

**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY,
KUMASI**



**THE EFFECTS OF GREEN SUPPLY CHAIN MANAGEMENT PRACTICES ON
FIRMS' PERFORMANCE; MEDIATING ROLE OF GREEN INNOVATION OF
MANUFACTURING FIRMS IN GHANA**

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DECLARATION

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

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DEDICATION

This study is dedicated to God Almighty, My Husband and Children and the entire management team of the Manufacturing firms in Ghana. God richly bless all of you.

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I thank God Almighty for his enablement. I am also grateful to my supervisor Mr Benjamin Cosmos Osei who guided me through this long essay period. Finally, I appreciate the efforts of all friends and colleagues who in diverse ways contributed to the success of this study.



ABSTRACT

The aim was to investigate the effect of GSCM practices on firms' performance; mediating role of green innovation. The specific objectives the study sought to achieve includes; to analyze the effect of GSCM on performance; to investigate the effect of green innovation on firms' performance and to examine the mediating effects of green innovation on GSCM practices and performance. A cross-sectional quantitative research approach was employed on a sample of two-hundred (200) respondents who were randomly selected. Questionnaire was employed using structured closed-ended 7-point Likert Scale. Descriptive statistics, such mean score, standard deviation, correlation, Multinomial logistics regression and Process Macro V3.3 method were employed for interpretation. The study's finding revealed that GSCM practices had direct no significant effect on firm performance. Also, green innovation had direct significant effect on firms' performance. Also, green innovation has full mediation effect on the relationship between GSCM practices and firm performance. The study recommends that firms should set aside about 5% of the annual net profit and re-invest into green innovations. This help the firms to improve their green innovations activities within the supply chain which tend to improve firms performance in short and long period.

Keywords: Firm Performance, Ghana, Green Innovation, Green Supply Chain Management.

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LIST OF ABBREVIATIONS

EP	Environment Performance
FP	Firm Performance
GDP	Gross Domestic Product
GI	Green Innovation
GSCM	Green Supply Chain Management
GSCMP	Green Supply Chain Management Practices
GSS	Ghana Statistical Service
HND	Higher National Diploma
RBV	Resource-Based View
SC	Supply Chain
SPSS	Statistical Package for Social Science



CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Today, the contributions of manufacturing firms to the development and growth of countries around the globe are enormous (Centobelli, Cerchione and Esposito, 2018). This has allowed many practitioners, analyst, researchers, academicians and concern players to recognize the importance of the sector to the development of the world (Baumann et al. 2013). In Ghanaian environment, the manufacturing sector has seen a great contributor to the country growth rate. It is evident that the sector has contributed about 24% to GDP during the periods from 2006 to 2020 first quarter (Ghana Statistical Service, 2020). On the other hand, there has been serious of motivation and pressure from all players in the country to reengineer the businesses of the sector through their activities and processes to be in line with the international standards (Kraus et al. 2012; Yang, 2017).

The justification of the series of pressures on the sector seems to be as result of recent high rate of supply chain disruptions. The firm's response to the consistent pressures has allow them to be more environmentally sustainable. Thus, the firms have positioned their minds to move from the traditional way of profit-oriented approach to a more balance approach that considers financial and environmental needs as a central business goal (Li, Xu, Deng and Liang, 2017). This occurrence has necessitated for the manufacturing firms to embrace GSCM (Geng, Mansouri and Aktas, 2017). Green supply chain management (GSCM) is explained as the practices that ensures the reduction or elimination of environmentally issues that occurs at the time of acquiring the

materials, production to the final consumer (Sharma et al., 2017). The concept of GSCM practices has numerous implications on firm's environmental and financial performance. In the context of GSCM practices on financial performance; Diab, AL-Bourini and Abu-Rumman (2015) argues that the practices of GSCM allow firms to reduce the level of waste produce by suppliers as well as minimize the waste of hazardous materials and effect tends to improve the firm's financial performance. Also, Lee and Kim (2017) Indicated that the activities of manufacturing firms are mostly associated with the spillage of chemicals in the environment which has an adverse implication on the industry and the environment. Therefore, the firms within the industry ability to form a union in adopting the GSCM practices through self-regulation of preventing harmful spillage that could improve the reputation of the firms and effect improves the financial performance. On the other hand, the GSCM practices implication of environmental performance arises in different forms. Thus, the partnership that exist among the actors along supply chain through effective synergy tends to help the firms improve its environmental performance as result of minimizing the waste of production (Burki, 2018).

The discussing of GSCM and its implication on firms financial and environmental performance has ignored the significance role of innovation. Based on this, many firms are now taking serious concern on the adoption of green innovation in every aspect of firms GSCM business due to the emergence of environmental concern (Lin et al., 2018). Wong (2020) suggested that customers have become very critical and sensitive to environmental issues and this has become vital for firms to adopt green innovation. The importance that is been attach to green innovation is becoming very promising in the area of GSCM which is significant in eliminating direct and indirect environmental impact of firm's final product (Lee and Kim, 2017). The infusion of green innovation in firm's GSCM practices has the ability to provide innovative ideas and approaches

to firms in helping in the development of green products. Also, the green innovation tends to seek various innovative ways through each stage of the firm's supply chain with the objective of gaining competitive edge as well as reduce the environmental problems that exist along the supply chain (Zailani, Amran and Jumadi, 2018). Hence, it is noted that the underlying importance of green innovation serves as fundamental tool in improving the GSCM practices among firms. Therefore, Roper and Tapinos (2016), claims that green innovation matters in GSCM performance. Thus, the adoption of product innovation, process innovation and managerial innovation leads to improve products that are environmentally friendly in terms of reduction in waste and decrease associated with cost, which leads to improve GSCM performance (Roper and Tapinos, 2016). Therefore, based on the background, the study aims to investigate GSCM practices on performance; mediating role of green innovations.

1.2 Problem Statement

Performance is key objective among manufacturing firms and GSCM practices plays a major role achieving the performance targets. Hence, various studies have been conducted in relation to the linkage between GSCM practices and firm performance (Shafique et al., 2017; Li et al., 2017; Wong, 2020; Azevedo et al., 2011). However, there has been some literatures that shows their argument concerning the linkage between GSCM and firm performance (Zailani et al., 2018; Seman et al., 2019; Arimura et al., 2011). The argument has been whether firm's GSCM practices have been fully absorbed with the objective of improving performance within the context of manufacturing firms has remained debatable. Burki (2018) and Qi et al., (2020) suggested that GSCM practices directly impact on firm performance through effective greening of supplier's goods. In support of study results by Burki (2018), Vachon and Klassen (2016) pointed out that there is direct link between GSCM practices and firm performance. Thus, the study showed that

the firms collaborated with their suppliers which allowed the suppliers to effectively provide green materials and this led to reduction to waste and improves environmental performance. While, Dubey et al. (2015) pointed out that firm's that embrace the concept of GSCM practices tend to attract more investors as well as enjoys increase in profit and improve environmental performance (Yang et al., 2013; Laari et al., 2016; Roy & Khastagir, 2016). Based on the resource-based view theory, firms that adopt the implementation of GSCM practices tend to have competitive edge within their niche and enhances environmental performance (Hami et al., 2015). With that, Lee and Kim (2017) indicated that firms constantly monitored and ensured that their suppliers provided environmentally friendly materials that helped improved firm's production processes.

Studies have investigated into GSCM practices and performance in separates studies (Arimura et al., 2011; Eltayeb et al., 2011; Azevedo et al., 2011), there is much literature focus on green supplier, green purchasing and green product which have dominated among the review literatures. However, Chiou *et al.* (2017) pointed out that green process innovation which encompasses design, logistics and environmental cooperation have been ignored in the context of GSCM practices. Therefore, the study created a gap that suggested that there is lack of literature review that holistically looks into GSCM practices that can be used as pivotal point for both theory building and theory testing. Accordingly, this study is set out to holistically look at how green innovation mediates the link between GSCM practices and firm performances. Moreover, the study in attempt to fill the research gap tends to discuss the effect of GSCM practices on performance; mediating role of green innovation.

1.3 Objectives of the Study

The general objective of the study is to investigate the effects of GSCM practices on firms' performance; the mediating role of green innovation of manufacturing firms in Ghana.

1.3.1 Specific Objectives

1. To analyze the effect of GSCM on performance among manufacturing firms in Ghana.
2. To investigate the effect of green innovation on performance among manufacturing firms in Ghana.
3. To investigate the mediating effects of green innovation on GSCM practices and performance among manufacturing firms in Ghana.

1.4 Research Questions

1. What is the effect of GSCM on firms' performance?
2. What is the effect of green innovation on firms' performance
3. What are the mediating effects of green innovation on GSCM practices and performance relation?

1.5 Significance of the Study

The significance of the study is divided in to three main areas; these includes, practice, policy and research. These are further presented and discussed under sub-headings.

1.5.1 Contribution to Practice

The study tend to give a practical and managerial insights on GSCM practices, innovation and performance among manufacturing firms in Ghana. The outcome of the study shall highlight and discuss its potential impact of GSCM practices on firm performance in the country. Further, the results of the current study shall provide the management of manufacturing firms in Ghana to

outline the best practices of GSCM. The outcome of the study result shall help improve the firm's through reducing of its level of waste within their supply chain activities while promising maximisation consumer satisfaction and good profit. The outcome shall help improve the smooth operations of the firms and better connect their efforts for sustainable performance improvement. Also, customers of the firm stand to gain as result of improve better products that comes out from the firm rectification of its pitfalls or problems in SCM practices.

1.5.2 Contribution to Policy

Concerning policy, the outcome of the study shall provide feedback to the policy makers such as Government, suppliers, consumers, environmentalist and producers in making informed policy decisions regarding the GSCM practices at all levels or stages in product manufacturing in the country. The policy direction by the stakeholders tend to ensure that there is sustainable GSCM practices to the manufacturing firms' across the country.

1.5.3 Contribution to Research

Even though, GSCM practices, innovations and performance has been studied in the literature, there is an empirical gap in literature. Hence, despite in the involvement of firms in adoption of different models in GSCM practices to impact on performance for the past decade, various literature concerning firm performance as result of GSCM practices has not been fully explored, which is still limited, especially in the developing countries as compare to developed economies. Also, it shall contribute the world discussion and literature by giving perspective on developing economy on the subject under discussion.

1.6 Overview of Research Methodology

Quantitative research approach was employed. The motivation for the choice of said method allows numerical data to be used that is involve with hypothesis analysis. The study adopted the quantitative approach because it enables the researcher to collect data form larger number of respondents using questionnaire for analysis. The study adopts cross-sectional study to address the objectives of the study. The justification for the choice of cross-sectional study is because it relative cost effective nature and convenient ways of conducting the study. Also, it allows all data to be collected at single point in time and gives room for the study to obtain a multiple outcomes relating to the project. The sample size was made up of total of two-hundred (200) respondents that was attained through the justification of Yamane Formulae. The population was divided into top, middle and lower-level management called stratum. Thus, the study adopted strata sampling technique. The study employs first-hand information source of data through the use of questionnaire. The study data gathered was analysed using mean, deviation, correlation and regression with the aid of SPSS.

1.7 Scope of the Study

The study is based on the theme GSCM practices, innovations and performance; moderating role of supply chain disruptions using manufacturing firms in Ghana. The study was conducted using selected manufacturing firms in Ghana. Thus, the study was conducted at the head-office of the respective firms. The selection of the head office was based on the justification that the firm major managerial decisions was most undertaken within the head-office concerning GSCM. The study ensured that the results of the project was generalized within the context of manufacturing firms within Ghana.

