

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

**Exploring the Forces Behind Adoption of Green Supply Chain
Management (GSCM) Practices in an Emerging Economy**

By

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A thesis submitted to the Department of Supply Chain and Information Systems,

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DOCTOR OF PHILOSOPHY

JUNE, 2019

DECLARATION

I hereby declare that this submission is my own work towards the award of PhD and that, to the best of my knowledge, it contains no material previously published by another 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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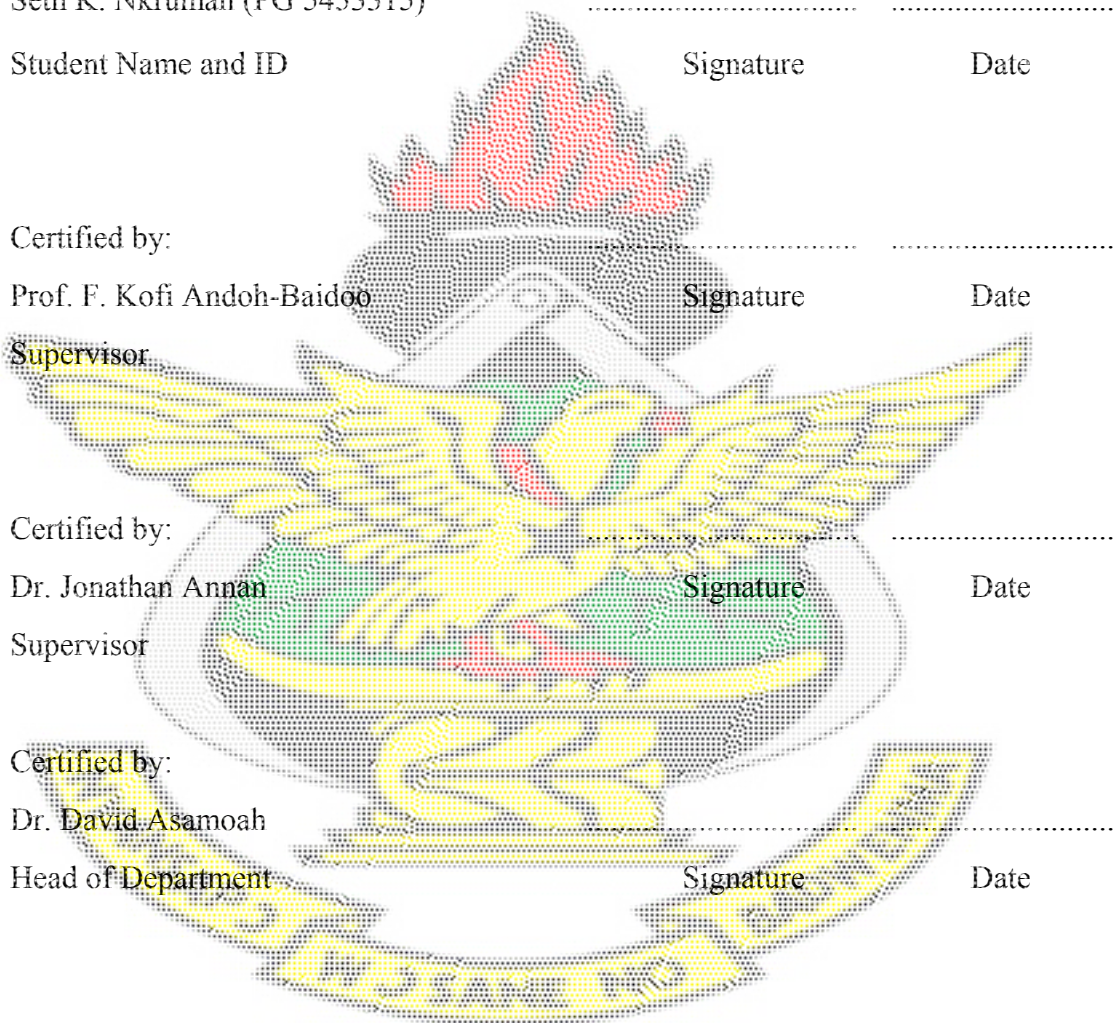
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DEDICATION

I dedicate this work to my beloved wife, Helena Akua Adomako and my kids, Maame Araba, Seth Abeiku Nkrumah, Sherry Nana Adjoa Nkrumah and Emily Ewura Esi Nkrumah.

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ABSTRACT

The concept of Green Supply Chain Management (GSCM) is becoming popular in Sub-Saharan Africa. However, empirical academic investigations into GSCM adoption in the region have been largely non-existent. The present study seeks to empirically explore the forces behind GSCM adoption in the region. Specifically, the study proposed that institutional pressures drive firms to develop GSCM capabilities, which enable them to adopt GSCM practices. Additionally, organizational culture is proposed as a moderator of the effect of GSCM Capabilities on GSCM Adoption. The study further proposed an additional dimension to institutional pressures, named Custodial Pressure, which captures the influence exerted by chiefs on organizations operating in Sub-Saharan Africa. Data was collected from a survey of 341 manufacturing and extractive firms operating in Ghana, out of which 146 usable responses were obtained, representing a response rate of 42.8%. The results of the data analysis revealed that firms surveyed had above average to high levels of GSCM adoption and GSCM capabilities. The measurement model was sound, including the proposed new Custodial Pressures construct. The findings indicated that Institutional Pressures positively and significantly impact GSCM Capabilities, with GSCM Capabilities positively impacting GSCM Adoption. GSCM Capabilities mediated the effect of Institutional Pressures on GSCM Adoption. Organizational culture was also found to moderate the effect of GSCM Capabilities on GSCM Adoption. Implications of the study include developing more relevant contextualization of institutional pressures driving GSCM and providing academic and practical guidelines to help drive successful GSCM adoption in Ghana and the sub-region.

TABLE OF CONTENTS

DECLARATION.....	ii
DEDICATION.....	iii
ACKNOWLEDGEMENTS	iv
ABSTRACT.....	v
TABLE OF CONTENTS	vi
LIST OF TABLES	x
LIST OF FIGURES	xi
LIST OF ABBREVIATIONS	xii
CHAPTER ONE	1
INTRODUCTION.....	1
1.1 Background of the Study	1
1.2 Problem Statement	4
1.3 Objectives of the Study	6
1.4 Research Questions	6
1.5 Significance of the Study	7
1.6 Overview of the Methodology	9
1.7 Scope of the Research	10
1.8 Organization of the Study	11
CHAPTER TWO.....	12
LITERATURE REVIEW	12
2.1 Introduction	12
2.1 Definitions and Philosophies of Supply Chain Management	12
2.2 Development of SCM	15
2.3 Objectives of Supply Chain Management (SCM)	17
2.4 SCM Processes	18
2.5 History and evolution of GSCM	19
2.6 The rise of environmental concerns in SCM	21
2.7 From Supply Chains to Sustainable (Green) Supply Chains	25
2.7.1 Product Design	26
2.7.2 Manufacturing By-Products	27
2.7.3 By-Products Produced During Product Use	27
2.7.4 Product Life Extension	27
2.7.5 Product End-Of-Life	27
2.7.6 Recovery Process at End-Of-Life	28
2.8 Definition of GSCM	29
2.9 GSCM Practices	31
2.9 Antecedents and Motivations for practicing GSCM	38
2.10 Capabilities for successful GSCM adoption	47
2.11 Benefits and Outcomes of GSCM adoption	51

2.12	Barriers to GSCM adoption and implementation	57
2.13	GSCM studies from Sub-Saharan Africa.....	58
CHAPTER THREE		60
THEORETICAL FRAMEWORK AND HYPOTHESES DEVELOPMENT		60
3.1	Introduction.....	60
3.2	Theoretical perspectives of GSCM studies.....	60
3.2.1	Institutional theory perspective to GSCM	60
3.2.2	Stakeholder theory approach to GSCM	63
3.2.3	Transactions Cost Theory	65
3.2.4	Resource Based View Theory.....	66
3.2.4	Dynamic Capabilities Approach to GSCM.....	67
3.3	Theoretical Background of the Study	68
3.3.1	Institutional Theory.....	68
3.3.2	Organizational Capabilities Theory	70
3.4	Theoretical Framework of the Study	72
3.4.1	Institutional Pressures	73
3.4.2	GSCM Adoption	76
3.4.3	GSCM Capabilities	78
3.4.4	Organizational Culture.....	80
3.6	Hypotheses development	81
3.6.1	Institutional Pressures and GSCM Capabilities	81
3.6.2	GSCM Capabilities and GSCM Adoption.....	82
3.6.3	The mediating role of GSCM Capabilities	84
3.6.4	The moderating role of Organizational Culture	85
CHAPTER FOUR.....		87
METHODOLOGY		87
4.1	Introduction.....	87
4.2	Research Philosophy.....	87
4.2.1	Ontology (Theoretical Perspective).....	87
4.2.2	Realism (Objectivism).....	88
4.2.3	Subjectivism (Constructionism/Interpretivism).....	90
4.3	Epistemology (Philosophy).....	92
4.3.1	Positivism	93
4.3.2	Epistemological Perspectives in Social Sciences	94
4.4	Research Philosophy and Orientation	95
4.4.1	The positivist research tradition.....	98
4.4.2	The Interpretivist Research Tradition	101
4.4.3	Pragmatic Research Tradition.....	102
4.4.4	The philosophical position of the study	103
4.5	Research Design.....	104
4.6	Research Method	105
4.7	Population	107

4.8 Sample Size and Sampling Technique.....	108
4.8.1 Response rate	109
4.9 Respondents to the Study.....	109
4.10 Research Instrument.....	109
4.10.1 Administration and Retrieval Procedure.....	110
4.11 Data Analysis.....	110
4.11.1 Analytic Method (SEM)	110
4.12 Validity and Reliability.....	111
CHAPTER FIVE	113
DATA ANALYSIS, INTERPRETATION AND DISCUSSION OF RESULTS	113
5.1 Introduction.....	113
5.2 Demographic Data	113
5.3 Descriptive analysis of constructs.....	116
5.3.1 Level of adoption of GSCM practices by surveyed firms	116
5.3.2 GSCM capabilities of the surveyed firms	120
5.3.3 Institutional Pressures faced by surveyed organizations	123
5.4 Partial Least Squares Structural Equation Modelling.....	127
5.5 Measurement model results	131
5.5.1 Convergent validity	132
5.5.2 Discriminant validity	136
5.6 Structural model results	143
5.7 Analysis of the Institutional Pressures construct	145
5.8 The Mediating role of GSCM-Capabilities	149
5.9 The Moderating role of Organizational Culture	150
5.10 ANOVA tests of Control factors.....	154
5.10.1 Employee Size and GSCM Adoption	154
5.10.2 Firm Revenue and GSCM Adoption.....	154
5.10.3 Industry group and GSCM Adoption.....	155
5.10.4 Organization type and GSCM Adoption.....	156
5.10.5 Organization Ownership and GSCM Adoption.....	156
CHAPTER SIX.....	157
SUMMARY OF FINDINGS, CONCLUSIONS AND	
RECOMMENDATIONS.....	157
6.1 Introduction.....	157
6.2 Summary of findings.....	157
6.3 Conclusions of the Study	159
6.4 Recommendations of the Study	160
6.5 Implications of the study.....	162
6.6 Limitations of the study	164
6.7 Directions for future research	165

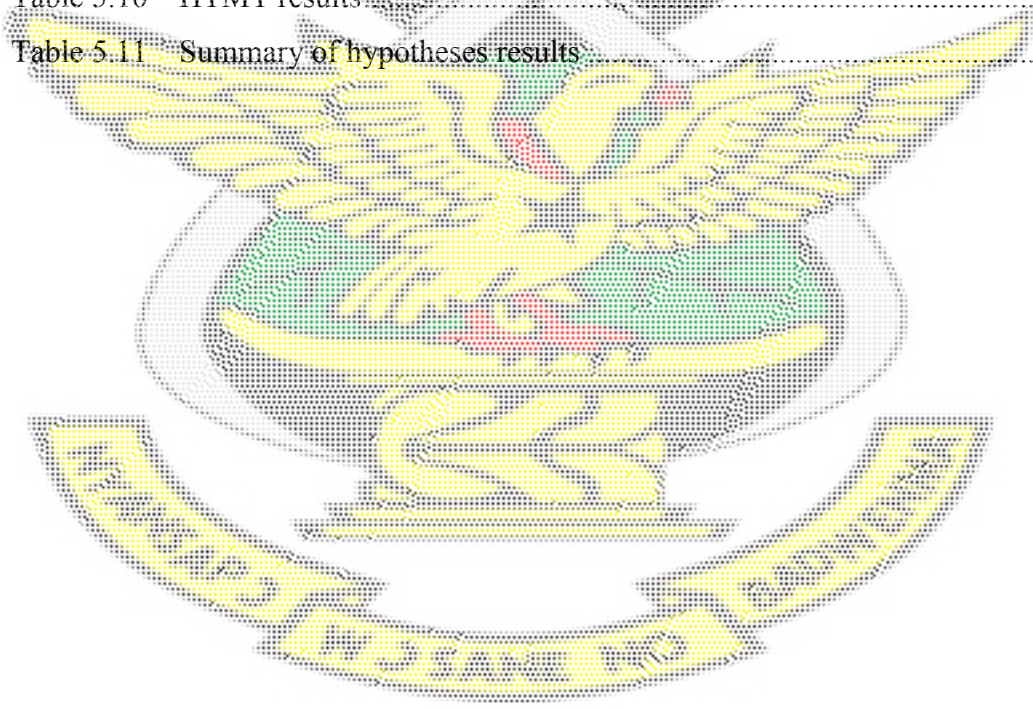
REFERENCES.....	166
Appendix 1: Constructs, Dimensions, and Research Items for Research model.....	195
Appendix 2: ANOVA results for Control Factors.....	199
Appendix 2a: Employee Size and GSCM Adoption.....	199
Appendix 2b: Firm Revenue and GSCM Adoption.....	200
Appendix 2c: Industry and GSCM Adoption.....	201
Appendix 2e: Firm Ownership and GSCM Adoption.....	203
Appendix 3: Krejcie and Morgan’s (1970) table of sample size determination.....	204

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LIST OF TABLES

Table 2.1	Definitions of GSCM.....	30
Table 2.2:	Empirical studies exploring GSCM practices.....	34
Table 2.3:	Empirical studies exploring GSCM Antecedents or Drivers.....	43
Table 2.4:	Studies exploring GSCM Capabilities.....	50
Table 2.5:	Empirical studies exploring GSCM Benefits or Outcomes.....	55
Table 5.1	Demographic data.....	115
Table 5.2	GSCM Practices among surveyed firms.....	117
Table 5.3	GSCM capabilities of surveyed firms.....	121
Table 5.4	Institutional pressures faced by surveyed firms.....	124
Table 5.6	Psychometric properties of constructs.....	133
Table 5.7	Item loadings.....	134
Table 5.8	Fornell-Larcker criterion.....	137
Table 5.9	Cross-loadings.....	139
Table 5.10	HTMT results.....	142
Table 5.11	Summary of hypotheses results.....	153



LIST OF FIGURES

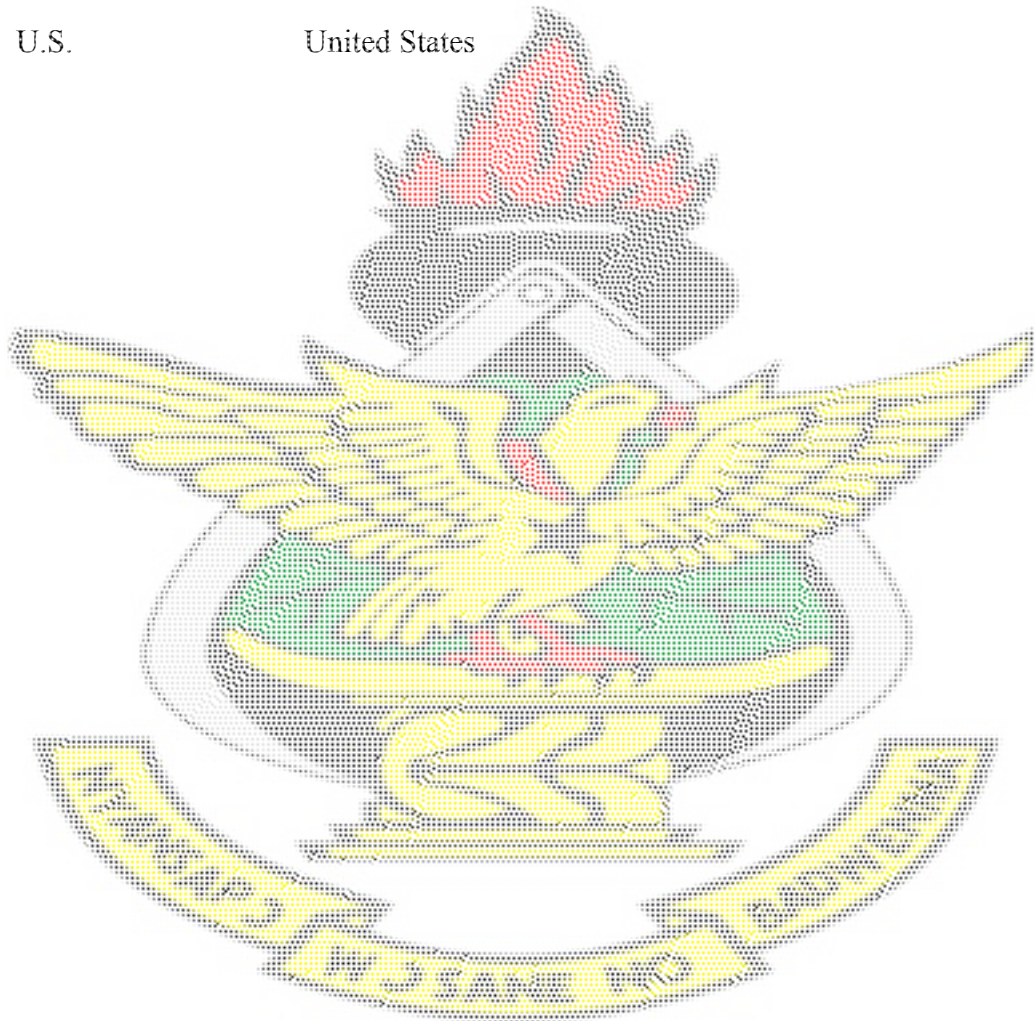
Figure 3.1 Theoretical Framework of the study	72
Figure 5.1 New Institutional Pressures construct	146
Figure 5.2 Research Model.....	148

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LIST OF ABBREVIATIONS

AVE	Average Variance Extracted
EU	European Union
SCM	Supply Chain Management
GSCM	Green Supply Chain Management
HTMT	Heterotrait-Monotrait method
RBV	Resource-based view
U.S.	United States



CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The challenge of achieving maximum profitability whilst remaining sustainable and environmentally responsible has become a major concern for most modern businesses. Concern over sustainability and the natural environment has attracted attention in recent years in the wake of numerous global and environmental problems (Morelli, 2011). As businesses are major contributors to present environmental challenges, there have been increasing calls for the adoption of “green practices” and environmentally sustainable business operations (Sarkis, 2006). Green practices aim at enhancing the environmentally-friendly image of products, processes, systems and technologies (Vachon and Klassen, 2006). The original focus on managing green practices within individual firms has been extended to Green Supply Chain Management (GSCM). GSCM represents “the management of a network of interconnected businesses involved in the ultimate provision of green products and green service packages required by the end customers” (Harland, 1996, p.65).

The European Union (EU) has indicated that over two billion tons of waste is created every year in the EU alone, with amount of waste generated growing by 10% annually. As a result, the EU and other national governments have enacted several environmental legislations in recent years. It has been noted that over two hundred legislations have been enacted by the EU alone since 1972 prescribing minimum acceptable levels of waste generation, water and air pollution (Baker et al., 2006). There are now stricter regulations in most parts of the developed world regarding the safety, environmental viability, and long-term effects of products and the processes

used to produce them. Whereas such regulations and legislations exist in many developing countries as well, enforcement has been a major challenge (Bonini and Gorner, 2011; Mensah and Larbi, 2005).

GSCM can be considered the process of “integrating environmental thinking into supply chain management, including product design, material sourcing and selection, manufacturing processes, delivery of the final product to the consumers as well as end-of-life management of the product after its useful life” (Srivastava, 2007, p. 54). The addition of “green” to supply chain management calls for the consideration of supply chain management issues and the natural environmental issues concurrently. This notion is further supported by Green et al. (1996) who indicated that green supply chain considers innovations in supply chain management in the context of the environment. Other scholars agree that GSCM considers the influence of supply chain management and the natural environment on each other (e.g., Hervani et al., 2005; Shang et al., 2010; Singh et al., 2014; Walton et al., 1998). GSCM encourages that all processes relating to sourcing, procuring, manufacturing and logistics management are planned and executed in an environmentally sustainable way. GSCM typically requires a firm to collaborate closely with other supply chain members to produce green products in an environmentally sustainable way (Tiwari, 2013).

Several benefits have been ascribed to GSCM adoption. First, GSCM is deemed necessary in the face of present environmental problems including environmental degradation, renewable resource depletion, environmental pollution, and global warming (Beamon, 1999). GSCM is also viewed as a tool to achieve standardization of safe and environmentally sound practices across industries (Gupta et al., 2010). For organizations, the key benefits of GSCM include positive impact on

financial performance and lower cost of operation due to minimization of waste. GSCM can also lead to increased competitive advantage through the production of environmental friendly products to customers achieved through effective management of supplier resources which reduces cost of production and promotes the recycling as well as reuse of materials. GSCM further helps companies reduce hazardous substances and avoid fines for violating environmental regulations (Emmett and Sood, 2010).

Despite the recent interest in environmentally sustainable supply chain management, GSCM research and implementations appear to be much more concentrated in the developed nations (Sarkis et al., 2011; Seuring and Müller, 2008; Zhu et al., 2008b). In most developed nations, GSCM practices are almost ubiquitous as most companies saw it as a natural continuation and complement to their existing environmental initiatives (Rao, 2002). This has not been the case for developing countries like Ghana, where adoption and enforcement of GSCM has lagged behind (Mensah and Larbi, 2005). It has been suggested that the drivers of GSCM implementation are many, ranging from “reactive regulatory reasons to proactive strategic and competitive advantage reasons” (Sarkis, 1999, p.2). Rehman and Srivastava (2011), in their study identified drivers of GSCM including management commitments, and regulatory measures.

Whilst the level of GSCM adoption among Ghanaian firms and drivers of GSCM adoption in Ghana has not been empirically explored in extant literature, it is believed that GSCM is becoming increasingly popular (Esen and El Barky, 2017). The government, regulatory bodies, and traditional leaders are among the key proponents of GSCM adoption particularly in mining, agriculture and manufacturing (Mensah and Larbi, 2005; Kleist, 2011).

1.2 Problem Statement

Several reasons necessitate the conduct of the study. First, whilst the understanding and adoption of GSCM is growing in recent times, academic study of the subject of GSCM adoption have centred on developed nations with relatively very little on developing countries (Sarkis et al., 2011; Seuring and Müller, 2008; Zhu et al., 2008b). Further, the few GSCM studies that focused on developing countries were conducted in Asia, with almost none from Sub-Saharan Africa (Srivastava, 2007). Thus, GSCM implementations in Sub-Saharan Africa region presents a new context that has not been adequately explored (Andoh-Baidoo, 2017). From a theoretical perspective, there may be additional institutional forces and capabilities in the context that have not been captured in existing GSCM models. This represents a significant gap in GSCM literature as the social, political, economic, legislative environment is known to influence adoption on green practices (Sarkis et al., 2011). This study explores the factors that drive GSCM adoption in a Sub-Saharan African country, a subject that has not been explored in existing literature.

Second, although there is some level of knowledge and information on greening the supply chain in developing nations, only a handful of firms have attempted to implement GSCM practices to a high level (Bonini and Gerner, 2011). GSCM adoption in most developing countries is fraught with challenges. For some industries, GSCM is embraced as a matter of policy or regulation to help satisfy the whims of environmental activists (Anbumozhi and Kanda, 2005). Although most organizations have knowledge on GSCM, they lack the financial strength to be committed to GSCM to enjoy the full benefits. The culture of firms in developing countries may not encourage adoption of environmentally sustainable practices, with firms likely to be more focused on surviving or increasing sales.

Additionally, some organizations lack the capabilities to adequately adopt GSCM practices. Industries are sometimes caught in the web of low customer demand, high sales and low profit that limits them from sustaining GSCM initiatives (Zhu et al., 2008b). In addition, whilst developed countries tend to have tough regulations on strict compliance to GSCM, most developing countries, particularly in Sub-Saharan Africa, find themselves in a vicious circle of poverty which sometimes softens their stance on green practices. Generally, monitoring and control by government and regulatory agencies in developing countries are weak (Mensah and Larbi, 2005).

Third, Ghana and Africa face considerable environmental issues and challenges including global warming, pollution, and environmental degradation as a result of increased economic and industrial activities in recent decades (Van Heerden et al., 2006). Environmental sustainability is a present concern for the Ghanaian government, local authorities and regulatory agencies who have devoted considerable resources to address these challenges, seemingly without much success (Aryee et al., 2003; Famiyeh et al., 2018). Despite efforts of regulatory bodies like the Environmental Protection Agency, the central and the local government, and community based organizations, the situation does not appear to be improving (Famiyeh et al., 2018; Mensah and Larbi, 2005). Corporations contribute significantly to environmental degradation in Ghana and Africa and any effort to tackle the situation would require organizations to be actively involved. Adopting GSCM practices is one way this can be achieved. However, no study has empirically explored what drives GSCM adoption in Ghana. This work aims at addressing this problem and would help improve the understanding of the drivers of GSCM adoption in Ghana and serve as a guide to enhancing GSCM adoption in Ghana and beyond.

1.3 Objectives of the Study

This present study explores GSCM adoption using data from Ghana, a Sub-Saharan African country, and attempts to understand the institutional forces that drive GSCM adoption, as well as the capabilities that would be needed to support GSCM adoption in Sub-Saharan Africa. The specific objectives are:

- i. To explore the level to which GSCM practices have been adopted by surveyed firms.
- ii. To investigate the effect of Institutional Pressures on GSCM Adoption.
- iii. To investigate the mediating role of GSCM Capabilities on the effect of Institutional Pressures on GSCM Adoption.
- iv. To examine the moderating effect of Organizational Culture on the effect of GSCM capabilities on GSCM adoption.

1.4 Research Questions

The following research questions are put forward to meet the objectives of this study:

- i. To what extent have GSCM practices been adopted by the surveyed firms?
- ii. What is the effect of Institutional Pressures on GSCM Adoption?
- iii. To what extent does GSCM Capabilities mediate the effect of Institutional Pressures on GSCM Adoption?
- iv. To what extent does Organizational Culture moderate the effect of GSCM capabilities on GSCM adoption?

1.5 Significance of the Study

The study has theoretical and practical significance. From the theoretical perspective, first, the study empirically addresses the antecedents of GSCM adoption in a Sub-Saharan African country, a hereto unexplored context (Onikute, 2013). The study presents knowledge and findings on institutional forces that drive GSCM adoption and the capabilities necessary to support GSCM adoption in Ghana, a nation in the Sub-Saharan Africa region. The social, legal, political, and economic environment influence adoption of green practices (Sarkis et al., 2011), and as environmental conditions vary from region to region, GSCM adoption issues are expected to vary across regions. This study thus presents an enhanced understanding of GSCM adoption in the Sub-Saharan African region, which provides a platform to address issues of waste management, quality management in industry and adoption of other environmentally friendly practices in the region (Hong et al., 2014). Thus, this study creates a body of knowledge on GSCM adoption that reflects the environment and context of the unexplored Sub-Saharan Africa region. Also, it is unknown from extant literature the level to which GSCM has been adopted in a Sub-Saharan African region, the institutional forces that drive GSCM adoption, as well as the capabilities that are required to support GSCM adoption. The present study addresses these research gaps and creates an understanding of the forces driving GSCM adoption in an unexplored region.

Second, the study explored the external forces that drive GSCM in Sub-Saharan African region from the institutional theory and the capability theory perspective. Institutional theory posits that three types of pressures – Coercive, Normative and Mimetic pressures – drive organizations to behave in certain ways to be perceived as legitimate (DiMaggio and Powell, 1983). However, in Sub-Sahara

Africa, pressure emanating from chiefs and traditional authorities is an additional institutional pressure that compels organizations to act in socially desirable ways. This “custodial pressure” is conceptually developed and empirically tested as an additional institutional pressure in this study. The new four-pronged institutional theory construct that is proposed in this study provides enhanced understanding of institutional forces within the Sub-Saharan African region, which can be used in subsequent studies which theorize the institutional environment of Sub-Saharan African countries or other contexts where additional institutional forces may be at work. Thus, the paper presents context-based theorization of GSCM in the Sub-Saharan Africa region (Andoh-Baidoo, 2017; Hong et al., 2014).

This study is of practical significance to Ghanaian and Sub-Saharan African managers and businesses. In contrast to most developed countries where GSCM practices have been widely adopted by organizations (Rao, 2002), GSCM adoption is still in its infancy in Ghana and most of Sub-Saharan Africa and faced with a lot of challenges in their attempts to adopt GSCM practices. As developing countries and governments continue to buy into the ‘green revolution’, businesses and firms are under pressure to adopt sustainable practices and improve their overall environmental performance about minimizing their levels of waste generation, land, water and air pollution, and minimizing natural resource use. Findings from this study provides a useful guide to Ghanaian firms and managers desiring to adopt GSCM practices. The study outlines institutional forces that drive GSCM in a Sub-Saharan African country, as well as the capabilities required for successful GSCM adoption in the region (Fahimnia et al., 2018)

The study has policy implications as it is of relevance to central governments, local governments, and regulatory bodies in Ghana and Sub-Saharan Africa. Sub-

Saharan African nations are exposed to industrial practices that impact negatively on the environment such as river pollution caused by activities of illegal mining (known as “galamsey” in Ghana), illicit dumping of industrial waste and air pollution (Van Heerden et al., 2006). GSCM is critical in achieving a cleaner, healthier and less risky environment which simultaneously supports industrial activities. The effectiveness of regulatory bodies like the Environmental Protection Agency in Ghana who are embroiled in a never-ending battle against illegal and dangerous practices in small scale mining, lumbering and fishing among others would receive a boost as GSCM represents an institutionalization and standardization of best practices with regards to environmental protection and management (Famiyeh et al., 2018; Mensah and Larbi, 2005). This sustainable approach to environmental management is also expected to help guard against renewable natural resource depletion, and in so doing, secure the future of extractive activities like mining, fishing, and lumbering in Ghana and beyond. Achieving sustainable industrialization and managing the natural environment has long been a major goal of many governments across the Sub-Saharan African region, and GSCM can help make this vision a reality. An understanding of GSCM and its benefits will help Sub-Saharan African nations achieve sustainable industrial development and secure future operations (Scheren et al., 2002).

