Another research by Golicic and Smith (2013) depicted a limited favourable outcome influences Green Supply Chain Orientation on financial performance, which in effect are less than that of Green Supply Chain Orientation on market and operational outcomes. Both internal and external Green Supply Chain Orientation practices do influence both economic and financial performance and indirectly through ecological, operational and cost-efficiencies According to (Zhu and Sarkis, 2004; Vachon and Klassen, 2006; Lai and Wong, 2012; Zhu *et al*, 2013; Green *et al*, 2013; Wong *et al*, 2017). The assertion of Phungrassami (2008) on GSCO and financial performance is that, green manufacturing is a continuous strategy used by firms to improve their performance both financially and in non-financial fronts. Achuora (2018) posits that, corporations aiming to implement GSCO may be seeking ways to enhance financial performance. Klassen and McLaughlin (1996) suggest that an organisations financial performance can significantly be enhanced by adopting environmentally friendly practices.

2.4.3 Challenges of GSCO Adoption in SMEs

Small and medium enterprises (SMEs) are often referred to as the main generators of economic growth and play a strategic role in the economic performance of any country (Sawaeand & Ali, 2020). SMEs account for the vast majority of firms, job creations, and market dynamism (Dabić, *et al*, 2021). This strategic role in the economy revolves around the production of products and services, innovation, the aiding of big businesses, and job creation (Aga, Francis, & Meza, 2015; Rijkers, Arourib, Freund, & Nucifora, 2015).

According to (WY Wong *et al*, 2014), implementing GSCO in the business requires a lot of effort as it may involve a restructuring of the business processes and the product itself. In this

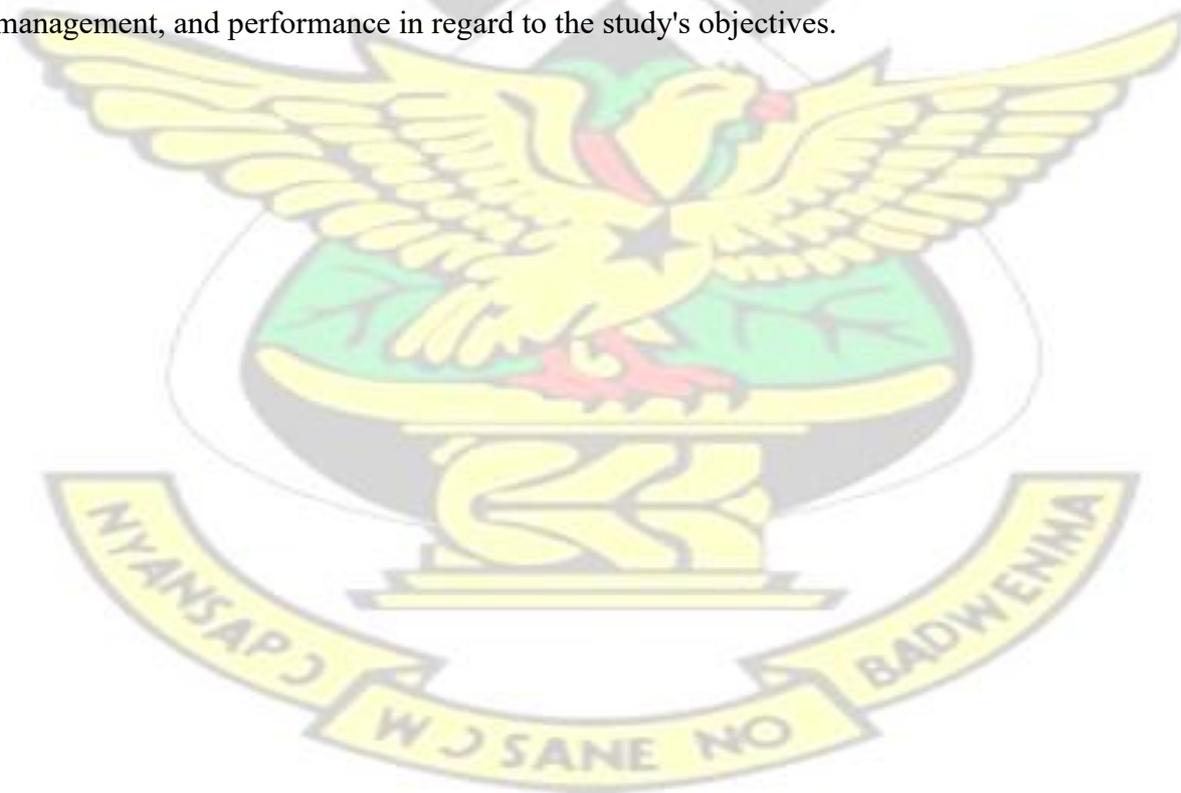
line, Srivastav and Gaur (2015) showed that some of the business processes include strategic sourcing, product design, transportation, and also distribution. Hence, there are a lot of things that need to be considered before an organisation can implement GSCO. It was reported by Hanna, Newman, and Johnson, (2000) that firms are facing difficulties in integrating sustainable strategy and corporate strategy in their business operations and having a sustainable vision and mission. Organisations who try to adopt GSCO have to strive hard in convincing the stakeholders and this is not an easy task as some may not co-operate at all (Bhattacharjee, 2015).

Focussing on SMEs, there are a few barriers and challenges that are significant and have caused a major impact towards the implementation of GSCO. Verma (2014) summarised that SMEs are the ones who faced a lot of challenges not only due to little funding but also a lack of understanding of the concept of GSCO (Kumar *et al*, 2018). Walker, Di Sisto, and McBain (2008) identified several internal (costs, management commitment, R&D, lack of awareness in the organisation, lack of understanding) and external (supplier commitment, customer's perception and willingness, lack of resources, lack of communication (networking), regulations that inhibits innovation) are barriers to GSCO implementation. The lack of information sharing and communication results in poor integration and collaboration which relates directly to the supplier's commitment to improving the supply chain management.

Studies by (Bhattacharjee, 2015; Solomon and Jamaluddin, 2014) demonstrated that internal factors are the ones that contribute much to the barriers to implementing GSCO. Bhattacharjee (2015) explains that practicing green initiatives is a costly affair since it requires green products/services, green technology, green power, and energy which will cost the organisation a fortune in R&D programs.

2.5 Conceptual Framework

A conceptual framework in research serves as a foundational structure that outlines the key concepts, theories, and variables relevant to a study. It provides a roadmap for understanding the relationships between different elements and guides the research design, data collection, and analysis processes. The importance of a conceptual framework lies in its ability to offer clarity and coherence to research endeavours. It helps researchers define the scope of their study, identify gaps in existing knowledge, and articulate hypotheses or research questions. Additionally, a well-constructed conceptual framework facilitates communication within the scholarly community by grounding the research in established theories and concepts, contributing to the overall validity and significance of the research findings. The conceptual framework in Figure 2.1 below describes the connections between green supply chain management, and performance in regard to the study's objectives.



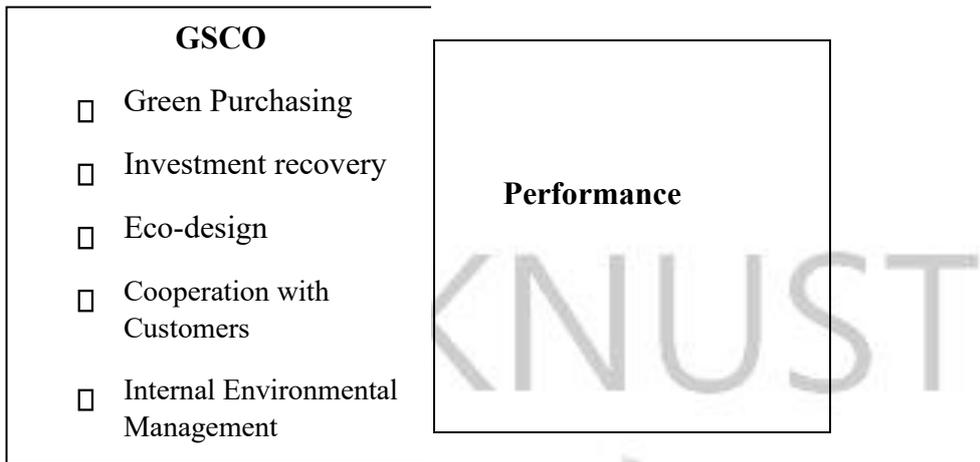


Figure 2.1 Conceptual Framework

Source: Authors' Construction (2022) adapted from Zhu et al. (2013).



CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Introduction

This chapter provides detailed information on how the research was designed, planned, and executed. The chapter provides an explanation of how the study was conducted and sought answers to the research questions. It provides details on the research philosophy, research approach and research design. This chapter also embodies and discusses study population, data collection instruments, method of data collection and data analysis. In addition, the chapter also addresses sample size, sampling techniques, instrument's reliability and validity issues as well as ethical considerations.

3.2 Research Design

The three main research approaches used in research are quantitative, qualitative, and mixed methods. The study utilised a quantitative research approach in order to impact of Green Supply Chain Orientation on firm performance in Ghana Cocoa Board. According to Mohammad (2013), a quantitative research approach seeks explanations and predictions that could be generalised to other persons, organisations and places. The assumptions underlying quantitative research approach include objectivism, the study is independent of the researcher and research is based on deductive forms of logic (Ihantola and Kihn, 2014; Peersman, 2014). The data collected by quantitative research tends to be numerical and are open to interpretation by use of statistics (Babbie and Mouton, 2015). In other words, the research uses data that are structured in the form of numbers or that can be immediately transported into numbers. Thus, the quantitative research approach involved the collection of data that information could be quantified and subjected to statistical treatment so as to support or refute alternate knowledge claims.

The intent of the study was to establish, confirm, or validate relationships and to develop generalisations that contributed to theory (Field, 2015). The study itself was not only independent of the researcher but the data was also used to objectively measure reality. The purpose of the quantitative research approach was to quantify the data by using statistical measures and control procedures which reduced bias and confounding variables. Also, the aim of the quantitative research approach was to identify potentially strong, non-random, correlations between explanatory (independent) variables and effects (dependant variables) by employing a relatively large number of cross-sectional observations (Braun and Clarke, 2012). As such, the quantitative research approach emphasised the production of precise and generalisable statistical findings.

The three major research philosophies identified in business research include pragmatism, interpretivism and positivism (Bryman and Bell, 2015). In line with research objectives, positivism was adopted for the study. Positivism was used for the study since it depends on quantifiable observations that would lead to statistical analyses. The main assumptions of the positivist research philosophy include the following: there are no differences in the logic of inquiry across sciences, research should aim to explain and predict; research should be empirically observable through human senses and that science is value-free and should be judged only by logic (Easterby-Smith *et al.*, 2012; Soni and Kodali, 2018). In other words, positivism is logically connected to pure scientific laws and is based on facts in order to satisfy the four requirements of falsifiability, logical consistency, relative explanatory power, and survival. Under the positivism research philosophy, it was possible to investigate what truly happens at PBC Limited through scientific measurement of people and system behaviours.

More so, positivism produces quantitative data; uses large samples and is concerned with hypothesis testing (Cohen *et al.*, 2013). The other benefit of using the positivist philosophy was that it could identify the precise relationships between chosen variables. In particular, the study

sought to assess the impact of Green Supply Chain Orientation on firm performance in PBC Limited. Above all, the reason for adopting a positivistic approach lied in the nature of the research questions, which aimed not to interpret the phenomenon of impact of Green Supply Chain Orientation but to understand the influence of Green Supply Chain Orientation on firm performance. In this sense, any causal relationships could be found and hypotheses developed and tested in order to predict the research problem (Cooper and Schindler, 2014). Using analytical techniques, the aim was to make statements which could be generalized and applicable to PBC Limited.

Furthermore, positivism was adopted for the study since it was based on the establishment of the measurement of facts. Moreover, Green Supply Chain Orientation is largely based on the development of knowledge and generalising theory according to scientific background (Creswell and Poth, 2017; Kothari and Gang, 2014). This is consistent with the positivist approach, which is basically concerned with development of research models and research hypotheses to be tested with empirical data (Bryman, 2015; Nikolić, Muresan, Feng and Singer, 2016). The research philosophy was based on description, explanation and uncovering facts, where the thought was endorsed by explicitly stated theories and hypotheses. The positivism philosophy enables the researcher to be independent of the study and use large samples (Easterby-Smith *et al.*, 2012).

According to Salkind (2012), a research design is a roadmap of how a researcher goes about answering the research questions. Many leading scholars including Bryman and Bell (2015) and MacIntosh and O’Gorman (2015) agree that the main research design widely used within business and management research include experiment, survey, case study, action research, grounded theory, ethnography and archival research. In business studies, the choice of a research design is influenced by the type of research questions, ability to meet the research objectives, consistency with the philosophical considerations and boundary of existing

knowledge. The study's research design was a survey as it was concerned with describing how Green Supply Chain Orientation influences firm performance. From a philosophical perspective, the survey research design followed the positivist approach as it could target what the researcher aimed to study within a particular conceptual framework.

The survey research design provided data on past and intended behaviours, beliefs, attitudes, feelings and other descriptive items relating to the influence of Green Supply Chain Orientation on firm performance. More so, data collection for the wider generalisations to population was the basic aim of survey so that the collected data could be aggregated across food manufacturing companies (Gorsuch, 2015). As pointed out by Root *et al.* (2015), survey is a rigorous approach which could remove bias from the research process and produce replicable results. In addition, the use of survey method did not require control over behavioural actions and mainly focused on contemporary events relating to the influence of Green Supply Chain Orientation on firm performance. With the survey method, it was possible for the researcher to measure the statistical reliability of results obtained from the sample (Brandenburg *et al.*, 2014).

Furthermore, the survey research design was generally easier to understand and also enabled information gathering in an economically feasible way. More importantly, the survey research design offered more control in relation to the research process. Surveys have generally been the most widely used research designs in Green Supply Chain Orientation studies (Xing *et al.*, 2016; Laari *et al.*, 2017; Scur and Barbosa, 2017; Sharma *et al.*, 2017; Tamarico *et al.*, 2017). Considering these advantages, the adopted survey research design fitted perfectly with the research resources available to the researcher.

3.3 Population of the Study

Population refers to the entire group of individuals, objects, or events that share a common characteristic and are the focus of a study. The population is the broader group to which the

researcher aims to generalize their findings. Depending on the research question and design, the population can be finite or infinite, and it may include people, animals, objects, or events. It is essential for researchers to clearly define and identify their target population to ensure the validity and generalizability of their study results. Pernecky (2016) describes a population as a larger collection of all subjects from where a sample is drawn. The population of the study consists of employees working in the cocoa processing industry, specifically, PBC Limited.

3.4 Sample Size and Sampling Technique

Yin (2014) describes a sample size as a small subset of a target population. It is important to have an optimum sample size which fulfils the requirements of efficiency, representativeness, reliability and flexibility (Bryman and Bell, 2015). As suggested by Gogtay and Thatte (2016), a sample size that is in a range of between 30 and 250 can be regarded as appropriate. The researcher found it important to have a statistically representative sample size. More so, quantitative research strategies require large samples in order to reduce sampling error and increase representativeness (Wiid and Diggines, 2011). Since it was impossible to collect primary data from all employees working in PBC Limited, 250 employees were sampled.

In this study, the researcher adopts the simple random sampling technique. The advantage of simple random sampling is that it protects the survey research from selection bias by randomly picking the sample with equal probability to any other possible sample (Mugenda and Mugenda, 2013). In addition, simple random sampling was used for the study because every member of the population had an equal chance of being selected with the probability of each bank selected swinging around 0.9. This would also improve the quality of information and gave true presentation of the entire population.

3.5 Data Collection Method

3.5.1 Sources and Types of Data

An integral part of research is the data collection process as accessing the right data helps in attaining the optimum results desired. There are two types of data sources, thus, primary and secondary data sources. Primary data has got to do with data that has been collected personally by the researcher while secondary data is considered as a type of data obtained from a source rather than that which a researcher has personally collected. Secondary data are often accessed through websites, annual reports, etc (Bryman & Bell, 2015). This study used primary data sources which implied that the researcher gets to the respondents personally for the data required.

3.5.2 Data Collection Technique

The consent of the human resource manager at PBC Limited was sought to engage the staff that met the specific requirements of the study. Subsequently, the identified potential respondents were contacted and asked to participate in the study. The researcher travelled to administer the questionnaires directly to the respondents at PBC. The questionnaires also addressed the research purpose, along with the confidentiality of respondents' answers, so as to increase the response rate and eliminate response bias (Nikolić, Muresan, Feng and Singer, 2016).

The drop and pick-later method, was used in the administration of the questionnaires. The drop and pick provided the respondents with enough time to answer the questionnaire since the researcher would come later to pick them. Moreover, using the drop-and-pick method increased the response rate to more than 70% and also allowed the researcher to collect primary data from a large sample at a low cost per datum (Soni and Kodali, 2018). Moreover, the method made the data collection simpler and the researcher was able to facilitate accuracy in the data

collection as the method entailed a personal appeal. The researcher then picked the questionnaires after the respondents had filled them.