1.8 Limitation of the Study

The contribution of the study is concrete. However, the scope of the study is limited which is attribute to the study use of cross-sectional design. This implies that the study cannot make concrete generalization over longitudinal approaches of study. Also, the study is limited based on the study alignment with quantitative research approach that basically deals with the detection of patterns and trends. Contra, this does not allow for detail exploration of the use of qualitative research to be use that will allow for in-depth interview with the key stakeholders on the subject matter. The study also indicated that the data collection is access using primary data which is done through usage of questionnaire. Therefore, the data is fought with validity and reliability problems since human activities are involved.

1.9 Organization of the Study

The study organised the chapters into five different sections. Based on this, first chapter that deals with the background of the study, problem statement, objectives as well as scope and justification of the study. Chapter two presents the review of the literature which is subject to various divisions. This includes; conceptual review, theoretical review, empirical and conceptual framework. Next, this involves chapter three which presents the method and procedures used to conduct the study. Chapter four presents the data findings and discussion of the result in line with subject under discussion. Finally, chapter five presents the conclusion and recommendations of the study.

CHAPTER TWO

LITERATURE REVIEW

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2.1 Introduction

This part of the chapter review the literature concerning “*GSCM practices and performance; mediating role of green innovation*”. The literature was categorised into conceptual review, theoretical review, empirical as well as conceptual framework.

2.2 Conceptual Review

This section of the project presents and discusses the conceptual reviews in line with the subject matter under discussion concerning GSCM practices and performance; mediating role of green innovation. Based on this, the project categorised the review into different sections that involves concept of GSCM, component of GSCM, GSCM and firm’s performance, green innovation, relationship between GSCM and performance and mediating effect of green innovation.

2.2.1 Green Supply Chain Management

The concept of GSCM is set up to incorporate environmental ideologies into the supply chain management (Srivastava, 2017). The activities of the GSCM includes; product design, material selection and sourcing, manufacturing as well as delivery of final product to customers, and post disposal (Petljak et al., 2018). The concept of GSCM does not only share the idea of being environmentally friendly only; but it is also considered as driver for commercial value in a business perspective. GSCM is been operationalized into different forms by scholars and researchers. Petljak et al. (2018) indicates that GSCM consists of green products, green supplier

selection, green purchasing, revise logistics as well as green distribution. On the other hand, Yildiz, Çankaya and Sezen (2019); Zhu and Sarkis (2014) indicates that GSCM involves internal environmental management that involves eco design, green purchasing, customer cooperation, and investment recovery. Foo et al. (2019) also suggests that GSCM entails the green design, sourcing, manufacturing, distribution and reverse logistics. In support of the above mentioned, Wang et al. (2018) argues that GSCM is basically divided into both internal and external green practices. Again, the model development in relation to GSCM by Zhu and Sarkis (2014) categorised GSCM into internal and external GSCM practices. Based on the above arguments, the study employ the operationalization of the GSCM into areas based on the following justification. Thus, the GSCM practices are considered as key practices have the potential to reduce the risk of environmental effect on any given firm supply chain process. Also, the practices have been quoted and justified in several literature (Yildiz Çankaya and Sezen, 2019). Finally, these GSCM practices can be implemented by firms both in developed and developing countries (Al-Ghwayeen and Abdallah, 2018).

2.2.2 Component of GSCM

2.1.2.1 Green Procurement

Green procurement is explained as the act of procuring goods and services with the idea of factoring environmental procure goods and services (Liu and Chang, 2017). The purchases ensures that the procure goods and services tend to reduce, reuse as well as recycle of materials. The importance of using green purchasing is that it has reason for firms been environmentally friendly. Also, this involves the various activities that are been adhered to at point of selecting suppliers with the intention of selecting the suppliers that practices eco-friendly methods (Singh and Trivedi, 2016). This shows that firms ensure that selection of suppliers as well as procuring

of materials needs to take into consideration and supply environmentally friendly goods (Chin et. al 2015).

2.1.2.2 Green Design

The green design involves the activities that goes into the designing of products with the objective of inculcating environmentally friendliness in the product design (Guo, 2017). Thus, the green design ensure that there is adequate guarantee of product quality that takes the basic principle of reduce, recycle and reuse. The importance of this is that the conformity of ensuring that product design takes into consideration environmental friendly design helps fulfil require green standards. Hence, this helps to provide no harmful to the environment as well as not contribute to waste (Hu and Fu, 2013).

2.1.2.3 Green Operations and Reverse Logistics

This involves the use of environmentally package and logistics. Thus, it is important for firms to inculcate environmentally friendly practices in the packaging of the products. The ability for firms to factor greening in the packaging serve key in eliminating and reducing waste (Carter and Ellram, 2018). Also, green logistics involves the practices of factoring environmentally friendly in the distribution of products and services to the final consumer (Carter and Ellram, 2018).

2.1.2.4 Green Manufacturing and Remanufacturing

Green manufacturing is expressed as the practices inculcating greening in the production processes of a given firms (Rehman et al., 2016). This shows it is important for firms to factor environmentally friendly practices into the manufacturing of products (Ghazilla et al., 2015). The implication of the infusion of the environmental friendly practices in the manufacturing of the products help in eliminating or reducing waste (Roy and Khastagir, 2016). Green manufacturing

can lead to lower raw material costs, production efficiency gains, reduced environmental and occupational safety expenses, and improved corporate image (Mitra and Datta, 2014).

Remanufacturing is defined as recycling integrated manufacturing (Mitra and Datta, 2014).

2.2.3 GSCM and Firms Performance

Studies have shown GSCM had an effect on improving firm performance cost, while it is recognized that GSCM requires large cost (Geng, Mansouri and Aktas, 2017). Khan and Qianli, 2017). Namagembe, Sridharan and Ryan (2016) indicates GSCM had no significant effect on firm performance. This is because not many companies have had the opportunity and resources to implement GSCM in their respective companies. However, there is significant linkage between GSCM and firm performance at point where companies improve their green innovation (Abu Seman et al., 2019).

Studies have argued that companies adoption of GSCM are as result of the increasing pressures from external stakeholders such as government, regulators and customers, which tend to improve performance (Burki, 2018; Seman et al., 2019). Handayani, Wahyudi and Suharnomo (2017) indicates that there is direct linkage between GSCM and firm performance. This implies that the ability for companies to effectively and efficiently implement GSCM in the companies supply chain activities tend to affect firm performance since customers are now environmentally centric. This shows that there is increasing need for GSCM among firms since it is driver for firm performance (Abeysekara, Wang and Kuruppuarachchi, 2019).

2.2.4 Relationship between Green Innovation and Firms Performance

The implementation of green innovation is key in the area of GSCM. Rao (2017) indicates that the linkage that exist between green innovation and firms' performance is supported by the theory

of co-creation model and evolutionary approach. Therefore, Prahalad and Ramaswamy (2014) indicates that the both theories argues that stakeholders involve in the supply chain process tend to create more green innovation in order to comply with the pressures from the external factors such as regulation and government. Chen (2018) mentioned that green suppliers contributes more to green innovations. Therefore, green innovations are considered to be key actors in inducing firm performance. Lee and Kim (2017) pointed out that green innovation serves as means through which firms' uses to innovate new product and services within the supply chain which help gain competitive advantage as well as reduces the environmental problems that occur in the market.

In support of the argument, Chien and Shih (2017) indicates that green innovation concept is considered an underlying key to firms' performance. It is supported by Lee and Kim (2017) claimed that the basis of innovation arises from supplier commitment in green product development is to help improve competitive advantage as well as firms performance. It is important to notice that supplier commitment is a key practices that surrounds the implementation of GSCSM (Preacher and Hayes, 2018). It relates more to green purchasing whereby supplier commitment is needed in providing manufacturers the material that meet environmental requirement (Reid and Miedzinski, 2018). Then, the green innovation will underlying this practice to develop new green product in more strategically. However, there are still limited research attention has been paid into the relationship between green innovation and firms' performance (Garg, 2015). In summary, the comprehensive GSCM practices in developing new green product can indirectly stimulate to more green innovation such as product innovation, process innovation, managerial innovation, and marketing innovation. Then, it will represent the full picture of innovation activities in underlying each stage of supply chain in delivering to improve firms' performance final product (Zhu et al., 2016).

2.2.5 Mediating Role of Green Innovation

Green innovation is expressed as environmental innovation that takes in the form of product innovation, process innovation, green technologies, managerial functions as well as manufacturing processes (Burki 2018; Li et al., 2017). This shows that green innovation has been a concept that has been promoted effectively in the manufacturing organisations as an environmental management concept (Zailani et al., 2018). The institution and adoption of green innovation do not only reduce the cost of production but also improves the consistency and standards of the products (Zhu and Sarkis, 2014). Based on the perspective of the definitions that have been discussed from the literature, green innovation is considered as a new environmental approach that is been used to develop new ideas with the motive of reducing the adverse impact on the environment as well as create differentiation of developed product among competitors (Abdullah and Yaakub, 2015).

Alhadid and Abu-Rumman (2014) argues that green innovation is been use to improve the performance of environmental management. Chen (2018) suggests that GSCM practices that takes in the form of internal and external practices set off green innovation, which trigger for supply chain management of firms in competitive environment. Also, Zailani et al. (2015) indicates that green innovation surface as result of the increasing pressure that exits in markets due to competitors, regulators and consumers. Li et al. (2017) argues that it is important for management of organisations to ensure that there is necessary resources available for utilization and implementation of new innovation through acquisition of knowledge. Therefore, the innovations involves the process, product as well as marketing attributes to help create product differentiation (Huang et al., 2016). Hence. The concept of green innovation is antidote for GSCM implementation success (Eltayeb et al., 2011).

2.3 Theoretical Review

This section of the study review the theories associated with the study in line with the theme of the project. The study reviews two main theories in connection with the subject of the study. The theories includes Resource Base-View Theory and Transaction Cost Theory. The justification of the application of the theories is that is to help put the study into better perspective in line with the subject matter. The study theories below have been properly explained based on the subject of the study.

2.3.1 Resource Base-View Theory

The theory was propounded by Prahalad and Hamel (1990). The theory is based on assumption which states that it is important firms to identify and analyse their resources and capabilities effectively in order to help develop strategies based on their assets to gain advantage in competitive market place (Fikru, 2016). In support of the argument, Rivard et al. (2016) indicates that firms are now embracing and adopting GSCM which is new mantra to thrive competitively in the keen business environment. In the context of the study, manufacturing firms are now adopting the use of GSCM practices in their business operation. The justification is that it is difficult for other business entities to imitate due to the green innovative ideologies that is been adopted within the GSCM (Jabbour et al., 2014).

In line with the study, it is important for the management of the firm to ensure that the activities that occurs along the supply chain are been channel towards greening. This sis because the customers of today are geared towards green products and services. Based on this, it is beneficial for the management of the firm identify their strength and capabilities and geared towards the practices of GSCM through green innovation, This help the firm to produce green products onto the market which will attract more customers which tend to make the firm gain competitive

advantage as well improve performance. The theory is important to the topic under study because firms effective practices of GSCM is key in gaining competitive advantage in the business environment. Therefore, firms ability to apply innovation through their GSCM tend to mitigate or reduce any supply chain disruption that might occur which tend to improve firm performance.