1.6 Overview of the Methodology

This dissertation is an exploratory study to investigate GSCM adoption among selected Ghanaian manufacturing and extractive firms. The study develops a research model that explores the relationship between four constructs – GSCM Adoption, GSCM Capabilities, Organizational Culture and Institutional Pressures. Details of the research model are presented in Chapter 3 of the work. Survey methodology was employed to gather data from manufacturing and extractive firms in Ghana. Items for

the constructs are adopted and modified from existing studies, while the Custodial Pressure construct was developed in this study. Structural equation modelling techniques were used to analyze the data.

Given the large and undetermined number of manufacturing and extractive firms operating in Ghana, it was necessary to select a representative sample from the population for data collection for this study. From a list of registered manufacturing and extractive firms operating in Ghana obtained from the Registrar General's department, 341 manufacturing and extractive firms were randomly selected to serve as the data for this study. The study solicited one response from each selected organization, preferably the head of supply chain management function of the organization. Details on the research methodology are presented in Chapter 4 of the study.

1.7 Scope of the Research

This section clearly delimits the boundaries of this study. The study investigates GSCM adoption among manufacturing and extractive organizations operating in Ghana. In selecting firms, no restrictions were set in terms of firm size, ownership type, firm type, or industry, although these were explored as control variables that may impact GSCM adoption in the study.

The study explores how the three traditional institutional pressures (Normative Pressure, Coercive Pressure, and Mimetic Pressure) and Custodial Pressure impact GSCM adoption in a Sub-Saharan African country. Also, the direct and indirect effects of four-pronged isomorphic pressures (Coercive Pressures, Normative Pressures, Mimetic Pressures and Custodial Pressures) on GSCM adoption (Green

Manufacturing, Green Purchasing, and Investment Recovery) were explored. Organizational Culture was additionally explored as a moderating variable.

1.8 Organization of the Study

The thesis is organized into six chapters. Chapter One presented the introduction of the study and discussed the background of the study, the problem statement, research objectives and research questions. Additionally, the significance of the study, overview of the methodology, and scope of the research are discussed. In Chapter Two, the researcher conducts an extensive theoretical and empirical literature review on important concepts and studies that form the foundation of the study. In Chapter Three, the theoretical background of the study, theoretical framework, research model, and hypotheses development are discussed. The research methodology is elaborated in Chapter Four. Next, data analysis is presented in Chapter Five. Finally, the thesis ends with the presentation of a summary of the findings, conclusion, implications, and limitations of the study in Chapter Six.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

In this chapter, a comprehensive review of the literature on GSCM is presented. The chapter explores history and evolution of GSCM literature, definitions of supply chain management (SCM) and GSCM, the literature on GSCM practices, GSCM antecedents, GSCM outcomes, and GSCM capabilities as these are relevant to the study. The chapter also dedicates a section to discuss GSCM literature in Sub-Saharan Africa and other developing regions as they closely reflect the Ghanaian context within which this study is conducted.

2.1 Definitions and Philosophies of Supply Chain Management

Supply chain Management (SCM) as operational term involves the flow of materials and products from mother earth to the eventual end user. Several definitions have been offered for SCM across the years. Whiles some see it as a “management philosophy”, other authors interpret SCM as a “management process” (Mentzer et al, 2001a). The underlisted are other views explaining supply chain management.

Definitions put forward by most authors align towards the school of thought of SCM being a management process. For example, Harland (1996) noted that SCM is a management of networks of interconnected organisations involved in the provision of products and services to end customers. La Londe (1997) also opined that SCM is a method of managing relationships, information and materials flow across company borders to deliver enhanced customer service and economic value through synchronized management of the movement of physical goods and associated

information from sourcing to consumption. According to Stadtler (2008), SCM is a task of integrating organisational units along supply chain and coordinating material, information and financial flows to meet customer demands with the aim of improving competitiveness of supply chain. The Council of Supply Chain Management professional (CSMP, 2001) cited in Stadtler (2008), defined SCM as an integrated activity with primary responsibility of linking key business functions and business processes within and across companies into a cohesive and high-performing business model. Biniazi et al. (2011) noted that SCM is a process of integrating supply chain activities and information flows associated with it, by improving and coordinating supply chain activities in manufacturing and product supply. In Kotler and Armstrong (2008), SCM is explained as managing upstream and downstream value added flows of materials, final goods and related information among suppliers, company, resellers and final customers. Hervani et al. (2005) further postulated that SCM is the coordination and management of complex network of activities involved in delivering a finished product to the end-user or customer (Hervani et al, 2005).

Some authors on the other hand have viewed SCM as a management philosophy. For example, Cooper and Ellram (1999) defined SCM as an integrative idea that controls the flow of distribution channel from supplier to ultimate user. Svensson (2007, p. 263) also explains SCM as “a business philosophy that strives to integrate subsidiary activities, actors and resources between different levels of points, from origin to consumption in channels”. Tyndall et al. (1998) explain SCM as a total flow of materials, from procurement of raw materials to delivery of finished products to customers, as well as related counter flows of information which control and record material movements. Chime

(2007) expresses SCM as the configuration, coordination and continuous improvement of a sequentially organized set of operations. Definitions put forward by other researchers further support the idea of SCM being a management philosophy. Slack et al (2007) defined SCM as a management of interconnection of organisations that relate to each other through upstream and downstream linkages between processes that create value for ultimate consumer in the form of products and services. Mentzer et al. (2001b) defined SCM as a systematic and strategic coordination of the traditional business functions within a company and across businesses within supply chain, for the purposes of improving long term performance of individual companies and the supply chain. Kaynak and Hartley (2008) also defined SCM as a combination of internal practices that are within the organization and external practices that are across organisational boundaries being integrated as an organization with its customers and suppliers. Finally, Flynn et al. (2010) were of the view that SCM is the “degree to which a firm strategically collaborates with its supply chain partners and collaboratively manage intra and inter organization processes to achieve effective and efficient flows of products and services, information, money and decisions to provide maximum value to the customer”.

In the context of this study, the researcher integrates both the process and philosophy. Thus, SCM is viewed as both a management philosophy and a management process. SCM has become very popular in developed countries and is increasingly becoming popular in emerging countries like Ghana. SCM is seen as a vital business function that covers processes including sourcing for raw materials and parts, manufacturing and assembling products, storage, order entry and tracking, distribution through the various channels and finally, delivery to the customer

(Hervani et al, 2005). A company's supply chain structure typically consists of external suppliers, internal functions of the company and external distributors as well as customers (commercial or end-users). The successful management of supply chain is therefore influenced by customer expectations, globalisation, information technology, government regulation, competition and the environment (Hervani et al, 2005).

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2.2 Development of SCM

In the industrial age, production was simply considered to be more of manufacturing that occurred within a single firm. Companies converted raw materials into a product entirely within a single firm (Harland, 1995; Fandel and Stammen, 2004; Hines, 2006; Kotzab et al, 2011). Increased marketing activities and environmental pressures led organisations to form supply chain network to help meet the rising customer demand (Zacharia, 2001a; Fandel and Stammen, 2004; Vonderembse et al, 2006). The word pipeline was used from the 1970s to the 1980s to mean material flow from source of supply to customers or end-users (Hunter et al, 1993; Lambert and Cooper, 2000) whilst in the 1990s supply networks became a more preferred phrase (Christopher, 1996).

In the 1990s, business environment became very dynamic in terms of increasing technological complexity, demanding markets, explosion of knowledge and increased global competition inspired the development of supply chain (Zacharia, 2001). This led to a significant paradigm shift in modern business management where individual businesses no longer compete as solely autonomous entities, but rather as supply chains (Bhattacharya et al, 1995; Christopher, 1996; Lambert and Cooper, 2000; Schary and Skjøtt-Larsen, 2001; Zacharia, 2001a;

Spekman et al, 2002; Hines, 2006; Vonderembse, 2006; Stadtler, 2008). The shift in competition from among individual business organisations to amongst supply chains makes supply chain management imperative in modern production and operations management (Vonderembse, 2006; Stadtler, 2008; Ellinger et al, 2012). The success of an organization depends on how well its entire supply chain competes with competitors' networks (Schary and Skjøtt-Larsen, 2001; Kotler and Armstrong, 2008; Attaran and Attaran, 2007). SCM is now a key component of business organizations' strategies (Ellinger, et al, 2006). Improving supply chain effectiveness is vital to individual firm and entire supply chain profitability (Cooper and Ellram, 1993; Dyer, 2000; Slack et al, 2007; Stadtler, 2008). Therefore, developing a supply chain production system and utilizing a supply chain orientation lead to greater opportunities for lower costs, improved customer value and differential advantage in the future (Zacharia, 2001).

The evolution of SCM can be viewed in two parts. The first started from 1800s and proceeding to today, covering craft production, mass production, lean production, just-in-time (JIT) production, tiered production, dispersed production and build-to-order production. The second involves intra company production, intercompany production and eventually supply chain production (Zacharia, 2001a). In the early part of the 20th century, the focus was on quality whilst the production method was craft production. In the 1930s and 1940s, cost was the overriding factor and mass production as the dominant production paradigm. In the 1980s, quality combined with low cost was the critical factor; lean production emphasizing supplier partnerships was the dominant production paradigm. The fundamental change between mass production and lean production is the increase in flexibility in workers and machines. In the 1990s and beyond, the critical factor was

flexibility and the dominant production paradigm was SCM (Zacharia, 2001a). These show that practical field of SCM is constantly changing, as the competitiveness of global companies increasingly depend on their capability to produce and deliver customized products and services fast and efficient all over the world. At the same time, an increasing percentage of value creation takes place outside boundaries of an individual firm (Bruce et al, 2004; Halldorsson et al, 2007; Kotzab et al, 2011). Supply chain production systems have significant role to play in many companies because selection of appropriate production system can directly affect strategic capability of firms (Zacharia, 2001).

2.3 Objectives of Supply Chain Management (SCM)

One of the primary objectives of SCM is integration and management of the sources and control of the flow of materials (Mckone-Sweet and Lee, 2009) using complete system approach across various functions and multiple tiers of suppliers (Mentzer et al, 2001a, Mckone-sweet and Lee, 2009). Supply chain links a company to its suppliers upstream and to its distributors downstream to serve customers (Chima, 2007).

Another objective of SCM is creation of value to satisfy customers' demand (Porte, 1985; Langley and Holcomb, 1992; Giunipero and Brand, 1996; Tyndall et al, 1998; Fawcett et al, 2008; Mentzer et al, 2001a) and provision of maximum customer service at lowest costs can improve customers' satisfaction (Chima, 2007). Product value is consumers' assessment on how well their needs were satisfied by goods or services (Goodstein and Butz, 1998 cited in Mentzer et al, 2001b) whilst customer satisfaction is a measure that shows how successful an organisation provides products or services to the market place for customers'

acceptance (Anderson et al, 1997; Olsen and Johnson, 2003). Value dictates customers' desires (Porter, 1985). Organisations are expected to satisfy customers by providing what customers want at the time they want it (Fawcett et al, 2008). Understanding the entire process of supply chain is essential in identifying and delivering value (Slater and Narver, 1994; Mentzer et al, 2001a): Customer satisfaction increases market share and profitability (Ellinger et al, 2012), return on investment and productivity (Anderson et al, 1997), market value added (Ittner and Lacker, 1996), shareholder value (Anderson et al, 1997), stock market performance (Ellinger et al, 2012), and customer loyalty (Oliver et al, 1992; Ellinger et al, 2012).

On the other hand, SCM minimizes total cost needed to provide required stocks at reduced order cycle time (Cooper and Ellram, 1993; Leonard and Cronan, 2002 in Fawcett et al, 2008). This will in turn create competitive advantage (Bowersox and Closs, 1996; Cooper and Ellram, 1993) and reduce inventory at improved delivery services (Fawcett et al, 2008).

2.4 SCM Processes

SCM processes involve activities and methods that are used in coordinating the flows of materials, information and finance from supplier to final customers. These activities include SCM orientation, integration, partnerships, leadership and SCM competency.

Organizations implementing SCM should have supply chain orientation (SCO) (Mentzer et al, 2001b). SCO is "the recognition by an organization of the systemic, strategic implications of the tactical activities involved in managing the various flows in a supply chain" (Mentzer et al, 2001b, p. 11). SCO is the idea of viewing the coordination of the supply chain from an overall system perspective,

with each of the tactical activities of distribution flows viewed within a broader strategic context. SCO is an organizational mind-set required by an organization to leverage SCM competency into superior performance (Mentzer et al, 2001b; Min et al., 2007). Thus, an organization has SCO if its management (in its entirety, not just one or two individuals) can see the implications of managing the upstream and downstream flows of products, services, finances and information across their supplier and their customers (Zacharia, 2001a).

SCO occurs when the focal firm starts to consider its supplier's supplier and its customers simultaneously (Zacharia, 2001a). It requires organizations to control SCM competency into better performance (Min, 2001). SCO depends on reliable information without which, right decisions cannot be taken (Slack et al 2007). SCO implementation requires SCO across several companies directly connected in the supply chain.

2.5 History and evolution of GSCM

The concept of GSCM is believed to have emerged in the 1990s and has since gained widespread popularity (Sarkis et al., 2011). The initial goals of GSCM appeared to be improving awareness to environmental concerns as well as the safety of employees and customers, whilst concurrently targeting judicious use of resources. GSCM is now being practiced in a wide array of organizational settings, from public to private firms, manufacturing to service firms, in developed and developing countries (Sarkis, 2011).

Sarkis et al. (2011) traced the first works on greening of supply chains to Ayres and Kneese (1969) who discussed issues of industrial metabolism whilst at the same time considering material balancing. Ayres and Kneese (1969) further

expatiated on the need for firms to actively manage how they produce and consume to simultaneously achieve effective industrial metabolism and material balancing in their supply chains. They also discussed industrial pollution and how greenhouse gases emitted by industries might drive climate change. The ideas on balancing the goals of industrial metabolism together with material flow was refined in the 1970s (Ayres, 1978). Stern et al. (1973) further expanded the discussion to consider achieving balance in organizational and governmental decision-making. The work of Stern et al. (1973) introduced a list of pollutants and explored how they impacted the environment using a decision modelling software like how analytical tools are used to explore product life cycles in present times.

During the 1980s, a field related to GSCM, “industrial ecology” began to grow, which strongly emphasized the principle of life cycle assessment Erkman, (1997). The idea of implementing environmental policies and initiatives which allow firms to gain a competitive advantage and achieve economic benefits was a watershed in industrial ecology literature (Frosch and Gallopoulos, 1989). At the same time, the ideas of industrial eco-systems concepts were further refined by Jelinski et al., (1992). Around this same period, other scholars began to stress the need to ecologically manage entire supply chains, not just the activities of individual organizations (Bhote, 1989).

The 1990s witnessed a more managerial, less technical study of GSCM which focused on specific themes within supply chain management including logistics (Murphy et al., 1994; Szymankiewicz, 1993), purchasing (Drumwright, 1994), and reverse logistics (Barnes, 1982; Pohlen and Farris, 1992). Later, scholars started to conceptually and systemically integrate the separate developed themes into a

complete view of supply chain management with an environmental focus, which gave birth to modern GSCM (Sarkis, 1995a, 1995b).

Most of these early studies were not empirical in nature, but mainly anecdotal and conceptual. However, the growth of the GSCM field has given rise to more empirical studies focusing on theory development and testing. These modern studies have largely been founded on the earlier anecdotal and conceptual studies (Seuring and Muller, 2008; Sarkis et al., 2011).

2.6 The rise of environmental concerns in SCM

From its development in the early centuries, environmental management in the view of Zanjirani et al. (2009) is management of human interactions and its impact on the environment. Though early efforts were more of emerging pollution control, proper management of the environment has helped in preventing air, land and water pollution to manage the entire ecosystems.

According to Carter and Rogers (2008), global environmental demands, with focus on environmental performance of firms have changed. Initially, environmental management was primarily concerned with wealth creation in terms of economic performance and its success, however, sustainability of the environment and social performance have been the recent or major towing objectives. This change, coupled with growing globalization, has drawn the attention of manufacturing companies to oblige to environmental policies. This has contributed to the reason why companies have now adopted friendly environment approach for profit maximization (Govindan and Cheng 2011). In this regard, there have been constant and deliberate efforts to achieve environmental sustainability.

Activities of environmental performance and practices are now expected to be incorporated into the business practices of SCM (Che, 2010). Firms are expected to consider the environmental impact of management decisions and practices on the entire supply chain and life cycle of the product (Al Khidir and Zailani, 2009). Environmental protection must be factored into the entire production process from design of the product, planning, organizing, controlling, warehousing and implementation of the entire process (Srivastava, 2007). Sarkis (2003) argues that the organization should voluntarily arrive at the need to maintain the environment in the design of their supply chain to support the “green environment” (Green et al., 2012) for sustainability. “Green supply chain” approach is significant in influencing total environmental change in the supply chain activities of the firm with focus on minimizing or eliminating wastages - emissions, energy, and hazardous chemical and solid waste - through to product end of life with the supply chain activities (Srivastava, 2007). Zanjirani (2009) posits that there are various approaches to environmentally conscious design classified into various categories - remanufacturing (Bras and McIntosh 1999), and legislations (Bellmann and Khare 2000), material/product recovery (Ferrer 2001), design for disassembly (Krikke et al. 2003), design for better material choices (Krikke et al. 2003), design for waste minimization, and design for recycling (Masanet and Horvath, 2007).

The GSCM practices according to a review by Chin et al. (2015) can be grouped into four main categories namely, Green procurement, manufacturing, distribution and logistics. Green procurement has to do with supplier selection where suppliers are selected based on their competence on the environment, technicalities in managing the environment, capabilities and support of industries to maintain their environmental objectives (Paulraj, 2011). It also incorporates reuse, recycling and

reduction in the procurement process by ensuring suppliers provide their issued compliance certification on environment and conduct auditing for suppliers' internal environmental management (Lee et al., 2012). The green supply chain manufacturing processes raw materials through to the finished product by so doing ensuring reduction of any harmful substance that they encounter, increasing energy efficiency, and minimizing waste (Ninlawan et al., 2010), and actively designing and redesigning. According to Lee et al. (2012), the supply chain manufacturing process requires the design of products that facilitate product reuse, recycle and retrieving material component and parts that help in reducing any hazardous component within its process and minimize consumption of materials. The distribution aspect includes downsize packaging, recycling, reuse and adoption of returnable packaging methods that help in minimization of material use (Ninlawan et al. 2010) and saving energy in warehouses. (Holt, 2009). The green supply chain logistics utilizes vehicles which have low emission of fuel to the environment.

Environmental sustainability according to Morelli (2011) is maintaining the balance and interconnectivity that satisfies the needs among human society and the control of the supporting ecosystem for continuous regeneration of necessary services to meet the demand and /or not diminishing the bio-diversity. In the view of Lai and Wong (2012), increasing pressure from international regulators, environmental based trade barriers and scarcity of resources, have been the eye opener for manufacturers in realizing the significance of environmental boosting and the implementation of sustainable practices that reuse/recycle the scarce resources. Example is the environmental standard, International Standards Organization (ISO) that has developed to set standard regulations globally applicable as far as environmental management is concerned (Hazen et al., 2011). At national levels, governments and

other stakeholders have enacted various regulatory measures and policies to ensure business activities are sustainable and all business operations are friendly to the environment. In Ghana, there are legislative laws by an Act of Parliament on environmental management and an institution set to regulate environment concerns. Apart from adopting the international and national standards and strategies in ensuring sustainability and environmental conservation, most organizations have developed organizational standards and strategies to handle environmental related issues (Global Environmental Management Services, 2015).

Failure by companies to achieve environmental sustainability in the supply chain can pose significant environmental impacts. Meanwhile practical implementation of the green supply chain benefits the cost savings companies, reduces environmental liabilities and establishes good public image (Wisner et al., 2012). Flammer (2013) confirms this indicating that companies are sensitive to environmental related issues by enhancing eco-friendly activities to attract resources from investors. In the opinion of Chin et al. (2015), increasing concerns and awareness in the supply chain management has drawn attention of bodies like governments, firms and partners within the supply chain to avoid eco-harmful activities and promote a sustainable environment. This has resulted in global warming reduction and commitment to green supply chain practices. Also, Uchida and Ferraro (2007) added that in situations where organizations factor into their core activities environmental sustainability and organization practices, they can strengthen their relationships with their customers, gain competitive advantage that leads to profitability and expand their customer base and entry to new market.

2.7 From Supply Chains to Sustainable (Green) Supply Chains

The relationship between sustainability and supply chain is the management of environmental, social and economic impact, and the encouragement of good governance practices, throughout the life cycles of goods and service (Chorn et al., 2015). Most countries now do not seek just economic growth but holistic sustainable development, leading to the rise and wide-spread adoption of the sustainable practices. The reason for sustainable development concepts is the result of the growing awareness of the global links between mounting environmental problems, socio-economic issues with poverty and inequality and concerns about healthy future for humanity (Hopwood et al., 2005). The principles of sustainable development include social equity, economic growth and environmental protection. These principles have influenced how businesses are expected to be conducted in most countries. There is a push for a change to sustainable supply chain practices because organizations have heavy impacts and consequence on the ecosystem (Zhu et al., 2012).

Sustainable supply chain represents the balanced use of natural, social and economic capital for the continued wellbeing of organizations, the planet and future generation. To fully understand product sustainability, a business considers not only its own operations, but also its entire network of suppliers, customers and supporting resources (Fiksel, 2010). There is a dramatic shift among corporations these days to ensure sustainability in their supply chains. This is due to the growing concerns of change in the environment; thus, anxieties over the climate change and energy security, increased pressure from stakeholder's advocacy groups, and regulatory directives that obliged companies to consider the environmental impact of their products and operations (Linton et al., 2007). Linton et al. (2007) posit that the focus

on environmental management and operation has moved from local optimization of environmental factors to the consideration of the entire supply chain during the production, consumption, customer service and disposal of the products. Their research captures the increasing concerns on sustainability, either driven by current legislation, public interest or competitive opportunities (Linton et al., 2007).

Sustainability as an integrative concept is following the trajectory as was done with ban on ozone depleting potential in product. Sustainability deals with new initiatives being proposed or adopted by both the public and private sectors (Linton et al., 2007). World organizations in the EU, Americas and Canada have become highly influential proponent of sustainability (American Chamber Commerce of Europe, 2004). Since supply chain considers product from their initial processing of raw materials to the delivery to the customers, it is imperative that the adoption of sustainable development practices becomes its focus (Linton et al., 2007). Linton et al. (2007) pointed out that sustainability must integrate issues and flows that extend beyond the core supply chain management. These issues and flows include; product design, manufacturing by products, by product produced during use, product life extension, product end-of-life and recovery processes at end-of-life.

2.7.1 Product Design

Life cycle assessment is a tool that is used to assist in the determination of how to design a product to minimize its environmental impact over its usable life and afterward. In engineering and product design, resource depletion and its impact on the environment is considered (Linton et al, 2007).

2.7.2 Manufacturing By-Products

Other issues to consider include the reduction and quality elimination of by-product through cleaner technologies temporary (Kemp, 1994 cited by Linton et al., 2007). Linton et al. (2007) also indicated that during manufacturing process there is an increase in the use of waste for producing new food products which is a function of process design and continuous improvement activities.

2.7.3 By-Products Produced During Product Use

Here, it is imperative to understand that product sustainability is not only a function of design but also product management (Linton et al., 2007). Thus, producers must involve themselves in the products used by the consumer by providing extended services to support and supplement sale of the original products (Wise, 1999).

2.7.4 Product Life Extension

Linton et al. (2007) pointed out that when product life is extended it leads to the avoidance of depleting new resource through the production of new products. They opined that there are varieties of techniques that could be implemented to extend product life cycle. Product obsolescence especially in consumption-oriented society is minimized through the extension of product life. These product manufacturers / providers must develop offerings that allow them to capture more product value. The authors also observed that adding value increases the life of such products.

2.7.5 Product End-Of-Life

Product end-of-life is very critical in ensuring sustainability in SCM. The disposal of product at the end-of-life relies on actions taken at earlier stage of the product design (Linton et al., 2007). The degree at which a product could be revised, remanufactured,

recycled, incinerated or disposed off is greatly influenced by the initial product design (Linton et al. 2007). For instance, the high level of lead content in cathode ray tubes and electronic products has resulted in complications for their disposal due to the high toxicity of lead. According to Linton and Yeomans (2004), cathode ray tubes have special regulations which ensure that such substances are diverted from municipal landfills with the intentions of integrating the lead into new product. Also, policies have been developed to produce more environmentally favourable mode of product end-of -life disposal. This has resulted in more storage of products and less redeployment of parts and materials into new products than intended (Linton et al., 2007). To have an appropriate outcome does not only depend on changes associated with environmental policies, regulations, incentives and disincentives but also on the operational aspect like forecasting, logistics, processing and other functions (Linton et al., 2007).

2.7.6 Recovery Process at End-Of-Life

Recovering of used products is now seen as an important field in ensuring sustainability (Linton et al., 2007). Several scholars have published on the design consideration for product recovery (e.g., De Brito and Dekker, 2004; Jayaraman et al, 2003). Fiksel (2010) indicated that commitment to SC sustainability requires awareness of the full product lifecycle, ranging from the conduct of upstream suppliers to the disposition of absolute products. They indicate that companies like HP and Walmart have implemented green purchasing policies to ensure that their suppliers adopt sustainable business practices. Fiksel (2010) indicated that commitment to SC sustainability requires awareness of the full product lifecycle, ranging from the conduct of upstream suppliers to the disposition of absolute products.

2.8 Definition of GSCM

GSCM is grounded on literature from the fields of natural environment management as well as supply chain management. As noted earlier, including the term ‘green’ to supply chain management basically introduces an added dimension of environmental concerns and influences in managing supply chains (Srivastava, 2007; Hervani et al., 2005). Several definitions for GSCM have been put forward in the literature. Additionally, the scope of the concept of GSCM explored in previous GSCM literature has been very diverse (Zhu and Sarkis 2004; Srivastava, 2007).

Table 2.1 presents several definitions proposed for GSCM. From Table 2.1, the definition and scope of GSCM varies greatly across studies. This may be due to the cross-disciplinary nature of GSCM which is formed from an integration of environmental management and supply chain management, both of which are relatively new and theoretically underdeveloped fields (Hervani et al., 2005; Eltayeb et al., 2011).

Table 2.1 Definitions of GSCM

Author (year)	Definition
Srivastava (2007, p. 54 - 55)	Integrating environmental thinking into supply chain management, including product design, material sourcing and selection, manufacturing processes, delivery of the final product to the consumers as well as end-of-life management of the product after its useful life.
Narasimhan and Carter (1998, p. 6)	Environmental (Green) supply chain management consists of the purchasing function's involvement in activities that include reduction, recycling, reuse and the substitution of materials
Godfrey (1998, p. 244)	The practice of monitoring and improving environmental performance in the supply chain
Hervani et al. (2005, p.334)	GSCM = Green Purchasing + Green Manufacturing/Materials Management + Green Distribution/Marketing + Reverse Logistics
Green et al. (1996, p. 188)	Green supply refers to the way in which innovations in supply chain management and industrial purchasing may be considered in the context of the environment
Gilbert (2001, p.1)	Greening the supply chain is the process of incorporating environmental criteria or concerns into organizational purchasing decisions and long-term relationships with suppliers
Zsidisin and Siferd (2001, p. 69)	The set of supply chain management policies held, actions taken and relationships formed in response to concerns related to the natural environment with regard to the design, acquisition, production, distribution, use, re-use and disposal of the firm's goods and services

From the foregoing definitions, GSCM is a concerted effort throughout the company and is more than simply putting some green practices in place, but rather a consistent, holistic improvement of the environmental performance of all levels of management and on the shop-floor (Davies and Hochman, 2007). Brik et al. (2013) defined green supply chain as a managerial approach that seeks to minimize a product or service's environmental and social impacts or footprint. According to Zhu et al. (2008a,b,c), GSCM "ranges from green purchasing to integrated life-cycle

management supply chains flowing from supplier, through to manufacturer, customer, and closing the loop with reverse logistics”.

Further, several concepts like sustainable supply chain management, green supply chain, supply chain environmental management, and environmental supply chain management, have arisen, and been used almost interchangeably with GSCM (Eltayeb et al., 2011; Rao 2002; Seuring, 2004; Lee, 2008). This has further contributed to the difficulty in establishing the definition and scope of GSCM.

In this study, the definition offered by Srivastava (2007) is adopted, that is “integrating environmental thinking into supply chain management, including product design, material sourcing and selection, manufacturing processes, delivery of the final product to the consumers as well as end-of-life management of the product after its useful life” (p. 54,55).

2.9 GSCM Practices

In keeping with the lack of consensus in the definition and scope of GSCM, GSCM practices have similarly not been clearly defined. Several practices have been captured in previous studies under the umbrella of GSCM practices by different scholars (Srivastava, 2007; Sarkis et al., 2011; Seuring and Muller, 2008). However, some GSCM practices are more cited in the literature, and these are identified and discussed briefly in this section.

Investment Recovery as a GSCM practice looks at how organizations strategically employ recycling, redeployment, and reselling to create more value from the organization’s materials and products (Zhu et al., 2008a). Practicing investment recovery is of both economic and environmental benefits to organizations. Investment

recovery has been explored as a GSCM practice in multiple GSCM studies (e.g., Zhu et al., 2008a; Zhu et al., 2008b; Zhu et al., 2007; Zhu and Sarkis 2004). Scholars have also explored a related concept, reverse logistics, quite extensively in previous GSCM studies (e.g., Alvarez-Gil et al., 2007; Beamon, 1999; Blumberg, 1999; Carter and Ellram, 1998; Hervani et al., 2005; Murphy and Poist, 2003; Ravi et al., 2005; Richey et al., 2005; Sarkis, 1999; Zhu et al., 2007). As a GSCM practice, reverse logistics encompasses all those processes that take back used products and/or materials so they can be reused or recycled.

Additionally, Eco-design has been a widely explored GSCM practice. Eco-design stresses on incorporating environmental and user considerations when designing and delivering products and services. For eco-design to be successful, there must be considerable levels of cooperation between functional areas of an organization, and with relevant stakeholders outside the organization (Islam et al., 2018). The scope of Eco-design is broad, and the concept has been explored in several studies (Beamon, 1999; Hervani et al., 2005; Sarkis, 1998; Walton et al., 1998; Zhu et al., 2007).

Another GSCM practice which has been well explored in the literature is Green Purchasing. This concept stresses on the need to incorporate environmental concerns into purchasing decisions of organizations (Bowen et al., 2001; Carter and Carter, 1998; Hervani et al., 2005; Min and Galle, 2001; Preuss, 2001; Rao, 2002, 2004; Walton et al., 1998; Zhu et al., 2007). The aim of Green Purchasing appears to be ensuring that products (goods and services) that are purchased have certain desirable environmental characteristics.

GSCM goes beyond the practicing firm to include its suppliers and customers. In GSCM literature, GSCM practices have been conceptualized to include cooperation with customers (Canning and Hanmer-Lloyd, 2001; Vachon and Klassen, 2006, Vachon and Klassen, 2007), and cooperation with suppliers (Bowen et al., 2001; Canning and Hanmer-Lloyd, 2001; Hall, 2000; Rao, 2002; Vachon and Klassen, 2006; Vachon and Klassen, 2007). Companies collaborate with their suppliers and customers to jointly develop programmes aimed at improving their environmental performance and develop green products and innovations.