During the dropping of the questionnaires, the researcher established rapport with the respondents to encourage them to respond to the questions accurately and precisely. Followup and clarification were provided through telephone to ensure proper understanding of the asked questions as well as to remind the respondents to submit their (feedback) answered questionnaires on time. Overall, the respondents completing the questionnaire required between 10 and 15 minutes, as that could have a positive effect on the response rate (Wiid and Diggines, 2011).

3.5.3 Data Collection Instrument

This research mainly relied on primary data which was collected using a questionnaire. In particular, structured questionnaires were used as the instrument for collecting primary quantitative data. The main reasons for using structured questionnaires are that they were easy to ask, provided a greater uniformity of responses, were more easily processed, reduced bias, and were faster to administer (Bryman and Bell, 2015). In addition, the use of structured questionnaires was another mechanism in motivating the respondents to respond as they did not require having a high level of comprehension on the topic. The other advantages of the questionnaires were that they were simple to administer; the data obtained was reliable; and the coding, analysis and interpretation of data were relatively simple and straightforward

(Creswell and Poth, 2017; Kothari and Gang, 2014).

The study used ordinal level of measurements whereby numbers were assigned to cases with only the order of cases permitting greater than and less than distinctions (Hair, Ringle and Sarstedt, 2013). As such, a five-point Likert scale was used to measure study variables since it supported such a relationship. The five-point Likert scale had scores with a tranged from 1 to

5 as follows: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree. Section A of the questionnaire contained questions that helped in generating demographic profile of the respondents such as gender, age, working experience and educational qualifications. Section B of the questionnaire asked about information relating to environmental supply chain management. Section C of the questionnaire asked about issues relating to firm performance.

3.6 Data Analysis

According to Peersman (2014) data analysis procedure includes the act of packaging the collected information, putting it in order and structuring its main components in a way that the findings can be easily and effectively communicated. The essential sequential operations for data included editing, coding and data entry. The aim of editing questionnaires was meant to achieve consistency within the collected data and detect, correct and eliminate any outliers (Bell, 2014; Ponterotto, 2017). As such, the completed questionnaires were edited for ensuring completeness and consistency in the responses. On the other hand, coding was a necessary step since the data was to be processed by computer software. Initially, questionnaires collected were assigned ID numbers for each organisation and numerical codes were allocated to all variables. The completed questionnaires' data were then directly entered into Statistical Package for Social Sciences (SPSS) software version 20.0

The collected primary data was then analysed with the help of descriptive and inferential statistics. Descriptive statistics were used to describe, present and summarise quantitative information in the form of measures of central tendency (mean) and measures of dispersion (standard deviation). Inferential statistics were used in the study to test the selected four statistical hypotheses in order to make conclusions. In particular, the Pearson correlation was used to measure the direction and strength of relationship between the research variables.

Moreover, linear regression was used to test significance (effect) of such a relationship of the dependent variable (firm performance) from independent variables (green supply chain orientation). Furthermore, tables and graphical descriptions were used to analyse the data.

Pearson's correlations coefficients with two tailed significant tests were run to examine the relationship among the study variables which are set out in the objectives of the study.

3.7 Reliability and Validity of Data

Validity is defined by Gorsuch (2015) as the extent to which an instrument measures what it is supposed to measure. Another definition by Golicic and Davis (2012), interprets validity as the extent to which a particular measure is free from both systematic and random error. The two types of validity which were of interest for this study were content validity, the degree of correspondence between the items selected to constitute a summated scale, and its conceptual definition and construct validity. Construct validity can be demonstrated by showing whereby a study construct is related to various other measures as specified in the theory (Henseler, Ringle and Sinkovics, 2016). Important to note, the study's variables were derived from accepted theories that were tested in previous studies and indicated positive results.

Reliability is described by Brandenburg, Govindan, Sarkis and Seuring (2014) as the attribute of consistency in measurement. The study used three approaches of reliability to ensure consistency of scores when measuring the research problem in the practical field. These included test-retest reliability, internal consistency, and inter-rater reliability. The study used test-retest reliability to measure whether the research phenomenon did not change at two different time points in time. In this process, the validity and reliability of instruments to measure corporate social responsibility and employee outcome were properly assessed.

Cronbach's alpha was used to determine the internal consistency of the instrument. Data reliability was measured using Cronbach's alpha coefficient which ranged between 0 and 1. According to Creswell (2014), Cronbach's alpha measures how closely related a set of items are as a group. Several researchers have used this approach to measure reliability in supply chain management research (Christopher, 2016; Njagi and Shalle, 2016; Omanga, 2017; Robson and McCartan, 2016). Higher alpha coefficient values mean there is consistency among the items in measuring the concept of interest. As pointed out by Duzan and Shariff (2015), if Cronbach's alpha coefficient is more than 0.7, it is considered acceptable whilst a Cronbach's alpha coefficient of less than 0.7 is questionable. As suggested by Kaufmann and Saw (2014), for survey research, reliability level between 0.6 and 0.7 is the lower limit of acceptability. Reliability values over 0.70 were preferable for this study.



CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1 Introduction

In this chapter, much emphasis is placed on the results obtained based on data gathered from respondents during the field survey. Results obtained in the data analysis process are presented using descriptive statistics which include the use of tables and figures in projecting and expounding what the study found. The first section of this chapter focuses on throwing more light on the demographic characteristics of the respondents to understand the calibre of respondents who availed themselves for this study.

4.2 Response Rate of the Study

The response rate of this study was calculated as the percentage of participants who provided valid responses out of the total number of participants in the sample. This served as a measure of the study's success in engaging respondents and obtaining their input. Thus, out of the 250 respondents sampled, only 220 of these respondents were able to complete and submit their questionnaires which were then considered for the final data analysis. In this case, a response rate of 88% indicated that a substantial majority of the intended sample chose to participate in the study. A high response rate of 88% enhances external validity, the extent to which findings can be generalized. Considering Hair *et al* (2019) suggestion of using a sample size of not less than 200 for structural equation modelling, this study's response rate of 220 respondents (88%) is deemed adequate to produce a reliable research outcome.

4.3. Profile of Respondents

The demographic characteristics of respondents in research plays a vital role as it helps the researcher understanding the type of people, he/she is dealing with. It also informs the researcher of the quality of responses provided as reaching out to the right responses have an impact on the quality of response provided. To have a grasp of the nature of respondents contacted for data, the researcher inquired of the respondents' gender, age and education status as these have the tendency to influence the results. The table below captures the demographic characteristics of the respondents who availed themselves for the research.

Table 4.1 Demographic Characteristics of Respondents

Variable	Frequency	Percentage
Gender		
Male	118	53.6
Female	102	46.4
Total	220	100.0
Age Group		
20 to 29	19	8.6
30 to 39	92	41.8
40 to 49	77	35
50+	32	14.5
Total	220	100
Education Status		
HND	37	16.9
Degree	107	48.6
Masters	66	30.0
Others	10	4.5
Total	220	100.0
Position/ Designation		
Manager	70	31.8
Supervisor	27	12.3
Professional	123	55.9
Total	220	100.0
Work Experience		
2-30	94	42.7
31-99	82	37.3
100+	44	20.0
Total	220	100.0
Firm Age		

Less than 5	56	25.5
6-10	72	32.7
11-15	63	28.6
15years and above	29	13.2
Total	220	100.0
Research and Development		
Yes	116	52.7
No	104	47.3
Total	220	100
Number of Employees		
Owner-Manager	29	13.2
Executive	105	47.7
Manager	86	39.1
Total	220	100.0

Source: Field Data (2023)

Table 4.1 presents a demonstration of the frequencies of the respondents from the Ghana Cocoa Board: Greater Accra Region Branch who responded to the questionnaire of the study. The table reveals that 53.6% (N=118) of the respondents were males while 46.4% (N=102) were females; giving the indication that there are more males than females in this respective firm.

The respondents also provided their age groups as they were besought to indicate the age group they belonged to. This gives knowledge concerning the physical force and vitality with which respondents are likely to demonstrate in their approach to work as generally, a more youthful workforce will have the vigour and briskness towards work for higher firm performance. The results from the table 4.1 proved this as 8.6% (N=19) were in the age group of 20 to 29 years, 41.8% (N=92) were from 30 to 39 years, 35% (N=77) were from 40 to 49 years and 14.5% (N=32) were 50 years and above.

The education status of the respondents was also solicited to help ascertain the intellectual and training level of the workers in the firm which translates to how well they handle issues at workplace in a logical and critical manner as touching thought ability to produce desired results.