2.3.2 Transaction Cost Theory

The theory of transaction cost theory is based on the assumption that ensures reduction of the cost of transaction (Busi and McIvor, 2008). In the context of business environment, business firms are adopting different innovative models to help in reducing the cost business transactions. Based on the context of the study, the application of the transaction cost theory is applicable at point where by the management of the firm adopts green innovation in their supply chain practices to reduce the cost and time to enhance performance of the firm. This shows that the management of the firm tend to find the best alternative model that will help the firms reduce cost of operation which transaction cost theory is best option (O'Brien 2011). This implies that the management of the firm adoption of green innovation in the activities and practices of the firm supply chain tend to allow the firm to produce environmentally products that reduces cost as well as improve performance. The importance of the theory to the topic under study is that green innovation is important and significant within the GSCM practices. Thus, the firm inculcating innovation within their GSCM will help developing green product that will reduce cost and enhance performance.

2.4 Empirical Literature Review

Chiou et al., (2017), investigated the GSCM practices and firm performance in Taiwan. In line with study, the study ensured that quantitative approach was used. The study participants were selected for the study using simple random sampling. Hence, a total of two-hundred and fifty-two

(252) was used sample size. The collection of the data was done using first-hand data source through questionnaire. The analysis of the data was conducted using correlation. Based on this, the result indicated there is direct link between GSCM and firm performance.

Afum et al., (2020), determined GSCM practices and firm performance. In line with study, the study ensured that quantitative approach was used. The study participants were selected for the study using simple random sampling. Hence, a total of one-hundred and twenty (120) was used sample size. The collection of the data was done using first-hand data source through questionnaire. The analysis of the data was conducted using correlation. Based on this, the result indicated there is direct link between GSCM and firm performance.

Seman et al., (2019) examined the mediating role green innovation on the link between GSCMP and firm performance in Malaysia. The study approach that was used in line with the objectives involves quantitative approach. The study participants sampled was determined using simple random. The collection of the data was done using first-hand data source through questionnaire. The mediating factor was established using Process Macro method. Based on this, the result showed that green innovation directly mediate the link between GSCM and firm performance.

Burki (2018), examined the moderating role supply chain disruption on the link between GSCMP and firm performance in Malaysia. The study approach that was used in line with the objectives involves quantitative approach. The study participants sampled was determined using simple random. Hence, a total of two-hundred and ten (210) was used sample size. The collection of the data was done using first-hand data source through questionnaire. The moderating factor was established using Process Macro method. The result indicated that supply chain disruption directly weakened the link between GSCP and firm performance.

Qi et al. (2020) empirically examined the moderating role supply chain disruption on the link between GSCMP and firm performance. The study approach that was used in line with the objectives involves quantitative approach. The study participants sampled was determined using simple random. Hence, a total of three-hundred and twenty (320) was used sample size. The collection of the data was done using first-hand data source through questionnaire. The moderating factor was established using process Macro method. The result indicated that supply chain disruption directly weakened the link between GSCP and firm performance.

Lee and Kim (2017) determined GSCM practices and firm performance in Korea. In line with study, the study ensured that quantitative approach was used. The study participants were selected for the study using simple random sampling. Hence, a total of three-hundred and fifty-two (352) was used sample size. The collection of the data was done using first-hand data source through questionnaire. The analysis of the data was conducted using correlation. Based on this, the result indicated there is direct link between GSCM and firm performance.

Ar-Ilker, (2017), examined the mediating role green innovation on the link between GSCMP and firm performance in Turkey. The study approach that was used in line with the objectives involves quantitative approach. The study participants sampled was determined using simple random. The collection of the data was done using first-hand data source through questionnaire. The mediating factor was established using Process Macro method. Based on this, the result showed that green innovation directly mediate the link between GSCM and firm performance.

Wong, (2020) determined GSCM practices and firm performance. In line with study, the study ensured that quantitative approach was used. The study participants were selected for the study

using simple random sampling. Hence, a total of one-hundred (100) was used sample size. The collection of the data was done using first-hand data source through questionnaire. The analysis of the data was conducted using correlation. Based on this, the result indicated there is direct link between GSCM and firm performance.

Lin et al., (2018) determined GSCM practices and firm performance in Vietnam. In line with study, the study ensured that quantitative approach was used. The study participants were selected for the study using simple random sampling. Hence, a total of three-hundred (300) was used sample size. The collection of the data was done using first-hand data source through questionnaire. The analysis of the data was conducted using correlation. Based on this, the result indicated there is direct link between GSCM and firm performance.

Tseng et al., (2013), empirically examined the moderating role supply chain disruption on the link between GSCMP and firm performance in Taiwan. The study approach that was used in line with the objectives involves quantitative approach. The study participants sampled was determined using simple random. Hence, a total of three-hundred and twenty (320) was used sample size. The collection of the data was done using first-hand data source through questionnaire. The result indicated that supply chain disruption directly weakened the link between GSCP and firm performance.

Van-Den Berg et al., (2017) investigated the GSCM practices and firm performance in South Africa. In line with study, the study ensured that quantitative approach was used. The study participants were selected for the study using simple random sampling. Hence, a total of one-hundred and fifty (150) was used sample size. The collection of the data was done using first-

hand data source through questionnaire. The analysis of the data was conducted using correlation. Based on this, the result indicated there is direct link between GSCM and firm performance.

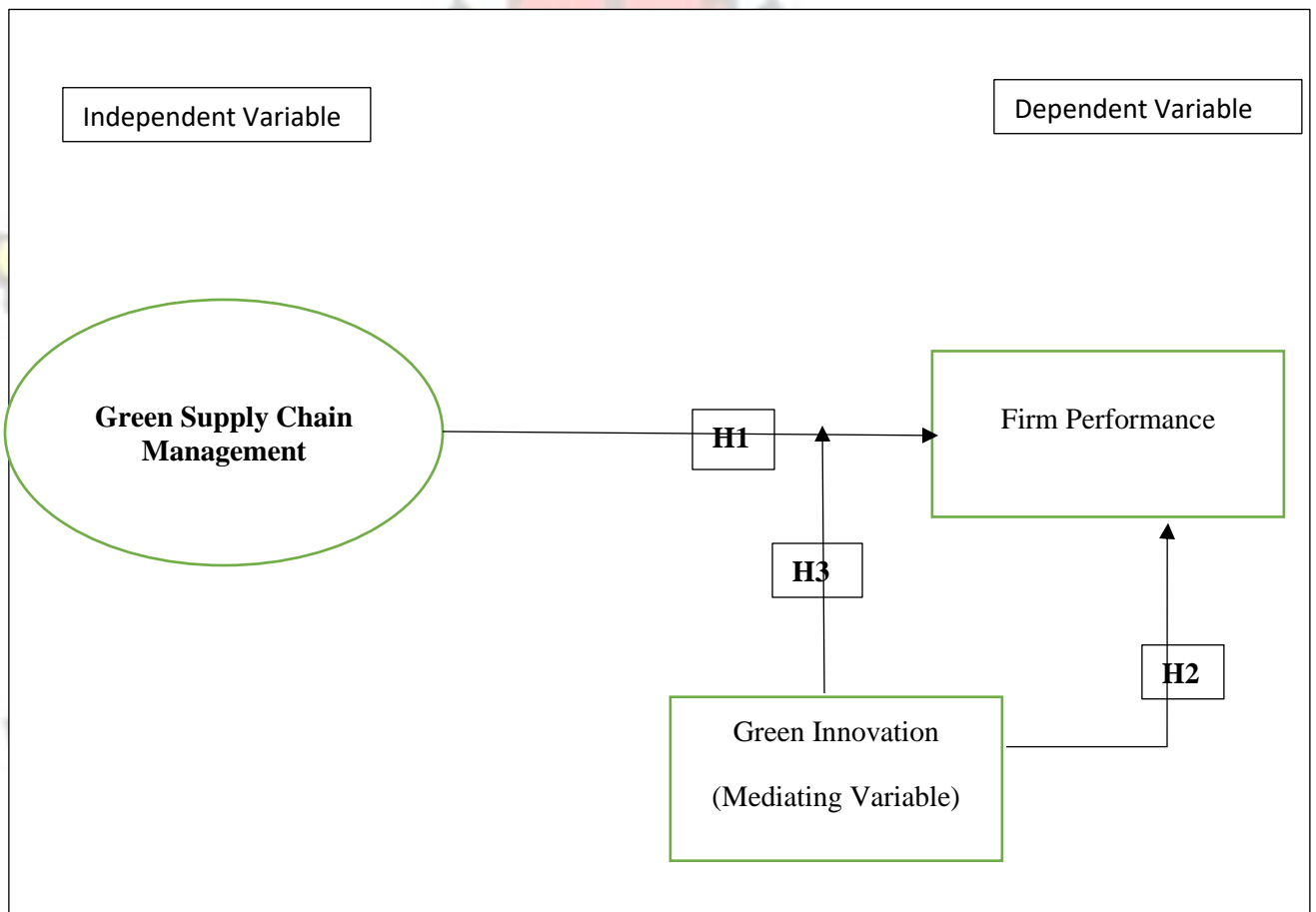
Roper and Tapinos, (2016) examined the mediating role green innovation on the link between GSCMP and firm performance in Malaysia. The study approach that was used in line with the objectives involves quantitative approach. The study participants sampled was determined using simple random. The collection of the data was done using first-hand data source through questionnaire. The mediating factor was established using Process Macro method. Based on this, the result showed that green innovation directly mediate the link between GSCM and firm performance.

Li et al., (2017) empirically examined the moderating role supply chain disruption on the link between GSCMP and firm performance in China. The study approach that was used in line with the objectives involves quantitative approach. The study participants sampled was determined using simple random. Hence, a total of two-hundred and twenty (220) was used sample size. The collection of the data was done using first-hand data source through questionnaire. The result indicated that supply chain disruption directly weakened the link between GSCP and firm performance.

Noor (2017), determined GSCM practices and firm performance. In line with study, the study ensured that quantitative approach was used. The study participants were selected for the study using simple random sampling. Hence, a total of one-hundred and sixty (160) was used sample size. The collection of the data was done using first-hand data source through questionnaire. The analysis of the data was conducted using correlation. Based on this, the result indicated there is direct link between GSCM and firm performance.

Khaksar et al., (2016) examined GSCM practices and firm performance in Lithuania. In line with study, the study ensured that quantitative approach was used. The study participants were selected for the study using simple random sampling. Hence, a total of four-hundred and fifty-two (450) was used sample size. The collection of the data was done using first-hand data source through questionnaire. The analysis of the data was conducted using correlation. Based on this, the result indicated there is direct link between GSCM and firm performance.

2.5 Conceptual Framework and Hypothesis Formulation



Source: Researcher Own Construct, (2023)

Figure 1: Conceptual Framework

2.5.1 Green Supply Chain Management and Firm Performance

The adoption and implementation of GSCM by companies tend to help preserve environment, reduce the cost of materials, recycle of materials as well as increase profit and improve performance (Abeysekara et al., 2019). Geng et al. (2017) found that GSCM directly impact on firms performance. In support of the above argument, Choi and Hwang (2017) indicates that the effective implementation of GSCM practices directly impact on firm performance. This shows that GSCM can develop competitive advantage and improve firm performance in the long term (Khan and Qianli, 2017). Gimenez and Tachizawa (2018) found that the implementation of GSCM practices positively impacts performance. In sum, based on the above discussion and literature reviewed, it is hypothesized that:

H1: Green supply chain management has a significant direct effect on firm performance.