Clearly, much work has been done in conceptually identifying what constitutes a GSCM practice. Interestingly, however, most of these have been anecdotal and conceptual, with empirical studies investigating GSCM practices being relatively fewer. This is perhaps indicative that the field of GSCM has not fully matured yet, and more empirical studies are needed to test conceptual and theoretical assumptions that have been made in GSCM literature.

As this study adopts an empirical survey approach to exploring GSCM, an in-depth review of other empirical studies that have explored GSCM is presented in Table 2.2. The primary GSCM practices from empirical studies are Eco-design, investment recovery, Green purchasing, and cooperating with suppliers and customers (see Table 2.2). Lin and Sheu (2012), however, conceptualized and operationalized GSCM practices in a considerably different way, using Green Certification and Green Direct Investment to measure firms' GSCM practices.

Table 2.2: Empirical studies exploring GSCM practices

Author (Year)	Country	Objective of the Study	Theory and Conceptual Framework	Identified GSCM Practices	Methodology	Findings
Zhu et al. (2007)	China	The study explored the factors that drive GSCM initiatives as well as GSCM performance among selected firms in an automotive supply chain.	<ul style="list-style-type: none"> - No specified theory. - Three main constructs were explored: (1) GSCM drivers (2) GSCM practices, and (3) Performance 	<ul style="list-style-type: none"> - Internal environmental management - Green purchasing - Cooperation with customers - Eco-design - Investment recovery 	<ul style="list-style-type: none"> - Survey of 89 automotive enterprises in China. - Proposed relationships were analysed using regression. - A case analysis of one company in the supply chain was additionally conducted. 	<ul style="list-style-type: none"> - Surveyed enterprises were experiencing strong pressures from regulations and markets. - Firms had a strong internal drive for adopting GSCM. - GSCM practices slightly improved firms' environmental and operational performance but did not improve firms' economic performance.
Zhu and Sarkis (2004)	China	The study explored whether operational practices influenced the performance of early adopters of GSCM.	<ul style="list-style-type: none"> - Theory not specified - The authors proposed that GSCM Practices impact Organizational Performance, was moderated by Just-in-time and Quality Management. 	<ul style="list-style-type: none"> - Internal environment management - External GSCM - Investment recovery - Eco-design 	<ul style="list-style-type: none"> - Survey of 186 manufacturing enterprises. - Hierarchical regression was used to test hypotheses. 	<ul style="list-style-type: none"> - Operational GSCM practices positively impacted on performance. - Just-in-time and quality management both significantly moderated the proposed effects.

Zhu et al. (2008b)	China	The study explored the perceived level of GSCM adoption for firms in four industries in China.	<ul style="list-style-type: none"> - Resource based, institutional, and stakeholder theories 	<ul style="list-style-type: none"> - External Activities - Investment Recovery - Eco-design 	<ul style="list-style-type: none"> - Survey of 128 manufacturing enterprises. - Level of green supply was compared across the four industries 	<ul style="list-style-type: none"> - The automobile industry reported the least levels of GSCM adoption. - External drivers of GSCM adoption for power industries and chemical industries was relatively low.
Zhu et al. (2005)	China	The study examined the pressures, practices and performance of GSCM.	Factor analysis was conducted to extract dimensions of GSCM pressures, practices, and performance.	<ul style="list-style-type: none"> - Internal environment management - External GSCM - Eco-design - Investment Recovery 	<ul style="list-style-type: none"> - Survey of managers in Chinese manufacturing and processing industries - Exploratory factor analysis conducted to extract groupings. 	<ul style="list-style-type: none"> - Four groupings of pressure were extracted - Four GSCM practices were extracted. - Four GSCM performance influences were extracted.
Zhu and Sarkis (2006)	China	This study compared drivers and GSCM practices across three industries in a developing country.	- GSCM antecedents and GSCM practices were compared using predetermined dimensions.	<ul style="list-style-type: none"> - Green Purchasing - Cooperation with Customers - Investment Recovery - Eco-Design - Internal Management 	<ul style="list-style-type: none"> - Survey of 118 firms in automobile, power generation, and the electronic / electrical industries. - ANOVA was used to compare differences 	<ul style="list-style-type: none"> - Differences were observed in drivers and GSCM practices across industries. - GSCM was a relatively new concept in China and most companies lacked experiences, necessary tools and management skills.

					within and across industry groups	
Vachon and Klassen (2006)	North America (USA and Canada)	Examined the antecedents of Green supply chain practices.	<ul style="list-style-type: none"> - Transaction cost theory - The relationships between Green supply chain practices and Supply Chain Integration was explored. 	<ul style="list-style-type: none"> - Environmental Collaboration with suppliers - Environmental Collaboration with customers - Environmental Monitoring with suppliers - Environmental Monitoring with customers 	<ul style="list-style-type: none"> - Data from 84 plants in North America 	<ul style="list-style-type: none"> - The level of technological integration with supply chain partners had a positive impact on environmental monitoring and collaboration. - Logistical integration only positively impacted environmental monitoring. - As the supply base was reduced, the extent of environmental collaboration with primary suppliers increased.
Zhu et al. (2008a)	China	This study investigated the relationships between organizational learning, management support, and extent of GSCM adoption for Chinese manufacturing firms.	<ul style="list-style-type: none"> - Resource based view - The study proposed that organizational learning and management support influence GSCM Practice. 	<ul style="list-style-type: none"> - External Activities - Investment Recovery - Eco-Design 	<ul style="list-style-type: none"> - Survey of 314 manufacturing firms. - OLS hierarchical regression used to analyze proposed 	<ul style="list-style-type: none"> - Both organizational learning and organizational support significantly impacted GSCM adoption after controlling for organization size.

					relationships.	
Laosirihongthong et al. (2013)	Thailand	Examined how proactive as well as reactive GSCM practices impacted Performance.	<ul style="list-style-type: none"> - Institutional theory. - Five GSCM practices were conceptualized to impact five dimensions of Performance. - Business strategy was introduced as controls. 	<ul style="list-style-type: none"> - Green purchasing practices - Product Related Eco-Design Practices - Packaging Related Eco-Design Practices - Reverse Logistics Practices - Legislations and Regulations 	<ul style="list-style-type: none"> - Survey involving 190 ISO 14001 certified manufacturing firms operating in Thailand. - Multivariate linear regression was used to analyze the hypotheses. 	<ul style="list-style-type: none"> - Re-active GSCM (legislations and regulations) practices had a positive impact on performance of firms. - Pro-active GSCM practices generally were minimally implemented and did not significantly impact performance.
Lin and Sheu (2012)	U.S. and Taiwan.	Explored what institutional variables impacted GSCM and how they impact manufacturing performance	<ul style="list-style-type: none"> - Institutional theory - Institutional pressures were conceptualized to influence GSCM Practices, which subsequently influences Manufacturing Performance 	<ul style="list-style-type: none"> - Green Certification; - Green Direct Investment 	<ul style="list-style-type: none"> - Survey of 112 U.S. and Taiwan manufacturing plants in the electric and electronics industry - SEM used to analyze data 	<ul style="list-style-type: none"> - Both Green Certification and Green Direct Investment minimally enhanced Manufacturing Performance

2.9 Antecedents and Motivations for practicing GSCM

With regards to antecedents and motivations for GSCM adoption, several drivers have been identified and discussed in previous literature. The study explores these antecedents and motivations for GSCM, starting first with anecdotal/conceptual and then empirical studies.

In modern times, issues on the environment have become global and important. Hart (1997) proposes that environmental initiatives are being driven by policy makers and leaders of firms in Western developed economies. Drivers of GSCM are sometimes classified into two broad groups, external and internal. The external drivers force firms to adopt Green practices through coercive institutional pressures (Campbell, 2007). Institutional scholars assert that external pressures are important because they compel leaders in the organization to adopt certain practices perceived to be acceptable or legitimate and to refrain from actions perceived to be unacceptable and illegitimate (Powell and Dimaggio, 2012).

External pressures such as strict rules and regulations which compel organizations to adopt environmentally sustainable business practices are often necessary because compliance with environmental regulations is believed to impose certain additional costs on organizations, and in so doing, reduce or weaken their competitiveness (Darnall, 2006). Aside the regulations, it is believed that customers have compelled some firms to adopt GSCM practices (Vandermerwe and Oliff 1990) thus customers' growing demand and preference for green products in recent years (Oyewole, 2001). Public opinion has become an important factor in forcing organizations to become more environmental friendly, although this influence varies from country to country depending on factors like access to information (Zhu et al.,

2005). Pertaining to competition as external driver, Chan and Makino (2007) have noted that organizations are forced to conform to institutional forces by adopting the business practices of competitors to be relevant in the institutional environment within which they operate.

For internal drivers to GSCM, Walker et al. (2008) distinguished between two drivers of GSCM; (i) managerial factors in relation to the ethical values as well as the commitment of top management to GSCM, and (ii) organizational factors associated with the economic benefits of adopting GSCM practices. With respect to top management team's ethical values and commitment, Vachon and Klassen (2006) mentioned that, different organizations are led by people possessing varying degrees of commitment to environmental sustainability issues and this could affect the extent to which the organization adopts GSCM. Top management of a firm may be committed to adopting GSCM because of a desire to "do the right thing" with little consideration for the economic implications arising from GSCM adoption (Donaldson and Davis, 1991). Zhu et al. (2005) also suggest that without strong commitment from top management, any GSCM initiative would most likely fail.

Trowbridge (2001) distinguished between internal and external drivers for the implementation of GSCM at a chip manufacturer. Internal drivers include the willingness to improve risk management due to potential interruptions in the supply chain, and the collaboration with suppliers to find alternative materials and equipment that minimize environmental impacts. External drivers include customers, investors and non-governmental organizations.

From an empirical point of view, few researchers have explored the antecedents of GSCM. Brik et al. (2013) explored five antecedents (regulatory

framework, pressure from customers, and competitive dynamics, leadership and economic incentives) of GSCM practices in Dubai. GSCM was conceptualized with six dimensions (Resource reduction, Waste elimination, Eco-design, Supplier selection and evaluation, Supplier development, and Supplier awareness). Data was obtained from 183 companies listed in the Dubai Chamber of Commerce and Industry (DCCI) Directory. Regression analysis of the relationships between the constructs revealed that competitive pressures and leadership highly predicted GSCM practices, whilst firm size and regulations weakly predicted GSCM practices.

Lin and Ho (2011) analyzed the factors influencing green adoption in the Chinese logistics industry. They examined the influence of Technological factors (Relative advantage, Compatibility, Complexity), Organizational factors (Organizational support, Quality of human resources, Company size) and Environmental factors (Customer pressure, Regulatory pressure, Government support, Environmental uncertainty) on Green practice adoption of Chinese logistics companies. It is however not clear how the authors measured Green adoption. Analysis of data from 322 Chinese logistics firms revealed that regulatory pressure, governmental support, organizational support, quality of human resources, and relative advantage and compatibility of green practices were antecedents of Green practices adoption.

Huang et al. (2012) conducted a survey of 100 SMEs in China to explore what drives Chinese small and medium size enterprises to adopt GSCM. Their study revealed three broad antecedents to GSCM namely, Pressures from regulations, Pressures from sales, and Pressures from the supply chain.

Ageron et al. (2012) conducted a study to examine the factors that cause firms to adopt sustainable business practices. Data for their study was obtained from 178 organizations. Their study identified the most important driver of sustainable supply management as top management vision, followed by Government regulatory requirements, and then Nature of business. Customer expectations, Competitor actions, other stakeholders such as NGOs, and Suppliers' green initiatives were reported as relatively less important reasons for adoption of sustainable supply management practices.

Al-Khidir and Zailani (2011) studied the drivers of GSCM using data from 132 ISO 14001 certified firms in Malaysia. Their study proposed four factors (Regulation, customer requirements, expected business gains, and social responsibility) as antecedents of green supply chain initiatives among Malaysian firms. The findings of their study revealed that regulations had the strongest effect on GSCM initiatives, with customer pressures, expected business benefits also significantly impacting GSCM initiatives. The findings however revealed that social responsibility did not significantly impact GSCM initiatives.

Zhu and Sarkis (2006) conducted an inter-sectoral survey of 118 Chinese firms in the automobile, power generation, and the electronic/electrical industries. Their study identified four main groups of GSCM drivers: (i) Regulations (central governmental environmental regulations, regional environmental regulations, import countries' environmental regulations, products conflicting with laws), (ii) Marketing (Export, sales to foreign customers in China, Chinese consumers' environmental drivers, establishing enterprise's green image), (iii) Suppliers (Supplier's advances in developing environmentally friendly goods, supplier's advances in developing environmentally sustainable packages, environmental partnership with suppliers,

making sure that suppliers will remain in business), (iv) Competitors (Competitors' green strategies, industrial professional group activities), and (v) Internal factors (Enterprise's environmental mission, internal multinational policies, potential liability and cost for disposal of harmful materials, cost of environmentally friendly goods and packaging).

The study of Zhu et al. (2005) on the drivers of GSCM using 314 Chinese manufacturing organizations on the other hand revealed that (i) Supply Chain Pressure, (ii) Cost-Related Pressure, (iii) Marketing, and (iv) Regulations as the important drivers of GSCM in the Chinese manufacturing and processing sector.

The survey conducted by Lin and Sheu (2012) of 112 manufacturing plants in the electric and electronics industry in U.S. and Taiwan confirmed that Coercive Pressures, Normative Pressures, and Mimetic Pressures influenced GSCM Practices (Green Certification, and Green Direct Investment), which subsequently influences Manufacturing Performance. Data was collected from U.S. and Taiwan.

Finally, Chien (2014) hypothesized that institutional pressures and stakeholders' pressure significantly drive adoption of GSCM practices. He tested these hypotheses using data collected from 175 manufacturing firms in Taiwan's electronic and electrical industry. Analysis of the data through structural equation modelling confirmed that institutional pressures and stakeholder pressures significantly impacted the adoption of GSCM practices by Taiwanese organizations. All the empirical studies reviewed in this section have been summarized in Table 2.3.

The review of the literature on the antecedents of GSCM adoption reveals that no study has been conducted on the subject in Sub-Saharan Africa, which represents a research gap that this study would address.

Table 2.3: Empirical studies exploring GSCM Antecedents or Drivers

Author (Year)	Country	Objective of the Study	Theory and Conceptual Framework	Identified GSCM Antecedents	Methodology	Findings
Lin and Ho (2011)	China	The study explored what influences the adoption of green practices among Chinese logistics firms	<ul style="list-style-type: none"> - The stakeholders' theory. - The study proposed that Technological factors, Organizational factors and environmental factors influenced green practice adoption in Chinese companies 	<ul style="list-style-type: none"> - Relative advantage, - Compatibility - Complexity - Organizational Support - Quality of human resources - Company Size - Customer pressure - Regulatory Pressure - Governmental Support - Environmental Uncertainty 	<ul style="list-style-type: none"> - Survey design. - Data gathered from 353 logistics firms - Structural Equation Modelling was used to analyze proposed relationships. 	<ul style="list-style-type: none"> - Regulatory pressure, governmental support, organizational support, quality of human resources, relative advantage and compatibility of green practices impacted adoption of green practices positively - Environmental uncertainty and green practice's complexity impacted green practices adoption negatively.
Huang et al. (2012)	China	The study explored what drives GSCM among Chinese small and medium size enterprises	<ul style="list-style-type: none"> - Theory of pressures - The study considered three pressures in relation to how they drive GSCM. 	<ul style="list-style-type: none"> - Pressures from regulations - Pressures from sales - Pressures from the supply chain 	<ul style="list-style-type: none"> - Survey of 100 SMEs - ANOVA was conducted to test hypotheses. 	<ul style="list-style-type: none"> - There were no differences in GSCM among surveyed firms. - All three pressures impacted on firm's adoption practices.
Ageron et al. (2012)	France	The study developed and tested a	The research framework explored (i) barriers for SSM; (ii)	<ul style="list-style-type: none"> - Top management vision - Government regulatory requirements 	<ul style="list-style-type: none"> - Survey of 178 French companies. 	The findings revealed that the two most important drivers of sustainable

		theoretical framework for sustainable supply management through an empirical investigation of French companies.	benefits and motivation for SSM, (iii) managerial approaches for SSM, (iv) Characteristics of suppliers, (v) Performance criteria for SSM, (vi) Greening supply chains, (vii) Reasons for SSM	<ul style="list-style-type: none"> - Nature of business - Customer expectations - Competitor actions - Other stakeholders such as NGOs - Suppliers' green initiatives 	- Study targeted managers.	supply management were top management vision and government regulatory requirements.
Brik et al., (2013)	Dubai	Explored the drivers of green supply chain in Dubai	- Institutional theory	<ul style="list-style-type: none"> - Local government regulations - Export country regulations - Competition - MNC pressures - Consumers - Economic incentives - Leadership 	<ul style="list-style-type: none"> - Survey method - 138 firms in Dubai - Regression analysis conducted 	- Firm size, export country regulations, MNC pressures, and leadership positively impacted GSCM.
Khidir and Zailani(2011)	Malaysia	The study explored the impact of drivers of green supply chain on green supply chain initiatives.	<ul style="list-style-type: none"> - Institutional theory - The study considered the impact of four drivers on green supply chain initiatives 	<ul style="list-style-type: none"> - Regulation - Customer requirements - Expected business gains - Social responsibility 	<ul style="list-style-type: none"> - Survey of 132 firms. - Two-step hierarchical regression analysis was conducted to test the proposed hypotheses. 	- The study showed that there are four drivers that motivate Malaysian firms to undertake green supply chain initiatives.

Zhu and Sarkis (2006)	China	This study compared drivers and practices of GSCM across three industries in a developing country	<ul style="list-style-type: none"> - GSCM antecedents and GSCM practices were compared using predetermined dimensions. 	<ul style="list-style-type: none"> - Regulations - Marketing - Suppliers & Competitors - Internal Pressures & Drivers 	<ul style="list-style-type: none"> - Survey of 118 firms in automobile, power generation, and the electronic / electrical industries. - ANOVA was used to compare differences within and across industry groups. 	<ul style="list-style-type: none"> - Differences were observed in drivers as well as GSCM practices across industries. - GSCM was still a relatively new concept in China and most companies lacked experiences, necessary tools and management skills.
Zhu et al. (2005)	China	The study examined pressures, practices and performance of GSCM	The study gathered research items on GSCM pressures, practices, and performance from previous studies and extracted dimensions through explorative factor analysis.	<ul style="list-style-type: none"> - Supply Chain Pressure - Cost-Related Pressure - Marketing - Regulations. 	<ul style="list-style-type: none"> - Survey of managers in Chinese manufacturing and processing industries - Items from previous studies were used in the survey and factor analysis conducted to extract groupings. 	<ul style="list-style-type: none"> - Four groupings of pressure were extracted: (i) Supply Chain pressure, (ii) Cost-related pressure, (iii) Marketing, and (iv) Regulations. - Four GSCM practices were extracted: - Four GSCM performance influences were extracted
Lin and Sheu (2012)	U.S. and Taiwan.	Explored what institutional	<ul style="list-style-type: none"> - Institutional theory - Institutional pressures 	<ul style="list-style-type: none"> - Coercive Pressures, - Normative Pressures, 	<ul style="list-style-type: none"> - Survey of 112 U.S. and 	<ul style="list-style-type: none"> - Both Green Certification and Green Direct

		variables impacted GSCM and how they impact manufacturing performance	were conceptualized to impact GSCM Practices which subsequently influences Manufacturing Performance	- Mimetic Pressures	Taiwan manufacturing plants in the electric and electronics industry - SEM used to analyze data	Investment minimally enhanced Manufacturing Performance
Chien (2014)	Taiwan's electrical and electronic manufacturers	Explored antecedents and effects of GSCM on 3 dimensions of performance:	- Institutional pressure and Stakeholder pressure were conceptualized to impact GSCM practices - GSCM impacted Economic performance, Environmental performance and Social Performance	- Institutional pressure - Stakeholder pressure	- Data obtained from 175 manufacturing firms - Analyzed the relationships using LISREL	- Both Institutional pressure and stakeholders pressure had a significant effect of GSCM practices

2.10 Capabilities for successful GSCM adoption

A competence or capability refers to an ability to accomplish a productive task through the deployment and coordination of material and immaterial resources (Dangelico et al., 2013). The term competence, often used interchangeably with capability, appears to have developed out of the resource-based view theory (Barney, 1991; Wernerfelt, 1984) and has been assimilated into other subsequent theories like the resource dependence theory, natural resource-based view, and dynamic capabilities theory. An often-cited definition of a firm's capabilities as espoused by Grant (1996, p. 337) is the "ability to perform repeatedly a productive task which relates either directly or indirectly to a firm's capacity for creating value through effecting the transformation of inputs into outputs." Hence, it is agreed that capabilities are comprised of bundles of skills and resources that are utilized in performing a task (Hart, 1995). Capabilities therefore shape the strategies of firms to a degree as the capabilities a firm possesses dictate what a firm can and cannot do in its attempts to gain a competitive advantage (Barney, 1991; Wernerfelt, 1984). These capabilities cannot be easily bought into a firm, since by nature capabilities are tacit, socially complex, and rare (Barney, 1991). Instead, capabilities must be developed over time from the skills and resources the firm has at its disposal within its overall strategic approach (Bowen et al., 2001; Teece et al., 1997).

Capabilities in the environmental management discipline refer to those bundles of skills and resources which allow organizations to outperform their rivals on environmental performance and possibly enhance industrial performance. According to Perez-Valls et al. (2015), GSCM can be considered as organizational initiatives aimed at improving environmental performance (Aragón-Correa, 1998). Perez-Valls et al. (2015) further stressed that green competences are dynamic

capabilities based on practices (green practices), routines and structures that can be used to detect opportunities, make the most of them and use them to transform organizations. Singh et al. (2014) used the term “green firm-specific advantages” to describe a bundle of strategic assets that make up green capabilities and resources, *deployed to implement environmental management practices*. From the forgoing studies, it appears green capabilities/competences refer to the ability, knowledge, or skills necessary to effectively and productively roll-out and manage green practices. Green firm-specific advantages have elsewhere been defined as “Firm-specific advantages that are developed in response to challenges posed by the natural environment to enhance both environmental and economic performance” and “Capabilities in the environmental area that allow firms to outperform their rivals and enhance industrial performance” (Singh et al., 2014).

Chen (2008), building on Hamel and Prahalad (1990) concept of core competence, proposed “green core competence” as a new construct, which may be of interest in this study. Chen (2008) defined green core competence as the collective learning and capabilities about green innovation and environmental management in an organization. According to Chen (2008), an environmental capability, technology, or know-how can be considered a green core competence when it is rare in the marketplace, not easily imitable, difficult to substitute, meets a wide variety of environmental needs, and makes considerable environmental contributions to customer benefits (Chen, 2008; Prahalad and Hamel, 2006).

GSCM capabilities have been explored in prior GSCM literature and have sometimes confusingly been used interchangeably with GSCM practices. In this study, the researcher clearly differentiates GSCM capabilities from GSCM practices. GSCM capabilities refer to the resources, skills, and systems that need to be put in

place in the organization or the supply chain to facilitate effective adoption of GSCM practices. Some of the capabilities required for effective GSCM implementation identified from literature are discussed next.

Shang et al (2010) conducted an exploratory study to identify the dimensions of GSCM capability. After obtaining 37 GSCM attributes from literature, factor analysis was conducted to extract 7 dimensions of GSCM capabilities. The data for the study was obtained from electronics-related manufacturing firms in Taiwan. The seven dimensions of GSCM obtained were (i) Green manufacturing and packaging, (ii) Environmental participation, (iii) Green marketing, (iv) Green supplier, (v) Green stock, and (vi) Green eco-design.

In Beske's (2012) conceptual paper, an integrated framework of sustainable supply chain management and dynamic capabilities was developed from three existing GSCM and dynamic models. Beske (2012) proposed that the dynamic capabilities for sustainable supply chain management were (i) Supply Chain Reconceptualization, (ii) Supply Chain Partner Development, (iii) Reflexive Supply Chain Control, (iv) Co-Evolving, and (iv) Knowledge Assessing. A summary of studies that have explored GSCM capabilities are presented in Table 2.4 below.

Table 2.4: Studies exploring GSCM Capabilities

Author (Year)	Country	Objective of the Study	Theory and Conceptual Framework	Identified GSCM Capabilities	Methodology	Findings
Shang et al. (2010)	Taiwan	Investigated the impact of GSCM capability on firm performance	The resource-based view and the natural-resource-based view of the firm.	<ul style="list-style-type: none"> - Green manufacturing and packaging - Environmental participation - Green marketing - Green supplier - Green stock - Green eco-design 	<ul style="list-style-type: none"> - Survey of 167 electronic companies listed on the stock market in Taiwan and Taiwan's OTC market. - Factor analysis was conducted on 37 identified GSCM attributes to reveal six dimensions of GSCM capabilities. - Cluster analysis grouped responding firms into four groups. 	<ul style="list-style-type: none"> - Six dimensions of GSCM capabilities were extracted from a factor analysis - Four groups/clusters of firms were identified
Beske (2012)	Country not specified.	The study set out to develop a framework that integrated dynamic capabilities in sustainable SCM practices	<ul style="list-style-type: none"> - Dynamic capabilities theory - An integrated framework consisting of Sustainable SCM, Dynamic Capabilities, and Sustainability Performance was proposed. 	<ul style="list-style-type: none"> - Supply Chain Reconceptualization - Supply Chain Partner Development - Reflexive Supply Chain Control - Co-Evolving - Knowledge Assessing 	<ul style="list-style-type: none"> - Conceptual paper - SCM, sustainable SCM and dynamic capabilities literature was examined. - Three models from sustainable SCM and dynamic capabilities literature were integrated 	<ul style="list-style-type: none"> - Dynamic capabilities and sustainable supply chain management were found to be linked.

2.11 Benefits and Outcomes of GSCM adoption

The benefits and outcomes of GSCM adoption as identified in the GSCM literature are explored. The conceptual and anecdotal studies are discussed first, followed by the empirical studies that have explored the topic.

It has been suggested that there is relationship between GSCM and performance (Green et al 1998) and that organizations that have implemented environmentally friendly packaging have increased their market share (Dorn 1996). Zhu and Cote (2004) suggest that green supply chain operations seek to optimize multiple objectives such as overall effectiveness, environmental performance and economic performance which enables firms achieve sustainable development. Testa and Iraldo (2010) claim that green supply chains in both manufacturing and retail could help in reducing emissions. They also indicated that, the assets of green supply chains are more intangible and are more focused on the benefit of having an excellent image for the organization rather than profit increases.

Lyon and Maxwell (2008) expatiated on some primary potential benefits of green supply chains. According to Lyon and Maxwell (2008), green supply chain improves agility, thus, it helps management mitigate risk and speed of innovations. Other potential benefits mentioned include, increasing adaptability, leading to continuous improvement, promoting alignment and bringing value to the organizations.

Further, Kumar and Chandrakar (2012) stressed that the idea of GSCM should not only be to create environmental benefit but must also create business benefit for firms. They emphasized that environmental benefits can come in the form of minimized generation of waste, reduced release of pollutants, recyclable products and

services, energy conserving products, energy renewable resources such as bio-based fuels, among others (Kumar and Chandrakar, 2012). Emmett and Sood (2010) discussed the benefits of green supply chain to include the following: (i) Sustainability of resources (ii) Minimized costs or greater efficiency (iii) Product differentiation and competitiveness (iv) Complying with regulations and minimizing risks, and (v) Enhanced quality and products.

Additional acclaimed positive outcomes of GSCM are reduced product life cycle costs (Cattanach, 1995). These include cost avoidance in procuring, managing, storing, and disposal of hazardous materials, as well as avoiding hostility from customers and regulatory bodies. There is also the positive impact of minimized environmental and health risks (Cattanach, 1995; Zhang et al; 1997) which include safer and cleaner production houses (Zhang al; 1997). Srivastava (2007) demonstrated that GSCM could go a long way to impact on the environment positively since it has the potential to control diminishing natural resources, overflowing waste sites, and increasing levels of pollutions.

Empirical studies exploring GSCM benefits and outcomes are relatively few. Important empirical studies exploring the benefits and outcomes of GSCM are discussed next. Yu et al. (2014) proposed and empirically tested a conceptual model that explored the effect of integrated GSCM on the operational performance of firms. Integrated GSCM was operationalized to consist of GSCM with Customers, Internal GSCM, and GSCM with Suppliers. On the other hand, Operational Performance was explored using four dimensions – Operational Flexibility, Delivery, Product Quality, and Production Cost. Data for testing the model was obtained from 126 Chinese automotive firms, analyzed through structural equation modelling. The findings of the study revealed all hypothesized paths were supported, with all three dimensions of

integrated GSCM positively impacted all four dimensions of operational performance. This suggests that within the Chinese automotive industry, GSCM is associated with higher operational performance.

The study of Chien (2014) explored whether GSCM practices impacted sustainable performance. Sustainable performance was defined in three dimensions, namely economic performance, environmental performance and social performance. Analysis of data collected from 175 manufacturing firms in Taiwan's electronic and electrical industry revealed that GSCM resulted in higher Economic performance, Environmental performance, and Social performance as hypothesized.

GSCM implementations have not always led to positive outcomes. For instance, the study of Zhu et al. (2007) on 89 automotive firms based in China revealed that GSCM implementation was associated with only slight improvements in environmental and operational performance and was not associated with any significant improvements in economic performance of firms.

Lin and Sheu (2012) conducted a study to examine the outcomes of the GSCM practices (Green Certification and Green Direct Investment) of 112 U.S. and Taiwan manufacturing plants in the electric and electronics industry. Analysis of the data using LISREL revealed that GSCM minimally enhanced Manufacturing Performance. Green Certification significantly impacted Manufacturing performance, whilst Green Direct investment did not significantly enhance Manufacturing performance.

Further, Eltayeb et al.'s (2011) study on the impact of GSCM initiatives of 569 ISO 14001 certified manufacturing firms in Malaysia revealed that whilst Eco-design was revealed to have significant positive effects on all four GSCM outcomes, Reverse logistics had a significant positive effect on only cost reductions. Further,

Green purchasing did not have a significant effect on any of the four types of outcome. Detailed reviews of the empirical papers exploring GSCM benefits and outcomes are presented in Table 2.5.