The table shows that 16.9% (N=37) of the workers had attained HND level of education, 48.6% (N=107) had obtained a degree, 30% (N=66) had Masters' Degree whereas 4.5% (N=10) had other levels of education other than those aforementioned. From observation, it is evident that the firm has workers with a relatively good educational background to work effectively. To add to that, the position of the workers was requested with the purpose of finding out the level of influence and capabilities each worker possesses towards production for determining how far one can go with the execution of their respective duties. The results proved that 31.8% (N=70) were Managers, 12.3% (N=27) were Supervisors and 55.9% (N=123) were Professionals. This indicates that, the workers have a level of influence in their designation that is relatively good to undertake the production for greater firm performance.

Furthermore, all the respondents of the firm acknowledged that their firm has existed for more than 25 years and have a research and development unit in the firm. They also gave the acknowledgement that their firm has kept on the average, more than 200 employees over the past three years.

4.4 Descriptive Statistics for Study Variables

The descriptive analysis of the study's variables serves as the foundation for understanding the basic characteristics, patterns, and distributions of the data collected for a research study. This crucial step in the data analysis provides a comprehensive overview of the main variables under investigation, critical to gaining insights into the dataset's characteristics and the initial observations of the study (Cox, & Battey, 2017). The descriptive analysis involves a range of techniques that aimed at summarizing and visualizing the data, setting the stage for more advanced statistical analyses and hypothesis testing. This summarizes the main characteristics

of each variable, including measures of central tendency (mean, median, and mode) and measures of variability (range, standard deviation, and variance).

4.4.1 Descriptive Statistics for Green Supply Chain Orientation (GSCO)

Green supply chain orientation refers to the integration of environmentally friendly practices and principles into the entire supply chain process, from the sourcing of raw materials to the distribution of finished products. This approach aims to minimize the negative environmental impacts associated with supply chain activities while also improving overall efficiency and reducing costs (Teixeira *et al.*, 2016; Zhu *et al.*, 2016; Sharma *et al.*, 2017).

Table 4.2 Descriptive Analysis Results on Green Supply Chain Orientation

Items	N	Min	Max	Mean	S.D
Green Purchasing (GP)					
Our firm cooperates with suppliers to meet environmental objectives	220	1	5	3.98	.899
Our firm emphasizes purchasing eco-friendly materials	220	1	5	3.63	.847
Our firm evaluates suppliers on the basis of specific environmental criteria	220	1	5	3.79	.955
Our firm cooperates with suppliers who have environmental certifications such as ISO 14001	220	1	5	3.52	1.122
Our firm has partnerships with suppliers that aim to build environmental solutions and/or develop	220	1	5	3.66	.811
Investment recovery (IR)					
Our firm has initiated Investment recovery (sale) of excess inventories/materials	220	1	5	3.71	.981
Our firm has established a recycling system for used and defective products	220	1	5	3.58	1.093
Our firm has initiated sale of excess capital equipment”	220	1	5	3.67	.975
Eco-design (ECD)					
“Our firm keeps on tracking, reporting and reducing the energy use	220	1	5	3.51	.968
Our firm designs products for reduced consumption of materials/energy	220	1	5	3.95	.917
Our firm design of products that can be reused, recycled and recovered	220	1	5	3.83	.858
Our firm emphasizes on optimization of design process to reduce solid and liquid waste”	220	1	5	3.84	.902

“Our firm emphasizes on optimization of design process to reduce air emission and noise	220	1	5	3.94	.941
Our firm emphasizes on design of products to reduce use of harmful/toxic material”	220	1	5	3.63	.968
Cooperation with Customers (CWC)					
“Our firm cooperates with customers for eco-design	220	1	5	3.88	.865
Our firm cooperates with customers for cleaner production	220	1	5	3.56	.914
Our firm cooperates with customers for green packaging	220	1	5	3.55	.870
Our firm adopts third-party-logistics for customer cooperation	220	1	5	3.98	.759
Our firm cooperates with customers for using less energy during product transportation	220	2	5	4.04	.636
Internal Environmental Management (IEM)					
Senior managers in our firm are committed to green supply chain management	220	2	5	4.14	.643
Our firm emphasizes cross-functional cooperation for environmental improvements	220	2	5	4.05	.633
Our firm emphasizes environmental compliance and auditing programs	220	1	5	4.21	.723
Our firm has pollution prevention plans	220	1	5	4.00	.667
Our firm has a system to track environmental laws and regulations”	220	1	5	4.17	.711

NB: Scale= 1= strongly disagree; 2= disagree; 3= neutral; 4= agree; 5= strongly agree

Source: Field Data (2023)

4.4.1.1 Green Purchasing

In Table 4.2 above illustrates the mean values and its corresponding standard deviation values deduced from the descriptive statistics analysis of Green Purchasing. The item with the highest mean score (M=3.98, SD=.899) is “Our firm cooperates with suppliers to meet environmental objectives” whereas the item with the lowest mean score (M=3.52, SD=1.122) is “Our firm cooperates with suppliers who have environmental certifications such as ISO 14001”. The intermediate mean score (M=3.66, SD=.811 amongst the items considered under green purchasing is “Our firm has partnerships with suppliers that aim to build environmental

solutions and/or develop”. This explains that with regard to green purchasing, the firms used in this study subscribe to the item with the highest mean score above the other items and the item they subscribe amongst all the other item is the one with the lowest mean score.

4.4.1.2 Investment recovery

The mean and standard deviation from the descriptive statistics analysis of Investment recovery is discussed in this paragraph. The least mean score is (M=3.58, SD=1.093) and is represented by the item “Our firm has established a recycling system for used and defective products” while the highest mean score is (M=3.71, SD=.981) and is a representative of the item “Our firm has initiated Investment recovery (sale) of excess inventories/materials”. This reveals that, in connection with investment recovery, the firms employed in this study acknowledge that their firms are inclined unto the item with the highest mean score above all the other items, with the lowest mean score being the least item they incline unto.

4.4.1.3 Eco-design

Regarding the mean values and standard deviation values derived from the descriptive statistics analysis of Eco-design, it is seen that (M=3.51, SD=.968) is the least mean score and stands for the item “Our firm keeps on tracking, reporting and reducing the energy use” whereas (M=3.95, SD=.917) is the greatest mean score and stands for the item “Our firm designs products for reduced consumption of materials/energy”. This implies that in relation to eco-design in manufacturing, the firms examined in this study are steered towards the latter item more than the rest of the items which also the former item being the least the firms are steered towards.

4.4.1.4 Cooperation with Customers

The overhead Table 4.2 gives the mean and standard deviation from the descriptive statistics analysis regarding Cooperation with Customers. Here, the item with the least mean score is (M=3.55, SD=.870) and represents the item “Our firm cooperates with customers for green packaging”. On the other hand, the highest mean score is (M=4.04, SD=.636) and also represents the item “Our firm cooperates with customers for using less energy during product transportation”. Hence, the latter item is the one in which the firms employed in this study are leaner towards above all the other items when it comes to cooperation with customers. Thus, the least item the firms are leaned toward is the former item.

Also, the mean and standard deviation from the descriptive statistics analysis in relation to Internal Environmental Management are discussed in this section. It is noticed that the item “Our firm emphasizes environmental compliance and auditing programs” have the highest mean score (M=4.21, SD=.723). However, the item “Our firm has pollution prevention plans” is the lowest mean score (M=4.00, SD=.667). This means that, in terms of internal environmental management, the firms taken into account in this very study paid more focus on the former item than the remaining items as the latter item falls beneath all the others.

4.4.2 Descriptive Statistics Results for Performance

Table 4.3 Measurement Items for Performance

Items	N	Min	Max	Mean	SD
Environmental Performance					
“Our firm has reduced consumption of hazardous/toxic material during the last three years compared to competitors	220	1	5	3.55	.954
Our firm has reduced air emissions during the last three years compared to competitors	220	1	5	4.19	4.621

Our firm has reduced effluent wastes during the last three years compared to competitors	220	1	5	3.68	.776
Our firm has sought to improve its environmental image/position during the last three years	220	2	5	4.13	.716
Our firm has reduced energy consumption during the last three years compared to competitors	220	1	5	3.55	.954
Our firm has reduced solid wastes during the last three years compared to competitors	220	1	5	3.97	.818
Operational Performance					
Our company has achieved operational cost savings during the last three years compared to competitors	220	1	5	3.71	1.014
Our company has improved products' quality during the last three years compared to competitors	220	1	5	4.34	.698
Our company has improved on-time delivery rate during the last three years compared to competitors.	220	1	5	4.32	.713
Our company has developed a flexible system for rapid response to change in orders/demand during the last three years compared to competitors	220	1	5	4.13	1.244
Our company has decreased inventory levels during the last three years compared to competitors	220	1	5	3.67	1.042
Financial Performance					
Our company has achieved operational cost savings during the last three years compared to competitors	220	1	5	3.71	1.014
Our company has improved products' quality during the last three years compared to competitors	220	1	5	4.34	.698
Our company has improved on-time delivery rate during the last three years compared to competitors.	220	1	5	4.32	.713
Our company has developed a flexible system for rapid response to change in orders/demand during the last three years compared to competitors	220	1	5	4.13	1.244
Our company has decreased inventory levels during the last three years compared to competitors"	220	1	5	3.67	1.042

NB: Scale= 1= strongly disagree; 2= disagree; 3= neutral; 4= agree; 5= strongly agree

Source: Field Data (2023).