2.5.2 Effects of Green Innovation on Firm Performance

Studies have argued that green innovation provides evidence that firms can compete effectively in the competitive market, improve product network as well as attract more consumers that directly affect firms' performance (Chen and Chang, 2018). Unsurprisingly, Abu-Seman et al., (2019) argued that green innovation has direct link with firms' performance. In support of the argument, Seman et al., (2019) indicates that green innovation impact directly on firms' performance. Thus, the study proposed the following hypothesis:

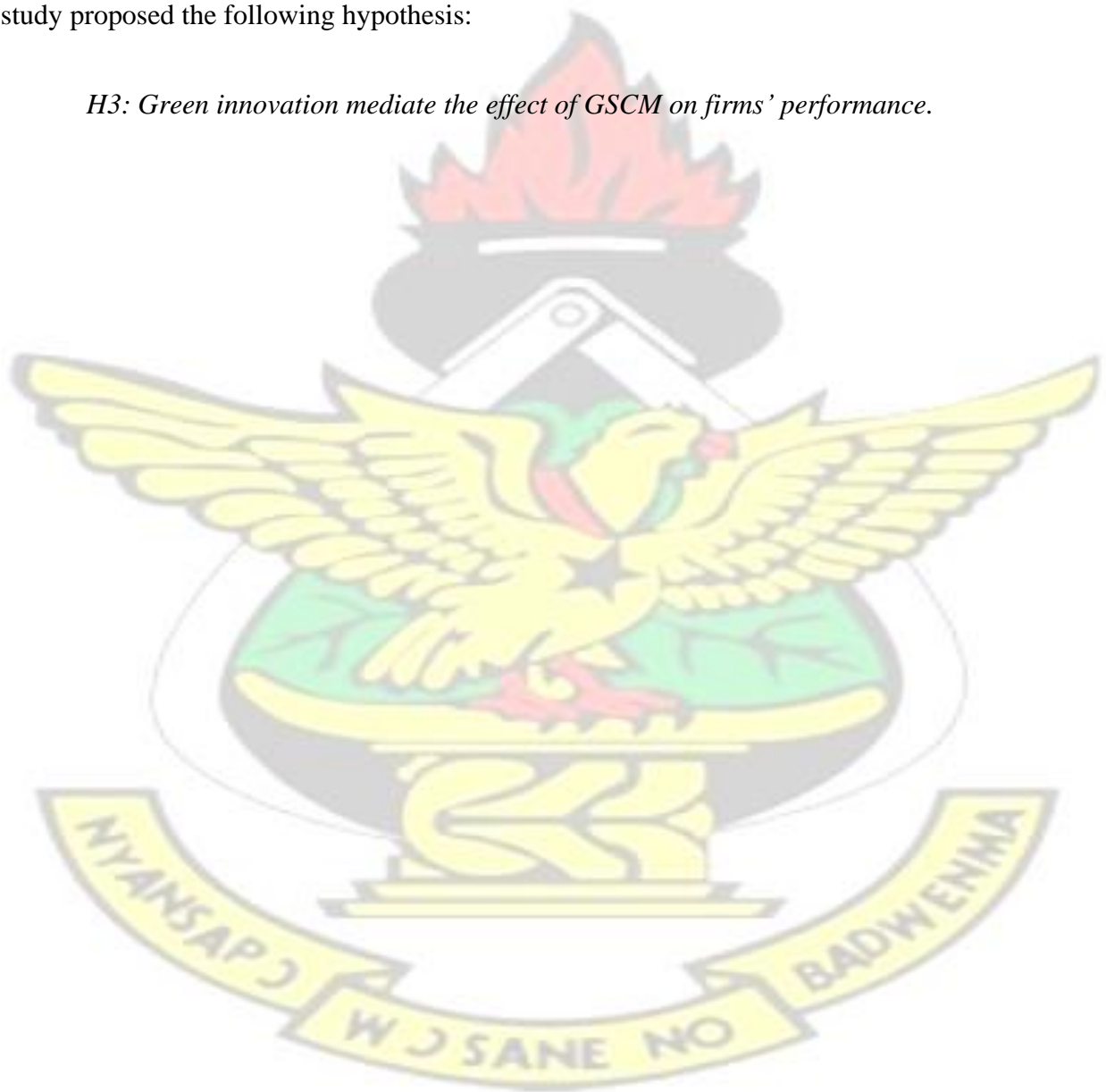
H2: There is direct significant effect between green innovation and firms' performance.

2.5.3 Mediating Effects of Green Innovation on GSCM Practices and Performance

Geng et al. (2017) indicates GSCM practices has direct link with firms' performance. The relevance of green innovation is that its introduction and implementation by firms' ensured that

firms improves its GSCM which tend to impact on firms' performance (Gimenez and Tachizawa, 2018). However, Chen and Chang (2018) indicates that the relationship that exist between GSCM and firms performance is mediated by the adoption and implementation of green innovation by firms. The basis is that while there is obvious link between GSCM and firms' performance, the study suggest that this linkage is mediated through the adoption of green innovation. Thus, the study proposed the following hypothesis:

H3: Green innovation mediate the effect of GSCM on firms' performance.



CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This part of the chapter presents the methodology concerning GSCM practices and firms' performance; mediating role of green innovation. The chapter is categorised into different sections. This includes research approach, research design; population as well as sample size and sample technique. Next, the study presents data collection procedure, reliability and validity, data analysis, ethical consideration and conclusion of the chapter.

3.2 Research Approach

The study employed quantitative research approach for the study. The justification for the choice of the said approach is based on the fact that it permits adequate numerical data set that is involve with hypothesis analysis. Again, it produces an objective data that clearly communicates through statistics and numbers. Also, the use of quantitative approach helps the study to collect large data set from respondents using questionnaire and finally, it allows for generalization of results as well as provides flexible ways of collecting, analyzing, and interpreting data and information.

3.3 Research Design

The study employed cross-sectional research design to the address the objectives of the study. The motivation for the choice of the said method is that it helps in the collection of data at one-point in time. Again, it ensures the collection of data from large pool of the study subjects as well as ensures comparison of difference between groups. On the other hand, the study employed

descriptive and explanatory research method. The justification for the adoption of description research is that it provides the study with proper and concise description of the study variables while the justification for the adoption of explanatory research allows for measurement of causes and effects between variables.

3.4 Population

Population is explained as an entire group or generally large collection of individuals that share the same or common interest with specific characteristics (Thacker, 2020). The population of the study consists of the management employees of the selected manufacturing firms in Ghana. The population of the study consists of four-hundred (400) employees among the firms. The justification for the choice of the said firms is that they are considered as one of the leading manufacturing firms in line with green products in the Ghana.

3.5 Sampling Technique and Sample Size

The total sample size of the study consisted of two-hundred (200) respondents. This was determined using the Yamane Formulae for sample size calculation (Yamane, 1967). In the formula, the population of the study is represented as “N” =400 the margin of error is represented by “e” =0.05.

$$n = \frac{N}{(1 + N(e)^2)}$$

$$n = \frac{400}{1 + 400(0.05)^2}$$

$$n = 200$$

Simple random sampling technique was used in selecting the respondents of the study. The study systematically randomly selected the respondents from the population of employees within the firm. The study ensured that the total number of available respondents who met the inclusion criteria were selected. This shows that the number of respondents were divided by certain interval that enabled the total sample size of 200 to be obtained among the study respondents. The study researcher ensured that the each respondent from the case profile. The respondents from the firm were assigned a random numbers and in a process the respondent not consenting to take part in the study, the following available respondent was represented until the targeted sample size was ascertained. The selected respondents had at least involved in GSCM practices. The justification for the choice of simple random sampling is that it ensures that all the respondents found within the population have an equal chance of representation. The implication is that it help reduce the level of biases associated with the study since all the members in the population were given equal opportunity to be represented.

3.6 Data Collection Procedure

3.6.1 Data Source

The study employed the used of primary data. Primary data is explained as type of data that has not been used by any other research study (Kabir, 2016). The source of the primary data was obtained using questionnaire adopted from studies by (Afum et al., 2020; Seman et al., 2019; Qi et al., 2020). The justification of the choice of used of primary data is based on its originality and reliability of the data source. Thus, the source of information is directly collected the first time from the study respondents.

3.6.2 Measurement Instrument

The study employed questionnaire as the study data instrument. The motivation behind the choice of questionnaire is that it permits large numbers of respondents to be represented at a particular time. The questionnaire was designed to coincide with the specific objectives of the study. The questionnaire was formed using 7-point Likert scale. The scale is said range from strongly agree to strongly disagree. The questions were designed into five (5) main construct. Based on this, Section A of the design of the questions were formed to coincide with the demographic features of the study participants.

Section B of the construct was designed in line with GSCM practices. The questions designed in connection with the GSCM practices construct contains seven (7) items asking the respondents to report their agreement and disagreement using the 7-scale. The source of the questions were developed by (Wong, 2020; Qi et al., 2020).

Section C of the construct was designed in line with green innovation. The questions designed in connection with the green innovations construct contains six (6) items asking the participants to report their agreement and disagreement using the scale. The source of the questions were developed by (Chiou et al., 2017; Seman et al., 2019).

Section D of the construct was designed in line with performance. The questions designed in connection with the performance construct contains nine (9) items asking the respondents to report their agreement and disagreement using scale. The source of the questions were developed by (Seman et al., 2019; Lee and Kim, 2017).

Table 1: Measurement Items

Construct	Number of Items	Source
GSCM Practices	7	Wong, 2020; Qi et al., 2020.
Green Innovation	6	Chiou et al., 2017; Seman et al., 2019).
Performance	9	Seman et al., (2019); Lee and Kim (2017).

Source: Author's own Construct, 2023

3.6.3 Pilot Testing

The study ensured that pilot study was conducted using twelve (12) respondents. The pilot study was performed using respondents outside the main sampled respondents for the study. Based on this, the study factored the various suggestions and recommendations that were ascertained from the pilot study for further amendment of the questions. This shows that all the comments were taken into consideration and re-piloted until no further changes were considered necessary. The rationale for performing the pilot study is to help identify potential problem areas and deficiencies in the research instruments.

3.6.4 Data Collection

The study ensured that the questionnaire was administered using physical contact that took in the form of face-to-face with the respondents. The researcher sought permission from the management of case profile with the purpose ascertaining research data. The researcher physically contacted the respondents individually and administered the questionnaire to the respondents. The respondents had the opportunity to answer the questions without any form of assistance and

influence. The study shown that after the completion of the questionnaires, the researcher collected instantly all the completed questionnaire.

3.7 Reliability and Validity

The study ensured that reliability test was conducted. The rationale for conducting such test is to help check the internal consistency of the questions. Based on this, the study adopted similar studies questions that were undertaken form the works by (Wong, 2020; Lin et al., 2018; Qi et al. 2020) in line with subject under discussion. Also, the study adopted Cronbach Alpha to test the reliability and validity of the study constructs. Hence, the alpha rate of 0.7 and higher is considered acceptable rate while lower rate tends to suggest lack of internal consistency.

3.8 Data Analysis

The study analysed the data using SPSS. The researcher ensured that the collected data was coded into 7-point scale ranging from strongly disagree to strongly agree. The researcher ensured that data was coded and entered coded numbers based on the agreement/disagreement on the subject matter using the data view of the SPSS while the raw questions are entered on the variable view to correspond to the input coded data in the data view. Also, the study analysed the demographic features descriptively. Demographic data was presented in frequencies and percentages. Also, the study used the measure of central tendency (Means and Standard Deviation) as well as correlation and Multi-logistical regression were reported for the effect of GSCM on performance (objective 1). The mediating effects of green innovation on GSCM practices and performance (objective 3), and finally, the effect of green innovation on performance (objective 2). The data was presented using bootstrapping method through the help of the process macro to establish the mediating role.