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Table 2.5: Empirical studies exploring GSCM Benefits or Outcomes

Author (Year)	Context of the Study	Objective of the Study	Theory and Conceptual Framework	Methodology	Identified GSCM Benefits
Yu et al. 2014	- China - Manufacturing sector	Empirically investigated the relationship between three dimensions of integrated GSCM and operational performance.	- Theory not specified. - Integrated GSCM was explored using 3 dimensions (GSCM with Customers, Internal GSCM, and GSCM with Suppliers) - Operational Performance was measured using flexibility, delivery, quality and cost	- Survey of 126 automotive firms in China. - Effects were explored using SEM	Integrated GSCM resulted in improved: - flexibility performance - delivery performance - quality performance - cost performance
Chien (2014)	Taiwan's electrical and electronic manufacturers	Explored antecedents and effects of GSCM on 3 dimensions of performance.	- Institutional pressure and Stakeholder pressure were conceptualized to impact GSCM practices - GSCM impacted Economic performance, Environmental performance and Social Performance	- Data obtained from 175 manufacturing firms - Analyzed the relationships using LISREL	GSCM resulted in higher: - Economic performance - Environmental performance - Social performance
Lin and Sheu (2012)	Manufacturing plants in U.S. and Taiwan.	Explored what institutional variables impacted GSCM and how they impact manufacturing performance	- Coercive Pressures, Normative Pressures, and Mimetic Pressures were conceptualized to influence GSCM Practices, which subsequently influences Manufacturing Performance	- Survey of 112 U.S. and Taiwan manufacturing plants in the electric and electronics industry - SEM used to analyze data	Both Green Certification and Green Direct Investment minimally enhanced Manufacturing Performance
Zhu et al. (2007)	China	The study explored the GSCM pressures or drivers (motivators),	- No specified theory. - Three main constructs were explored: (1) GSCM drivers with External factors (Regulations,	- Survey method - Data collected from 89 automotive enterprises within China.	- GSCM minimally enhanced environmental and operational

		initiatives and performance among selected firms in an automotive supply chain	Markets, and Suppliers) and Internal factors as sub-constructs, (2) GSCM practices with Internal Management, Green Purchasing, Customer Cooperation, Investment Recovery, and Eco-design as sub-constructs, and (3) Performance with Environmental Performance, Positive Economic Performance, Negative Economic Performance, and Operational Performance as sub-constructs.	<ul style="list-style-type: none"> - Proposed relationships were analyzed using regression. - A case analysis of one company in the supply chain, the Dalian Diesel Engine Plant was additionally conducted. 	<p>performance.</p> <ul style="list-style-type: none"> - GSCM did not significantly enhance economic performance.
Eltayeb et al., (2011)	Malaysia	Assessed the environmental, economic and intangible outcomes resulting from the adoption of green supply chain initiatives	<ul style="list-style-type: none"> - Theory not specified - The study considered the impact of three green supply chain initiatives on four dimensions of green supply chain outcomes 	<ul style="list-style-type: none"> - Survey approach - 569 ISO 14001 certified firms in Malaysia 	<ul style="list-style-type: none"> - Eco-design positively impacted on all four GSCM outcomes. - Reverse logistics only positively impacted cost reductions - Green purchasing did not positively impact any of the four GSCM outcomes.

2.12 Barriers to GSCM adoption and implementation

The literature on GSCM barriers is reviewed next. The literature on GSCM barriers is almost exclusively conceptual or anecdotal, with very little empirical exploration of GSCM barriers being conducted to date. One of the few empirical studies on GSCM was conducted by Zhu et al (2017) who discovered that many Chinese manufacturers had low levels of GSCM implementations because of insufficient environmental awareness, lax environmental laws, and poorly enforced regulations regarding GSCM.

The study of Xuejun and Qi (2008) revealed that the principal barriers to the implementation of GSCM practices in China included: (i) poor regulations, (ii) weak consumer awareness on issues of environmental protection, (iii) technological barriers, and (iv) rising cost of doing business. Sarkis et al. (2005) also opined (i) Non-standardized data, (ii) poor technological integration, (iii) geographical and cultural difference, (iv) organizational policy difference, (v) lack of standardized matrices, and (vi) multiple tiers within a supply chain all serve as barriers to GSCM implementation.

Govindan et al. (2014) examined barriers to GSCM implementation in Indian industries using analytic hierarchy process. Analysis of responses of experts from 87 companies regarding 47 barriers revealed that outsourcing barriers were the most important group, followed by technology barriers, knowledge barriers, then financial barriers, and finally involvement and support barriers which was the least important group.

2.13 GSCM studies from Sub-Saharan Africa

Seman et al. (2012) indicates that there is insufficient research examining the adoption and implementation of GSCM in developing countries compared to developed countries. They further state that in developing economies, there are limited number of studies focused on GSCM research particularly on GSCM adoption and implementation by industries (Seman et al 2012). Considering the fact that the social, political, economic, legislative environment is known to influence green practices adoption (Sarkis et al., 2011), GSCM adoption from developing countries is expected to vary from adoption in developed countries due to their considerably different environments. There is therefore the need for more academic studies into GSCM adoption in developing countries.

Anbumozhi and Kanda (2005) opined that most firms particularly those in developing countries adopt GSCM with the goal of reducing the negative environmental effects and not as a proactive approach to tackle the issue of waste or pollution. Further, they stress that the GSCM solutions adopted in developing countries are usually of the traditional “command-and-control” or “end-of-the-pipe” type. There is hence the need for greater effort and interest in exploring GSCM adoption and implementation within the context of developing countries.

There is particularly little research attention focused on GSCM practices in African countries. GSCM remains new in Sub-Saharan Africa and South-East Asia and not many firms have implemented GSCM practices to a high level (Fahimnia et al., 2015). However, adoption rates are growing in South East Asian Region (Philippines, Indonesia, Malaysia, Thailand, and Singapore), and studies from China,

Malaysia and Taiwan have begun to grow significantly (Fahimnia et al., 2015; Rao, 2002).

A recent study by Famiyeh et al. (2018) was conducted to explore the effect of GSCM (measured by Environmental Management Practices and Green Purchasing) on operational competitive performance for Ghanaian manufacturing firms (in terms of reduced cost, improved quality, flexibility, and delivery time). Data was obtained from 370 organizations and analyzed using structural equation modelling techniques. The findings of the study revealed that both Environmental Management Practices and Green Purchasing significantly impacted on operational competitive performance in terms of cost, quality and flexibility, but not delivery time.

The researcher's literature search revealed no empirical GSCM papers that explore the drivers of GSCM adoption in the region. It is important to explore what drives GSCM adoption in the Sub-Saharan Africa region because the context may affect GSCM adoption in a unique way (Asamoah et al., 2015). This study, will among others, address the research gaps.

CHAPTER THREE

THEORETICAL FRAMEWORK AND HYPOTHESES DEVELOPMENT

3.1 Introduction

In this chapter, the researcher presents the theoretical background, theoretical framework and conceptual framework that underpin the study. This is followed by a detailed discussion of the research model, research constructs, and hypotheses that are tested in this study.

3.2 Theoretical perspectives of GSCM studies

Several theories have been adopted to underpin GSCM studies. Principal among them are the Institutional theory, Stakeholder theory, and Resource Based view theory. A literature review on GSCM by Sarkis et al. (2011) revealed nine organizational theories that have been used in GSCM literature: Complexity, Ecological Modernization, Information, Institutional, Resource Based View, Resource Dependence, Social Network, Stakeholder, and Transaction Cost Economics. Their study focused on the GSCM adoption, diffusion and outcomes. Some of the principal theories used in GSCM studies are discussed next.

3.2.1 Institutional theory perspective to GSCM

The institutional theory has been predominantly used in GSCM studies to explain GSCM drivers, motivation, and antecedents (Sarkis et al., 2011; Srivastava 2007). The institutional theory posits that firms face certain pressures from regulatory bodies, governments, industry associations, and other firms to behave in certain ways to be viewed as legitimate (DiMaggio and Powell, 1983).

Institutional theory examines how external pressures influence a company to adopt an organizational practice (Hirsch, 1975; Lai et al., 2006). The institutional theory can be used to study how a company addresses green issues due to external pressures (Jennings and Zandbergen, 1995), and thus the institutional theory is important in explaining environmental related practices (Lounsbury, 2008). Within the institutional theory, there are three forms of isomorphic drivers namely, coercive, normative, and mimetic (DiMaggio and Powell, 1983). Coercive isomorphic drivers occur from influences exerted by those in power. Government agencies are an example of powerful institutions that may coercively influence the actions of an organization through, for example, fines and trade barriers (Rivera, 2004). Normative isomorphic drivers cause organizations to conform to be perceived as having legitimate organizational activities. Social normative pressures can explain environmental management practices among enterprises (Ball and Craig, 2010). Mimetic isomorphic drivers can be seen in instances where firms copy or mimic the actions of more successful firms to enjoy similar successes (Aerts et al., 2006).

It has been noted that coercive pressures are especially important in driving sustainable environmental practices (Kilbourne et al., 2002). Previous studies show that governments are key groups to promote voluntary environmental management practices (Rivera, 2004). Coercive pressures emanating from governments significantly compelled responding organizations to adopt voluntary green initiatives in the study of Clemens and Douglas (2006), although coercive pressures were less important in driving adoption of green initiatives for firms with significant resources dedicated to green initiatives. Regulations in developed countries have caused an increase in institutional pressures for improved environmental management by enterprises in developing countries, many typically surpassing local requirements. For

example, the European Community Directive on Waste Electrical and Electronic Equipment (WEEE) now requires all manufacturers in developing countries to take back used products or pay premiums when these manufacturers export electrical and electronic equipment to Europe (Yu et al., 2006). At the same time, developing countries such as China have enacted increasingly strict environmental regulations, which drive manufacturers to implement GSCM practices (Zhu and Sarkis, 2007).

Socially related requirements such as those from the customer and the market and their increasing environmental expectation form the core normative pressure for firms to implement GSCM. In developed countries, consumers generally have high levels of environmental awareness. For example, it is estimated that 75% of U.S. consumers made their purchasing decisions with the enterprises' environmental reputation in mind and 80% of the consumers were willing to pay more for environmentally friendly products (Carter et al., 2000). Thus, normative social pressures in developed countries such as England and Canada are found to be mainly originated from consumers' ethical values and ecological thinking (Ball and Craig, 2010). Previous studies show that consumers in developing countries have increasingly heightened environmental awareness and are starting to opt for green products (Harris, 2006).

In addition to normative pressures from consumers, exports and sales to foreign customers are two more important drivers that prompt manufacturers to adopt GSCM practices for developing countries such as China (Christmann and Taylor, 2001). Enterprises may follow or 'mimic' competitors merely because of their success, where such behaviour in operations and manufacturing is typically defined as the competitive benchmarking. The rationale is simply to follow the actions of successful competitors to replicate their successful paths. Imitation plays a significant

role for enterprises in developed countries such as Canada, France, and Germany to implement GSCM related practices (Aerts et al., 2006). Globalization has created opportunities for manufacturers in developing countries such as China to learn from their foreign competitors to implement environmental management practices (Christmann and Taylor, 2001). Joint ventures in a developing country may also help implement GSCM practices such as eco-design by imitating their parent companies, and then diffuse their experiences to other enterprises in the developing country (Zhu and Liu, 2010).

3.2.2 Stakeholder theory approach to GSCM

Stakeholder theory has been applied to GSCM stressing the role and importance of all stakeholders in achieving effective GSCM. A stakeholder is “any group or individual who can affect or is affected by the achievement of an organization’s objectives” (Freeman, 1984, p. 46). Stakeholder theory suggests that companies produce externalities that affect many parties (stakeholders) which are both internal and external to the firm. Externalities often cause stakeholders to increase pressures on companies to reduce negative impacts and increase positive ones. Various categorizations have been used to group stakeholders and include direct or indirect, primary and secondary, or based on multiple dimensions of legitimacy (Delmas, 2001; Delmas and Toffel, 2004; Delmas, 2002), urgency and power (Mitchell et al., 1997). Thus, many developments and directions for the stakeholder theory do exist, but the basic premise is that internal and external groups will influence organizational practices. Environmental externalities may be internalized through these stakeholder pressures within and between supply chain members. Stakeholders are usually closely aligned with social institutions, and thus confounding relationships with institutional theory may also exist, especially if there are norms and

legitimacy aspects of stakeholder theory that overlap institutional theory. Yet there are some differences, such as stakeholders internal to the supply chain (that is, supply chain partners) or organizational stakeholders may exist, whereas institutional theory focuses on external pressures only.

Supply chain as an entity also has a variety of stakeholders, even more so than individual enterprises with an expansion of these stakeholder groups particularly when environmental issues are introduced (de Brito et al., 2008). Stakeholder analysis for GSCM is especially pertinent as there are views that not all GSCM practices are conducive for generating competitive advantages for enterprises and are necessary due to pressures from stakeholders. The stakeholder theory is usually introduced as an explanatory theory related to antecedents or contingencies for adoption of various GSCM practices. Specific stakeholder influences on green purchasing (Maignan and McAlister, 2003); life cycle analysis in the supply chain (Matos and Hall, 2007); environmentally oriented reverse logistics (Sarkis et al., 2010); 'closing the loop' for greening supply chains (Zhu et al., 2008c), and general GSCM or green logistics practices have received research attention (Chen and Shih, 2007; Gonzalez-Benito and Gonzalez-Benito, 2006). Identifying and investigating the roles of various stakeholders within GSCM practices has also been an application approach by researchers utilizing the stakeholder theory (de Brito et al., 2008; Gunther and Scheibe, 2005).

Much of the previous GSCM research based on the stakeholder theory has been conducted from a multi-theoretic (Sarkis et al., 2010) or general explanatory theory perspective to explain specific phenomenon (Sarkis et al., 2010; Tate et al., 2010). Yet, the advancement of stakeholder theory through GSCM research has not occurred, even though unique perspectives have been implemented through other

theories such as 'sphere of influence' theory, where the organization's sphere of influence may impact supply chain partner environmental initiatives and innovations (Hall, 2001).

3.2.3 Transactions Cost Theory

The transactions cost theory states that external or internal provision is decided based on a cost comparison with regards to the sum of transaction and production costs. Transaction costs can be defined as all costs of planning, adapting, and monitoring a task (Coward, 2003). Gartner (2005) pointed out that transaction costs can be categorized into ex ante and ex post types. He explained that on one hand, asset specificity can increase the revenue in the future or reduce the product cost, so it may encourage a complex ex ante incentive alignment. On the other hand, assets specificity remains the specific interest for at least one side or both sides in the transaction front and form bilateral independence. Consequently, it will lead to a complex ex post structural influence.

Williamson (1999) asserts that the frequency of transaction refers to the number of times the transactions occur between buyer and seller, and to him this transaction cost here is linear correlated with the scale economy issue. Williamson (1999) quoted Adam Smith's famous theorem "division of labour is limited by the extent of the market" and explains that transaction will not implement specialized structures as it comes with the high cost except the cost can be reasonable. Williamson (1999) noted that it depended on the two sides: first, particular structures with a great deal of investment in asset specificity might bring enormous benefits; and second, the cost of specific structures could be covered by its operation in other transaction. Therefore, for certain level of asset specificity, he contended that the

greater the volumes of trade, the more likely the welfares of hierarchical governance surpass the costs and the governance will be efficient only if the occurrence of transaction occur at a high mark.

Levy (2005) explained that with regards to the procedure applied in transaction cost research, some researchers tried to apply various procedures such as historical and econometrics methods to explain the effects of transaction cost on outsourcing. For example, Williamson (2000) used quantitative case study to analyze the franchise bidding for natural monopoly in USA. Levy used econometric analysis to study the vertical integration in industries by using cross sectional study. Nevertheless, qualitative analysis still occupies a place in transaction cost research. Levy (2005) said the three measurements of transaction cost (uncertainty, assets specificity, and frequency) are difficult to measure with the financial statement or database. He said, researches based on transaction cost principle are always performed by surveys, questionnaires and face to face interviews.

3.2.4 Resource Based View Theory

Resource-based View theory emphasizes the value of leveraging scarce firm-specific resources through business relationships (Barney, 1991; Peteraf, 1993). Dibern and Heinzl (2009, p. 103) indicated that the resource-based theory “provides reference points for when resources are to be kept and expanded within the firm for strategic reasons and when they should be brought in from an external provider”. In this theory, the author stated that “a firm will not use external competency as long as it can generate the same capabilities using internal resources. In other words, it applies to making a decision as to whether unique resources (tangible or intangible assets) should be kept and expanded within the firm for strategic reasons or whether they

should be brought in from an external provider”. If deficit in resources and capabilities are problematic, an alternative for the purpose of filling these gaps will be Resource Based Theory which argues that, “an organization’s bundle of resources, which include tangible and intangible assets, knowledge and skills are the primary predictors of superior financial performance”. Cumps et al (2006) used a framework of Peppard and Ward (2004), which consists of three levels: the resource level, the organizing level and the enterprise level. The resource level makes up the company’s business and technical skills, knowledge and experience coupled with the behaviour of the company (Cumps et al, 2006). According to Peppard and Ward (2004), resources are stocks owned and controlled by the company. They cite examples of such resources as information, systems, technology, skills and knowledge. They therefore explain that if an organization has any available competencies, they are those that the organization uses to mobilize its internal resources effectively.

3.2.4 Dynamic Capabilities Approach to GSCM

Dynamic capabilities help enable an enterprise to profitably build and renew resources and assets that lie both within and beyond its boundaries, reconfiguring them as needed to innovate and respond to (or bring about) changes in the market and in the business environment more generally (Pisano and Teece, 2007; Teece, et al., 1997). Successfully building strong dynamic capabilities allows firms to challenge competitors that are enamoured with the resources they currently possess, that ignore (or are ignorant of) changing customer needs, that cherish the status quo, that fail to empower entrepreneurs and change agents, and that prioritize efficiency over innovation (Teece, 2014). Dynamic capabilities reside, in part, with individual managers and the top management team.

Dynamic capabilities are about doing the right things, at the right time, based on new product (and process) development, unique managerial orchestration processes, a strong and change-oriented organizational culture, and a prescient assessment of the business environment and technological opportunities. Dynamic capabilities are about adapting, orchestrating, and innovating. Strong dynamic capabilities allow firms to stay congruent with market and technological developments, as well as with broader societal goals (Teece, 2014).

Dynamic capabilities govern other organizational activities. They can allow an enterprise to generate superior profits by developing and producing differentiated products and services that address new and existing markets where demand is robust. They enable the firm to integrate, build, and reconfigure internal and external resources to maintain leadership in continually shifting business environments. Strong dynamic capabilities enable the firm to produce not just the best of a product type, but something that is unique and exceptional in the value it provides to the buyer and the return it generates for the shareholder and other stakeholders.

3.3 Theoretical Background of the Study

Two central theories are important in helping the researcher achieve the research objectives. These are the institutional theory and the dynamic capabilities theory. A detailed discussion of these theories is presented next.

3.3.1 Institutional Theory

Institutional theory directs attention at forces that lie beyond the organizational boundary, in the realm of social processes (DiMaggio & Powell, 1991; Scott, 2005). Organizational action is seen, not as a choice among an unlimited array of

possibilities determined by purely internal arrangements, but rather as a choice among a narrowly defined set of legitimate options determined by the group of actors which comprise the firm's organizational field (Scott, 2005). The form of this influence is manifested in institutions: rules, norms and beliefs which create descriptions of reality for the organization; explanations of what is and what is not, what can be acted upon and what cannot. Institutional theory, in short, asks questions about how organizational choices are shaped, mediated and channelled by the institutional environment.

The institutional approach thus argues that in modern societies, organizations are typified as systems of rationally ordered rules and activities (Weber 1946) and the type of policies and strategic decisions an organization takes influence how they are perceived and can be a basis for achieving their goals (Meyer and Rowan, 1977). This gives rise to widespread social conceptions of appropriate organizational norms and behaviours that constitute the institutional environment of organizations. As organizations compete for resources, customers, political power, and economic and social fitness (Carroll and Delacroix, 1982), institutional theories posit that organizations face pressures to conform to these shared notions of appropriate forms and behaviours, since violating them may call into question the organization's legitimacy and thus affect its ability to secure resources and social support (DiMaggio and Powell, 1983).

Mimetic forces occur when organizations feel compelled to mimic the actions of other organizations that are perceived to be successful or legitimate (DiMaggio and Powell, 1983; Liang et al., 2007). Coercive pressures deal with the extent of formal and informal pressures perceived by the competitive conditions, and requirements and incentives from the local government and industry associations. Normative pressures

are “the collective struggle of members of an occupation to define the conditions and methods of their work, to control the production of the future member professionals, and to establish a cognitive base and legitimization for their occupational autonomy” (DiMaggio and Powell 1983, p. 152). The researcher explores the forces from the Ghanaian environment that drive firms to adopt GSCM practices from the institutional theory perspective.

3.3.2 Organizational Capabilities Theory

The capabilities theory is believed to have developed out of the resource-based view (RBV) which posits that firms are able to gain a competitive advantage over their rivals when they possess valuable, rare and not easily imitable resources (Barney, 1991). Capabilities refer to bundles of skills, competences and resources that are used to perform a task (Barney, 1991). A capability can be harnessed, against the opposition of circumstance, to produce desirable outcomes. It is distinct from an organization’s intentions, motivations, or strategy. Capabilities are not appropriately summarized by a production function because capabilities are what the organization could accomplish, not necessarily what it is currently producing. Capabilities arise in part from learning, from organizational resources, and from organizational histories. They are untethered from purposes or products. For example, a capability to make machines powered by small, compact internal combustion engines can manifest itself in the manufacturing of automobiles, outboard (boat) motors, or tractors and lawn mowers. In this study, we propose that there are certain capabilities that help in the adoption of GSCM adoption, and that firms possession of GSCM capabilities influence adoption of GSCM practices.

Capabilities have been explored in different domains including IT (Bharadwaj, 2000; Lu and Ramamurthy, 2011), organization studies (Grewal and Tansuhaj, 2001; Knight and Cavusgil, 2004) and recently, sustainability, environment and GSCM (Bowen et al., 2001; Green et al., 2012; Shang et al., 2010). Capabilities have been defined as “complex bundles of individual skills, assets and accumulated knowledge exercised through organizational processes, that enable firms to co-ordinate activities and make use of their resources” (Olavarrieta and Ellinger, 1997, p.563).

Many studies focus on the role of “organizational capabilities” in both organizational innovation and organizational performance (Cohen and Levinthal, 2000; Teece and Pisano, 1994; Winter, 1987). These studies suggest organizations vary in their internal resource base and procedures, affecting their ability to respond to internal and external changes or challenges. Organizational capabilities include factors such as: organizational resources, organizational innovativeness and organizational monitoring systems. Organizational resources and capacity refer to overall level of resources and specialized environmental resources and capacities possessed by firms (Hervani et al., 2005).

In this study, two capabilities that would enable the successful adoption of GSCM practices are adopted from previous studies (Shang et al., 2010; Zhu et al., 2007). These are Environmental Participation and Green Eco-Design. GSCM Capabilities was conceptualized as a second-order reflective construct with Environmental Participation and Green Eco-Design being a first-order construct. These two dimensions were chosen because they feature prominently in empirical studies exploring GSCM, suggesting some level of academic consensus on these variables as GSCM capabilities. Details about the GSCM capabilities items are presented in Appendix 1.

3.4 Theoretical Framework of the Study

The theoretical framework developed for this study suggests that Institutional Pressures (made up of mimetic pressures, normative pressures, coercive pressures and custodial pressures) impact the GSCM Capabilities of firms (made up of Environmental Participation and Green Eco-design), and that the GSCM Capabilities impacts GSCM adoption (made up of Green Purchasing, Investment Recovery, and Green Manufacturing and Packaging). The theoretical framework further proposes that GSCM Capabilities mediate the effect of Institutional Pressures on GSCM Adoption. Finally, the effect of GSCM Capabilities on GSCM Adoption is also proposed to be moderated by Organizational Culture. The conceptual framework is presented in Figure 3.1 and discussed in detail next.

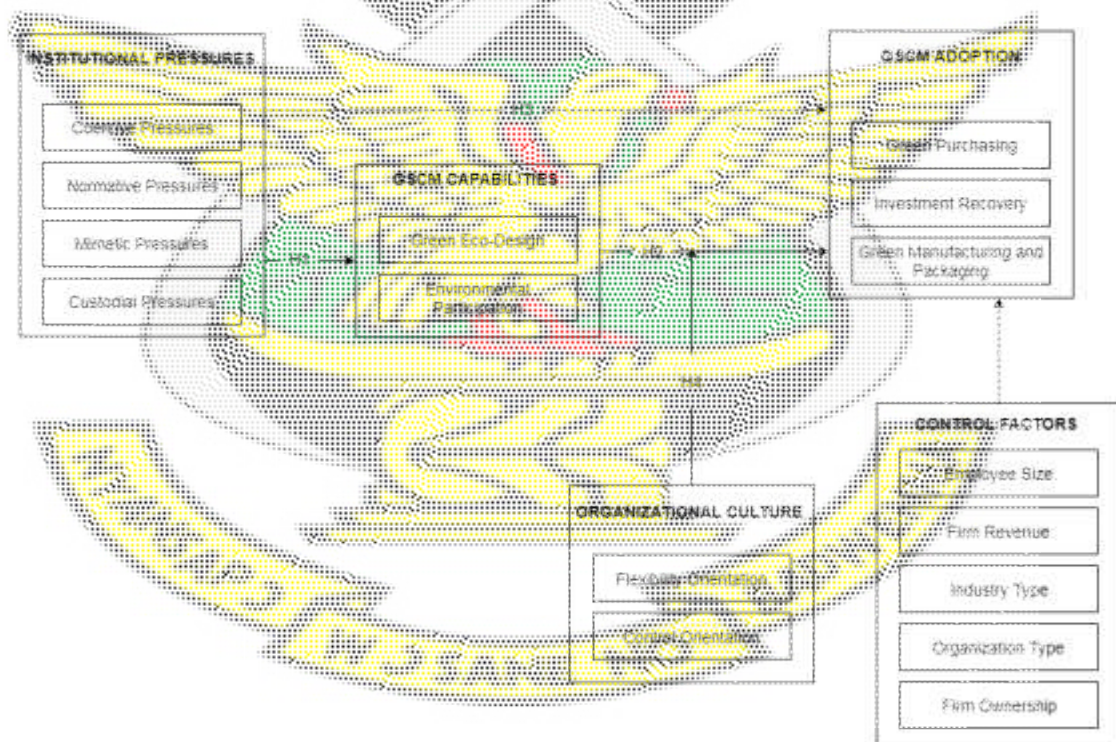


Figure 3.1 Theoretical Framework of the study

3.4.1 Institutional Pressures

DiMaggio and Powell's (1983) three institutional forces – coercive, normative, and mimetic pressures – are adopted for this study. Mimetic forces occur when organizations feel compelled to mimic the actions of other organizations that are perceived to be successful or legitimate (DiMaggio and Powell, 1983; Liang et al., 2007). Coercive pressure deals with the extent of formal and informal pressures perceived by the competitive conditions, and requirements as well as incentives from the local government and industry associations. Coercive pressure results from influences exerted by those in power. Government agencies are an example of powerful institutions that may coercively influence the actions of an organization through, for example, fines and trade barriers (Rivera, 2004). Normative pressures are “the collective struggle of members of an occupation to define the conditions and methods of their work, to control the production of the future member professionals, and to establish a cognitive base and legitimization for their occupational autonomy” (DiMaggio and Powell 1983, p. 152).

In addition to the three generic institutional pressures, the influence of chiefs is an additional institutional pressure that exerts significant influence on organizations in Sub-Saharan Africa. The influence of chiefs is thus explored as an additional institutional pressure. In Ghana and Sub-Saharan Africa, traditional authority exists and is expressed through the institution of chieftaincy, headed by chiefs. Chiefs are viewed as the principal leaders and owners of land, with the influence of some chiefs spanning across several states and regional boundaries (Bekker, 1993). The institution of chieftaincy in Sub-Saharan Africa is unique from traditional authorities in other regions who largely play ceremonial roles or serve as the government of those nations.

In Ghana for instance, even though chiefs are not allowed to play a role in active politics, their role in national development is acknowledged and enshrined in the constitution and formalized through the national and regional houses of chiefs and regulated under the Ministry of Chieftaincy. This allows chiefs to play an active advisory and supporting role in national development (Crook, 2005). As the chiefs are often in direct contact with community members, have great understanding into the culture and needs of communities; and are highly respected in their communities, they are often ideal channels through which socio-economic development can be effectively delivered to communities (Mabutla, 2001; Mthadeni, 2002; Logan, 2008). Influential chiefs like the Asantehene, chief of the Ashanti kingdom, and the Okyenhene, chief of the Akyim-Abuakwa Traditional Area have led and supported multiple community development efforts, lobbied for community projects, established scholarship and development funds, among other achievements worth millions of dollars (Kleist, 2011).

Chiefs also exercise a great deal of influence on businesses and organizations that operate within their traditional areas and influence their success and acceptance within the community (Keulder, 2010). As chiefs are viewed as the owners of the land, organizations that engage in extractive activities like mining and fishing must first seek the permission of chiefs before they can commence operations. Without permission from the chiefs, operations of organizations within the community are viewed as illegitimate by the community, even if all legal requirements have been met. It is not only at the start of operations that organizations require the permission of chiefs, but continual permission and support of the chiefs is required in most cases. Chiefs can sometimes withdraw their support for organizations when certain agreed upon conditions are not met, or an organization takes certain actions that are deemed

unacceptable to the traditional authorities, and this can seriously destabilize organizations. This approval and legitimacy influence of chieftaincy makes it a powerful institution and businesses operating in Sub-Saharan Africa actively seek to manage their relationship with traditional authorities.

The approval and legitimacy required from chiefs enable them to strongly negotiate for community facing projects and other expressions of corporate social responsibility from organizations operating within their communities. Chiefs are thus able to play an advocacy role and frequently advocate and push organizations, especially large ones, regarding issues such as providing community infrastructure, employing community members, providing scholarships for community members, etc (Kleist, 2011). Chiefs also advocate for greener practices from organizations, such as calling on organizations to ensure that their activities result in minimal water, noise, land and air pollution. The advocacy influence of chiefs is frequently demonstrated in two ways. First, there is an open-door policy to most organizations for chiefs, and they can often walk into organizations and advocate for community causes. Second, most large organizations operating in their communities are required to organize regular public hearings, where chiefs and members of the community sit together with leaders of the organizations operating within their community to discuss concerns and agreed upon solutions. Whilst there have been recent calls for chiefs to direct their advisory, legitimacy, and advocacy influence towards stopping the activities of illegal mining in their communities (Ghanaweb, 2017a; Ghanaweb, 2017b), previous studies have not explored whether chiefs influence adoption of green practices in Sub-Saharan Africa. The influence exerted by chiefs on organizations to act in environmentally sustainable ways does not fit well within either of the three-generic

institutional pressures and is as such conceptualized as a fourth institutional pressure, named “Custodial Pressure”.

3.4.2 GSCM Adoption

Green et al. (2012) have noted that manufacturing organizations have begun to implement GSCM practices in response to customer demand for products and services that are environmentally sustainable and that are created through environmentally sustainable practices and in response to governmental environmental regulations. Several GSCM practices have been identified and studied in GSCM literature (Álvarez-Gil et al., 2007; Beamon, 1999; Bowen et al., 2001; Canning and Hanmer-Lloyd, 2001; Carter and Ellram, 1998; Glenn et al., 2005; Hall, 2000; Hervani et al., 2005; Rao, 2002; Vachon and Klassen, 2008). In this study, the researcher conceptualized GSCM practices as a second order reflective construct with three sub-constructs – Green Purchasing, Green Manufacturing, and Investment Recovery. These three dimensions represent recurring constructs in multiple empirical studies that explore GSCM in manufacturing, industrial, and/or primary sectors.