Table 4.3 above illustrates the standard deviation values as well as the corresponding mean values from the descriptive statistics analysis which concerns Environmental Performance. The table presents that the least mean scores are (M=3.55, SD=.954) and (M=3.55, SD=.954),

represents the items, “our firm has reduced consumption of hazardous/toxic material during the last three years compared to competitors” and “Our firm has reduced energy consumption during the last three years compared to competitors” respectively. The highest mean score, however, is (M=4.19, SD=4.621) and stands for the item, “Our firm has reduced air emissions during the last three years compared to competitors”. The meaning drawn from this is that, with regard to environmental performance, the respondents of the firms under this study made an acknowledgement that among all the items, the latter item is concentrated on more – as the items with the least focus is the former pair of items.

The standard deviation and mean values deduced from the descriptive statistics analysis for Operational Performance are discussed in this section. It is seen that the greatest mean score is (M=4.34, SD=.698) typifies the item, “Our company has improved products’ quality during the last three years compared to competitors” whilst the lowest mean score is (M=3.67, SD=1.042) and as well typifies the item, “Our company has decreased inventory levels during the last three years compared to competitors”. This means that the selected firms for the study are more inclined to the former item than the remainder of the items which has the latter being the least inclined to, as regards operational performance.

The standard deviation and mean values from the descriptive statistics analysis regarding Financial Performance is discussed in this section. It could be noticed from the table that, the greatest mean score is (M=4.34, SD=.698) and appears for the item, “Our company has improved products’ quality during the last three years compared to competitors” whereas the item with the least mean score being (M=3.67, SD=1.042) and also appears for the item, “Our company has decreased inventory levels during the last three years compared to competitors”. This signifies that, of all the items regarding financial performance, the respondents

acknowledged that their respective firms are more focused on the former item than the remaining items which has the latter item being the least focused on.

4.5 Confirmatory Factor Analysis and Reliability Test

In the realm of data analysis, two essential techniques, Confirmatory Factor Analysis (CFA) and Reliability Test, play pivotal roles in ensuring the validity and robustness of measurement instruments and the overall quality of research findings. These techniques provide researchers with valuable tools to refine their models, verify underlying structures, and establish the consistency of measurements (Hair Page, & Brunsveld, 2019).

Confirmatory factor analysis was used also to establish convergent validity by confirming that all scale items loaded significantly on their construct factors (Anderson & Gerbing 1988). Convergent validity was also confirmed by comparing the χ^2 differences between a constrained confirmatory factor model with an inter-factor correlation set at 0 (indicating no relationship between the two constructs) and an unconstrained model with an inter-factor correlation set free.

Table 4.4 Confirmatory Factor Analysis and Reliability Test

Items Description	Loadings (t-values)
Green Purchasing (CR=.89 AVE= .71 α =.716)	
“Our firm cooperates with suppliers to meet environmental objectives	.76 (fixed)
Our firm emphasizes purchasing eco-friendly materials	.75 (11.76)
Our firm evaluates suppliers on the basis of specific environmental criteria	.90 (14.44)
Our firm cooperates with suppliers who have environmental certifications such as ISO 14001	.83 (18.72)
Our firm has partnerships with suppliers that aim to build environmental solutions and/or develop	.85 (12.0)
Investment recovery (CR=.93 AVE= .83 α =.834)	

Our firm has initiated Investment recovery (sale) of excess inventories/materials	.92 (fixed)
Our firm has established a recycling system for used and defective products	.95 (16.96)
Our firm has initiated sale of excess capital equipment”	

Eco-design (CR=.87 AVE= .73 α =.867)	
Our organisation keeps on tracking, reporting and reducing the energy use	.69 (fixed)
Our organisation designs products for reduced consumption of materials	.80 (9.60)
Our organisation designs products for reducing consumption of energy	.76 (9.29)
Cooperation with Customers (CR = .96; AVE = .87; α = .984)	
Our organisation cooperates with customers for eco-design	.82 (fixed)
Our organisation cooperates with customers for cleaner production	.78 (8.38)
Our organisation cooperates with customers for green packaging	.85 (12.0)
Our organisation adopts third-party-logistics for customer cooperation	.76 (9.29)
Our organisation cooperates with customers for product take-back	.93 (fixed)
Our organisation cooperates with customers for reverse logistics relationships	.78 (8.38)
Our organisation cooperates with customers for using less energy during product transportation	.80 (12.76)
Internal Environmental Management (α = .76; CR = .78; AVE = .957)	
“Commitment of GSCM from senior managers	.85 (fixed)
Support for GSCM from mid-level managers	.95 (16.96)
Cross-functional cooperation for environmental improvements	.83 (18.72)
Total quality environmental management	.84 (16.96)
Environmental compliance and auditing programs	.87 (17.77)
ISO 14001 certification	.92 (12.0)
Environmental Management Systems exist	.86 (11.10)
Eco-labeling of products”	0.81(12.45)
Financial Performance (CR=.83 AVE= .73 α =.80)	
Our market share has increased during the last three years compared to competitors	.84 (fixed)
Our overall competitive position in Jordan has improved during the last three years compared to competitors	.85 (13.84)
Our sales have increased during the last three years compared to competitors	.90 (12.18)

Our customer satisfaction level has increased during the last three years compared to competitors	.85 (12.0)
Our profitability has increased during the last three years compared to competitors	.89 (12.99)
Our market share has increased during the last three years compared to competitors	.74 (11.64)
Operational Performance	
Our company has achieved operational cost savings during the last three years compared to competitors	.69 (fixed)
Our company has improved products' quality during the last three years compared to competitors	.80 (9.60)
Our company has improved on-time delivery rate during the last three years compared to competitors.	.78 (8.38)
Our company has developed a flexible system for rapid response to change in orders/demand during the last three years compared to competitors	.95 (13.88)
Our company has decreased inventory levels during the last three years compared to competitors	.80 (12.76)
Our company has achieved operational cost savings during the last three years compared to competitors	.90 (15.21)
Environmental Performance	
Our firm has reduced consumption of hazardous/toxic material during the last three years compared to competitors	.72(fixed)
Our firm has reduced air emissions during the last three years compared to competitors	.65(8.41)
Our firm has reduced effluent wastes during the last three years compared to competitors	.61(9.04)
Our firm has sought to improve its environmental image/position during the last three years	.75(7.64)
Our firm has reduced energy consumption during the last three years compared to competitors	.75(7.68)
Our firm has reduced solid wastes during the last three years compared to competitors	0.87(7.82)

Source: Field Data (2023)

4.5.1 Model Fit Indices

According to Schoenherr and Swink (2012), the results of the CFA should indicate overall good model fit and suggest no modification to the specified factor structure. Following this, the model fit indices were taken into consideration to check how fit and good the model is for further analysis to proceed.

Table 4.5 Goodness of Fit Indices

CFA Model	χ^2	df	χ^2/DF	p-value	RMSEA	NNFI	CFI	SRMR
Model 1 (GSCO)	90.94	55	1.64	0.000	0.057	0.86	0.87	0.050
Model 2 (PROD)	185.87	100	1.86	0.000	0.068	0.91	0.93	0.049
Overall Model	276.81	155	1.79	0.000	0.063	0.89	0.90	0.050

Source: Field Data (2023)

The goodness of fit indices are statistical measures used to assess how well an observed data set fits a theoretical or hypothesized model. These indices help researchers determine the extent to which the model accurately represents the data (Parady, Ory & Walker, 2021; Watanabe & Suzuki, 2021; Cipriani, Hirsch & Vittorietti, 2023). The goodness of fit indices values were hence obtained from the CFA conducted. The overall values of the key parameters such RMSEA, NNFI, CFI, SRMR etc showed that the model was good as it met the requirements proposed by (Fornell and Larcker, 1981; Schoenherr & Swink, 2012; Hair *et al*, 2016).

4.6 Correlation Analysis

Correlation analysis helps in exploring the type (positive, negative or none) and degree of association (magnitude of closeness) between two variables (Senthilnathan, 2019). This section

of the study presents and explains the correlation results obtained after running Pearson Correlation test.