3.8.1 Model Specification

The study established the effect of GSCM practices, innovations and performance; moderating role of supply chain disruptions based on the prior research conducted by (Qi et al., 2020; Wong, 2020). The study estimates the following model:

$$PRF = \beta_0 + \beta_1 GSCMP + \beta_2 GI + \varepsilon_t \dots \dots \dots (1)$$

Where:

PRF = Performance

GSCMP= Green Supply Chain Management Practices

GI = Green Innovation

β_0 = constant of the model

$\beta_1 + \beta_2$ = coefficient of the model

ε_t = stochastic error term.

3.8.2 Variables Description and Measurement

Table 2: Variables Description and Measurement

Abbreviation	Variable	Measurement	Expected sign
PRF	Performance (Dependent Variable)	This is measured by using financial, social and environmental	
GSCMP	Green Supply Chain Management Practices Independent Variable)	This is measured using green procurement, manufacturing, distribution and logistics	+/-
GI	Green Innovation (Mediating Variable)	This is measured using product innovation, process innovation and managerial innovation	+/-

Source: Author's own Construct, 2023

3.9 Ethical Consideration

The study ensured that ethical consideration was undertaken in line with the subject under discussion. The study ensured that all the study participants were fully informed on their participation on the study data collection. The study ensured that effective steps were taken not harm the study participants. Also, the study ensured that the study participants were no other time been influence in their participation on the study but rather the respondents had the opportunity of willingness and voluntary to participate in the study without any undue influence. Lastly, the study ensured that participant's personal data were protected

3.10 Profile of Organisation of Manufacturing Firms

Ghana's most important manufacturing industries include aluminum smelting, oil refining, chemicals and cement, processing of metals, pharmaceutical manufacturing, wood processing, as well as textile and garment manufacturing. The manufacturing sector is a subsector of industry. It covers 16 of the 33 sub-sectors in the international standard classification of industries (ISIC). Manufacturing Value Added (MVA) was 5.6313% of GDP in 2016. The sector has experienced a sustained decrease in its share of GDP throughout the past decade, losing more than 40% of its 2006 share of 10.2%. However, GDP from Manufacturing in Ghana averaged 2173.25 GHS million from 2006 until 2017, reaching an all-time high of 2543 GHS million in 2017. 'The One District One Factory' initiative by government brings exciting prospects for the industrialisation of the economy. This policy, among others would establish a factory in each of the 216 districts in Ghana and would build strong value chains around key industries such as automobiles and other high value products for exports.

In 2003, the last time an industrial census was conducted in Ghana, there were about 26,000 manufacturing establishments employing about 243,500 persons. About 55% of the

establishments were micro-businesses, employing less than 4 persons; 40% were small businesses, employing between 5 and 19 persons; 5% were medium businesses, employing 20–99 persons; and only 1% were large Diagnostic. Most of the establishments were located in the Greater Accra and Ashanti regions; Greater Accra had 25.7% of establishments and 27.9% of employees while Ashanti had 24.7% of establishments and 24.3% of employees.



CHAPTER FOUR

DATA ANALYSES AND DISCUSSIONS

4.1 Introduction

This chapter tend to presents the results of the analysis as well as the discussion of the result. Based on this, the study firstly presents the demographic features of the study participants. Also, the study ensures the presentation of the descriptive result based on the main constructs. Next, the study presents the reliability and correlation results and this followed by the regression results. Finally, the result presents the discussion of the results.

4.1.1 Rate of Questionnaire Response

Table 3: Rate of Questionnaire Responses

	Distributed	Received	Rate%
Questionnaire	200	200	100%
Total	200	200	100%

Source: Field data, 2023

Based on the result shown in Table 3 concerning the administered questionnaire. The result shown that based on the total number of distributed questionnaires which consisted of two-hundred (200) sampled questions. The study received 100% response rate. This shows that the study received 100% response rate. The implication of the result is that majority of the prior studies from Burki (2018) and Seman et al., (2019) were found to use samples ranging from 200 to 300 sample which makes it the result adequate.

4.2 Demographic Analyses of Respondents

Table 4: Demographic Profiles

	Frequency	Percent
Education Status		
SHS/A'level/O'level	13	6
Diploma/HND	36	18
1 st Degree	115	58
2 nd Degree	36	18
Total	200	100
Years of Working Experience		
1-10 years	77	38
11-20 years	120	60
above 21 years	3	2
Total	200	100
Positions of Respondents		
Supply Chain Managers	32	16
General manager	72	36
Marketing/Sales Manager	62	31
Operations Manager	31	15
Other top management position	3	2
Total	200	100
Years of Holding Position		
1-10 years	158	79
11-20 years	40	20
above 21 years	2	2
Total	200	100

Source: Field data, 2023

Concerning the result in line with the educational background of the study participants as shown in Table 4. Based on this, the result indicated that 58% of the study participants had obtained first degree at the time of conducting the study. Also, the study revealed that 18% each of the total respondents had acquired second degree and diploma/HND as their highest education level at the time of conducting the study while 6% of the study participants hold SHS/A'level/O'level as their

highest education certificate. The implication of the result is that the study participants were more educated which made them understood the concept of the study.

Also, concerning the number of years the study participants had worked with the firms as shown Table 4. The result revealed that 60% of the study participants had worked for the firms for a period between 11 to 20 years while 38% of the respondents had worked between 1 to 10 years. Finally, the result revealed that 2% of the participants had worked with among the firms over 21 years. The implication is that the study participant's longevity in terms of years of working brought with experience which helped in their impact of answering the questions.

Concerning the positions held by the study participants, the result revealed that majority representing 36% hold the position of general managers'. Again, 31% and 16% of the respondents hold the positions of marketing/sales managers and supply chain managers respectively. Lastly, the result indicated that 15% and 2% of the participants were operations managers and other top management positions respectively. The implication is that the study participants had adequate knowledge on the subject matter. Finally, concerning the years of positions of the respondents, as shown in Table 4. The result indicated that 79% of the study participants had been working in the current positive between 1 to 10 years while 20% and 2% representing 11 to 20 years and above 21 years respectively.

4.3 Descriptive Statistics Results

This part of the chapter deals with the descriptive results of the study constructs. Hence, the study made used of mean, deviation, correlation, multi logistical regression as well as process macro method. Based on this, the study presents the themes in line with the objectives of the project.

4.3.1 Green Supply Chain Management Practices

Table 5: GSCPM Practices

Items	N	Mean	±SD
Our firm design it products to avoid or reduce the use of hazardous products and their manufacturing process.	200	5.67	0.892
Our firm has close cooperation with its suppliers regarding the environmental objectives	200	4.49	1.319
Our firm procured eco-friendly materials and products	200	4.75	1.194
Our firm provides design specifications to its partners that include environmental requirements for purchased items.	200	4.29	1.423
Our firms uses eco product life-cycle approach for distribution	200	4.30	1.367
Our firm uses eco-friendly packaging and recycling of waste products	200	3.88	1.266
Supplier relationship closeness to determine the purchasing criteria and quality of materials from suppliers	200	4.62	1.036
Average Mean		4.571	1.214

Source: Field data, 2023

The study revealed the result concerning GSCM practices as shown in Table 5. Based on this, the study revealed that study participants agreed that the firms designed its products to avoid or reduce the use of hazardous products and their manufacturing process (5.67). This implies that the firms ensured modern innovation and design were inculcated in used of green activities in the production of products. The motivation is that hazardous products on the market is disadvantage to the firms in terms of discouraging customers to patronise the products. This is due to the fact that customers are now into products that are eco-friendly to the environment. Based on this, the

study indicated that the firms consistently designed its products which were easily recycled and reused. The implication is that the firms adopted and practices of modern green design in their production and manufacturing of products which helped reduced the hazardous products. This attracted more customers to patronise the products of the firms based on the infusion of green design in the products of the firms which improved the sales levels and reduced environmental pollution.

Also, the study revealed that the respondents somewhat agreed to the statement which depicts that the firms procured eco-friendly materials and products (4.75). This implies that the firms consistently ensured that procurement of materials that were used for the production of products of the firms were procured from suppliers that inculcated eco-friendly activities in their supply. This shows that the firm effectively ensured that the procurement of materials used for the manufacturing of their finished products were sourced from eco-friendly suppliers. The implication is that the raw materials that were procured for the production of finished products were favourable to the environment in terms of not causing damage to the environment. Hence, the firms effectively procurement of eco-friendly materials helped reduced the waste which was huge cost to the firms. This ensured that the firms reduced the cost of waste in the supply chain which led to improve efficiency in the production of finished products.

Again, the result showed that the study participants somewhat agreed to the statements which depicts that supplier relationship closeness to determine the purchasing criteria and quality of materials from suppliers (4.62) and firms have closed cooperation with its suppliers regarding the environmental objectives (4.49). This implies that the firms ensured that there are closed bond that were established between firms and its key suppliers. Hence, this kind of bond and

cooperation that were established between the parties along the supply chain. This helped the firms to communicate its environmental objectives to its key supplies. Based on this, the firms established cooperation with key suppliers helped allowed the firms to ensure the suppliers abide with the green environmental objectives. This made the suppliers to comply with the firms environmental objectives in terms of supplying eco-friendly products. The implication is that the firms closed cooperation with key suppliers helped the suppliers to deliver by way of complying with the environmental objectives. This made the supplies to provide raw materials that the met the green environmental criteria which led to reduction of waste in the environment.

In addition, the study participants were uncertain to the statement which depicts that the firms uses eco product life-cycle approach for distribution (4.3). This implies that the firm's eco-product life-cycle that were adopted and practiced from the time of procuring the raw materials from the suppliers to the time of manufacturing the product to the point of distributing the final product to consumer were slow. This shows that the there is more improvement that needs to done in terms of the firm GSCM practices that were exhibited within the supply chain. The implication is that the total environment impact that was obtained from the firm material acquisition, manufacturing, distribution and disposal was not hugely embraced within the supply chain. This shows that the firm were uncertain to the practices of the GSCM since there were some challenges that were associated with the GSCM practices which was aligned with huge capital expensive nature of the practices.

Finally, the study revealed that the study participants were uncertain to the statements which depicts the firms provided design specifications to its partners that included environmental requirements for purchased items (4.29) and firms use eco-friendly packaging and recycling of

waste products (3.88). This implies that the firms designed that were agreed with the respective partners of the firms in terms of complying and delivering on green practices were adhered by the firms partners. However, the study indicated that the firms were more cautious with their partners since competition in supply chain were very keen and competitive in terms of supplier's requirement in supplying eco-friendly materials. This made it a little difficult on the part of the firms in terms of the suppliers fully committed to firms' environmental requirement since other competitor firms are also offering equal and better green practice partnership.