The first dimension of GSCM Adoption is Green Purchasing. The term Green purchasing has been used to refer to the involvement of purchasing function in supply chain management activities to facilitate recycling, reuse, and resource reduction (Carter et al., 1998). Green purchasing enhances the overall environmental goals and undertakings of organizations in several ways. For instance, by procuring more environmentally friendly raw materials to be used in production, a firm can enhance its environmental performance across its entire value chain. Green purchasing is widely practiced in developed countries and is growing in importance in developing regions (Zhu and Cote, 2004). Zsidisin and Hendrick (1998) in a multinational

investigation identified key factors for green purchasing such as providing design specification to suppliers that include environmental requirements for purchased items, cooperation with suppliers for environmental objectives, environmental audits for supplier's internal management, and suppliers' ISO14001 certification.

The second dimension of GSCM Adoption is Green Manufacturing and Packaging. According to Deif (2011), the term green manufacturing and packaging has been developed to capture environmentally friendly manufacturing that employs various green strategies (objectives and principles) and techniques (technology and innovations) to become more eco-efficient (Deif, 2011). Green Manufacturing and Packaging in this study refers to an organization's adoption of environmentally sustainable manufacturing practices in its core operations. The researcher conceptualized Green Manufacturing to encompass adoption of pollution-reducing manufacturing practices, acquisition of clean technology, and use of ecological products in manufacturing and packaging (Shang et al., 2010).

Finally, Investment Recovery, the third GSCM Adoption dimension, describes how firms strategically recycle, redeploy, and resell capital and materials, enabling them to obtain more value from their capital and materials (Kumar and Chandrakar, 2012). The goal of Investment Recovery is transforming excess capital and material assets into revenue by selling off these redundant assets, minimizing space used for storing excess capital and materials, and redeploying redundant capital and materials to places where they will be more useful (Atkinson, 2002; Kumar and Chandrakar, 2012). Investment recovery also covers equipment that are no longer operational, waste or damaged products, by-products created through the production process, as well as decommissioned or out-of-order buildings and facilities (Cottrill, 1997; Kumar and Chandrakar, 2012). Thus, investment recovery creates both environmental

and economic benefits for firms. Cottrill (1997) has argued that revenue obtained through investment recovery feeds largely into the profits of firms, and the benefits of investment recovery has been seen in diverse industries particularly consumer goods and computing (Cottrill, 1997; Sarkis 2003; Avery 1997; Franke et al., 2006; Kumar and Chandrakar, 2012). Finally, it has been noted that investment recovery facilitates the achievement of other environmentally sustainable practices including; reclamation, remanufacturing, recycling and reuse (Prabinski et al., 2006; Kumar and Chandrakar, 2012). Investment Recovery systems in developing countries have received less attention than in developed countries such as the US and Germany due to less enlightened waste management policies and the lack of closed-loop systems infrastructure (Zhu and Zhao, 2003). Investment Recovery centres on elements of “closing the loop”, reverse logistics and reuse or recycling of materials. U.S and European enterprises have also considered investment recovery as a critical aspect for green purchasing and GSCM (Zsidisin and Hendrick, 1998). Investment recovery is a traditional business practice, but it can also be considered a green practice since it can reduce waste that may have otherwise been disposed. Even though investment recovery may not be the most sustainable practice, it does lengthen the life of the product or material where it can be recycled into other products or materials.

3.4.3 GSCM Capabilities

Developed from the premise of ordinary capabilities in resource-based view theory, GSCM Capabilities in this study is defined as the bundle of resources, skills, competences, and knowledge that enable the adoption of GSCM practices in an organization. The study acknowledges that firms must have the necessary know-how and resources to successfully adopt GSCM practices. Two primary GSCM

Capabilities are identified in this study - Green Eco-design and Environmental Participation.

Green Eco-design refers to the capability of firms to successfully integrate green environmental specifications in the design and development of products (Holdway et al., 2002). Green eco-design capabilities must be intentionally developed in an organization. Early eco-design work focused primarily on technical improvements to products and processes to mitigate environmental costs. Benefits of eco-design become more pronounced when it is not just limited to incorporating environmental thinking into the design of products in-house, but when external stakeholders such as suppliers, customers, governmental and regulatory bodies are integrated into the eco-design effort (González-Benito and González-Benito, 2005; Partidario and Vergragt, 2002).

For eco-design to be successful, functional areas within the organization such as operations, procurement, and marketing must cooperate closely. There should as well be corporation with stakeholders outside the firm as attested to by previous studies (Walton et al., 1998). Eco-design is relatively more matured in the U.S and European countries and has witnessed impressive recent growth in China (Zhu et al., 2010). Eco-design in Africa has however not been previously explored but is explored as an important capability for successful GSCM adoption in this study.

The second proposed GSCM Capability is Environmental Participation. Environmental Participation here encompass the ability of the firms to bring together all stakeholders, both internal and external, work together towards achieving GSCM objectives. Smaller aspects of Environmental Participation have been explored as Co-operation with Suppliers, Co-operation with Customers, Internal Management, and

Green Supplier in previous studies (Shang et al., 2010; Zhu and Sarkis 2006; Zhu et al., 2007). In this study, the researcher conceptualizes that the ability to bring on-board relevant stakeholders to work together to achieve environmental objectives is an important enabler of GSCM Adoption. Environmental Participation was measured with items which encompass senior management commitment to GSCM, cross-functional cooperation for environmental improvements, and participation in government-subsidized natural environment programmes (Shang et al., 2010).

3.4.4 Organizational Culture

Organizational culture refers to a collection of shared assumptions, values, and beliefs that is reflected in organizational practices and goals and that helps its members understand organizational functioning (Liu et al., 2010). Liu et al. (2010) noted that a firm's organizational culture affects how it responds to external events and makes strategic choices. Whilst several ways of measuring organizational culture has been proposed, in this study, the researcher adopts the flexibility-control perspective to organizational culture (Khazanchi et al., 2007; Lewis and Boyer, 2002; McDermott and Stock, 1999). The flexibility-control orientation depicts a firm's desire for a focus on change or stability. A flexibility orientation values creativity, spontaneity, and risk taking (Berthon et al., 2001; Khazanchi et al., 2007). In contrast, a control orientation emphasizes order, predictability, and efficiency (Khazanchi et al., 2007). Thus, the researcher conceptualizes that firms can either have a flexibility orientation or a control orientation to GSCM adoption. Firms with a flexibility orientation to GSCM are more willing to "go green" and make changes in their organizations to become more environmentally sustainable. On the other hand, firms with a control orientation to GSCM are conceptualized as more likely to resist making green changes to their organizations and would rather attempt to maintain current business practices.

3.6 Hypotheses development

Four major relationships which explore Institutional Pressures, GSCM Capabilities, GSCM Adoption and Organizational Culture are developed and tested in this study. These hypotheses are discussed next.

3.6.1 Institutional Pressures and GSCM Capabilities

It has been noted that modern-day firms face considerable pressures to become more environmentally sustainable (Hall, 2000). This development, according to Andersen and Skjoett-Larsen (2009) forces firms to move beyond their usual operations to inculcate sustainability thinking into their entire supply chains. As noted by Seuring and Muller (2008), customers' interest in sustainable products – sustainably sourced, manufactured, packaged, and delivered – has grown considerably in recent years and is frequently highlighted as a key pressure for supply chain organizations. NGOs can also exploit corporate vulnerability to press their sustainability agenda (Chen and Kitsis, 2017). Gunningham et al., (2004) cited the media as a powerful sustainability driver as they can mobilize public opinion and damage corporate image. Faisal (2010) posits that community pressures and threat of liability actions is forcing companies to drive their environmental performance. This is echoed by Chacon-Vargas and Moreno-Mantillo (2014) who noted that stakeholders both inside and outside organizations are of prime importance to the incorporation of green initiatives into supply chain management.

The influence of external institutions on decision making in organizations hinges on the institutional theory proposed by DiMaggio and Powell (1983). Institutional theory posits that behavioural and structural changes in organizations are driven by the firms' quest to obtain legitimacy. Thus, firms respond to external

pressures to be accepted as legitimate institutions. According to Liang et al (1997), the drive for legitimacy fosters institutionalization, which makes institutions similar and gives rise to “institutional isomorphism”. DiMaggio and Powell (1983) identified coercive, mimetic and normative types of institutional isomorphism. In this study, the author proposes a new kind of isomorphism named custodial isomorphism which additionally drives firms to adopt GSCM practices.

Olavarrieta and Ellinger (1997) defined capabilities as “complex bundles of individual skills, assets and accumulated knowledge exercised through organizational processes that enable firms to co-ordinate activities and make use of their resources”. From this, GSCM capabilities are defined in this study as complex bundle of skills and accumulated knowledge that will enable firms successfully implement GSCM initiatives. Using the Resource Based View (RBV) and Natural Resource Based View theories, Shang et al, (2010) suggested the existence of six GSCM capabilities in the form of green manufacturing and packaging, environmental participation, green marketing, green supplier, green stock and green eco-design. Firms, in response to external pressure from the institutional environment to become more environmentally sustainable, will seek to develop the capabilities that would enable them to become more environmentally sustainable (Charcon-Vargas and Moreno-Mantilla, 2014; Vachon and Klassen, 2006). Taken together, the researcher hypothesizes that:

H1: Institutional Pressures is positively related to the development of GSCM Capabilities.

3.6.2 GSCM Capabilities and GSCM Adoption

Based on the RBV theory, organizational capabilities refer to complex bundles of tangible and intangible resources controlled by a firm that are exercised through

organizational processes and enable it to conceive and implement value-creating strategies (Olavarrieta and Ellinger, 1997). Likewise, the literature suggests that these capabilities might emerge when firms proactively address social and environmental issues in their business strategies (Sharma and Vredenburg, 1998).

Bowen et al. (2009) argued that the existence of supply management capabilities eases the implementation of green supply, by helping to disseminate environmentally friendly practices in the procurement process. The development of capabilities in any sense facilitates the smooth implementation of initiatives in the specific area. According to Chin et al. (2015), environmental collaboration is key capability that can be used by firms advantageously to facilitate GSCM implementation. Bowen et al. (2009) further argued that the implementation of GSCM initiatives can be better explained through developing and deploying the firm's internalized resources. Sarkis (2003) found that the development of collaborative capacity between a focal firm and its suppliers is a key ingredient to the implementation of GSCM initiatives. Charcon-Vargas and Moreno-Mantilla (2014) referred to the formation of social and environmental partnerships as key supply chain capability that facilitated the implementation of GSCM initiatives among small and medium sized firms in Columbia. Bowen et al. (2009) cautioned managers against the implementation of complex GSCM initiatives until they have fully developed the enabling capabilities. In support, Charcon-Vargas and Moreno-Mantilla (2014), posit that existence of capabilities facilitate the implementation of environmental approaches. Further, Charcon-Vargas and Moreno-Mantilla (2014) have noted that a firm's capabilities (which refer to a firm's capacity to deploy resources, usually in combination, using organizational processes, to generate a desired end) are a good indicator of the strategic decisions and actions of the firm. From the foregoing

discussions, successful adoption of GSCM practices is largely dependent on whether the implementing firm has the resources and capabilities to support GSCM implementation. Thus, the researcher argues that:

H2: GSCM Capabilities is positively related to GSCM Adoption.

3.6.3 The mediating role of GSCM Capabilities

The researcher proposes that GSCM Capabilities have an intervening role in the way Institutional Pressures enhance GSCM Adoption. Firms in most countries are facing strong institutional pressures to adopt environmentally sustainable business practices (Campbell, 2007). However, GSCM implementation represents a complex endeavour that requires firms to develop or obtain specialized capabilities to be successfully implemented (Bowen et al. 2009; Charcon-Vargas and Moreno-Mantilla, 2014). The researcher proposes that strong institutional pressures to adopt GSCM compel firms to seek for ways to incorporate environmental sustainability into the design of their products (Green Eco-design) and to begin to cooperate with internal and external stakeholders on how to improve their environmental performance (Environmental Participation) to achieve the goal of successful GSCM adoption and implementation. Bowen et al. (2009) further argued that the implementation of GSCM initiatives can be better explained through developing and deploying the firm's internalized resources and not necessarily from institutional pressures. This postulates that the immediate antecedent of successful GSCM implementation is the capabilities possessed by the firm, supporting the proposition that GSCM capabilities may be an intervening variable to the effect of institutional pressures on GSCM adoption. This leads the researcher to hypothesize that:

H3: GSCM Capabilities mediates the relationship between Institutional Pressures and GSCM Adoption

3.6.4 The moderating role of Organizational Culture

White et al. (2003) define organizational culture as a “group of values and beliefs that is echoed in organizational practices and objectives which helps members create a shared purpose and function”. The organizational culture affects how firms respond to events and changes in the external environment and how strategic choices are made. Several classifications of organization culture exist in the literature. A few include McAfee et al, (2002): relational and transaction-oriented culture, McDermott and Stock, (1999); flexibility-control orientation. This study adopts the flexibility-control orientation as the means of classifying organizational culture. This classification is suitable for the study because it focuses on the firm’s responses to external pressures and the motivation to undertake innovative ventures. This falls directly with the study’s aim to explore GSCM adoption, an innovative business operation through the impact of external pressures and internal drivers.

Firms with flexibility orientation often value creativity, spontaneity and support risk taking. On the other hand, control-oriented firms emphasize procedures, predictability and increasing efficiency (Liu et al, 2010). According to Lewis and Boyer (2002), a firm’s orientation influences their interpretation of external events, which in turn influence how they respond to the expectations and requirements of the environment. Thus, it is expected that the response of flexibility-oriented firms to external pressures will differ from that of control-oriented firms. This is supported by the institutional theory which acknowledges that whilst seeking to respond to

pressures and seek legitimacy, firms often exercise their own discretion in taking initiatives (Liu et al, 2010).

Building on the hypothesis 2 which suggests that GSCM capabilities positively impact the adoption of GSCM practices, the researcher postulates that this relationship is moderated by the organizational culture. Thus, the researcher posits that the extent to which firms can achieve successful GSCM adoption from their GSCM capabilities is influenced by the type of culture present in the organization. Firms who have a flexibility orientation to GSCM adoption are more open to “going green” and as such are more willing to utilize the GSCM capabilities to achieve high levels of GSCM adoption. Additionally, management and employees in flexibility orientation firms would show less resistance to GSCM and other environmental management initiatives (Liu et al, 2010). On the other hand, firms with a control orientation to GSCM adoption would be less willing to utilize the firms GSCM capabilities. It is also expected that firms with a control orientation to GSCM adoption will demonstrate stronger resistance to the adoption of GSCM practices and other environmental initiatives, preferring rather to maintain the status-quo (Liu et al, 2010). The organizational culture of the firm thus influences the extent to which GSCM capabilities are effective in enhancing GSCM adoption. From the above, the author hypothesizes that

H4: Organizational Culture moderates the relationship between GSCM Capabilities and GSCM Adoption

CHAPTER FOUR

METHODOLOGY

4.1 Introduction

This chapter presents a detailed discussion of the philosophical foundations of the study and the methodology that was followed in conducting the study. Specifically, the research philosophy, the research epistemology, the research design, the research method, population, sample size, sampling techniques, and data collection procedure are discussed. Additionally, the analytical method selected for data analysis is discussed and justified.

4.2 Research Philosophy

4.2.1 Ontology (Theoretical Perspective)

Ontology is a Greek word meaning “on” or “being” (Thomas, 2004). According to Crotty (1998), “Ontology is the study of being. It is concerned with ‘what is’, with the nature of existence, with the structure of reality as such” (p. 10). It expresses a way of understanding, which is the reality that researcher investigates (Crotty, 1998; Wisker, 2008). Ontology is central element of metaphysics that attempts to answer questions such as: what kind of creature is human being? What is the nature of reality? “Ontological scheme proposes that the world contains four distinct but overlapping levels of being: the material, the vegetable, the animal and the human” (Thomas, 2004, p. 36). Material level consists of non-living objects: stones, sand, water and so on. Vegetable level comprises all plants, such as trees and flowers. Animal level consists of entities that are alive and possess consciousness, being able to respond to their environments and move within them. The highest

level of being is the human, because human beings possess self-awareness, sense of reasoning, consciousness, exchange meanings (through language), produce art, literature and music whilst others cannot (Crotty, 1998; Thomas, 2004; Bryman and Bell, 2007). The ontological scheme has several epistemological implications. Each level of being can be known through methods most appropriate to that level (Thomas, 2004; Bryman and Bell, 2011). Ontological assumptions describe different epistemological and methodological positions (Morgan and Smirich, 1980). Some ontologists claimed that reality exists, which we may not be aware because of our limited perceptual equipment. Reality exists, but we have no complete knowledge about it. Others argued that only publicly observable phenomena are to be considered real and mental states are held not to qualify (Crotty, 1998; Thomas, 2004; Wisker, 2008). Based on these expressions ontology could broadly be classified into objectivism (realism) and Interpretivism (constructionism) (Burrell and Morgan, 2017; Bryman and Bell, 2007).

4.2.2 Realism (Objectivism)

Realism has been the dominant approach in sciences and social sciences research for more than 30 years (Sayer, 1992; Maxwell and Mittapalli, 2010). Realism maintains that reality exists independent of our perceptions or our theories about them (Bryman and Bell, 2007; Maxwell and Mittapalli, 2010). Thus, the real world is complex and stratified (Robson, 2011) such that objects and reality can exist independent of our mind with or without our knowledge (Blaikie, 1993; Crotty, 1998; Sayer, 1992; Thomas, 2004; Schwandt, 2007). Social actors have no control over social phenomena and their meanings (Creswell, 2011). What it means to know, understanding and values are objectified in people we are studying and if we go about it in the right way, we can discover the objective truth (Crotty, 1998;

Schwandt, 2007). Therefore, scientific conceptualization is simply a way of knowing the reality (Bryman and Bell, 2007). In realism, social and natural sciences can use similar type of approach in data collection and analysis (Bryman and Bell, 2007; Schwandt, 2007). Social phenomena are produced by mechanisms, that are real, but that are not directly accessible to observation. The task of the researcher is to construct hypotheses about such mechanisms and seek out their effects (Bryman and Bell, 2007, p. 628). The guiding descriptions are of structures and mechanisms rather than phenomena and events.

An organization represents social order and force inhabitants to follow the requirements of the organization. That is, organization comprised of consistently real process and structures (Bryman and Bell, 2007; Creswell, 2011). “In both organization and culture, the social entity in question comes across as something external to the actor and as having almost tangible reality of its own. It has characteristics of an object and hence of having an objective reality” (Bryman and Bell, 2011, p. 15). It is possible to view research designs as entities not simply a model for research, but also as actual conceptualizations and practices employed in a specific study. Relationships between researcher and participants in a study can also be real component of design-in-use of a study, because it is critical to actual functioning of study (Maxwell, 2005 cited in Maxwell and Mittapalli, 2010). Realist perspective and approaches can make important contributions to mixed methods research. These contributions include overall perspective in which quantitative and qualitative methods and assumptions can better be integrated and specific insight and strategies that enable mixed methods researchers to understand the contexts and processes they study (Maxwell and Mittapalli, 2010).

4.2.3 Subjectivism (Constructionism/Interpretivism)

Subjectivism, sometimes called constructionism or interpretivism, is interpretivists' view signifying focus on how social world is interpreted by those involved in it (Robson, 2011); Elements of interpretivism, postmodern, critical theory, constructivist and participative inquiry, fit comfortably together with one another (Niglas, 2010, p. 218). Constructionism emphasises world of experience as it occurs, felt and undergone by people acting in social situation (Schwandt, 2007). Through communication and interaction with people, the researcher becomes part of the study (Easterby-Smith et al, 2002). Meaning does not have an independent existence; meaning is not 'objective' or 'out there' awaiting discovery. Rather, meaning is created through interaction with others and through historical and cultural norms that operate in individual lives (Schwandt, 2007; Robson, 2011). "Social phenomena and their meanings are not only produced through social interaction but they are in constant state of revision" (Bryman and Bell, 2007, p. 23). People construct meaning and social reality from their experience. Meaning is directed toward some objects or things (Thomas, 2004; Creswell, 2011). People behaviour can only be understood if the researcher understands those meaning and such meaning have to be interpreted according to context in which they occur (Thomas, 2004). Therefore, a participant's and researcher's personal, cultural and historical experience influence their interpretation of 'reality'. There can be as many realities or meanings as possible as there are participants and researchers on a single phenomenon (Creswell, 2011; Robson, 2011). "Our experience, thought and speech about reality and/or reality itself are a function of the particular conceptual scheme/framework (culture, form of life, language, game and paradigm) in which we live and that different conceptual schemes yield incommensurable

understanding of experience and reality” (Schwandt, 2007, p. 40). Researchers always present specific version of social reality, rather than that can be regarded as definite, showing that knowledge is viewed as indeterminate (Bryman and Bell, 2007). Meanings are often negotiated socially and historically (Robson, 2011). The focus is on individual or in specific context which people live and work. The concern is to understand historical and cultural settings of participants and how individuals construct and make sense of the world (Creswell, 2011; Robson, 2011). The aims are understandings (Robson, 2011), multiple construction of meanings and knowledge (Creswell, 2011). “Constructionism is naturalistic perspective and most research under it use qualitative research process largely inductive with the researcher generating meaning from the data collected in the field” (Creswell, 2011, p. 9). The researchers use observation and interview methods which provide multiple perspectives (Robson, 2011). The more opened the questioning the better, as the researcher listens carefully to what people say or do in their life setting (Creswell, 2011).

In the view of subjectivism, “an organization is a socially constructed product, a label used by individuals to make sense of their social experience, so it can be understood only from the point of view of individuals who directly involve themselves in its activities” (Bryman and Bell, 2007, p. 26). Researchers with this theoretical orientation always reject the notion of objective reality of an object (Bryman and Bell, 2007). They argued that whatever the underlying nature of reality (there are differing views amongst them about this), there is no direct access to it (Robson, 2011). Constructionism frequently results in an interest in the representation of social phenomena (Bryman and Bell, 2007). We cannot take for granted, as the natural scientist does, the availability of a pre-constituted world

of phenomena for investigation and must instead examine the processes by which social world is constructed (Walsh, 1972 cited in Bryman and Bell, 2007). Therefore, everything in the world and about the world is nothing but a sociolinguistic product of historically situated interactions (Schwandt, 2007). ‘The precise difference between objectivism and subjectivism is the sharp split between viewing the social world as an objective reality and as subjective reality in a continuous state of flux’ (Bryman and Bell, 2007, p.24)

4.3 Epistemology (Philosophy)

Epistemology is philosophical theory of knowledge of how we know, what we know (Dictionary of Sociology, 2000). ‘Epistemology is a pivotal issue in any form of research for it is about how we know whether or not any claim; including our own, made about the phenomena we are interested in, is warranted. That is, what do we mean by the concept ‘truth’ and how do we know whether some claim is true or false? In other words, what is our theory of truth?’ (Saunders et al, 2009, p.191). Epistemology is the study of the nature of knowledge, its possibility, scope and general basis. It deals with how we create new knowledge or validate the existing knowledge. The aim is to provide philosophical grounding for deciding what kinds of knowledge are possible and how we can confirm that they are adequate and legitimate (Maynard, 1994 cited in Crotty, 1998). Philosophical ideas have great influence on research practices and therefore they must be identified (Creswell, 2011). Epistemology distinguishes knowledge from opinion, belief or falsehood (Creswell, 2011) and provides justification for methodologies (aims, functions and assumptions of method) (Schwandt, 2007; Crotty, 1998). It specifies the relationship between the researchers and the reality (Maynard, 1994 cited in Crotty, 1998). While ontology deals with the nature of being (the nature of reality/knowledge),

epistemology deals with how to acquire and understand the knowledge (Guba and Lincoln, 1994). Social sciences research epistemology is broadly divided into two: empiricism/positivism and rationalism/constructionism (Crotty, 1998; Thomas, 2004; Zikmund, 2010; Bryman and Bell, 2007, Creswell, 2011). Below is a brief account of positivism assumptions:

4.3.1 Positivism

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Positivism was coined in the nineteenth century by Auguste Comte (Thomas, 2004). Positivism is also called scientific method or doing science research, positivist/post-positivist research, post positivism and empirical science (Niglas, 2010; Creswell, 2011). Positivism is an epistemology linked with empiricism, behaviourism, naturalism or scientific status to social research (Wisker, 2008; Robson, 2011). Others view it as an ordered universe made up of atomistic, discrete and observable events (Blaikie, 1993; Crotty, 1998). The assumption of Positivism is that legitimate knowledge is those that are obtained directly from experience or scientific observation (Crotty, 1998; Thomas, 2004; Schwandt, 2007; Creswell, 2011; Robson, 2011). That is meaning and reality or causes of social phenomena exists freely from the operation of our consciousness; meaning/reality exists only if they can be proved (Crotty, 1998; Patton, 2002; Thomas, 2004; Wisker, 2008); Positivism rejects speculation, theoretical entities (invisible or unknowable view), theological and metaphysical explanations (Newman and Benz, 1998). Their belief is that ‘a real world is a verifiable pattern that can be observed and predicted-that reality exists and truth is worth striving for’ (Patton, 2002, p, 91). “The world is essentially knowable; that it consists of knowledgeable facts; and that, if we ask the right question in the right way, use the right research methods, carry out the right kind of experiments and processes, we will discover these facts or truths” (Wisker, 2008. p.

65). The world is a big variable, net of kinds and these variables directly and indirectly interrelate to each other (Thomas, 2004). Positivists' social scientist adopts natural sciences methods of doing research where results are expressed on empirical generalizations (Cohen et al, 2007; Walliman, 2011). In positivism, human behaviour is studied in the same way as natural objects such as stones or fishes (Thomas, 2004). Subject to fixed laws, behaviour can be determined and there is no room for multiple interpretations (Wisker, 2008). The researcher is an observer of social reality and cannot manipulate the result of the research (Cohen et al, 2007). Positivism largely uses quantitative data derived from the application of strict rules and procedures (Robson, 2011). It often uses experiment, observation, survey and statistics to collect and analyze data (Neuman, 1997). Data obtained from experiments and surveys are used to prove the relationships between variables in which some variables are isolated and their interactions are observed, and/or use correlational methods to discover their statistical relationships. Through these processes, behaviour of the net or part of it, selected for study can be understood, explained and predicted. Observations are expressed as descriptions; descriptions are only valid if they objectively depict the properties of object and exclude any elements that cannot be verified by multiple observers (Thomas, 2004).

4.3.2 Epistemological Perspectives in Social Sciences

Epistemological perspectives in social sciences are discussed next. "A particular issue in this context is the question of whether or not social world can and should be studied according to the same principles, procedures and ethos as the natural sciences" (Bryman and Bell, 2011, p. 15). Positivism dominated social sciences research from late 1800s through early 1900s (Newman and Benz, 1998). Others are of the view that the dominant epistemologies in social sciences are positivism and

constructionism with several alternatives within each orientation (Thomas, 2004). In the 1940s and 1950s, quantitative research dominated social sciences. In the mid-1960s, while quantitative perspective continued to get social science research acceptance; there was a doubt on positivism domination on social sciences research and evident chasm between human social systems and mathematical logic grew (Newman and Benz, 1998; Thomas, 2004). 'New epistemologies began to emerge that acknowledged the value-laden nature of human social interactions. That human beings construct reality for themselves and that knowledge itself is transmitted in social ways were beginning to be assumed. Questions arose about the tenability of applying natural methodology to these complex human dynamics' (Newman and Benz, 1998, p. 5). This shows that qualitative research methods originated from quantitative research in social sciences. The debate therefore points at which is more scientific-qualitative or quantitative methods? The deductive methods of the logical positivists (quantitative researchers) or the inductive methods of the naturalists (qualitative researchers)? Can the results of qualitative research be generalized as are the results of quantitative research? Can science be value laden (qualitative) or only legitimate if value free (quantitative)? What epistemological assumptions are violated by adopting one paradigm or the other? (Newman and Benz, 1998, p. 7)

4.4 Research Philosophy and Orientation

Research is not neutral, but reflects the researchers, interest, values, abilities assumptions, aims, ambition and philosophies (Creswell, 2011). Wittingly or unwittingly every research is based on a philosophy, particularly the philosophy of the researcher which is informed by the philosophy of the area of knowledge or

discipline. According to Creswell (2011), Collis and Hussey (2013), philosophical thinking revolves epistemological, ontological and axiological assumption.

In order to give this study intended rigour and vigour and to assess the knowledge that emerges from this study in terms of its validity and reliability, there is the need to explore various research philosophies in order to conduct this study based on the right epistemology, which according to Sinders *et al.* (2007), is what constitutes accepted knowledge or truths in a particular discipline or field of study. This is normally based on two main philosophical paradigms which are positivism and interpretivism. Positivism is an epistemological approach that believes in the application of natural science methods to the study of society since the positivist view of reliable knowledge are those created through empirical and measurable means. However, interpretivism involving both phenomenology and constructivism see knowledge as created by the meanings individuals attach to phenomena to construct meaning (Creswell, 2011). Interpretivism is based on the thinking that humans as respondents in a research situation are different from resources or equipment and substances in natural science research, because they have feelings and consciousness which cannot be studied in the way natural science is studied, therefore researchers should grab the subjective meaning of social behaviour (Bryman, 2008). Consequently, the research philosophy one adopts should be informed by the knowledge area, or discipline as this will influence the researcher's methodology and strategy. Moreover, research philosophy also reflects the kind of relationship between knowledge and the process by which it is developed. That is whether the researcher will consider data on resources (the resource researcher), that is more akin to the position of a natural scientist or collection of data on feelings, opinions and attitudes, which has no external reality (Creswell, 2011). It must be noted that, in this

postmodern era, different epistemologies have arisen that hold different assumptions about the nature of knowledge, even within the same discipline; in view of this, different schools of thought are possible (Creswell, 2011). Consequently, depending on the discipline involved, a study may take a polar stance of embarking on a research either through a positivist research route or interpretivist research tradition, or where a discipline or mixture of disciplines allow the use of eclectic approach of pragmatism which is an omelette of methodologies thriving on both interpretivism and positivism to embark on a study.

It follows then that, arriving at the right approach, involves a thorough assessment of philosophy or philosophies of their methods, in order to gauge the motives that underpins the choice of their methods through prudent assessment of the type of disciplines involved, and their perception of reality (ontology) in order to create or extend knowledge that fit in the concepts and constructs of that knowledge area or discipline like a puzzle in order to grab the big picture and also add to it in a systematic way in a particular area.

In consonance with the aforesaid, Nikitina (2006) provided a framework for choosing a philosophical approach, when multiple areas are involved, akin to problem solving through inter disciplinary research approach through contextualization and conceptualization.

To highlight the significance of a research philosophy to choose the right methodology, Easterby-Smith *et al.* (2002) maintains that the choice of appropriate research philosophy helps to choose the right research methodology in three ways:

1. First and foremost, it can help the researcher refine and improve the overall research strategy.
2. Secondly, knowledge of research philosophies will enable researchers analyze different methodologies and avoid pitfalls by identifying the strengths and limitations of a method or approach at an early stage.
3. Finally, it would help the researcher to be creative and innovative in the selection or adoption of research methodologies.