Table 4.6 Correlation Matrix Analysis

Variables	1	2	3	4	5	6	7	8
1 Education status	1							
2 Designation	0.079	1						
3 Work experience	0.068	-.213**	1					
4 Green purchasing	-0.098	0.008	0.105	1				
5 Investment recovery	-0.096	-0.015	0.099	.578**	1			
6 Eco-design	-.133*	0.028	0.12	.671**	.759**	1		
7 Cooperation with customers	-0.113	0.045	0.08	.620**	.531**	.648**	1	
8 Firm performance	0.038	-0.066	-0.032	.179**	0.104	.145*	.289**	1

Source: Field Data (2023)

The correlation results above show the relationship between the constructs of Green Supply Chain Orientation and firm performance. The researcher included control variables such as education status, designation and work experience to control for any potential effect the variables may have on the analysis conducted. It could be observed from the table above that there exists a positive but insignificant relationship between education status and firm performance ($r=.038$, $p>0.05$). While the results exhibited that designation ($r= -.066$, $p>0.05$)

and work experience ($r = -.032$) have an insignificant negative relationship with firm performance. Green purchasing which is a subconstruct of GSCO showed a significant positive relationship with firm performance ($r = .179$, $p = 0.000$). Though the results revealed that investment recovery ($r = -.104$, $p > 0.05$) had an insignificant positive relationship with firm performance, eco-design ($r = -.145$, $p = 0.000$) and cooperation with customers ($r = -.289$, $p = 0.000$) showed a significant positive relationship with firm performance.

4.7 Regression Results

In Table 4.10 above, the regression table shows the results obtained during the linear regression analysis. Control variables and independent variable were run against the dependent variable. The results showed that education status ($\beta = .096$, $p > 0.05$) had an insignificant positive effect on firm performance. Designation ($\beta = -.104$, $p > 0.05$) and work experience ($\beta = -.081$, $p > 0.05$) exhibited an insignificant negative relationship and effect on firm performance. While Green Supply Chain Orientation (GSCO) showed a significant positive effect on firm performance ($\beta = .373$, $t\text{-value} = 3.063$, $p > 0.05$). The beta value of .373 suggests that when PBC increases its Green Supply Chain Orientation by 1%, firm performance will increase by .37%. The F-value of 3.18 also suggests that the model used is significant and hence results obtained are reliable.

Table 4.7 Regression Results of Green Supply Chain Orientation and Firm Performance

<i>Variable</i>	<i>Parameter</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-value</i>	<i>P-value</i>
(Constant)	β_0	2.618	.584	4.482	.000
Education status	β_1	.096	.077	1.254	.211
Designation	β_2	-.104	.079	-1.315	.190
Work experience	β_3	-.081	.061	-1.337	.183

GSCO	β_4	.390	.124	3.157	.002
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“Dependent variable: Firm performance Predictors: (Constant), education status, designation, work experience, and GSCO; **Model fitness:** F-value = 3.18; P-value = 0.000; Rsquared = .056, **Note:** p-value: **, * significant at 1% and 5% respectively”

4.8 Discussion of Results

This section of the study focuses on discussing key findings revealed in the study. This study aimed at examining the impact of Green Supply Chain Orientation on firm performance in Ghana Cocoa Board. The study also focused on achieving the following specific objectives (1) examine the levels of Green Supply Chain Orientation at PBC Limited; (2) examine the levels of firm performance at PBC as a result of complying with environmental supply chain management; (3) assess the relationship between Green Supply Chain Orientation and firm performance.

The first objective which sought at examining the levels of Green Supply Chain Orientation at PBC Limited was achieved with the aid of descriptive statistics. The descriptive statistics results of the constructs of Green Supply Chain Orientation (GSCO) thus, green purchasing (M=3.72, SD=.927), investment recovery (M=3.65, SD=.1.016), eco-design (M=3.78, SD=.926) and cooperation with customers (M=3.80, SD=.809) revealed an overall mean score (M=3.793, SD= 0.89). This finding affirms the studies of (Teixeira *et al.*, 2016; Zhu *et al.*, 2016; Sharma *et al.*, 2017) who suggested that firms with a good level of GSCO are able to realise an improvement in their firm performance. According to Green *et al.* (2012) GSCO practices should include green purchasing, cooperation with customers, eco-design and investment recovery. Tseng *et al.* (2015) argued that firms are unlikely to perform well if GSCO is practiced in isolation. To mitigate ever-increasing environmental concerns of various stakeholders, a firm should pay attention to external partners of the supply chain along with

internal business operations (Laari *et al.*, 2016). Scholars such as (Tseng and Chiu, 2013; Ali, Bentley & Habib, 2017) have argued that choosing the right supplier has a significant effect in realizing a company's environmental goals and a key strategic route for firms to reduce environmental impact on operations. Zhu and Sarkis (2004) also argue that investment recovery may increase a product's life as the product can be recycled into other usable materials. Besides the financial benefits, these methods also have a positive impact on the environment, which is cited for example in the works of Zhu *et al.* (2008) and Chen *et al.* (2012). Considering the more than average levels of Green Supply Chain Orientation practices at PBC, it could be deduced that the company has taken good initiatives at choosing the right suppliers to ensure they improve on their GSCO practices. This could also be attributed to the good cooperation with customers as Customer cooperation is critical in developing a reliable sustainable compliance system (Lam, Van de Voorde & Green, 2020).

The second objective of the study also aimed at examining the levels of firm performance at PBC as a result of complying with Green Supply Chain Orientation (GSCO). The descriptive statistics was used to achieve this objective. The descriptive statistics revealed that firm performance mean score ($M=4.04$, $SD=.769$) were beyond average indicating that the firm performance levels at PBC is good due to compliance with Green Supply Chain Orientation (GSCO). This finding is in line with the findings of (Lu and Hung, 2011) who found that the firm performance of a firm could be maximised as a result of GSCO practices. According to Lu and Hung (2011), firm performance is to maximize use of resources, manpower and scientific measures to reduce costs and to the satisfaction of employees, managers and consumers. The firm performance in organization is a series of coordinated and planned actions to improve the program and better use of talents, facilities, spaces and places. These practices design and implement in modern program (Tavari *et al.*, 2008).

The third objective of the study also sought to ascertain the relationship between Green Supply Chain Orientation and firm performance. The correlation matrix table and regression results both revealed a significant positive relationship ($\beta = .373$, $t\text{-value} = 3.157$, $p \leq 0.05$) indicating that, when PBC increases its GSCO practices, it will experience improved firm performance. This finding finds support for the seminal studies of scholars including (Zhu and Sarkis, 2004; Chien and Shih, 2007; Zhu *et al.*, 2007b; Ninlawan *et al.*, 2010; Zhu *et al.*, 2010; Azevedo *et al.*, 2011) who also found that adopting or practicing GSCO in organisations increases the firm performance levels of the organisation. Zhu *et al.* (2007b) argued that through the implementation of GSCO, organisations are encouraged to improve and sustain their relationship with the suppliers and customers to achieve enhanced firm performance. Moreover, the interactions among customers, suppliers, and partners, as well as joint research and development will promote environmental performance (Zhu *et al.*, 2007b). Apart from improving firm performance, the implementation of GSCO also ensure that the organisations and their suppliers conform to the environmental regulations (Chien and Shieh, 2007). In brief, the adoption of a sustainable approach, such as GSCO, reduces waste and hazardous materials, lowers the transaction and operational costs, encourages the practices of reusing and recycling the raw materials, promotes efficient utilisation of resources, and assists the organisations to conform with the environmental regulations and hence make them more productive (Chien and Shih, 2007; Tsoufas and Pappis, 2006; Sarkis, 2003).

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter represents the final chapter of this study and hence summarises the major findings revealed from the data analysis conducted in the previous chapter. This chapter does not only conclude or summarise the key findings of the study but as well juxtaposes the findings with that of previous studies to confirm or decent to the findings of previous researchers. The chapter as well proffers empirical recommendations to the PBC Limited with the aim of enhancing their firm performance levels. This study aimed at examining the impact of Green Supply Chain Orientation on firm performance in PBC Limited. Following the objectives set out in this study, the researcher also considered setting the following specific objectives to arrive at the general objective. Thus, (1) examine the levels of Green Supply Chain Orientation at PBC Limited (2) examine the levels of firm performance at PBC as a result of complying with environmental supply chain management; (3) assess the relationship between Green Supply Chain Orientation and firm performance. Using the simple random sampling technique, the study administered 250 questionnaires to respondents who were mainly employees of PBC. However, only 220 questionnaires were valid and duly completed for further analysis. The Statistical Package for Social Sciences (SPSS) was used to analyse data collected from the field to make useful meaning of the data.