4.3.2 Green Innovation

Table 6: Green Innovation

Items	N	Mean	±SD
Our firm uses materials that are easy to recycle, reuses, and decompose.	200	4.55	1.641
Our firm uses less or non-polluting/toxic materials that are environmentally friendly	200	4.91	1.238
Our firm redesigned and improved products or services to meet new environmental criteria	200	4.22	1.453
Our firm has adjusted its business activities to reduce the damage to the ecological environment	200	4.01	1.393
Our firm regularly conducts environmental audits and chain management	200	3.93	1.309
Our firm components or materials in the production process is recycled or reconditioned	200	4.15	1.419
Average Mean		4.30	1.409

Source: Field data, 2023

Concerning the result shown in Table 6 in line with green innovation, the study revealed that majority of the study participants somewhat agreed to the statement which depicts that firms uses less or non-polluting/toxic materials that are environmentally friendly (4.91). This implies that firms innovatively ensured that materials that were acquired for production of products were in line with the greening procedures and policies. Hence, the firms ensured that the kind partnership and cooperation that were established between them and suppliers helped the firms to ensure eco-friendly materials were supplied. This type of green innovation allowed firms produced products that were less toxic and produces less waste onto the environment. The implication is that firm's adoption and practices of eco-friendly materials helped produced products with less waste which led to less pollution onto the environment. Based on this, consumers of this modern era are very loyal to firms that are friendly to the environment since human lives are important. Hence, the firms green innovation of producing products which produced less waste and pollution to the environment did attract more customers to patronise their products. The increased in customers patronage helped improved the sales generation of firms.

Further, the study revealed that the respondents somewhat agreed to the statement which depicts that firms uses materials that are easy to recycle, reuses, and decompose (4.55). This implies that firm's adopted a green innovation which ensured that products that were produced are easily recycled, reused and decomposed. This shows that firms regularly ensured that raw materials that were used in the manufacturing of products had eco-friendly ideologies. This helped made easy for firms to recycle and reuse the finished products which led to reduction of waste. The implication is that the firm huge cost that is associated with treatment and discharge of wastes

were reduced. This helped increased firms cash flow since the firms had not over-spent huge sums of money in treating waste due to firms' green innovation practices.

In addition, the study revealed that the study participants agreed to the statement which depict that firms redesigned and improved products or services to meet new environmental criteria (4.22). This implies that firm's ensured that modern green innovations were designed within the supply chain activities of the firms. Based on this, the study indicated that firms green innovation activities were performed through switching to biofuels, recycled of materials as well as reduced the level of energy used throughout the supply chain. The implication is that the firm's adoption and implementation of green innovation activities helped the firms' to redesign and improve their products and services. Hence, the green innovations that were employed improved the products of the firms which attracted more customers to patronise the products. This was achieved due to the firms' reduced pollution as well as decreased of hazardous materials which impacted on the increased in market share of the firms which led to improve return on investment and profits.

Also, the study revealed that the respondents were agreed to the statements which depicts that firms components or materials in the production process are recycled or reconditioned (4.15) and firms have adjusted its business activities to reduce the damage to the ecological environment (4.01). This implies that the level of business activities and production that were performed within the supply chain in terms of adjusted business activities to infuse green activities with the objective of impacting positively in reducing damage to the environment were achieved. The implication is that the firm's ensured that green technology was adopted in their manufacturing production processes. This helped the firms reduced the waste generations since the waste were recycled into other finished products. Hence, the firm's ability to recycle their wastes helped

reduced the cost of operations to the firms which helped impacted positively to the firms' performance through increased in profits.

Lastly, the study revealed that the respondents were uncertain to the statement which depicts that firms regularly conducts environmental audits and chain management (3.93). This implies that the firms ensured that regular environmental audit were innovatively initiated. This was performed which helped the firm to ensure that the business activities that were practiced through the production of products meet the environmental criteria. The study showed that the firm environmental audit helped the firm adhered to the international and local environmental practices and policies.

4.3.3 Firm Performance

Based on the result shown in Table 7 concerning the firm performance. Hence, the study revealed that majority of the study participants agreed that the firms reduced pollutant emissions (5.46). This implies that the firms practices of GSCM along its supply chain activities have helped reduced the level of emission pollution that arose from the firms business operations. Hence, the study showed that the firms adoption and practices of greening in their supply chain from the time of acquiring the raw materials for production to the time of manufacturing and distributing the final product to consumer. The implication is that the firms ensured that green practices were effectively inculcated into firms supply chain which reduced the level waste as well as the emission pollution onto the environment. This made the consumers of the firms understood that firms have its consumers live at heart and hence, this drawn majority of the consumers in the market to patronise the products of firms which improved cash flow and revenue

Table 7: Performance

Items	N	Mean	±SD
Over the last three years, our firm has greatly increased cash flow	200	4.75	1.462
Over the last three years our firm has greatly increased in return on investment (ROI)	200	4.50	1.298
Over the last three years our firm has greatly increased in return on asset (ROA)	200	4.62	1.448
Over the last three years our firm has greatly increased in market share	200	4.36	1.311
Over the last three years our firm has greatly increased in profit	200	4.33	1.349
Reduction of pollutant emissions	200	5.46	1.106
Reduction of waste water	200	5.03	1.258
Reduction of solid wastes	200	4.75	1.194
Decrease of consumption for hazardous/harmful/toxic materials	200	5.12	0.967
Average Mean		4.77	1.266

Source: Field data, 2023

Also, the result revealed that the study participants somewhat agreed to the statement which depicts that firms have decreased consumption for hazardous/harmful/toxic materials (5.12). This implies that the firms have reduced the consumption of toxic materials due to the practices of greening in their supply chain activities. The firm ensured that the practices of modern GSCM along the supply chain has helped the reduced the increasing level of toxic materials. This shows that the firm GSCM practices were eco-friendly to the environment which limited the level of toxic onto the environment. The implication is that the reduced level of toxic materials such waste and pollution onto the environment helped improved the image of the firms. Hence, the increased

in image made the firms be noted for its green activities along the supply chain which attracted more customers and hence increased the market share of firms.

Further, the result revealed that the respondents somewhat agreed to the statements which depicts that firms reduced waste water (5.13) and reduction of solid wastes (4.75). This implies that the firms practices of GSCM tend to help reduced the waste water and solid waste. Hence, the firms ensured that raw materials that were acquired for the manufacturing of the finished products had the greening initiative throughout the supply chain, thus; the materials were eco-friendly to the environment. The implication is that the firms produced limited waste which were easily recycled and reused for other products. Hence, this produced an additional income and revenue which improved the return on investment for the firms.

In addition, the result indicated that the respondents somewhat agreed to the statements which depicts that over the last three years, our firms have greatly increased cash flow (4.75); increased in return on asset (ROA) (4.62) and increased in return on investment (ROI) (4.50). This implies that firm's practices of GSCM along the supply chain helped decreased waste, reduced emission onto the environment as well as increased recycled and reused of waste. The implication is that the firms practices of the GSCM tend to attract customers. This is because customers are environmental sensitive which helped to attract them to patronise the products of the firm. Based on this, firms increased cash flow which led to improve return on investment as well as return on asset. Lastly, the result revealed that the respondents were uncertain to the statements which depicts that over the last three years our firm has greatly increased in market share (4.36) and the firm has greatly increased in profit (4.33). This implies that the firm level of improvement in their profit margin was not clear. This shows that the firm practices of GSCM was effective in reducing

waste and pollution. However, the level of supply chain disruption that occurred within the firms GSCM practices weakened the firms' profit margin.

4.4 Reliability and Validity Test

The study revealed the result concerning reliability of the variables under the construct as shown in Table 8. Based on this, the result revealed average Cronbach Alpha rate of 0.742. This implies that the individual constructs all pass the test by exceeding the threshold of 0.70.

Table 8: Results of Reliability and Validity

	Number of Items	Cronbach Alpha
GSCM practices	7	0.723
Green innovation	6	0.781
Performance	9	0.745
Cronbach Alpha	22	0.750

Source: Field data, 2023

4.5 Correlation Matrix

Based on the result shown in Table 9 concerning the Spearman's correlation. The study revealed that all the variables with their coefficient less than 0.60. This shows that the result does not have any problem in terms of multicollinearity of the variables under discussion. Concerning the result shown in Table 10, the result revealed there is there is direct insignificant correlation between GSCM practices and firms' performance ($r = .094$, $p\text{-value} > 0.05$). This implies that firms GSCM practices that were employed along the supply chain of the firm helped reduced waste and pollution on the environment. However, the level of impact that was associated with improvement of firms' performance through the practices of GSCM was limited by series of supply chain disruption such as covid-19 pandemic, industrial accidents as well as technological shift. The

implication is that firms cost of operation increased disruptions that occurred along the supply chain affected the performance of firms. The result was not in line with the work by Wong, (2020) and Lee and Kim (2017), which indicates that there is direct significant correlation between GSCM practices and firms performance.

Table 9: Correlation Matrix

Variables	Log_ GRSCP	Log_ GRINN	Log_ SCDIS	Log_ FPERE
Spearman's rho Log10GRSCP Coefficient	1	.561	.301	.094
Sig. (2-tailed)		.000	.000	.186
N	200	200	200	200
Log10GRINN Coefficient	.562	1	.450	.130
Sig. (2-tailed)	.000		.000	.067
N	200	200	200	200
Log10FPERE Coefficient	.094	.130	.087	1
Sig. (2-tailed)	.186	.067	.220	
N	200	200	200	200

**Significant at the 0.05 (two-tailed)

Source: Field data, 2023

Further, the result indicated that there is direct significant correlation between green innovation and firms performance ($r= 0.562$, $p\text{-value}<0.05$). This implies that firms green innovation practices that took the form of redesigned and improved products, the used of eco-friendly materials that produced less toxic and waste as well as recycled and reused of waste. This shows that firms redesigned and improved of products made the firms' product unique in the market which was eco-friendly to the market in terms of packaging and distribution network. This helped widen the scope of the market with consumers patronized the products which led to improve

performance. The result conform to the works by Seman et al., (2019) and Ar-Ilker, (2017), which showed that there is direct link between green innovation and firms performance.

4.6 Multinomial Logistics Regression

Table 10: Model Fitting Information

Items	Model Fitting Criteria		Likelihood Ratio Test	
	-2Log Likelihood	Chi-Square	df	Sig.
Intercept Only	1.293			
Final	1.156	137.125	102	0.012

Source: Field data, 2023

Concerning the model fitting significance as shown in Table 10. Based on this, the result revealed that the final model indicated ($P < 0.05$). This shows that the final model is significant at 5% level. This implies that the model is statistically significant. Based on this, the study concluded the model is fit with the data used.

Table 11: Goodness-of-Fit

	Chi-Square	Df	Sig.
Pearson	5545.040	6494	.595
Deviance	1149.376	6494	.682

Source: Field data, 2023

Table 11 showed the goodness-of-fit results of the study. Based on this, the result revealed that there is no significant level among Pearson and Deviance. This implies that the significant level displayed indicated ($P > .595$, $P > .682$) respectively are more than 5%. The implication is that the

model is fit for the data set. Hence, the data sample is set to fit the distribution from population with a normal distribution.

Table 12: Pseudo R-Square

Cox and Snell	.496
Nagelkerke	.497
McFadden	.105

Source: Field data, 2023

Concerning the result model R-square as shown in Table 12. Hence, the study made used of the Nagelkerke result. Based on this, the result revealed an estimation regression model of 49.7% or (adjusted R square = 0.497). This implies that the variability that occurs in firm's performance is caused by the independent variables namely; GSCM practices and green innovation. In other words, independent variables together explained only 0.497 units of the firms' performance as dependent variable.

Table 13: Likelihood Ratio Test

Effect	Model Fitting Criteria		Likelihood Ratio Test	
	-2Log Likelihood	Chi-Square	df	Sig.
Intercept	1.216	59.868	34	.004
Log_GRSCP	1.183	26.364	34	.822
Log_GRINN	1.195	38.517	34	.272

Source: Field data, 2023

The result revealed likelihood ratio as shown in Table 13. Based on this, Log_GRSCP revealed a no significant level ($P > 0.05$; $P = 0.822$). Also, the other independent variable which consisted of

Log_GRINN which depicts ($P > 0.05$). The implication of the result of the predictor is that the variable contributed significantly to the model of the study.