To choose the appropriate philosophy for this study various philosophical positions are discussed below:

4.4.1 The positivist research tradition

Most research literature including that of Sunder *et al.* (2007), continue to trumpet the ideology that Positivism relates to philosophical stance that entails working with observable social reality. The positivist advocates the use of natural science methods, where observable social reality form the basis and the methods of data collection, to generate knowledge that can exist in a form of law-like generalization (Remenyi *et al.*, 1998). Hence the central thesis of positivism is that research must be based on the empiricist approach and shouldn't be subject to value judgments based on human values or intentions.

To the positivist, reality must be objective and independent of the observer, and even human behaviour should be explained in a similar way as the natural scientist do, employing methods that are value-free neutral, impartial and objective methods (Easterby-Smith *et al.*, 2012). Subsequently the positivist observer assumes phenomena can be studied as hard facts and the relationship between these facts can

be established as scientific laws. To the positivist, such laws represent truths. They are of the view that social objects should be studied the same way as natural objects, since objective reality that is not depended on human mind exists. Arguably, it is based on this premise that Comte (1853) suggests that all real knowledge should be derived from human observation of objective reality and the senses must be used to accumulate data that is discernible and measurable and must reject any approach that is transcendental. In this regard, the positivist antipathy to meta-physics is rooted in scientific reasoning and not any construct or concepts that are abstract and has the tendency to generate sophistry and illusion (Hume 1984). Hence the positivist epistemologist stresses the importance of induction and verification in addition to establishment of laws and cleanses its approach from knowledge created through specialization and subjectivism.

Therefore, the positivist research tradition favours the use of quantitative approach, thus employing data collections techniques that involve rigorous quantitative measurement by employing research strategies such as: experiments, surveys and statistics, with the testing of hypothesis through analysis of the measured values to develop theories. This was also reinforced by Hughes (1994) when he posits that the research methodology of a positivist should be quantitative which is the only basis for valued generalization and law, and should be value free, meaning the research design should be informed by this criterion rather than human beliefs and interest, with an ultimate aim to identify casual explanations and generation of laws that explain human behaviour, while the researcher should play an independent role and should not manipulate the subjects under scrutiny. To Eldabi *et al.*, (2002) the positive methodology reflects that of a linear and logical structure in which hypothesis takes the form of causal links between the constituent variables stated in the

hypothesis leading to acceptance or rejection of the theoretical proposition. It is instructive to note that, the positivist approach has several implications for research. For operationalization of concepts, the process of reductionism, where problems are better understood by reducing them to the simplest possible elements are employed.

This brings to the fore that researchers leaning towards the positivist epistemology must employ objective methods, rather than making inferences subjectively through sensation, reflection or intuition (Easterby-Smith et al., 2012).

However, positivism is not crystal ball that is not flawless, but have also received its fair share of attacks in academia by critics. The major criticism of positivism is that it is limited and flawed in research endeavours where analysis of human behaviour is involved (Creswell, 2011). Ayer (2012) questions the use of positivist and empirical approaches to the study of human behaviour and suggests that there may be something about the “nature of men” that makes the establishment of laws and ability to generalize possible. Payle (1995) reinforced this sentiment of Ayer (1969), when he contended that, humans are not objects, but subjects to influence behaviour, feelings, which the positivist would reject as irrelevant belonging to the realms of metaphysics. According to him, positivism yields useful but limited results, causing rich insights to be lost, as it only provides superficial view of phenomena it investigates (Bond 1993, Moccia 1988, and Sunders and Mark 2007). In conclusion, positivism holds that, knowledge or truths can only be ascertained through verifiable facts of reality and not on belief that cannot be verified through observation and examination of external reality. In the positivist approach, speculations and assumptions related to knowledge based on the metaphysics are discarded, hence the exploration and examination of human feelings goes beyond the scope of positivism (Creswell, 2011).

4.4.2 The Interpretivist Research Tradition

In contrast to a positivist investigator whose approach is hinged on quantitative techniques and also by employing statistical methods, the Interpretivist investigators are of the view that, it is necessary for researchers to understand differences between humans in their role as social actors and also interpret phenomena in accordance with the set of meanings humans give to a particular phenomenon, by the way humans make sense of the world around us.

The heritage of interpretivism comes from two intellectual traditions of phenomenology and symbolic interactionism (Creswell, 2011). Phenomenology refers to the way we see the world around us while symbolic interactionism reflects the process of interpreting the world around us (Ibid). The interpretivist epistemology posits that, the pattern of human behaviour are not due to pre-existing laws but created from the evolving systems of meaning generated through social interaction. Crucial to the interpretivist epistemology is that, the researcher must lay emphases on analyzing the world view of the population or subjects under study.

Thus, the interpretivist researcher must know the respondent's perception of reality or truths, and what they hold as relevant. In view of this, an interpretivist researcher does not attempt to be value free, because of the held on notion that the world is constantly changing and what is perceived as reality today may change overtime. As some philosophers would put it, truths are plastic in nature, since they vary with people, place and time and what is accepted as truths today may be dangerously insulting tomorrow (Easterby-Smith et al, 2002).

Consequently, the interpretivists are not concerned about generalizability but only aim to capture rich complexity of social phenomena (Creswell, 2011), through the

collection of detailed qualitative data to acquire in-depth understanding of the subjects and social actions in everyday life (Newman, 1997). Undoubtedly, this kind of approach to research undermines the fundamental postulates and tenets of positivism as it does not support the positivist approach of reductionism and hypothesis testing. This is why Creswell (2011) view the interpretivist approach as an inquiry process of understanding social or human phenomena based on complex and holistic picture of problems in a natural settings and this kind of thinking is the fulcrum on which interpretivism rests and also glued to the precepts that researchers cannot and should not be neutral by dissociating themselves from observed phenomena in their enquiry in the social world (Baxter and Eyles, 1997; Guba and Lincoln, 1994; Schwandt, 1994).

In sum, the interpretivist methodology entails working with qualitative data or qualitative approach to research in sharp contrast to positivism since it lay much emphasis on subjectivism and individuality rather than objectivism and replication as truth (Neuman, 1997). However, the interpretivist approach is also criticized especially by critical scientist for concentrating on the individual actors, their intentions and meanings, but the interpretivist is comfortable with qualitative techniques instead of quantitative techniques which is the pivot of the positivist ideological creed.

4.4.3 Pragmatic Research Tradition

Though in recent times there is promotion of the application of the orthodoxy and orthopraxis of positivism to social issues, many a researcher will also take polar stance conducting research within the positivist or interpretivist research traditions. Undoubtedly, this has also brought about competition for methodological primacy as

to whether the interpretivist or the positivist approach offers the best way to create or extend knowledge. To iron out this great controversy, Guba and Lincoln (1994) argue that the question of methods are secondary to questions of epistemology and ontology, hence choosing between one of the two positions is unnecessary and somewhat unrealistic in practice as no approach is necessarily superior to the other, it all depends on the research questions for which answers are being sought (Creswell, 2011). This brings to the fore the most important determinant of research philosophy that depends on the research questions since one approach may be better than the other for answering a particular question.

This confirms the pragmatic view that it is perfectly possible to work with both positivist and interpretivist research philosophies by employing mix methods, both qualitative and quantitative techniques in the same study (Sunders *et al.*, 2007). Therefore, Tashakkori and Teddie (1998) maintain that pragmatism is intuitively appealing and more appropriate for researchers, since they must think of a research philosophy to be adopted in a continuum rather than opposite positions, as the knower and the known at some point must interact, and researchers must avoid pointless debate about what constitutes truth and reality. Hence, a researcher must study what interests them and that which is of value to them to bring about the positive consequence within their value system.

4.4.4 The philosophical position of the study

Based on the earlier discussion about the philosophies that underpins the choice of a particular research methodology, and given the overall objective of this study which seeks to explore Green Supply Chain Management (GSCM) adoption in Ghana, the researcher adopts positivism. Consequently, the research cannot take an eclectic

approach by applying the orthodoxy and orthopraxy of pragmatism. Therefore, it remains the conviction of the researcher to orient this study around the Positivist research ontology, as the nature of reality which in the researcher's opinion can create and extend knowledge in GSCM.

4.5 Research Design

The research sets out to explore adoption of GSCM practices among selected Ghanaian extractive and manufacturing firms, and to investigate the drivers of GSCM adoption. As GSCM within the Ghanaian context is largely unstudied in extant literature, the present study adopts an exploratory approach (Stebbins, 2001).

Quantitative research allows an objective and formal process in which numerical data are used to measure phenomena and produce findings (Leach, 1990). This approach permits the specification of dependent and independent variables associated with the problem allowing researchers to gain enough information about the relationship between these variables under investigation. In addition, using the quantitative method allows the research problem to be distinctively defined and conducted in very specific terms (Cooper and Schindler, 1998).

According to Kealey and Protheroe (1996), a quantitative study can be used to reduce subjectivity associated with research procedures as its processes are clearly defined with the research goals and test hypotheses properly articulated. Such a well-defined process enables the researcher to arrive at a more objective conclusion. In addition, quantitative research can produce factual and reliable results that can be generalizable to some larger population (Maxwell, 1992) while providing the possibility of direct replication of the findings.

4.6 Research Method

The study adopted the survey method to gather data to test the research model that was developed for the study. Given the nature of the study, and the need to collect large amounts of data from a widely geographically dispersed population (manufacturing and extractive firms operating in Ghana), the survey method was deemed to be the most appropriate method. The survey method is also good in generating quantitative data - the type of data required for this research. Compared to other methods like case studies and experimental studies, surveys are faster, less expensive, and can enable the researcher collect data from varied and dispersed sources (Robson, 2002; Sekaran, 2006).

In conducting the study, quantitative survey techniques are deployed to help the researcher empirically explore the proposed constructs and relationships. Quantitative research is perceived to have the benefit of being more objective, formal, and verifiable compared to qualitative research, since proposed relationships and constructs are clearly specified and measured and reported (Cooper and Schindler, 2011). Survey research is an effective research method used for the collection of data from the “representative” sample of the target population. Surveys are also useful in describing a large population with accurate representative sample. Besides, surveys are flexible where many variables and questions are asked on a topic at a time (Babbie, 2007; Mathiyazhagan, and Nandan, 2010).

There are however several limitations associated with using survey as a research design. Mathiyazhagan and Nandan (2010) believed that survey research design is inappropriate when studying diverse or vast heterogeneous groups. To these authors, it is difficult to utilize survey research methodology to study complex

phenomena and population (unlike the population in this current study). This study examined GSCM, a concept that has been well developed in many developed countries, in an emerging Sub-Saharan African country. The basic conceptualization of GSCM has been well established in literature. Further the study focuses on extractive and manufacturing firms only, which makes the population not overly complex.

Sample selection bias can also result from the use of survey methods which may skew the data collected (Babbie, 2007; Creswell, 2011). To prevent this problem, the researcher needs to choose and apply robust statistical tools (Hair et al., 2012; Henseler et al., 2015). Babbie (2007) argued that quantitative surveys cannot be used for exploratory research where there is the need to explore meanings and feelings of people. Surveys are also limited to narratives and historical analysis of events (Choy, 2014). The present study, in line with positivist philosophy in a realist theoretical perspective, collects data on factual phenomena like the extent to which firms have been able to adopt GSCM practices, the level of GSCM capabilities the firms have, as well as the institutional pressures these firms have been exposed to. Thus, the use of survey was appropriate and enabled the collection of the depth of data required for the study. Further, GSCM adoption, GSCM capabilities, and institutional pressures are constructs whose outcome measures are already established and have been tested in various populations and industries.

The research items used in the survey, except for the Custodial Pressure items, were sourced from prior studies. They were then evaluated by three industry experts whose inputs were sought to make the research items more valid and fit the context of GSCM practices among Ghanaian manufacturing and extractive firms. The Custodial Pressure measures, on the other hand, were developed in this study following

McKenzie et al. (2011) scale development process. After the Custodial Pressure construct was conceptualized as a new dimension of institutional pressure in the Sub-Saharan African region, the researcher developed measures for the new construct through literature reviews of the role of chiefs in sustainable business operations in the region. The developed measures were refined by sending them to experts who assessed the items and their inputs were incorporated. The required statistical tests were conducted to further clean the measures and ensure their validity and reliability. The results of the statistical tests are presented in Chapter Five of the study.

4.7 Population

Manufacturing and extractive firms that operate in Ghana and have adopted environmentally sustainable practices in their supply chain management constitute the population of the study. Service organizations were not considered in this study due to wide discrepancies in the literature on what GSCM adoption in service firms is, and what it entails. GSCM in manufacturing and extractive firms on the other hand is better conceptualized and explored in the literature and could therefore be more reliably measured.

Given the large nature of the population for this study, the researcher adopted some rules to help define the population for the study. First, the research considers only formally registered companies. This helps the study gather data from only legitimate firms in Ghana. Thus, the list of companies registered at the Registrar General's Department is used as the population of the study.

Second, the study considered active companies that have been in existence for more than one year. This was necessary because GSCM have been conceptualized to span across the whole supply chain and they become fairly established across the

supply chain with time (Zhu et al., 2007). Also, the study was interested in measuring the effects of external institutional and regulatory pressures, and these can only be properly seen over time. Hence, the study considers active companies that were registered before January 1, 2015. The records from the Registrar General's Department revealed a total of 3000 firms.

4.8 Sample Size and Sampling Technique.

Singh (2006) defined the sample size as “the actual number of cases chosen to represent the population for the purpose of a study”. A sample of 341 cases was selected for the study. The sample size is determined based on Krejcie and Morgan's (1970) sample size determination based on a confidence interval of 95% and margin of error 5%. The Krejcie and Morgan table provides a simple and reliable way to determine sample sizes (Deghani and Navimipour, 2019). A table of Krejcie and Morgan's population and sample size is included in the appendix.

At a general level, sampling techniques are either probability based or non-probability based. Zikmund et al. (2010) provided a distinction between the two in the sense that probability sampling “offers each case an equal chance of being selected as part of the sample” whereas non-probability sampling techniques “are often subjective and based on researcher preferences instead of equal chances of selection”. Throughout studies, the probability sampling techniques have been identified as most reliable and unbiased (Cooper and Schindler, 2012). Based on this argument, the simple random sampling technique was used in this study.

To obtain the random sample, all firms in the sampling frame were numbered. Microsoft Excel was used to generate random numbers using the =RANDBETWEEN (1, 3000) function. This produced a list of 341 randomly generated numbers. The

firms were selected based on their corresponding numbers as obtained from the random numbers.

4.8.1 Response rate

In all, 341 questionnaires were distributed to the selected manufacturing and extractive organizations by the researcher and two trained research assistants, and a total of 156 questionnaires were successfully retrieved, forming an initial response rate of 45.7%. Close inspection of the questionnaires revealed that 5 questionnaires had a considerable number of responses missing (more than 10% of total responses missing). Thus, questionnaires with more than 8 missing responses were dropped as recommended by (Black 2012), leaving the 146 complete and usable questionnaires, which represents an effective response rate of 42.8%.

4.9 Respondents to the Study

The study targets selected manufacturing and extractive firms in Ghana that have adopted GSCM. For each selected firm, a manager from the supply chain department (or operations, purchasing, procurement department as the case may be) was requested to respond to the questionnaire. Middle level managers from the supply chain function were considered because they are typically at the centre of GSCM practice implementation of firms (Carter et al., 1998; Zhu et al., 2007). Only one respondent was sourced from each firm.

4.10 Research Instrument

A structured questionnaire was used as the data collection tool. All questions were close ended. With the exception of three items on the custodial pressures construct that were developed by the researcher, all other items were obtained from validated

scales in the literature. The questionnaires consisted of 60 items. The sources of the various items have been provided in the appendix.

4.10.1 Administration and Retrieval Procedure

All questionnaires were personally delivered and retrieved by the researcher and the trained field assistants. Personal delivery and retrieval was chosen because it has proven to improve response rate in comparison with delivery by post and e-mail.

4.11 Data Analysis

The data analysis is presented in five parts, starting with a discussion of the demographic data collected, followed by a descriptive analysis of the level of GSCM adoption and GSCM capabilities of the firms, as well as the institutional pressures the firms are exposed to. This leads to the PLS-SEM analysis, starting first with the measurement model results, and then the structural model results. The results of the model are then discussed into some detail.

4.11.1 Analytic Method (SEM)

The analytic method that was employed for this study was structural equation modelling (SEM) analysis. SEM is a family of statistical procedures that depicts multiple relationships among latent constructs through the use of equations quite similar to multiple regression equations (Hair et al., 2014). In contrast with simple regression, SEM can model multiple relationships among independent (exogenous latent variable) and dependent (endogenous latent variable) constructs simultaneously with great speed (Hair et al., 2014). There are two broad families of SEM analysis techniques – the covariance-based SEM and the variance-based SEM.

The present study adopted the partial least squares (PLS) technique, a variance based SEM technique. Several reasons led to the choice to use PLS-SEM over covariance based structural equation modelling (CB-SEM). First PLS-SEM is advantageous compared to CB-SEM when analyzing predictive research models and models that are in the early stages of theory development (Fornell and Bookstein, 1982; Hair et al., 2014). Given that the researcher extends institutional theory in the Sub-Saharan African region to include a new Custodial Pressure dimension, the PLS-SEM approach is more appropriate for the study (Hair et al., 2014). Additionally, the study is predictive in nature and seeks to explore the extent to which adoption of GSCM practices is predicted by Institutional Pressures and GSCM Capability.

Also, PLS does not require many of the restrictive assumptions underlying covariance-based structural equation modeling (SEM) techniques, such as multivariate normality and large sample size (Falk and Miller, 1992). The study's sample size of 146 is more than adequate for PLS estimation procedures since the PLS-SEM methodology can better handle small sample size. (Deghani and Navimipour, 2019).

4.12 Validity and Reliability

Ensuring validity and reliability is important in any study for the results to be deemed valid. The validity and reliability concerns were addressed through several recommended techniques (Bhattacharjee, 2012; Hair et al., 2014).

First, the research items used in the questionnaire were sourced from already validated items from previous studies on GSCM. This was done to help improve the content validity of the study. Further, the items were given to managers and experts in the field of environmental sustainability in Ghana to peruse whether they adequately

reflected GSCM in Ghana. The comments of the experts were incorporated into the items to improve the content validity.

Before analyzing data from the survey, the relevant reliability and validity tests, including convergent validity and discriminant validity were conducted to ensure the research model is sound. Standard measurement model analysis criteria such as Cronbach alpha, composite reliability, and average variance extracted (AVE) were also examined for adequacy.



CHAPTER FIVE

DATA ANALYSIS, INTERPRETATION AND DISCUSSION OF RESULTS

5.1 Introduction

The present study was conducted to examine the factors behind the implementation of GSCM practices in an emerging economy. To achieve this goal, a survey of firms in manufacturing and extractive industries which has witnessed high GSCM adoption was conducted. In this chapter, the data from the survey conducted is presented, analyzed and discussed in line with the objectives of the study.

5.2 Demographic Data

The study collected demographic data on the responding firms regarding their employee size, annual revenue levels, industry type, organization type, and ownership type. The demographic data was analyzed using frequency tables. Analysis of the employee size revealed that majority of the responding firms had from 100 to 500 employees (30.8%) and 501 to 2000 employees (33.6%). Firms with more than 2000 employees formed about 13.0% of responses received. The results thus clearly show that most of the responding firms have larger than 100 employees (77.4%) and thus can be considered as large organizations (Teal, 2002). Small firms - firms with less than 30 employees - accounted for only 5.5% of responses received, whilst medium firms - firms with 30 to 100 employees - cumulatively accounted for 11.6% of responding firms. Missing responses for the employee size variable amounted to 5.5% of responses received.

Analysis of the annual revenue of the responding firms also revealed that majority of the responding firms were large, with majority of responding firms (34.9%) indicating they had annual revenues exceeding GHC 50 million. Firms with revenue levels from

GHC 10,000,001 to GHC 50 million represented 22.6% of responses received, whilst firms with GHC 1,000,001 to GHC 10 million constituted 12.3% of responding firms. Firms with revenue levels less than GHC 1 million cumulatively accounted for only 16.4% of the responding firms, with 6.2% reporting revenues levels of less than GHC 80,000, 7.5% reporting revenue levels of GHC 80,001 to GHC 200,000, and 2.7% of responding firms reporting revenue levels of GHC 200,001 to GHC 1 million. There were 20 missing responses for this variable.

Examining the industry to which firms belonged revealed that majority (65.1%) of the responding firms indicated that they were manufacturing firms and 10.3% indicating they are in the mining and minerals industry. Also, 7.5% indicated they were in the oil and gas industry. Another 5.5% of responding firms belonged to the plastics industry, whilst 2.1% of the firms were in the timber and wood industries. 14 respondents selected “other” for their industries, suggesting that their organizations did not clearly fall under any of the options provided. These included firms operating in power generation and assembly of automobiles and heavy equipment.

With regards to organization type, the clear majority of responding firms were privately owned (85.6%), with state owned organizations accounting for 11.6% of responding firms. 2.7% of the respondents failed to indicate whether their organizations were state-owned or privately owned.

Finally, with regards to the ownership of the responding organizations, it was revealed that majority of the organizations were private limited liability companies (65.8%), with sole proprietorships accounting for 11.6% of responding companies, partnerships accounting for 9.6%, and public limited liability companies constituting 8.2% of responding organizations. Missing responses accounted for 4.8% of the responses

received. The demographic results from the survey conducted is summarized in Table 5.1 below.

Table 5.1 Demographic data

Employee Size	Frequency	Percentage
Less than 30	8	5.5
30 to 59	11	7.5
60 to 99	6	4.1
100 to 500	45	30.8
501 to 2000	49	33.6
More than 2000	19	13.0
Missing	8	5.5
Total	146	100.0
Annual Firm Revenue (Ghana Cedis)	Frequency	Percent
Less than 80,000	9	6.2
80,001 to 200,000	11	7.5
200,001 to 1,000,000	4	2.7
1,000,001 to 10,000,000	18	12.3
10,000,001 to 50,000,000	33	22.6
More than 50,000,000	51	34.9
Missing	20	13.7
Total	146	100.0
Industry Type	Frequency	Percent
Oil and Gas	11	7.5
Manufacturing	95	65.1
Mining and Minerals	15	10.3
Timber and Wood	3	2.1
Plastics	8	5.5
Other	14	9.6
Total	146	100.0
Organization Type	Frequency	Percent
State Owned	17	11.6
Privately Owned	125	85.6
Missing	4	2.7
Total	146	100.0
Ownership Type	Frequency	Percent
Sole Proprietorship	17	11.6
Limited Liability	96	65.8
Partnership	14	9.6
Public Limited Liability	12	8.2
Missing	7	4.8
Total	146	100.0

Source: Field study (2018)

5.3 Descriptive analysis of constructs

In this section, the researcher conducted an in-depth descriptive analysis of the level of GSCM adoption reported by the surveyed firms, the level of GSCM capabilities of the firms, as well the level of institutional pressures the surveyed firms reported that their organizations faced.

5.3.1 Level of adoption of GSCM practices by surveyed firms

The researcher first examined the extent to which the responding firms have adopted GSCM practices. Respondents were requested to use five-point Likert scales to indicate the extent to which their organizations practiced Green Purchasing, Green Manufacturing and Packaging and Investment Recovery. Research items measuring each of these constructs were presented to the respondents, and their responses were analyzed to estimate the level of GSCM adoption in their firms. For each research item, the researcher presented the number of responding firms (N), the minimum responses received (Min), the maximum response received (Max), the average of the responses (Mean) and the standard deviation of the responses (S.D). The results of the level of GSCM adoption in the responding firms is presented in Table 5.2 below.

Table 5.2 GSCM Practices among surveyed firms

Green Purchasing	N	Min	Max	Mean	S.D
Our organization provides design specification to suppliers that include environmental requirements for purchased items	144	1	5	3.79	1.182
Our organization cooperates with suppliers for environmental objectives	146	1	5	4.03	1.050
Our organization conducts environmental audit for suppliers' inner management	145	1	5	3.83	1.175
Our organization checks inquires of our suppliers' ISO 14000 certification	145	1	5	3.80	1.321
Our organization evaluates environmentally friendly practices of our second-tier suppliers	146	1	5	3.75	1.142
<i>Average level of Green Purchasing</i>				3.84	1.174
Green Manufacturing and Packaging	N	Min	Max	Mean	S.D
Our organization uses production planning and control focused on reducing waste and optimizing materials exploitation	146	1	5	4.31	0.987
Our organization tries to substitute polluting and hazardous materials/parts	145	1	5	4.14	1.116
Our organization uses process design focused on reducing energy and natural resources consumption in operations	145	1	5	4.11	0.973
Our manufacturing process reduces the noise pollution to the minimum	146	1	5	4.10	1.033
We use recyclable or reusable packaging/containers	141	1	5	3.96	1.339
We use filters and controls on emissions and discharges	145	1	5	4.19	1.069
We try to select cleaner transportation methods	144	1	5	4.36	0.921
We seek to avoid or reduce use of hazardous products and manufacturing processes	145	1	5	4.36	0.918
Our organization seeks to acquire clean technology/equipment	144	1	5	4.44	0.867
We use ecological materials for primary packaging	142	1	5	3.94	1.128
<i>Average level of Green Manufacturing</i>				4.191	1.035
Investment Recovery	N	Min	Max	Mean	S.D
Our organization engages in investment recovery (sale) of excess inventories/Materials	146	1	5	3.40	1.290
Our organization engages in sale of scrap and used materials	146	1	5	3.65	1.378
Our organization engages in sale of excess capital equipment	144	1	5	3.28	1.356
<i>Average level of Investment Recovery</i>				3.44	1.341

Source: Field study (2018)

Positively framed research items were used to measure the GSCM practices in the responding firms using five point Likert scales anchored with 1 = Strongly Disagree and 5 = Strongly Agree. Thus, the mean values for each research item are expected to range from a lowest possible value of 1.00 representing lowest level of adoption and a highest possible value of 5.00 representing the highest level of adoption. A mean value of 3.0 represents an average level of GSCM adoption. From Table 5.2, it can be observed that the average level of Green Purchasing practices was 3.84, which is above average level of adoption. Specifically, for Green Purchasing, respondents most strongly agreed that their organizations cooperated with suppliers on environmental objectives (Mean = 4.03, S.D = 1.182). The evidence also suggests that firms practiced above average levels of conducting environmental audit for suppliers' inner management (Mean = 3.83, S.D = 1.175), checking whether suppliers have ISO 14000 certification (Mean = 3.80, S.D = 1.321), providing suppliers with environmental requirements as part of the design specification (Mean = 3.79, S.D = 1.182), and evaluating the environmentally friendly practices of their second-tier suppliers.

With regards to the level of Green Manufacturing and Packaging practiced by the responding firms, the data revealed an average level of 4.191, which was high. Specifically, it was revealed that, for Green Manufacturing and Packaging practices, the firms were most interested in acquiring clean technology or equipment (Mean = 4.44, S.D = 0.867). The firms also placed high priority on seeking cleaner transportation methods (Mean = 4.36, S.D = 0.921) and seeking to avoid or reduce use of hazardous products and manufacturing process (Mean = 4.36, S.D = 0.918). Following these, responding organizations reported that they used production planning and control focused on reducing waste and optimizing materials exploitation

(Mean = 4.31, S.D = 0.987), whilst trying to substitute polluting and hazardous materials/parts (Mean = 4.14, S.D = 1.116). The data also revealed that firms practiced cleaner production practices such as using filters and controls to minimize emissions and discharges (Mean = 4.19, S.D = 1.069), reducing noise pollution (Mean = 4.10, S.D = 1.033), as well as using process designs focused on reducing energy and natural resource consumption (Mean = 4.11, S.D = 0.973). The average levels of adoption of only two Green Manufacturing and Packaging practices were lower than 4.00. These are using recyclable or reusable packaging/containers (Mean = 3.96, S.D = 1.339) and using ecological materials for primary packaging (Mean = 3.94, S.D = 1.128). This suggests that while the responding organizations were performing well in incorporating environmental sustainability into manufacturing processes and inputs used, they performed a little weaker when it came to the packaging aspect of the goods produced. This suggests there is the need for firms to search for ways to become more environmentally sustainable in the packaging aspect of manufacturing.

The final GSCM practice explored in this study was Investment Recovery. Here, the level of adoption of Investment Recovery practices was much lower than both Green Manufacturing and Green Purchasing, with the overall mean of Investment Recovery found to be 3.44, which is a little higher than the average of 3.0. The data revealed that firms engaged in the sale of scrap and used materials to a higher than average level (Mean = 3.65, S.D = 1.378). This was followed by engaging in investment recovery (sale) of excess inventories/materials (Mean = 3.40, S.D = 1.290), and engaging in sale of excess capital equipment (Mean = 3.28, S.D = 1.356), which was only slightly higher than average. This indicates that investment recovery represents an underutilized GSCM practice, which Ghanaian firms can adopt to enhance their environmental sustainability.

5.3.2 GSCM capabilities of the surveyed firms

The researcher next examined the extent to which the responding firms have the requisite GSCM capabilities to support the GSCM adoption. Respondents were requested to use five-point Likert scales to indicate the extent to which their organizations had Green Eco-Design capabilities and Environmental Participation capabilities. Research items measuring these constructs were presented to the respondents, and their responses were analyzed to estimate the level of GSCM adoption in their firms. For each research item, the researcher presented the number of responding firms (N), the minimum responses received (Min), the maximum response received (Max), the average of the responses (Mean) and the standard deviation of the responses (S.D). The results of the level of GSCM capabilities in the responding firms is presented in Table 5.3 below.