5.2 Summary of Findings

The summary of the findings obtained in this study are in the subsections below.

5.2.1 The levels of Green Supply Chain Orientation at PBC Limited

The study assessed the levels of Green Supply Chain Orientation at PBC Limited using the descriptive statistics. The mean scores of the descriptive statistics were important to measuring the overall levels of Green Supply Chain Orientation at Ghana Cocoa Board. The results revealed mean scores of the constructs of Green Supply Chain Orientation (GSCO) thus, green purchasing, investment recovery, eco-design, and cooperation with customers.

Since the levels of GSCO at PBC were far above average, it was deduced that the levels of GSCO practices at PBC are encouraging. The findings found support for the studies of (Teixeira *et al.*, 2016; Zhu *et al.*, 2016; Sharma *et al.*, 2017) who suggested that firms with good levels of GSCO are able to realise an improvement in their firm performance.

5.2.2 The Levels of Firm performance at PBC as a Result of Complying with Green Supply Chain Orientation

The levels of firm performance were also assessed using the mean scores obtained from the results of the descriptive statistics conducted. The descriptive statistics revealed that firm performance mean score was beyond average indicating that the firm performance levels at PBC are good due to compliance with Green Supply Chain Orientation (GSCO). This finding is in line with the findings of who found that the firm performance of a firm could be maximized as a result of GSCO practices. According to Tavari *et al* (2008), firm performance in

organization is a series of coordinated and planned actions to improve the program and better use of talents, facilities, spaces, and places. Thus, knowing when to implement the right GSCO construct is key to ensuring improved firm performance.

5.2.3 The Relationship Between Green Supply Chain Orientation and Firm performance

In measuring the relationship between GSCO and firm performance, the correlation matrix table and regression analysis were utilised. The correlation matrix table and regression results both revealed a significant positive relationship ($\beta = .373$, $t\text{-value} = 3.063$, $p > 0.05$) indicating that, when PBC increases its GSCO practices, it will experience an improved firm performance.

This finding finds support for the seminal studies of scholars including (Zhu and Sarkis, 2004; Chien and Shih, 2007; Zhu *et al.*, 2007b; Ninlawan *et al.*, 2010; Zhu *et al.*, 2010; Azevedo *et al.*, 2011) who also found that adopting or practicing GSCO in organisations increases the firm performance levels of the organisation. Zhu *et al.* (2007b) argued that through the implementation of GSCO, organizations are encouraged to improve and sustain their relationship with suppliers and customers to achieve enhanced firm performance.

5.3 Conclusion

Global concerns about environmental sustainability have caused companies that are seen as the source of environmental problems to have to review their production processes and supply chains as a result of pressure from the community and governments. The adoption of Green Supply Chain Orientation practices has received a warm reception since the introduction of the sustainability concept following the adverse impact of global warming. PBC Limited has not been left out in its contribution toward environmental sustainability. However, the impact of embracing a Green Supply Chain Orientation on firm performance at PBC Limited have over

the years not been assessed. This study hence focused on examining the impact of Green Supply Chain Orientation on firm performance in Ghana Cocoa Board.

The study also made attempts to examine the levels of Green Supply Chain Orientation and firm performance in Ghana Cocoa Board. To achieve the set objectives, the simple random sampling technique was adopted in administering 250 questionnaires to respondents who were mainly employees at PBC. Out of the 250 questionnaires administered, only 220 were valid and hence used to further conduct other robust analysis. The data obtained were first of all coded into excel spreadsheet and later transported into the Statistical Package for Social Sciences (SPSS) for robust analysis. The results of the study revealed that the levels of Green Supply Chain Orientation ($M=3.793$, $SD= 0.89$) and firm performance ($M=4.04$, $SD=.769$) were beyond average and encouraging considering the 5-point Likert scale used in assessing the items under GSCO and firm performance.

5.4 Recommendations

Following the findings of this study, which suggested the GSCO levels of PBC are high, managers can view a strong green orientation as a way to mitigate potential environmental liabilities and improve long-term risk management and achieve improved firm performance. As green supply chain practices often require collaboration with suppliers to ensure the adoption of sustainable practices throughout the supply chain. Managers should consider fostering strong relationships with suppliers and encouraging their participation in environmentally responsible initiatives. Also, the implementation of green supply chain practices can drive innovation and process improvements. Managers can seek opportunities to identify and implement more efficient and sustainable processes that positively impact firm performance.

5.4.1 Managerial Implications

The study revealing a positive relationship between GSCO and firm performance suggests that focusing on green supply chain practices is not just a short-term trend but a sustainable strategy for long-term success. Managers should recognize that adopting and enhancing green supply chain practices can contribute positively to overall firm performance. This suggests that integrating environmentally friendly practices into the supply chain can align with and support broader strategic goals. Managers should develop key performance indicators (KPIs) and metrics to monitor and assess the impact of green supply chain practices on various aspects of firm performance, such as cost savings, revenue growth, and environmental impact. The positive relationship found between GSCO and firm performance suggests that investing in sustainability initiatives and green supply chain practices can pay off in terms of improved financial and operational outcomes.

5.5 Theoretical Implications

The Resource-Based View (RBV) theory is a widely used framework in strategic management that focuses on how a firm's unique resources and capabilities contribute to its competitive advantage and superior performance. The positive relationship between green supply chain orientation and firm performance suggests that a firm's commitment to environmentally conscious practices can become a valuable and sustainable source of competitive advantage. This aligns with the RBV's emphasis on unique resources that are difficult to imitate or replicate. The study's findings imply that firms that excel in adopting and implementing green supply chain practices possess unique resources (such as environmental expertise, sustainable supplier relationships, and waste reduction systems) that differentiate them from competitors. This resource heterogeneity contributes to their superior firm performance. These results

support the RBV's concept of resource valuation. Thus, resources that contribute positively to firm performance, such as green supply chain practices, are considered valuable resources that enhance a firm's competitiveness and profitability.

Firms that successfully implement a green supply chain orientation and experience improved firm performance may benefit from higher levels of resource appropriability. This means they can capture a larger share of the value generated by their unique resource base. As the study shows a positive relationship between green supply chain practices and firm performance, other firms may find it challenging to imitate or substitute these practices. This is consistent with the RBV's concept of inimitability and the creation of barriers to imitation.

5.6 Suggestions for Further Research

It is recommended that conducting a longitudinal study to assess the long-term impact of Green Supply Chain Orientation (GSCO) on the firm performance of PBC Limited. By tracking changes in GSCO practices and firm performance over an extended period, the research can provide insights into the sustainability of positive outcomes. This approach would allow for a deeper understanding of how GSCO practices contribute to firm performance trends, offering valuable information for both PBC Limited and the broader business community interested in sustainable supply chain management.

It is important to extend the research scope by conducting a comparative analysis of GSCO and firm performance across different industries. This would involve assessing how GSCO practices vary in their impact on firm performance within the cocoa industry and comparing these findings with those from other sectors. Such a comparative approach can yield valuable insights into industry-specific challenges and opportunities related to GSCO. Additionally, it

can contribute to the generalizability of the research findings and provide a broader perspective on the role of green supply chain practices in diverse business environments.