Table 14: Parameters Estimate

Log_FPERE	B	Std. Error	Wald	Df	Sig.	Exp(B)	95% Confidence Interval	
							Lower. Bound	Upper Bound
Intercept	1.591	15.802	1.158	1	.282			
Log_GRSCP	23.269	10.873	.843	1	.359	5.704	3.580	9.099
Log_GRINN	21.689	31.098	.486	1	.001	3.801	1.289	1.126

Source: Field data, 2023

Based on the result shown in Table 14 concerning the parameters estimate of the study variables. The result revealed that Log_GRSCP ($b = 23.269$, $Wald = 0.843$, $P > 0.05$) had direct no significant link with firms performance. This shows that the odd ratio of 5.704 indicates that for every one unit increase of firm GSCM practices, the odds of the firms' performance increased by 5.704. This shows that H1 is not fully supported which states that there is direct significant link between GSCM practices and firms' performance. The result is not in line with the work by Afum et al (2020), which indicates that there is direct significant link between GSCMP and firms performance. This implies that the firms GSCM practices and its impact on firms' performance were limited. This was attributed to firm's disruption that occurred along the supply chain which affected the activities of the firms GSCM practices. The implication is that the firm's performance were directly affected in terms financial and environmental performance of the firms but the level of impact was not significant. The result was not in line with the work by Wong, (2020), which indicates that there is direct significant link between GSCM practices and firm performance.

Finally, the result revealed that Log_GRINN ($b=21.689$; $Wald=0.486$; $P<0.05$) had direct significant link with firms' performance. This implies that the odd ratio of 3.801 indicates that for every one unit increase of firms green innovation, the odds of the firms' performance increases by 3.801 units. The result is in line with work Seman et al., (2019), established that there is direct link between green innovation and firm performance.

4.7 Mediating Effect of Green Innovation on the Relationship Between GSCM Practices and Firm Performance

Table 15: Green Innovation as a Mediator

Mediation Model:						
Variable/Effect	B	SE	T	Prob.	95% Confidence Interval	
					Low	High
Direct Effect						
GSCM Practices → Firm Performance	23.269	10.873	0.843	0.359**	3.580	9.099
GSC Practices → Green Innovation → Firm Performance	11.261	6.512	0.561	0.001**	0.356	0.352
Effect						
Direct Effect	0.367	0.035	2.301	0.000**	0.219	0.458
Indirect Effect	0.450	0.061			0.721	1.24
Total	0.817	0.514	3.021	0.001**	1.013	0.352

Based on 200 Bootstrap Samples

Source: Field data, 2023

Based on the results shown in Table 15 concerning the mediating role of green innovation. The study adopted bootstrapping method using process macro to establish the mediating role. Hence, the result indicated that green innovation has mediation effect ($\beta = 0.037$, $p\text{-value}<0.05$) on the relationship between GSCM practices and firms performance with non-zeros within the 95%

confidence interval (Low = .219, high = .458). The study also showed that the established direct effect based on 200 bootstrap samples indicated a significant direct link between GSCM practices and firms performance mediated by green innovation ($a*b = .367$, Bootstrap CI95 = .219 and .458). Based on this, the result revealed that green innovation mediated (full mediation) the link between GSCM practices and firms performance. Therefore, the H2 is accepted.

4.8 Discussions of Findings

4.8.1 Effect of GSCM Practices on Firm Performance

The study revealed that GSCM practices had direct no significant effect on firms' performance. The result does not conform to the work by Afum et al (2020), which indicates that there is direct significant link between GSCMP and firm performance. This implies that firm's ensured modern innovation and design were inculcated into green activities in the production of products. The motivation is that hazardous products on the market is disadvantage to the firms in terms of discouraging customers to patronise the products of the firms. This is due to the fact customers are now into products that are eco-friendly to the environment. Based on this, the study indicated that firms consistently designed its products which were easily recycled and reused. Hence, the firms adopted and practices of modern green design in their production and manufacturing of products helped reduced the hazardous products. The implication is that firms practices of the GSCM tend to attract customers. This is because customers are environmental sensitive which helped to attract them to patronise the firms' products. However, the level of increased in customer growth did not hugely impacted on the profitability of firms as well as return on investment. The result does not conform to the work by Handayani et al., (2017) which established that there is direct link between GSCM and firms performance. This implies that the ability for companies to

effectively and efficiently implement GSCM in the companies supply chain activities tend to affect firms performance since customers are now environmentally centric.

Also, the study revealed that firms consistently ensured that procurement of materials that were used for the production of products were procured from suppliers that inculcated eco-friendly activities in their suppliers. This shows that firms effectively ensured that the procurement of materials used for the manufacturing of their finished products were sourced from eco-friendly suppliers. The implication is that the raw materials that were procured from the production of finished products were favourable to the environment in terms of not causing damage to the environment. Hence, firms effectively procurement of eco-friendly materials which helped reduced wastes which were huge cost to the firms. This ensured that firms reduced the cost of waste in the supply chain which led to improve efficiency in the production of finished products. The implication is that the reduced level of toxic materials such as waste and pollution onto the environment helped improved the image of firms. However, the increased in image made firms be noted for its green activities along the supply chain which attracted more customers and hence increased the market share of firms. Therefore, the cost of operating GSCM practices was expensive which made it difficult for firms to improve its return on investment in spite of improve market share; hence, affecting firms performance. The result is consisted with the work by Geng et al., (2017) and Khan and Qianli (2017), which indicates that GSCM requires large cost. Namagembe et al., (2016) established that GSCM had no significant effect on firms' performance.

Further, the study revealed that firm's eco-product life-cycle that was adopted and practiced from the time of procuring the raw materials from the suppliers to the time of manufacturing the product to the point of distributing the final product to consumer were slow. This shows that the there is

more improvement that needs to be done in terms of the firms' GSCM practices that were exhibited within the supply chain. The implication is that the total environmental impact that was obtained from the firm's material acquisition, manufacturing, distribution and disposal was not significant. The result was not in line with the work by Lee and Kim (2017), which shows that GSCM practices directly impact on firms' performance. This signifies that the firms encountered some level of challenges in their GSCM practices in terms of the high cost nature of the practices as well as disturbances of supply chain disruption. Hence, these forms of disruptions made it difficult for the firms to achieve their end result in terms of significantly impacting firms' performance. The result is not consistent with the work by Chiou et al., (2017) which established that there is a significant direct link between GSCM and firms' performance.

Lastly, the study revealed the firm designed that were agreed with the respective partners of the firms in terms of complying and delivering on green practices were adhered to by firms' partners. However, the study indicated that the suppliers' partners were more cautious in supplying materials. This was because the competition in the supply chain was very keen and competitive in terms of the supplier's requirement in supplying eco-friendly materials. This made it a little difficult on the part of firms in terms of the suppliers fully committed to firms' environmental requirements since other competitor firms were also offering equal and better green practice partnerships. The implication is that the firm's level of improvement in their profit margins was limited due to the reduction in the supplier's supply of eco-friendly materials to the firms. This adversely affected activities along the supply chain which hindered firms' profit margins. The result is not consistent with the work by Van-Den Berg et al., (2017) which established that GSCM has a direct link with firms' performance.

4.9.2 Effect of Green Innovation on Firm Performance

The study revealed that green innovation had direct significant effect on firms' performance. The result is consisted with the works by Seman et al., (2019); Rao (2017) and Chien and Shih (2017), which established that green innovation has direct link with firms' performance. This implies that firm's ensured that modern green innovations were designed within the supply chain activities of the firms. The study indicated that firms green innovation activities were performed through switching to biofuels, recycled of materials as well as reduced the level of energy used throughout the supply chain. The implication is that the firm's adoption and implementation of green innovation activities helped the firms' to redesign and improve their products and services. Hence, the green innovations that were employed improved the products of the firms which attracted more customers to patronise the products. This was achieved due to the firms' reduced pollution as well as decreased of hazardous materials which impacted positively in market share of the firms which led to improve return on investment and profits. The result is consisted with the studies by Preacher and Hayes (2018) and Lee and Kim (2017), which established that green innovation directly impact on firms' performance.

The study revealed that the firms inculcated green innovation activities into business activities and production that were performed within the supply chain of the firms. This implies that the firms adjusted business activities which infused green innovation activities with the objective of impacting positively in reducing damage to the environment were achieved. The implication is that the firm's ensured that green technologies were adopted in the firms manufacturing production processes. This helped the firms reduced the waste generations since the waste were recycled into other finished products. Hence, the firm's ability to recycle their wastes helped

reduced the cost of operations to the firms which helped impacted positively to the firms' performance through increased in profits. Therefore, the implication is that the firms produced limited waste which were easily recycled and reused for other products. Hence, this produced an additional income and revenue which improved the return on investment for the firms. The result is in line with work by Zhu et al. (2016), which indicated that green innovation has direct link with firms' performance.

4.9.3 Mediating Effects of Green Innovation on GSCM Practices and Performance

The study revealed that green innovation has full mediation effect on the relationship between GSCM practices and firms performance. The result is consisted with the literature that argues that green innovation serves as means through which firm's uses to innovate new product and services within the supply china which help gain competitive advantage as well as reduces the environmental problems that occur in the market (Lee & Kim, 2017). This implies that firms innovatively ensured that materials that were acquired for production of products were in line with the greening procedures and policies in the Ghanaian context and internationally. The firm's ensured that the kind partnership and cooperation that were established between firms and suppliers helped ensured eco-friendly materials were supplied. This type of green innovation allowed firms produced products to be less toxic and produces less waste onto the environment. The implication is that firm's adoption and practices of eco-friendly materials helped produced products with less waste which led to less pollution onto the environment. Based on this, consumers of this modern era are very loyal to firms that are friendly to the environment since human lives are important. Hence, firms green innovation of producing products which produced less waste and pollution to the environment did attract more customers to patronise their products. The increased in customers patronage helped improved the sales generation of firms. The result

was in line with the work by Seman et al., (2019) which established that green innovation had direct mediating role between GSCM and performance.

Also, the study revealed that firms adopted green innovation which ensured that products that were produced are easily recycled, reused and decomposed. This shows that firms regularly ensured that raw materials that were used in the manufacturing of products had eco-friendly ideologies. This helped made easy for the firm to recycle and reuse the finished products which led to reduction in waste. The implication is that firm's huge costs that are associated with treatment and discharge of wastes were reduced. This helped increased firms cash flow since the firms had not over-spent huge sums of money in treating waste due to firms' green innovation practices. The result is consisted with the work by Qi et al. (2020), which established that green innovation fully mediate the link between GSCMP and firm performance.

Lastly, the study revealed that firms regularly conducted environmental audits and chain management as part of green innovation initiative. This implies that firms ensured that regular environmental audit were innovatively initiated and performed on regular basis. This helped firms identified the loopholes and deficiencies in the GSCM practices. Based on this, firms effectively adhered to the policies and laws that are in line with the GSCM practices. The implication is that firm's identification of the weakness in the GSCM practices through their environmental audit helped the firms to improve its green innovations activities through redesigned of products helped improved firms' performance. The result is consisted with the work by Ar-Ilker, (2017), which indicated that green innovation fully meditated the link between GSCMP and firms' performance.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents result summary of the findings in line with the specific objectives of the study. Also, the study precisely drawn conclusion on the subject under discussion while appropriate recommendations are drawn from the findings. The study in addition makes suggestions for future research.