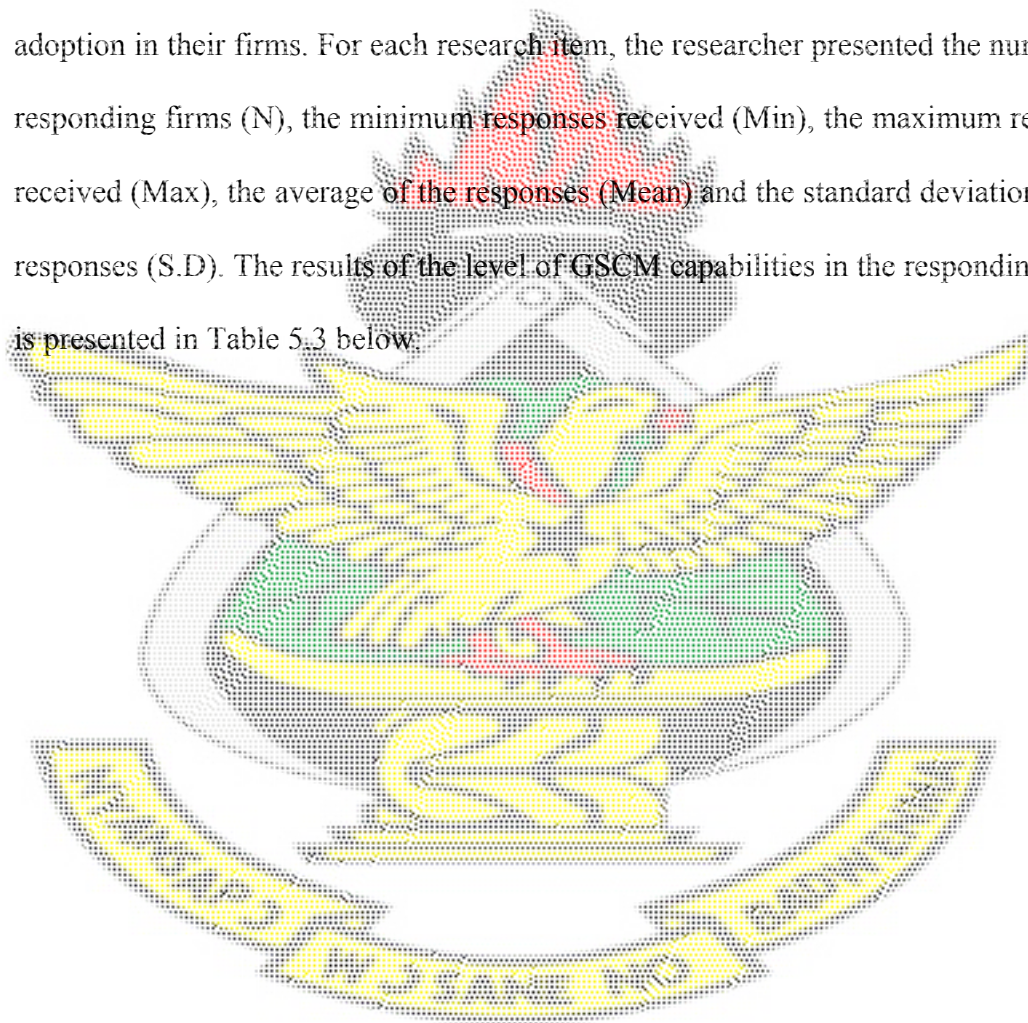


Table 5.3 GSCM capabilities of surveyed firms

Green Eco-Design	N	Min	Max	Mean	S.D
Design of products for reduced consumption of materials	144	1	5	4.01	1.131
Design of products for reduced consumption of energy	145	1	5	4.06	1.079
Designs focused on reducing resource consumption and waste generation in product usage	144	1	5	4.15	0.989
Design of products to avoid or reduce use of hazardous of products and/or their manufacturing process	146	1	5	4.18	1.100
Design of products for reuse, recycle, recovery of material, component parts	144	1	5	3.89	1.291
Design of products for reduced consumption of material/energy	145	1	5	4.10	1.065
<i>Average level of Green Eco-Design</i>				4.065	1.109
Environmental Participation	N	Min	Max	Mean	S.D
Natural environment training programs for managers and employees	145	1	5	4.26	0.934
Cross-functional cooperation for environmental improvements	142	1	5	4.00	1.004
Established an environmental protection index of recycling, gaseous reduction and energy conservation	146	1	5	3.93	1.106
Environmental management system exists	146	1	5	4.33	0.940
Commitment to GSCM from senior managers	146	1	5	4.23	0.981
Each full-time employee well understands the environmental performance target for this year	143	1	5	4.01	1.031
The company's efforts in relation to environmental matters have exceeded the requirements of the relevant regulations	144	1	5	3.61	1.091
Natural environmental seminars for executives	145	1	5	3.80	1.200
Participation in government-subsidized natural environmental programs	145	1	5	4.02	1.139
<i>Average level of Environmental Participation</i>				4.021	1.047

Source: Field study (2018).

Positively framed research items were used to measure the level to which responding firms possessed GSCM capabilities (Green Eco-design and Environmental Participation) using five point Likert scales anchored with 1 = Strongly Disagree and 5 = Strongly Agree. Thus, the mean values for each research item are expected to range from a lowest possible value of 1.00 representing lowest level of adoption and a highest possible value of 5.00 representing the highest level of adoption. A mean value of 3.0 represents an average level of GSCM capabilities. From Table 5.3, it can be observed that the average level of Green Eco-design capabilities was 4.065, which

is high. This suggests that Ghanaian manufacturing and extractive firms believed they possessed the capabilities required to adopt GSCM. Specifically, for Green Eco-design, respondents most strongly agreed that their organizations had the capability to design products to avoid or reduce use of hazardous products (Mean = 4.18, S.D = 1.100). The evidence also suggest that firms had high capabilities in producing designs focused on reducing resource consumption and waste generation in product usage (Mean = 4.15, S.D = 0.989), as well as design of products for reduced consumption of material/energy (Mean = 4.10, S.D = 1.065), design of products for reduced consumption of energy (Mean = 4.06, S.D = 1.079), and design of products for reduced consumption of materials (Mean = 4.01, S.D = 1.131). The only Green Eco-design item with a mean value less than 4.0 was the capability to design products for reuse, recycle, recovery of material, component parts (Mean = 3.89, S.D = 1.291), although this was well above the average level of 3.0.

With regards to the level of Environmental Participation capabilities of the responding firms, the data revealed an average level of 4.021, which was again high. Specifically, it was revealed that, for Environmental Participation capabilities, the respondents most strongly agreed that their organizations had well defined systems for managing the environment (Mean = 4.33, S.D = 0.940). The results also suggested that firms organized natural environment training programs for managers and employees (Mean = 4.26, S.D = 0.981) and participated in government-subsidized natural environmental programs (Mean = 4.02, S.D = 1.139). The results showed that senior managers were committed to GSCM (Mean = 4.23, S.D = 0.918), and full-time employees of the firms well understand the environmental performance goals of the firms (Mean = 4.01, S.D = 1.031). There appeared to be high levels of cross-functional cooperation for environmental improvements as well (Mean = 4.00, S.D =

1.004). The average of three environmental participation items fell short of the high 4.0 mark but were still higher than the average of 3.0. These were the firms that have established an environmental protection index of recycling, gaseous reduction and energy conservation (Mean = 3.93, S.D = 1.196), the firms organizing natural environmental seminars for executives (Mean = 3.80, S.D = 1.200), and the company's efforts in relation to environmental matters have exceeded the requirements of the relevant regulations (Mean = 3.61, S.D = 1.091), which had the least mean. This seems to suggest that Ghanaian manufacturing and extractive firms are mainly interested in reaching the minimum acceptable level of environmental performance, but are not interested in pursuing environmental performance levels higher than what is required.

5.3.3 Institutional Pressures faced by surveyed organizations

The researcher also examined the institutional pressures to adopt GSCM that the responding organizations faced. Respondents were requested to use five-point Likert scales to indicate the extent to which their organizations faced Mimetic pressures, Normative pressures, Coercive pressures and Custodial Pressures. Research items measuring these constructs were presented to the respondents, and their responses were analyzed to estimate the level of GSCM adoption in their firms. For each research item, the researcher presented the number of responding firms (N), the minimum responses received (Min), the maximum response received (Max), the average of the responses (Mean) and the standard deviation of the responses (S.D). The results of the level of GSCM adoption in the responding firms is presented in Table 5.4 below.

Table 5.4 Institutional pressures faced by surveyed firms

Coercive Pressure	N	Min	Max	Mean	S.D
Our main customers that matter to us believe that we should adopt GSCM	146	1	5	3.81	1.200
We may not retain our important customers without GSCM	146	1	5	3.38	1.293
Our main suppliers that matter to us believe that we should adopt GSCM	142	1	5	4.01	1.017
Our suppliers that are crucial to us hotly wish us to adopt GSCM	144	1	5	3.80	1.075
The local government requires our firm to practice GSCM	146	1	5	4.05	1.119
The industry association requires our firm to use GSCM	146	1	5	4.10	1.072
<i>Average level of Coercive Pressure</i>				3.858	1.129
Normative Pressure	N	Min	Max	Mean	S.D
GSCM has been widely adopted by our suppliers currently	146	1	5	3.84	1.035
GSCM has been widely adopted by our customers currently	146	1	5	3.65	0.973
GSCM has been widely adopted by our competitors currently	146	1	5	3.82	1.037
<i>Average level of Normative Pressure</i>				3.77	1.015
Mimetic Pressure	N	Min	Max	Mean	S.D
Our main competitors that have adopted GSCM benefited greatly	146	1	5	3.82	1.017
Our main competitors that have adopted GSCM are perceived favorably by customers	146	1	5	3.49	1.045
Our main competitors that have adopted GSCM are more competitive	145	1	5	3.73	1.036
Our main competitors who have adopted GSCM are favorably perceived by others in the same industry	145	1	5	3.59	1.096
<i>Average level of Mimetic Pressure</i>				3.658	1.049
Custodial Pressure	N	Min	Max	Mean	S.D
The support and approval of chiefs is important for the success of our organization	146	1	5	3.55	1.204
Chiefs and traditional leaders in our communities are important stakeholders our organization seeks to actively engage with	145	1	5	3.52	1.253
Chiefs and traditional leaders in the communities our organization operates require us to act in environmentally sustainable ways	146	1	5	4.11	1.004
Chiefs and traditional leaders in the communities our organization operates are actively involved in shaping our green policies	146	1	5	3.66	1.097
Chiefs and traditional leaders in the communities our organization operates influence our organization's green practices	144	1	5	3.26	1.157
We frequently consult with chiefs and traditional leaders in the communities our organization operates when embarking on major activities or expansions	146	1	5	3.23	1.291
<i>Average level of Custodial Pressure</i>				3.555	1.168

Source: Field study (2018)

Positively framed research items were used to measure the institutional forces compelling Ghanaian manufacturing and extractive firms to adopt GSCM using five point Likert scales anchored with 1 = Strongly Disagree and 5 = Strongly Agree. Thus, the mean values for each research item are expected to range from a lowest possible value of 1.00 representing lowest level of institutional pressure and a highest possible value of 5.00 representing the highest level of institutional pressure. A mean value of 3.0 represents an average level of institutional pressure. From Table 5.4, it can be observed that the average level of Coercive Pressure was 3.858, which is well above average level of 3.0. Specifically, the strongest Coercive pressure was reported from industry associations (Mean = 4.10, S.D = 1.072), with high levels of coercive pressure emanating from local governments (Mean = 4.05, S.D = 1.119), and the firms' suppliers (Mean = 4.01, S.D = 1.017). The customers of the responding firms were identified as an influential source of coercive pressures (Mean = 3.81, S.D = 1.200), however the respondents only marginally agreed that they do not retain their important customers without GSCM (Mean = 3.38, S.D = 1.129). This suggests that customers in Ghana do not actively pressurize manufacturing and extractive firms in Ghana to adopt environmentally sustainable business practices.

With regards to Normative pressure to adopt GSCM, average level of normative pressure was 3.77, which was well above the average level of 3.0. The respondents agreed that GSCM had been widely adopted by the firms' suppliers (Mean = 3.84, S.D = 1.035), GSCM had been widely adopted by the firms' competitors (Mean = 3.82, S.D = 1.037), and that GSCM had been widely adopted by the firms' customers (Mean = 3.65, S.D = 0.973). This seems to appear that adoption of GSCM practices is becoming a norm in the supply chains within which the firms operate, meaning normative pressure to adopt GSCM was likely to be high.

In exploring the Mimetic pressure on Ghanaian manufacturing and extractive firms to adopt GSCM, it was revealed that once again this pressure is well above average, with a mean of 3.658. Respondents agreed that competitors that have adopted GSCM benefited greatly (Mean = 3.82, S.D = 1.017), competitors that have adopted GSCM are more competitive (Mean = 3.73, S.D = 1.036), and main competitors who have adopted GSCM are favorably perceived by others in the same industry (Mean = 3.49, S.D = 1.045). From these results, it can be seen that respondents perceived above average levels of benefits of GSCM to main competitors that had adopted GSCM, meaning there would be some levels of pressure to mimic these competitors in adopting GSCM.

Finally, with regards to Custodial pressure, consistent to the other three traditional institutional pressures, above average levels of custodial pressure was reported by the respondents, with a mean of 3.555. There was strong agreement on the statement that “chiefs and traditional leaders in the communities our organization operates require us to act in environmentally sustainable ways” (Mean = 4.11, S.D = 1.004), suggesting that strong custodial pressure could influence environmental sustainability. Respondents agreed that chiefs and traditional leaders in the communities their organizations operate are actively involved in shaping their firms’ green policies (Mean = 3.66, S.D = 1.097), although they were not very influential in the actual implementation of these policies (Mean = 3.26, S.D = 1.291). The legitimacy of the chieftaincy institution has also been confirmed by the results which indicated that the support and approval of chiefs is important for the success of the firms (Mean = 3.55, S.D = 1.204) and that chiefs and traditional leaders in communities are important stakeholders our organization seeks to actively engage with (Mean = 3.52, S.D = 1.157). Respondents however only marginally agreed that

they frequently consult with chiefs and traditional leaders in the communities their organizations operate when embarking on major activities or expansions” (Mean = 3.23, S.D = 1.291).

5.4 Partial Least Squares Structural Equation Modelling

Having examined the level of GSCM adoption by the surveyed firms, the researcher proceeded to examine and analyze the research model that was proposed for the study. The researcher adopted structural equation modelling (SEM) to examine and analyze the research model. SEM represents second-generation statistical analytic techniques which enable researchers overcome deficiencies in first-generation techniques which include regression-based approaches such as: multiple regression, logistic regression, and analysis of variance and also techniques such as exploratory and confirmatory factor analysis, cluster analysis, and multidimensional scaling (Hair et al., 2016). This is because SEM is able to incorporate unobservable variables measured indirectly by indicator variables, and also facilitate accounting for measurement error in observed variables (Chin, 1998; Hair et al., 2016). There are two broad families of SEM, namely covariance-based SEM (CB-SEM) and partial least squares SEM (PLS-SEM; also called PLS path modelling). CB-SEM is primarily used to confirm (or reject) theories (i.e., a set of systematic relationships between multiple variables that can be tested empirically). It does this by determining how well a proposed theoretical model can estimate the covariance matrix for a sample data set. In contrast, PLS-SEM is primarily used to develop theories in exploratory research. It does this by focusing on explaining the variance in the dependent variables when examining the model (Hair et al., 2016).

Although Partial Least Squares Structural Equation Modelling (PLS-SEM) has been referred to as a “soft-modelling” approach (Wold, 1980) and perceived to be less suited to testing well-established theories due to a lack of a global optimization criterion to assess overall model fit (Hair et al., 2014), several positive features of PLS-SEM resulted in it being selected as the analytical approach for this study. First, it has been observed that PLS-SEM is advantageous compared to CB-SEM when analyzing predictive research models that are in the early stages of theory development (Fornell and Bookstein, 1982). CB-SEM on the other hand is stronger than PLS-SEM when the objective is confirming theories (Hair et al., 2012). PLS-SEM operates much like multiple regression, using an iterative approach that maximizes the explained variance of endogenous constructs (Fornell and Bookstein, 1982). This characteristic makes PLS-SEM particularly valuable for exploratory research purposes. Given that the unique institutional environments of Sub-Saharan African countries interact with GSCM capabilities to influence adoption of GSCM practices have not been explored in previous studies, PLS-SEM was the appropriate structural equation modelling approach for empirically exploring the phenomenon. Also, the study is predictive in nature, setting out to explain the extent to which institutional pressures and GSCM capabilities influence GSCM adoption of Ghanaian firms. Additionally, it has been noted that PLS-SEM is more effective compared to CB-SEM in handling problematic modelling issues that routinely occur in the social sciences such as unusual data characteristics (e.g. non-normal data) and highly complex models (Hair et al., 2014). These are the main considerations that led to the selection of PLS-SEM over CB-SEM as the analytical approach for this study.

To ensure good results are obtained from the analysis of the research model, it is necessary to ensure that an adequate number of responses have been obtained. A

popular guideline indicates that the minimum sample size for a PLS model should be equal to the larger of the following: (i) ten times the largest number of formative indicators used to measure one construct; or (ii) ten times the largest number of independent constructs directed at a construct in the inner model (Barclay et al., 1995; Hair et al., 2014). There was no formatively measured constructs in the model, and GSCM Capabilities had the highest number of predictors (with five predictors). Hence, a minimum sample size of 50 (5×10) should be sufficient for reliable results to be obtained. This criterion is however considered an over simplistic estimation of minimum sample size, as it fails to consider important factors such as effect size, reliability, and number of indicators, all of which can affect power (Henseler et al., 2009). To provide a more rigorous test for adequacy of the sample size, a priori power analysis was conducted using GPower version 3.1. Given a recommended alpha of 0.05, a medium effect size of 0.3, and considering the five predictors of GSCM Capabilities, the power test revealed that a minimum sample size of 111 would be required to achieve the recommended minimum power of 0.95. Hence the sample size of 151 used in this study was sufficient to achieve valid results.

Having established the appropriateness of PLS-SEM for analysis of the research model, and the appropriateness of the sample size, the researcher proceeded to conduct the PLS-SEM analysis. The evaluation or assessment of models in PLS-SEM is done and reported separately for the outer model (measurement model) and the inner model (structural model) (Hair et al., 2014; Ringle et al., 2015).

The evaluation of outer model begins with verifying both the reliability and validity of the indicators (Hair et al., 2014). The reliability of each of the indicators is assessed where their loadings were acceptable, that is higher than 0.70 (Hair et al., 2014). The second step of evaluating reflective indicators of the outer model was the

assessment of validity. This involved the examination of the convergent validity and discriminant validity of the research constructs (Henseler et al., 2015). Convergent validity is achieved when scores of items used to measure a construct correlate with or are related to scores of other items that are designed to measure the same construct (Campbell and Fiske, 1959). Convergent validity is assumed when each item has outer loadings above 0.70, each construct's composite reliability is higher than 0.70, ρ_A is higher than 0.7, and the AVE is 0.50 or higher (Hair et al., 2014; Dijkstra and Henseler, 2015).

Discriminant validity represents the extent to which a construct is empirically distinct from other constructs. It also represents the extent to which a construct measures what it is intended to measure (Hair et al., 2012). Discriminant validity was first assessed through the Fornell and Larcker (1981) criterion. The Fornell and Larcker (1981) criterion assumes that a construct shares more variance with its indicators than with any other construct in the PLS model. This requirement was tested for by the AVE of each construct. The AVE values for each latent variable should be higher than the highest squared correlation with any other construct. Discriminant validity can also be established by assessing the cross loadings of the indicators (Henseler et al., 2012; Rigdon, 2014). Here, the loadings of each indicator on its construct should be higher than the cross loadings on other constructs. Furthermore, these loadings are acceptable when they are 0.70 or higher. Indicators loading less than 0.70 are removed, especially if the instrument is new or not matured (Henseler et al., 2009). Finally, the discriminant validity was assessed using the HTMT test. HTMT is the average of the heterotrait-heteromethod correlations (i.e., the correlations of indicators across constructs measuring different phenomena),

relative to the average of the monotrait-heteromethod correlations (i.e., the correlations of indicators within the same construct) (Henseler et al, 2015).

The structural model tests the hypothesized relationship between the latent constructs. The evaluation of reflective inner models involves the assessment of the coefficient of determination (R^2), path coefficients, and t-values. Assessment of structural model in PLS-SEM is based on how well the exogenous variables can predict the dependent variables (Hair et al., 2014). The first step in the assessment of the inner model involved the evaluation of the R^2 (Henseler et al., 2012). This measures the model's predictive accuracy with its predictor latent constructs. The evaluation criteria for R^2 range from 0 to 1 and values of 0.75, 0.50 or 0.25 present substantial, moderate, or weak levels, respectively, of predictive accuracy of the constructs in the model (Hair et al., 2012; Henseler et al., 2009).

The next step involved the evaluation of the path coefficients of the inner or the structural model. Path coefficients represent the hypothesized relationships linking the constructs in the PLS model (Hair et al., 2014). The path coefficients were estimated based on values +1 to -1, after running a PLS model algorithm. For example, coefficients value closer to +1 represents strong positive relationships and -1 indicates strong negative relationships. In addition, standard error values were obtained using bootstrapping procedure to test the significance and the strength of each path in the PLS model, which estimates t-values of the path coefficients. A path's strength is significant if its t-value is higher than 1.96 at 0.05 (Hair et al., 2014; Sarstedt et al., 2014). The results of the measurement model analysis is presented and discussed next.

5.5 Measurement model results

Measurement model analysis was conducted to confirm if the research model was sound. The measurement model was assessed by performing the relevant tests and ensuring they meet recommended thresholds.

5.5.1 Convergent validity

Convergent validity was assessed by assessing the psychometric properties of the research constructs (Cronbach's alpha, Composite reliability, and Average Variance Extracted) and ensuring that they meet recommended thresholds (Hair et al., 2014). The first criterion to be evaluated is typically internal consistency reliability. The traditional criterion for internal consistency is Cronbach's alpha, which provides an estimate of the reliability based on the inter correlations of the observed indicator variables, and a benchmark of 0.7 and above is recommended (Chin, 1998; Hair et al., 2010). From Table 5.6, all constructs have Cronbach Alpha values greater than 0.7, except Flexibility Orientation, which has a Cronbach Alpha of 0.613. Cronbach's alpha assumes that all indicators are equally reliable (i.e., all the indicators have equal outer loadings on the construct). But PLS-SEM prioritizes the indicators according to their individual reliability. Moreover, Cronbach's alpha is sensitive to the number of items in the scale and generally tends to underestimate the internal consistency reliability. As such, it may be used as a more conservative measure of internal consistency reliability. Due to Cronbach's alpha's limitations, it is technically more appropriate to apply a different measure of internal consistency reliability, which is referred to as composite reliability. Composite reliability measures the ability of the indicators to explain the variance of their latent variable, with a proposed benchmark of greater than 0.7 (Chin, 1998). From Table 5.6, all constructs have composite reliabilities greater than 0.7.

Average Variance Extracted (AVE) is the grand mean value of the squared loadings of a set of indicators and is equivalent to the communality of a construct, with a recommended threshold of greater than 0.5 (Hair et al., 2014). An AVE of 0.50 or higher indicates that, on average, the construct explains more than half of the variance of its indicators. All constructs meet this requirement as can be seen in Table 5.6.

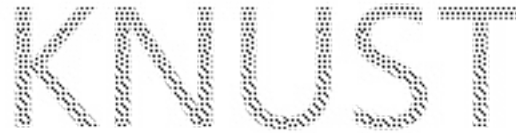


Table 5.6 Psychometric properties of constructs

Construct	Cronbach's Alpha	Composite Reliability	AVE
Custodial Pressure	0.854	0.89	0.575
Coercive Pressure	0.826	0.885	0.657
Control Orientation	0.931	0.951	0.829
Green Eco-design	0.915	0.937	0.749
Environmental Participation	0.917	0.933	0.634
Flexibility Orientation	0.613	0.838	0.721
Green Manufacturing	0.916	0.932	0.63
Green Purchasing	0.91	0.933	0.736
Investment Recovery	0.828	0.897	0.744
Mimetic Pressure	0.869	0.911	0.718
Normative Pressure	0.864	0.917	0.786

Further, for there to be high convergent validity, there should be high item loadings. High outer loadings on a construct indicate the associated indicators have much in common, which is captured by the construct. The size of the outer loading is also commonly called indicator reliability, and a minimum threshold of 0.7 is recommended for indicator reliability (Hair et al., 2016). Item with loadings less than 0.7 were dropped as recommended, with all the remaining items having outer loadings greater than 0.7 as can be seen in Table 5.7.

Table 5.7 Item loadings

	CHF	CONT	COE	EPA	FLEX	ECO	GMP	GPU	IRE	MIM	NOR
CHF1	0.721										
CHF2	0.767										
CHF3	0.770										
CHF4	0.826										
CHF5	0.751										
CHF6	0.708										
CNTL1		0.873									
CNTL2		0.920									
CNTL3		0.931									
CNTL4		0.916									
CPR3			0.820								
CPR4			0.834								
CPR5			0.787								
CPR6			0.801								
EPA1				0.806							
EPA2				0.744							
EPA3				0.767							
EPA4				0.842							
EPA5				0.835							
EPA6				0.755							
EPA8				0.826							
EPA9				0.790							
FLEX1					0.837						
FLEX2					0.861						
GEC1						0.907					
GEC2						0.883					

	CHF	CONT	COE	EPA	FLEX	ECO	GMP	GPU	IRE	MIM	NOR
GEC4						0.913					
GEC5						0.828					
GEC6						0.789					
GMP2							0.789				
GMP3							0.837				
GMP4							0.775				
GMP5							0.780				
GMP6							0.803				
GMP7							0.806				
GMP8							0.787				
GMP9							0.770				
GPU1								0.843			
GPU2								0.876			
GPU3								0.884			
GPU4								0.834			
GPU5								0.853			
IRE1									0.885		
IRE2									0.831		
IRE3									0.872		
MPR1										0.829	
MPR2										0.871	
MPR3										0.832	
MPR4										0.857	
NPR1											0.893
NPR2											0.868
NPR3											0.898

5.5.2 Discriminant validity

Discriminant validity ensures that a construct measure is empirically unique and represents phenomena of interest that other measures in a structural equation model do not capture (Hair et al. 2010). Discriminant validity was assessed using three techniques; (i) the Fornell-Larcker criterion, (ii) item cross-loadings, and (iii) heterotrait-monotrait ratio of correlations (HTMT).

The Fornell-Larcker criterion is one approach to assessing discriminant validity. It compares the square root of the AVE values with the latent variable correlations. Specifically, the square root of each construct's AVE should be greater than its highest correlation with any other construct. An alternative approach to evaluating the results of the Fornell-Larcker criterion is to determine whether the AVE is larger than the squared correlation with any other construct. The logic of the Fornell-Larcker method is based on the idea that a construct shares more variance with its associated indicators than with any other construct. The Fornell-Larcker criterion indicates that there is discriminant validity when the squared root of the AVE of a factor is greater than its correlation with all other factors in the model (Fornell and Larcker, 1981, Hair et al., 2016). In Table 5.8 below, the diagonal values in bold represent the square root of the AVE of the construct, whilst off-diagonal values represent interrelation among constructs. Table 5.8 shows that all diagonal variables are greater than off-diagonal values, confirming discriminant validity of the model.

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Table 5.8 Fornell-Larcker criterion

	CHF	COE	CONT	ECO	EPA	FLEX	GMP	GPU	IRE	MIM	NOR
CHF	0.758										
COE	0.351	0.811									
CONT	0.222	0.449	0.910								
ECO	0.218	0.518	0.650	0.866							
EPA	0.322	0.626	0.620	0.591	0.796						
FLEX	0.372	0.408	0.546	0.436	0.555	0.849					
GMP	0.214	0.540	0.711	0.760	0.723	0.518	0.794				
GPU	0.312	0.672	0.544	0.559	0.757	0.480	0.614	0.858			
IRE	0.155	0.320	0.359	0.394	0.352	0.288	0.376	0.423	0.863		
MIM	0.257	0.648	0.238	0.338	0.371	0.223	0.279	0.474	0.216	0.848	
NOR	0.235	0.721	0.430	0.479	0.578	0.387	0.519	0.631	0.247	0.708	0.887

Next, the cross loading technique suggests that there is discriminant validity when no research item loads higher on other constructs than their own constructs (Hair et al., 2014; Barclay et al., 1995). All items with high cross-loadings were dropped as recommended (Hair et al., 2012). After dropping items, all measurement items loaded higher on their own constructs than against other constructs, confirming discriminant validity of the research model as can be seen in Table 5.9.