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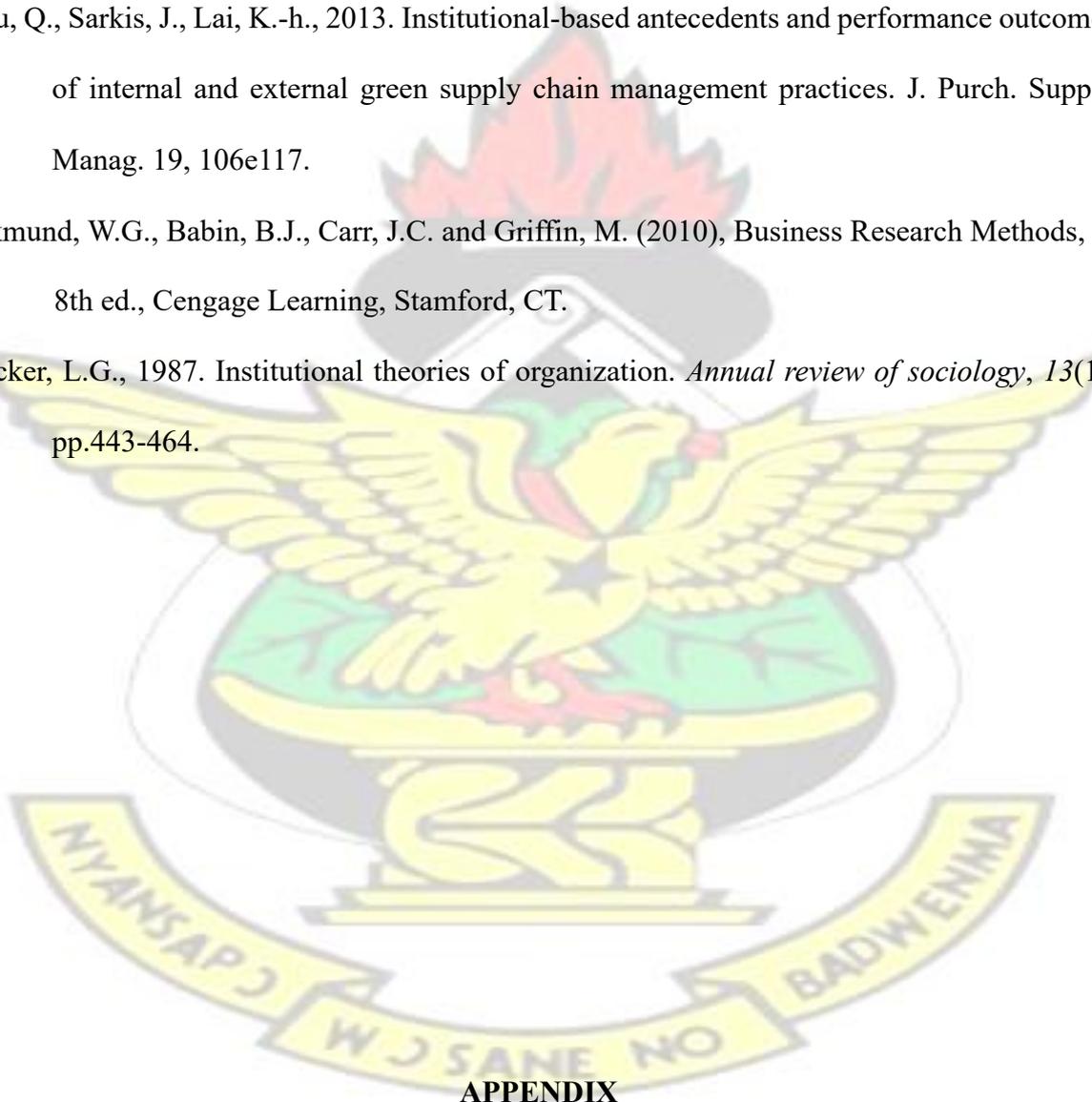
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APPENDIX

QUESTIONNAIRE

Dear Sir/Madam,

I am a candidate for an MSC degree in **Logistics and Supply Chain** at the Kwame Nkrumah University of Science and Technology, Kumasi. As part of the requirement for the award of the degree, I am conducting research to “**examine the effect of Green Supply Chain Orientation (GSCO) on the firm performance of the cocoa processing industry in Ghana**” and will require your genuine assistance.

Brief background of the study

This study seeks to **examine the effect of Green Supply Chain Orientation on Firm Performance of the Cocoa processing industry in Ghana**. The study is purely academic-oriented; as such I would like to assure you that your responses would not be used for any other purpose other than those stated before. For the purposes of improving the quality of the study, I humbly request you to take your time to read and understand the items on this instrument before you respond to them. Objective responses offered will be highly appreciated.

Please read the instruction(s) under each section of the instrument to assist you in your responses and indicate your answer by ticking the appropriate box [✓]. Please provide answers to the questions below based on your knowledge and experience as an employee in your company. No response is wrong and your responses will be strictly confidential.

Thank you so much for your willingness to participate in this study.

Research Objectives

To achieve the general objective which seeks to examine the effect of Green Supply Chain Orientation (GSCO) on the firm performance of cocoa processing industry in Ghana, this study specifically aims at

- iv. Assessing the levels of GSCO at the selected cocoa processing firm.
- v. Assessing the levels of firm performance at the selected cocoa processing firm.
- vi. Evaluating the relationship between GSCO and firm performance at the selected cocoa processing industry firm.

Questionnaire ID: _____

SECTION A: FIRM BACKGROUND & RESPONDENT'S INFORMATION

1. This firm is mainly a... Manufacturing organisation Service organisation
 Others
2. Describe your firm's activities.....
3. How long has this firm existed/operated in the industry?
.....Years

4. Number of employees in the firm 2 – 30 31 – 99 100+
5. On the average, how many employees has this firm kept over the past three years.....employees
6. Does this firm have a research and development unit? Yes No
7. Please indicate your **gender** Male Female
8. Please indicate your **age** (years) Less than 20 20 to 29 30 to 39 40 to 49 50+
9. Please indicate your **current position** in this firm Owner-manager Executive Manager
10. Please indicate the number of years that you have held your current position in this firm.....

Section I: Green Supply Chain Management

How will you rate your firm in relation to the green supply chain management constructs in the Table below? “1= strongly disagree”, “2= disagree”, “3= neutral”, “4= agree”, “5= strongly agree”, to indicate the strength of your firm in terms of;

Code	Items	Response				
		Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
	<i>Green Purchasing (Zhu et al, 2013)</i>					

GP1	Our firm cooperates with suppliers to meet environmental objectives					
GP2	Our firm emphasizes purchasing eco-friendly materials					
GP3	Our firm evaluates suppliers on the basis of specific environmental criteria					
GP4	Our firm cooperates with suppliers who have environmental certifications such as ISO 14001					
GP5	Our firm has partnerships with suppliers that aim to build environmental solutions and/or develop					
	<i>Investment recovery</i>					
IR1	Our firm has initiated Investment recovery (sale) of excess inventories/materials					
IR2	Our firm has established a recycling system for used and defective products					
IR3	Our firm has initiated sale of excess capital equipment					
	<i>Eco-design (Zhu et al, 2010)</i>					
ED1	Our firm keeps on tracking, reporting and reducing the energy					
ED2	Our firm designs products for reduced consumption of materials/energy					
ED3	Our firm design of products that can be reused, recycled and recovered					
ED4	Our firm emphasizes on optimization of design process to reduce solid and liquid waste					
ED5	Our firm emphasizes on optimization of design process to reduce air emission and noise					
ED6	Our firm emphasizes on design of products to reduce use of harmful/toxic material					
	<i>Cooperation with Customers (Zhu et al, 2013)</i>					
CC1	Our firm cooperates with customers for eco-design					
CC2	Our firm cooperates with customers for cleaner production					
CC3	Our firm cooperates with customers for green packaging					
CC4	Our firm adopts third-party-logistics for customer cooperation					
CC5	Our firm cooperates with customers for using less energy during product transportation					
	<i>Internal environmental management (Zhu et al, 2013)</i>					
IEM1	Senior managers in our firm are committed to green supply chain management					
IEM2	Our firm emphasizes cross-functional cooperation for environmental improvements					
IEM3	Our firm emphasizes environmental compliance and auditing programs					
IEM4	Our firm has pollution prevention plans					

IEM5	Our firm has a system to track environmental laws and					
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Section II: Performance

How will you rate your firm in relation to the performance constructs in the Table below? “1= strongly disagree”, “2= disagree”, “3= neutral”, “4= agree”, “5= strongly agree”, to indicate the strength of your firm in terms of;

Code	Items	Response				
		Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
	Environmental Performance (Chien, 2014)					
EP1	Our firm has reduced consumption of hazardous/toxic material during the last three years compared to competitors					
EP 2	Our firm has reduced air emissions during the last three years compared to competitors					
EP3	Our firm has reduced effluent wastes during the last three years compared to competitors					
EP4	Our firm has sought to improve its environmental image/position during the last three years					
EP5	Our firm has reduced energy consumption during the last three years compared to competitors					
EP6	Our firm has reduced solid wastes during the last three years compared to competitors					
	Operational Performance (Zhu <i>et al</i>, 2005)					
OP1	Our company has achieved operational cost savings during the last three years compared to competitors					
OP2	Our company has improved products’ quality during the last three years compared to competitors					
OP3	Our company has improved on-time delivery rate during the last three years compared to competitors.					

OP4	Our company has developed a flexible system for rapid response to change in orders/demand during the last three years compared to competitors					
OP5	Our company has decreased inventory levels during the last three years compared to competitors					
	Financial Performance (Beyene, 2015)					
FP1	Our market share has increased during the last three years compared to competitors					
FP2	Our overall competitive position in Jordan has improved during the last three years compared to competitors					
FP 3	Our sales have increased during the last three years compared to competitors					
FP 4	Our customer satisfaction level has increased during the last three years compared to competitors					
FP 5	Our profitability has increased during the last three years compared to competitors					