5.2 Summary of Findings

Based on the study's first objective, GSCM practices has direct no significant effect on firms' performance. This implies that firms GSCM practices did improve firms' performance. However, the level of effect that GSCM practices had on firms' performance was not significant. This shows that firm's practices of GSCM in the form of eco-friendly materials, eco-friendly packaging and recycling of waste, close cooperation of suppliers as well as reduction of toxic products were effectively practiced along the supply change but its impact on the firms' performance was doubtful.

Also, concerning the second objective, green innovation has direct significant effect on firms' performance. This implies that green innovation improved the firms' supply chain activates which impacted directly on firms performance. Thus, the firm's green innovation helped reduced pollution as well as decreased of hazardous materials which impacted positively in market share of the firms which led to improve return on investment and profits.

Finally, concerning the third objective, green innovation has full mediation effect on the relationship between GSCM practices and firms' performance. This shows that firm's green innovation initiative helped reduced the level of waste and pollution onto the environment. Hence, this shows that the green innovation serves a full mediation variable that directly link GSCM practices and firm performance.

5.3 Conclusion

The study concluded that GSCM practices had direct no significant effect on firms' performance. This implies that firms GSCM practices that were employed along the supply chain helped reduced waste and pollution on the environment. However, the level of impact that was associated with improvement of firms' performance through the practices of GSCM was limited. This was due to series of supply chain disruption such as covid-19 pandemic, industrial accidents as well as technological shift. The implication is that the cost of operating GSCM practices was expensive which made it difficult for firms to improve its return on investment in spite of improved market share; hence, affecting firms' performance. Also, the study concluded that green innovation has full mediation effect on the relationship between GSCM practices and firms' performance. This shows that firm's adoption and practices of eco-friendly materials helped produced products with less waste which led to less pollution and cost of production which directly impacted on firms performance.

5.4 Recommendations

The study revealed that there is direct no significant link between GSCM practices and firms' performance. Based on this, the study recommends that firms should design and implement GSCM practices framework. This will serve as guideline upon which firms will inculcate

environmental requirements in the supply chain which will involve the use of few materials, procuring of green materials, partnering of green suppliers and adopting green network and distribution. The implication is that firms will reduce the cost of operation, improve image and attract and expand the markets share which will significantly impact on firms' performance.

Also, the result indicated that green innovation has direct significant effect on firms' performance. Based on this, the study recommends that firms should set aside about 5% of the annual net profit and re-invest into green innovations. This help the firms to improve their green innovations activities within the supply chain which tend to improve firms performance in short and long period.

Finally, the study revealed that green innovation has full mediation effect on the relationship between GSCM practices and firms' performance. Based on this, the study recommends that the firms should invest heavily in green innovation since the study showed that green activities had direct significant impact between GSCMP and firms' performance. Therefore, firms should ensure that top management should be commitment in supporting both financial and non-financial towards green innovation. This will help directly improve GSCMP and firms' performance.

5.5 Suggested Areas for Future Studies

The study suggests that since it is difficult on the part of the study to make generalization of the results due to the small sample size been used to represent the entire population. Hence, it is prudent for future research to ensure that there is increase in the sample size through the inclusion of other firms in other sectors. The implication is that the study will be able to male precise

conclusion on the subject matter. Also, the realised that single source of data information was used for the study. Therefore, it is important for future study to adopt mixed method. This tend to give source of information which give diverse that helps to complement each other. Lastly, the study suggests that future research should adopt comparative study. Thus, the future study should involve other firms from other African countries. The basis is to help improve the scope of the study.



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APPENDIX

>> Based on the respective scales provided, kindly circle a number that best represents your opinion on each statement							
SECTION 3: FIRM PERFORMANCE <i>In relation to your firm, indicate the extent to which you agree or disagree with the following statements by checking the appropriate number from 1 to 7.</i>	Not at all						To an extreme extent
Over the last three years, our firm has greatly increased cash flow	1	2	3	4	5	6	7
Over the last three years our firm has greatly increased in return on investment (ROI)	1	2	3	4	5	6	7
Over the last three years our firm has greatly increased in return on asset (ROA)	1	2	3	4	5	6	7
Over the last three years our firm has greatly increased in market share	1	2	3	4	5	6	7
Over the last three years our firm has greatly increased in profit	1	2	3	4	5	6	7
SECTION 5: GREEN SUPPLY CHAIN PRACTICES <i>In relation to your firm, indicate the extent to which you agree or disagree with the following statements by checking the appropriate number from 1 to 7.</i>	Strongly disagree						Strongly agree
Our firm design it products to avoid or reduce the use of hazardous products and their manufacturing process.	1	2	3	4	5	6	7
Our firm has close cooperation with its suppliers regarding the environmental objectives.	1	2	3	4	5	6	7

Our firm procured eco-friendly materials and products	1	2	3	4	5	6	7
Our firm provides design specifications to its partners that include environmental requirements for purchased items.	1	2	3	4	5	6	7
Our firms uses eco product life-cycle approach for distribution	1	2	3	4	5	6	7
Our firm uses eco-friendly packaging and recycling of waste products	1	2	3	4	5	6	7
Supplier relationship closeness to determine the purchasing criteria and quality of materials from suppliers	1	2	3	4	5	6	7
SECTION 6: GREEN INNOVATION <i>In relation to your firm, indicate the extent to which you agree or disagree with the following statements by checking the appropriate number from 1 to 7.</i>	Strongly disagree						Strongly agree
Our firm uses materials that are easy to recycle, reuses, and decompose.	1	2	3	4	5	6	7
Our firm uses less or non-polluting/toxic materials that are environmentally friendly	1	2	3	4	5	6	7
Our firm redesigned and improved products or services to meet new environmental criteria	1	2	3	4	5	6	7
	1	2	3	4	5	6	7
Our firm has adjusted its business activities to reduce the damage to the ecological environment	1	2	3	4	5	6	7
Our firm regularly conducts environmental audits and chain management	1	2	3	4	5	6	7
Our firm components or materials in the production process is recycled or reconditioned	1	2	3	4	5	6	7

SECTION 7: SUPPLY CHAIN DISRUPTIONS									Strongly agree
<i>In relation to your firm, indicate the extent to which you agree or disagree with the following statements by checking the appropriate number from 1 to 7.</i>	Strongly disagree								
Our firm industrial accidents weaken GSCM in improving firms' performance	1	2	3	4	5	6	7		
Our firm technological shifts strengthen the use of GSCM in enhancing firm performance	1	2	3	4	5	6	7		
Political events weaken our firm GSCM in improving firms' performance	1	2	3	4	5	6	7		
Natural disasters weaken our firms GSCM practices.	1	2	3	4	5	6	7		
SECTION 15: ENVIRONMENTAL PERFORMANCE									
<i>In relation to your firm, indicate the extent to which you agree or disagree with the following statements by checking the appropriate number from 1 to 7</i>									
Reduction of pollutant emissions	1	2	3	4	5	6	7		
Reduction of waste water	1	2	3	4	5	6	7		
Reduction of solid wastes	1	2	3	4	5	6	7		
Decrease of consumption for hazardous/harmful/toxic materials	1	2	3	4	5	6	7		

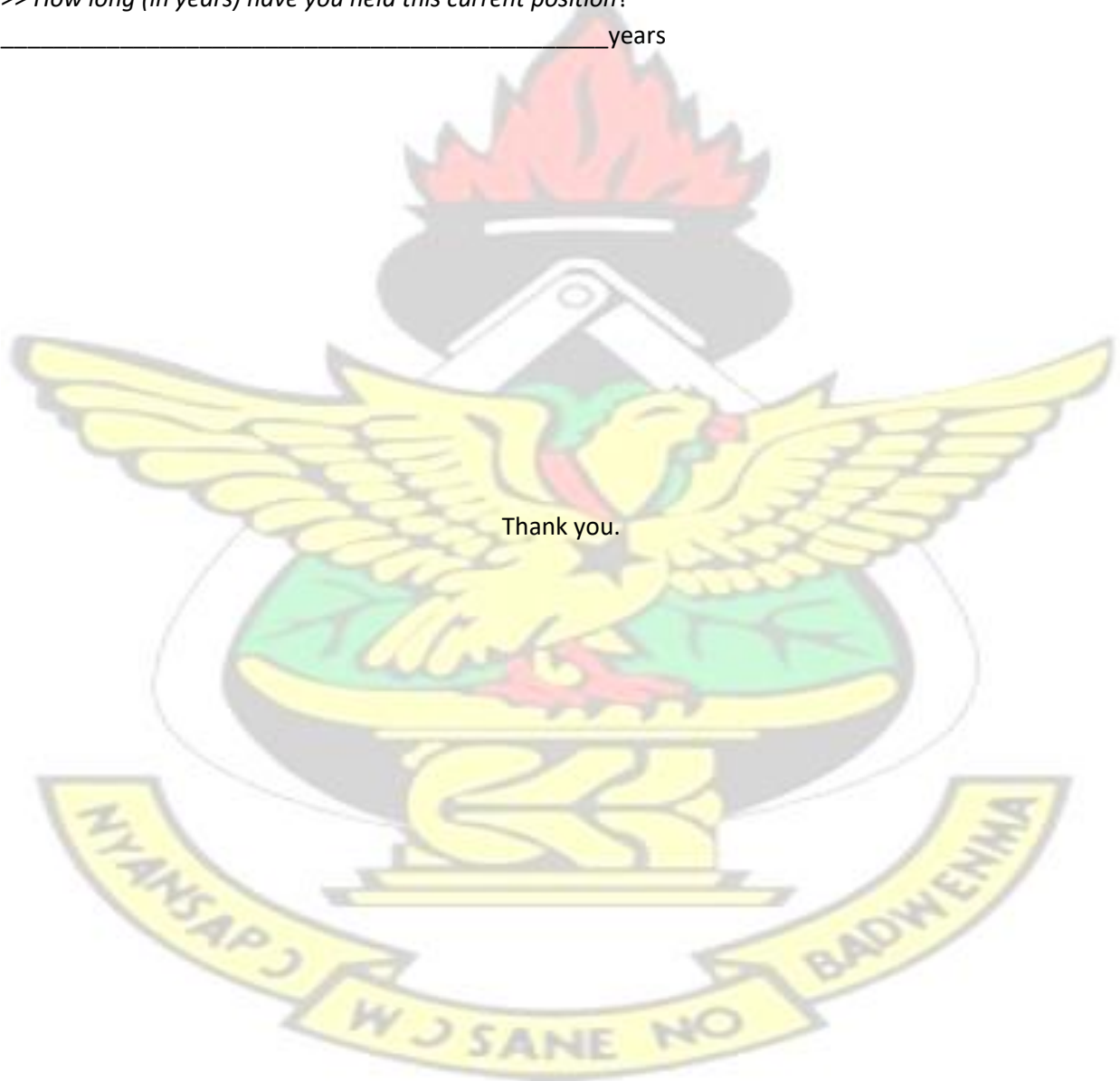
>> Please, what is your education level? Up to SHS/A'level/O'level Up to Diploma/HND
Up to 1st Degree Up to 2nd Degree Up to PhD

>> How long have you worked in this industry? About _____ years

>> What is your position in your organisation? CEO General manager Marketing/Sales Manager

Operations Manager Other top management position (kindly indicate _____)

>> How long (in years) have you held this current position?
_____ years



Thank you.