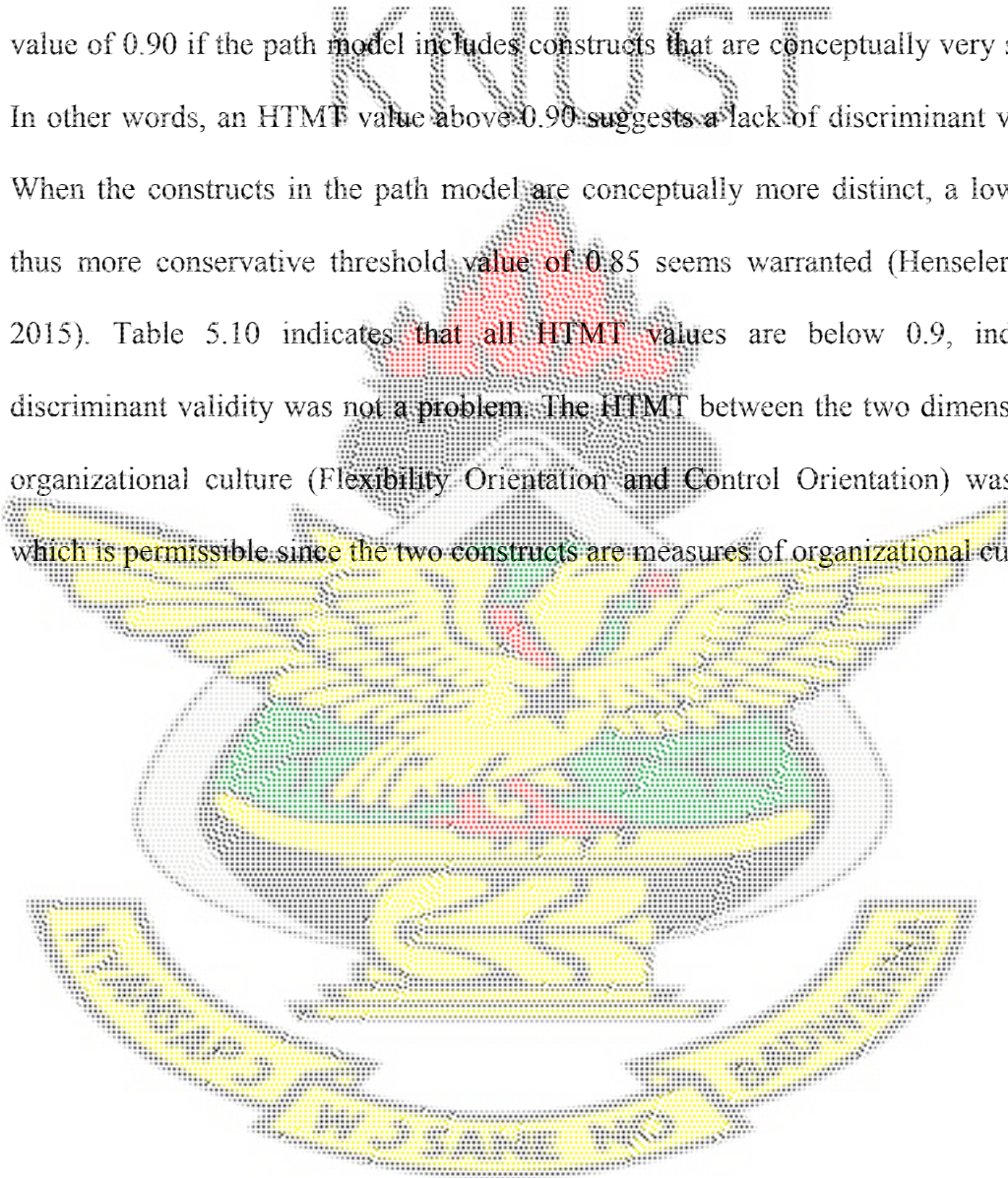


Table 5.9 Cross-loadings

	CHF	CONT	COE	EPA	FLEX	ECO	GMP	GPU	IRE	MIM	NOR
CHF1	0.721	0.051	0.307	0.167	0.246	0.080	0.084	0.209	0.060	0.243	0.195
CHF2	0.767	0.177	0.192	0.213	0.204	0.214	0.149	0.169	0.180	0.161	0.132
CHF3	0.770	0.262	0.294	0.296	0.339	0.176	0.246	0.283	0.173	0.114	0.133
CHF4	0.826	0.237	0.402	0.335	0.363	0.284	0.269	0.359	0.161	0.292	0.309
CHF5	0.751	0.112	0.150	0.178	0.226	0.115	0.091	0.142	0.029	0.225	0.147
CHF6	0.708	0.160	0.159	0.258	0.295	0.064	0.079	0.198	0.087	0.057	0.069
CNTL1	0.171	0.873	0.413	0.591	0.495	0.564	0.667	0.543	0.309	0.232	0.429
CNTL2	0.194	0.920	0.395	0.550	0.492	0.597	0.672	0.449	0.301	0.204	0.386
CNTL3	0.260	0.931	0.423	0.545	0.532	0.578	0.584	0.489	0.337	0.239	0.398
CNTL4	0.182	0.916	0.404	0.576	0.466	0.627	0.668	0.501	0.361	0.192	0.354
CPR3	0.246	0.309	0.820	0.513	0.285	0.359	0.414	0.568	0.200	0.565	0.595
CPR4	0.368	0.241	0.834	0.474	0.278	0.334	0.332	0.587	0.291	0.580	0.596
CPR5	0.273	0.556	0.787	0.568	0.448	0.562	0.540	0.522	0.262	0.407	0.542
CPR6	0.247	0.378	0.801	0.486	0.328	0.447	0.484	0.501	0.285	0.535	0.604
EPA1	0.314	0.522	0.598	0.806	0.446	0.491	0.540	0.668	0.245	0.397	0.485
EPA2	0.227	0.473	0.468	0.744	0.397	0.389	0.458	0.560	0.205	0.306	0.400
EPA3	0.227	0.411	0.398	0.767	0.384	0.450	0.530	0.469	0.212	0.272	0.400
EPA4	0.161	0.523	0.423	0.842	0.444	0.508	0.624	0.555	0.368	0.182	0.416
EPA5	0.339	0.466	0.581	0.835	0.471	0.475	0.636	0.669	0.328	0.342	0.550
EPA6	0.210	0.463	0.443	0.755	0.392	0.365	0.550	0.614	0.194	0.316	0.470
EPA8	0.300	0.519	0.544	0.826	0.428	0.545	0.592	0.699	0.333	0.280	0.500
EPA9	0.268	0.568	0.524	0.790	0.568	0.517	0.661	0.580	0.330	0.280	0.455
FLEX1	0.362	0.438	0.321	0.511	0.837	0.306	0.424	0.392	0.225	0.143	0.242
FLEX2	0.274	0.487	0.370	0.435	0.861	0.431	0.455	0.422	0.262	0.233	0.409
GEC1	0.209	0.577	0.417	0.524	0.363	0.907	0.667	0.489	0.343	0.358	0.481
GEC2	0.184	0.539	0.433	0.528	0.345	0.883	0.615	0.488	0.327	0.258	0.358

	CHF	CONT	COE	EPA	FLEX	ECO	GMP	GPU	IRE	MIM	NOR
GEC4	0.223	0.670	0.495	0.575	0.461	0.913	0.690	0.520	0.379	0.314	0.453
GEC5	0.214	0.527	0.461	0.496	0.407	0.828	0.674	0.482	0.326	0.286	0.438
GEC6	0.104	0.484	0.438	0.421	0.304	0.789	0.651	0.439	0.331	0.240	0.333
GMP2	0.222	0.585	0.579	0.607	0.408	0.660	0.789	0.507	0.363	0.319	0.454
GMP3	0.113	0.620	0.433	0.639	0.404	0.687	0.837	0.534	0.378	0.203	0.396
GMP4	0.139	0.500	0.344	0.512	0.393	0.564	0.775	0.435	0.204	0.182	0.364
GMP5	0.321	0.587	0.547	0.535	0.416	0.605	0.780	0.503	0.358	0.285	0.392
GMP6	0.184	0.490	0.473	0.559	0.404	0.613	0.803	0.528	0.291	0.262	0.460
GMP7	0.107	0.616	0.397	0.628	0.493	0.551	0.806	0.526	0.321	0.205	0.406
GMP8	0.138	0.524	0.313	0.519	0.332	0.568	0.787	0.382	0.228	0.126	0.389
GMP9	0.132	0.582	0.318	0.581	0.433	0.571	0.770	0.465	0.224	0.174	0.434
GPU1	0.345	0.360	0.519	0.578	0.390	0.394	0.421	0.843	0.401	0.412	0.521
GPU2	0.269	0.487	0.585	0.698	0.462	0.533	0.569	0.876	0.365	0.438	0.580
GPU3	0.301	0.515	0.636	0.694	0.451	0.528	0.561	0.884	0.375	0.355	0.559
GPU4	0.164	0.448	0.561	0.597	0.312	0.448	0.480	0.834	0.281	0.382	0.472
GPU5	0.258	0.508	0.579	0.669	0.432	0.485	0.585	0.853	0.389	0.448	0.566
IRE1	0.201	0.274	0.339	0.330	0.250	0.364	0.335	0.457	0.885	0.260	0.288
IRE2	0.084	0.416	0.211	0.296	0.295	0.384	0.326	0.278	0.831	0.093	0.147
IRE3	0.105	0.252	0.268	0.282	0.202	0.273	0.314	0.345	0.872	0.194	0.193
MPR1	0.229	0.355	0.690	0.415	0.287	0.430	0.347	0.522	0.242	0.829	0.634
MPR2	0.147	0.204	0.471	0.258	0.185	0.292	0.203	0.347	0.246	0.871	0.580
MPR3	0.180	0.056	0.495	0.285	0.113	0.199	0.161	0.336	0.128	0.832	0.584
MPR4	0.308	0.172	0.519	0.288	0.159	0.208	0.219	0.385	0.115	0.857	0.596
NPR1	0.209	0.331	0.674	0.552	0.355	0.409	0.490	0.661	0.193	0.625	0.893
NPR2	0.167	0.240	0.523	0.393	0.212	0.302	0.341	0.381	0.141	0.581	0.868
NPR3	0.243	0.549	0.707	0.577	0.443	0.544	0.533	0.614	0.311	0.671	0.898

Finally, the discriminant validity was assessed using the HTMT test. HTMT is the average of the heterotrait-heteromethod correlations (i.e., the correlations of indicators across constructs measuring different phenomena), relative to the average of the monotrait-heteromethod correlations (i.e., the correlations of indicators within the same construct) (Henseler et al, 2015). Henseler et al. (2015) suggest a threshold value of 0.90 if the path model includes constructs that are conceptually very similar. In other words, an HTMT value above 0.90 suggests a lack of discriminant validity. When the constructs in the path model are conceptually more distinct, a lower and thus more conservative threshold value of 0.85 seems warranted (Henseler et al., 2015). Table 5.10 indicates that all HTMT values are below 0.9, indicating discriminant validity was not a problem. The HTMT between the two dimensions of organizational culture (Flexibility Orientation and Control Orientation) was 0.851 which is permissible since the two constructs are measures of organizational culture.



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Table 5.10 HTMT results

	CHF	COE	CONT	ECO	EPA	FLEX	GMP	GPU	IRE	MIM	NOR
CHF											
COE	0.395										
CONT	0.245	0.522									
ECO	0.229	0.604	0.701								
EPA	0.358	0.721	0.671	0.639							
FLEX	0.510	0.579	0.721	0.577	0.742						
GMP	0.231	0.623	0.769	0.831	0.785	0.689					
GPU	0.338	0.772	0.588	0.609	0.825	0.638	0.665				
IRE	0.178	0.382	0.414	0.453	0.398	0.404	0.428	0.480			
MIM	0.275	0.752	0.258	0.372	0.414	0.298	0.305	0.527	0.256		
NOR	0.249	0.846	0.470	0.529	0.642	0.517	0.577	0.700	0.281	0.812	

5.6 Structural model results

Having established the validity and reliability of the measurement model, the researcher proceeded to explore the results of the structural model. This involves examining the model's predictive capabilities and the relationships between the constructs. However, before structural model analysis begins, there is the need to examine the structural model for collinearity. The reason is that the estimation of path coefficients in the structural models is based on OLS regressions of each endogenous latent variable on its corresponding predecessor constructs. Just as in a regular multiple regression, the path coefficients might be biased if the estimation involves critical levels of collinearity among the predictor constructs (Hair et al., 2016). To assess collinearity, we apply the tolerance and VIF values, with tolerance values below 0.20 (VIF value above 5) in the predictor constructs as critical levels of collinearity.

After running the PLS-SEM algorithm, estimates are obtained for the structural model relationships (i.e., the path coefficients), which represent the hypothesized relationships among the constructs. The path coefficients have standardized values approximately between -1 and $+1$ (values can be smaller/larger but usually fall in between these bounds). Estimated path coefficients close to $+1$ represent strong positive relationships (and vice versa for negative values) that are usually statistically significant (i.e., different from zero in the population). The closer the estimated coefficients are to 0, the weaker are the relationships. Very low values close to 0 are usually not significantly different from zero (Hair et al., 2016). Whether a coefficient is significant ultimately depends on its standard error that is obtained by means of bootstrapping. The bootstrap standard error enables computing the empirical t values and p values for all structural path coefficients. When an empirical t value is

larger than the critical value, we conclude that the coefficient is statistically significant at a certain error probability (i.e., significance level). Commonly used critical values for two-tailed tests are 1.65 (significance level = 10%), 1.96 (significance level = 5%), and 2.57 (significance level = 1%) (Hair et al., 2016).

After examining the significance of relationships, it is important to assess the relevance of significant relationships. However, the path coefficients in the structural model may be significant, but their size may be very small. Such situations often occur with large sample sizes. An analysis of the relative importance of relationships is crucial for interpreting the results and drawing conclusions since such small coefficients, even though significant, may not warrant managerial attention (Hair et al., 2016).

The most commonly used measure to evaluate the structural model is the coefficient of determination (R^2 value). This coefficient is a measure of the model's predictive power and is calculated as the squared correlation between a specific endogenous construct's actual and predicted values. The coefficient represents the exogenous latent variables' combined effects on the endogenous latent variable. That is, the coefficient represents the amount of variance in the endogenous constructs explained by all of the exogenous constructs linked to it. Because the R^2 is the squared correlation of actual and predicted values and, as such, includes all the data that have been used for model estimation to judge the model's predictive power, it represents a measure of in-sample predictive power (Rigdon, 2010; Sarstedt et al., 2014). The R^2 value ranges from 0 to 1, with higher levels indicating higher levels of predictive accuracy. Whilst there are no globally accepted thresholds for interpreting R^2 , in most scholarly social science research, R^2 values of 0.75, 0.50, or 0.25 for

endogenous latent variables can, as a rule of thumb, be respectively described as substantial, moderate, or weak (Hair et al., 2016; Henseler et al., 2009).

5.7 Analysis of the Institutional Pressures construct

Institutional Pressures in Sub-Sahara Africa was conceptualized as a second-order construct consisting of four first-order constructs, (i) Normative Pressure, (ii) Mimetic Pressure, (iii) Coercive Pressure, and (iv) Custodial Pressure. To analyze the second-order reflective Institutional Pressures construct, the researcher modelled the individual first-order factors to their second-order factors and then performed principal component factor analysis. Tanaka and Huba (1984) note that a high correlation of the first-order factors to second-order factors may be indicative of valid higher order relationship between them. From Table 5.8, it is seen that the first-order factors correlate and are significantly different from zero, confirming their proposed second-order factor structure. Also, the absence of negative correlations among the constructs means that high values on one do not preclude a high value on another. Further, all inter-correlations among first-order constructs are below the recommended threshold of 0.90 (Bagozzi et al., 1991), indicating distinctiveness of the first-order factors and confirming discriminant validity of the institutional pressures constructs as depicted in Figure 5.1 below.

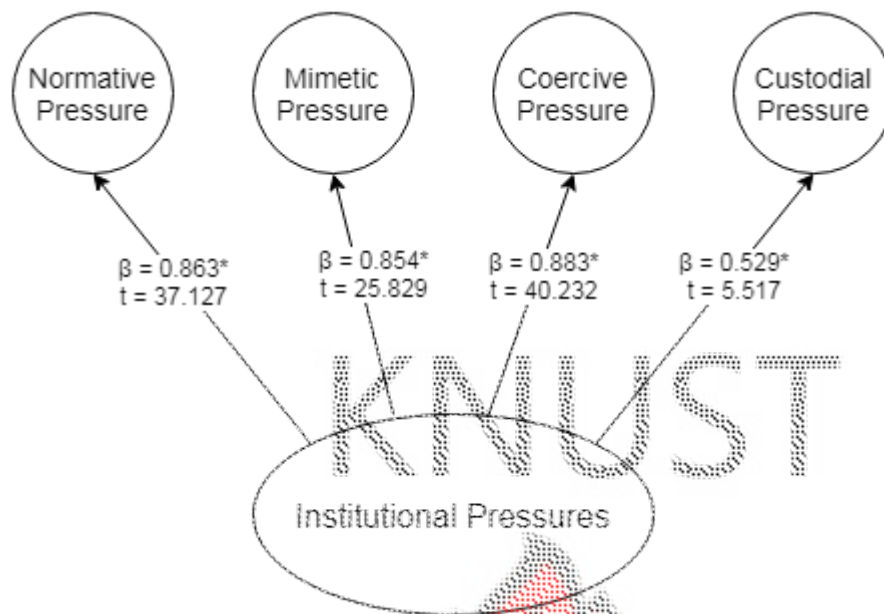


Figure 5.1 New Institutional Pressures construct

From the foregoing second-order analysis of the Institutional Pressures construct, Normative Pressure, Mimetic Pressure, Coercive Pressure and Custodial Pressure are distinctly and significantly reflective of Institutional Pressures in Sub-Saharan Africa as stipulated in this study.

Before discussing the results of the structural model, the researcher examined the structural model for collinearity issues by examining the VIF values of all sets of predictor constructs in the structural model. The VIF values ranged between 1.000 to 1.473 which indicates that collinearity among the predictor constructs is not a critical issue in the structural model. An examination of the predictive accuracy revealed that GSCM Capabilities had an R^2 of 0.398 which represents a moderate to substantial level of predictive accuracy whilst GSCM Adoption had an R^2 of 0.797 which represents substantial predictive accuracy (Hair et al., 2016). This implies that the identified predictors of GSCM Capabilities and GSCM Adoption were very important in predicting the two constructs.

Examining the PLS algorithm and the bootstrapping analyses enabled the researcher to obtain the path coefficients and the t and p values respectively. The path coefficients, t values, and p-values of the research model are shown in Figure 5.2, with the hypothesized paths in bold. Examination of the research model results revealed that for the direct effects, Institutional Pressures had a positive and statistically significant effect on GSCM Capabilities ($\beta = 0.631$, $t = 12.639$, $p < 0.0005$), supporting hypothesis 1. This means that higher levels of Institutional Pressures would result in higher levels of GSCM Capabilities.

The results also indicated that GSCM Capabilities had a strong positive and significant effect on GSCM Adoption ($\beta = 0.737$, $t = 13.356$, $p < 0.0005$), supporting hypothesis 2. Thus, higher levels of GSCM Capabilities result in higher levels of GSCM Adoption.

The indirect effects (mediation effect and moderating effects) in the research model are discussed in more detail next.

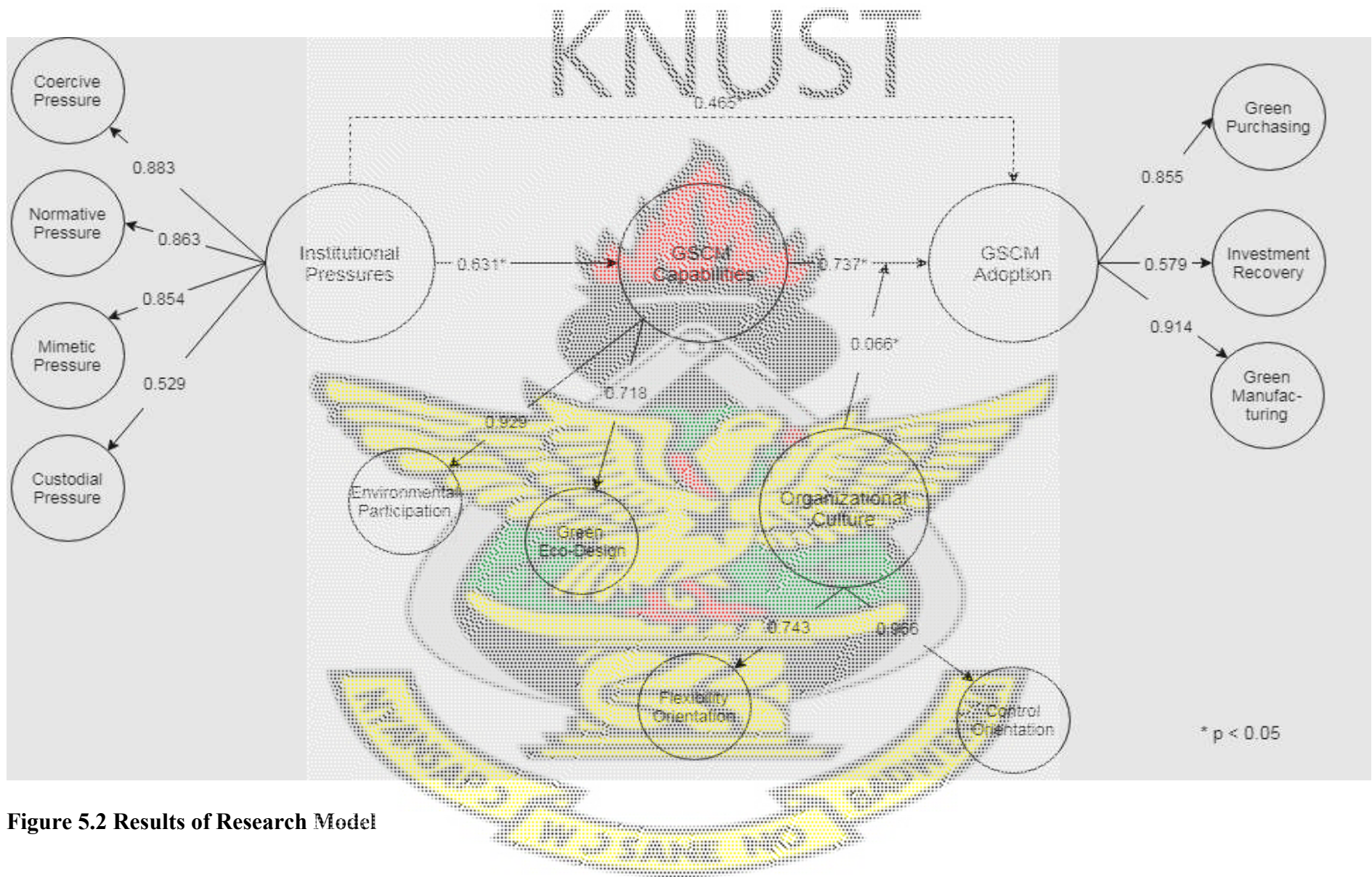


Figure 5.2 Results of Research Model

5.8 The Mediating role of GSCM Capabilities

The relationships between constructs are not always a direct effect of one or more constructs on another. There are instances of indirect relationships between constructs. Two of the most common indirect relationships that exist between constructs are mediation and moderation. Mediation occurs when a third variable, referred to as a mediator variable, intervenes between two other related constructs. More precisely, a change in the exogenous construct results in a change of the mediator variable, which, in turn, changes the endogenous construct. Thereby, a mediator variable governs the nature (i.e., the underlying mechanism or process) of the relationship between two constructs. Analyzing the strength of the mediator variable's relationships with the other constructs allows substantiating the mechanisms that underlie the cause-effect relationship between an exogenous construct and an endogenous construct.

The researcher explored the mediating effect of GSCM Capabilities on the effect of Institutional Pressures on GSCM Adoption. Prior testing of the significance of mediating effects relied on the Sobel (1982) test. The Sobel test compares the direct relationship between the independent variable and the dependent variable with the indirect relationship between the independent variable and dependent variable that includes the mediation construct (Helm et al., 2010). The Sobel test assumes a normal distribution that is not, however, consistent with the nonparametric PLS-SEM method. Moreover, the parametric assumptions of the Sobel test usually do not hold for the indirect effect, since the multiplication of two normally distributed coefficients results in a non-normal distribution of their product. Furthermore, the Sobel test requires unstandardized path coefficients as input for the test statistic and

lacks statistical power, especially when applied to small sample sizes. For these reasons, research has dismissed the Sobel test for evaluating mediation analysis, especially in PLS-SEM studies (Hair et al., 2016).

Instead of using the Sobel test, researchers should bootstrap the sampling distribution of the indirect effect. This approach has also been brought forward in a regression context (Preacher and Hayes, 2004, Preacher and Hayes, 2008). Bootstrapping makes no assumptions about the shape of the variables' distribution or the sampling distribution of the statistics and can be applied to small sample sizes with more confidence. In addition, bootstrapping the indirect effect yields higher levels of statistical power compared with the Sobel test.

Results from running the PLS algorithm and bootstrapping analysis revealed that the indirect effect of Institutional Pressures on GSCM Adoption was positive and significant ($\beta = 0.465$, $t = 8.396$, $p < 0.0005$), which is indicative of the existence of a mediating effect of GSCM Capabilities on the effect of Institutional Pressures on GSCM Adoption (Hair et al., 2016; Nitzl et al., 2016).

5.9 The Moderating role of Organizational Culture

Moderation represents another type of indirect relationship that exists between constructs. When moderation is present, the strength or even the direction of a relationship between two constructs depends on a third variable. In other words, the nature of the relationship differs depending on the values of the third variable. When interpreting the results of a moderation analysis, the primary interest is with the significance of the interaction term. If the

interaction term's effect on the endogenous construct is significant, we conclude that the moderator has a significant moderating effect on the relationship between the independent variable and the dependent variable (Hair et al., 2016). The researcher adopted the two-stage approach in modelling interaction terms as it has been found to yield the highest statistical power and is preferred when the objective is to determine whether or not the moderator exerts a significant effect on the relationship (Hair et al., 2016; Henseler and Chin, 2010).

The researcher explored the moderating effects of Organizational Culture on the relationship between GSCM Capabilities and GSCM Adoption. To interpret the moderating effect, the researcher examined the path coefficient and the effect size (f^2) of the interaction term as recommended (Hair et al., 2016). The path-coefficient (in conjunction with the bootstrapping analysis) helps determine the significance of the interaction term. The effect size (f^2) on the other hand enables an assessment of the change in the R^2 value when an exogenous construct is omitted from the model. In case of the interactions effect, the f^2 effect size indicates how much the moderation contributes to the explanation of the endogenous latent variable. General guidelines for assessing f^2 suggest that values of 0.02, 0.15, and 0.35 represent small, medium, and large effect sizes, respectively (Cohen, 1988). However, Aguinis et al. (2005) have shown that the average effect size in tests of moderation is only 0.009. Against this background, Kenny (2016) proposes that 0.005, 0.01, and 0.025 constitute more realistic standards for small, medium, and large effect sizes respectively.

The results of moderation analysis revealed that the moderating effect of Organizational Culture on the relationship between GSCM Capabilities and GSCM Adoption was significant ($\beta = 0.066$, $t = 2.002$, $p < 0.05$). The effect size of the moderator translates into a high effect size. Thus the results indicate that Organizational Culture significantly influences the relationship between GSCM Capabilities and GSCM Adoption, leading us to accept hypothesis 4.

The results of the hypotheses that were tested are summarized in Table 5.11



Table 5.11 Summary of hypotheses results

		Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ((O/STDEV))	P Values	Decision
H1	INST -> CAPA	0.631	0.632	0.050	12.639	0.000	Supported
H2	CAPA -> ADOP	0.737	0.733	0.055	13.356	0.000	Supported
H3	INST -> CAPA ->ADOP	0.465	0.464	0.055	8.396	0.000	Supported
H4	CAPA x CUL -> ADOP	0.066	0.065	0.033	2.002	0.045	Supported

5.10 ANOVA tests of Control factors

The researcher additionally explored the effect of the proposed control factors (Employee Size, Firm Revenue, Industry Type, Organization Type, and Organization Ownership) on the dependent variable (GSCM Adoption).

5.10.1 Employee Size and GSCM Adoption

The researcher conducted a one-way ANOVA test to explore whether GSCM adoption levels varied significantly based on employee size. Employee size was recoded into three groups; (i) small firms (firms with less than 100 employees), (ii) medium sized firms (firms with 100 to 500 employees), and (iii) large firms (firms with more than 500 employees). Missing data was treated by excluding cases analysis by analysis. The average level of GSCM adoption for small firms was 3.99, whilst medium sized firms had GSCM adoption levels of 3.94, with large firms having adoption levels of 4.01. The ANOVA results revealed that there were no statistically significant differences between the groups ($F(2,123) = 0.100$, $p = 0.905$). This indicates that the level of GSCM adoption by Ghanaian manufacturing and extractive firms is not based on the size of the firms in terms of employees. Larger firms did not have significantly higher levels of GSCM adoption than smaller firms. Details of the ANOVA results are presented in Appendix 2a.

5.10.2 Firm Revenue and GSCM Adoption

Next, the researcher further explored whether GSCM Adoption levels varied based on annual firm revenue. Four groups of firms were created; with Group 1 consisting of firms with annual revenues up to GH¢1 million, Group 2 consisting of firms with annual revenues from GH¢ 1 million to GH¢10 million, Group 3 consisting of firms

with annual revenues from GH¢10 million to GH¢50 million, and Group 4 made up of firms with annual revenues more than GH¢50 million. The mean level of GSCM adoption for Group 1 was found to be 3.77, while that of Group 2 was 4.14, with Group 3 being 4.19 and Group 4 being 3.97. The ANOVA test results once again revealed that no statistically significant differences in GSCM Adoption existed between the groups based on annual firm revenue ($F(3,111) = 1.485$, $p = 0.222$), suggesting that “richer” companies had not implemented GSCM to a significantly higher level. This leads us to conclude that GSCM Adoption levels did not vary based on firm revenue. It would be interesting to explore amount of revenue or resources dedicated to GSCM as a control variable in future GSCM studies. The full ANOVA results are presented in Appedix 2b.

5.10.3 Industry group and GSCM Adoption

The study also examined whether GSCM adoption levels varied based on industry groups. This study focused on two industry groups, the manufacturing firms and extractive firms (mining and minerals, timber and wood, oil and gas). Missing data was treated by excluding cases analysis by analysis. One-way ANOVA results revealed that statistically significant differences occurred between the groups ($F(1,119) = 3.939$, $p = 0.049$). The mean level of GSCM adoption in manufacturing firms (Mean = 4.08, S.D = 0.775) was higher than in extractive firms (Mean = 3.73, S.D = 0.744), indicating that manufacturing firms had adopted GSCM practices to a higher level. This could perhaps be attributed to less effective enforcement of regulations in extractive firms, particularly the mining sector compared to the manufacturing sector. Also manufacturing associations are stronger than extractive ones and could be more compelled to adopt GSCM practices. Details of the ANOVA results are presented in Appendix 2c.

5.10.4 Organization type and GSCM Adoption

Next, Organization type was explored as a control variable for the level of GSCM adoption by firms. Given that there are only two groups (state owned or privately owned), an independent t-test was conducted to compare the differences in mean for the two groups. The mean GSCM Adoption for State Owned firms (N=14) was 3.72 whilst the mean for 116 privately-owned firms was 4.01. The independent t-test table reveals no statistically significant difference between the means of GSCM adoption for state-owned firms and privately owned firms ($p = 0.173$). Details of the independent t-test results are presented in Appendix 2d.

5.10.5 Organization Ownership and GSCM Adoption

Finally, ownership was examined as a control of GSCM Adoption. Again, one-way ANOVA test was conducted, with missing data treated by excluding cases analysis by analysis. Four groups were identified with Limited Liability firms having the highest average level of GSCM adoption of 4.10, Partnership firms having GSCM adoption of 3.74, firms owned by sole proprietors having GSCM adoption level of 3.70 and Public Limited liability firms having the lowest GSCM adoption levels of 3.46. The ANOVA test revealed that statistically significant differences occurred between groups ($F(3,124) = 3.303, p = 0.023$). Post-hoc tests however could not specify which groups had significant differences. Details of the ANOVA results are presented in Appendix 2e.

CHAPTER SIX

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

In this concluding chapter, the researcher presents the summary of the key findings of the study, as well as the conclusions, recommendations, and implications of the study. The limitations of the study as well as directions for future research are as well presented in this chapter.

6.2 Summary of findings

The study was conducted to explore the forces that drive adoption of GSCM practices among manufacturing and extractive firms in Ghana, an emerging Sub-Saharan African economy. The study proposed that Institutional pressures (Coercive Pressure, Normative Pressure, Mimetic Pressure, and a new proposed institutional pressure, Custodial Pressure) compel firms to develop GSCM capabilities (Environmental Participation and Green Eco-Design), which enable them to successfully adopt GSCM practices (Green Purchasing, Green Manufacturing and Packaging, and Investment Recovery). The study also hypothesized that GSCM Capabilities mediated the effect of Institutional Pressures on GSCM Adoption, and that Organizational Culture (Flexibility Orientation and Control Orientation) moderated the effect of GSCM Capabilities on GSCM Adoption.

Analysis of survey data from 146 manufacturing and extractive firms in Ghana revealed mixed results for the level of GSCM Adoption. The findings indicated that the level of Green Manufacturing and Packaging practiced in the surveyed firms was high (Mean = 4.191), however, level of Investment Recovery practices was above

average (Mean = 3.44), with the level of Green Purchasing being relatively high (Mean = 3.84). The surveyed firms also reported relatively lower levels of environmentally sustainable packaging. With regards to the GSCM capabilities possessed by the firms, it was revealed that firms possessed high levels of Green Eco-design (Mean = 4.065) and Environmental Participation (Mean = 4.021). Firms also reported facing quite high levels of institutional pressure to adopt environmentally sound business practices (Coercive pressure = 3.858, Normative pressure = 3.77, Mimetic pressure = 3.658, Custodial pressure = 3.555).

Analysis of the research model revealed that the measurement model was sound. The new proposed Custodial pressure construct was statistically confirmed as a sub-construct of the higher order institutional pressures construct, confirming that the influence of chiefs and traditional leaders constitutes an important dimension of institutional environment of Sub-Saharan African countries as proposed. The results of the study also revealed that Institutional Pressures had a positive and significant effect on the GSCM Capabilities of firms ($\beta = 0.631$, $t = 12.639$, $p < 0.0005$), supporting hypothesis 1. This suggests that exerting higher levels of coercive, normative, mimetic and custodial pressures on manufacturing and extractive firms will compel them to acquire or develop the capabilities needed for GSCM implementation as hypothesized.

The findings also suggested that higher GSCM Capabilities lead to higher levels of GSCM Adoption ($\beta = 0.737$, $t = 13.346$, $p < 0.0005$), supporting hypothesis 2. Here, firms that are better able to bring all stakeholders on-board to collaborate for environmental sustainability (Environmental Participation) and firms with better know-how and ability to introduce environmental concerns in the design of their products and projects were more successful in adopting GSCM practices.

Findings of the study also indicated that GSCM Capabilities mediated the effect of Institutional Pressures on GSCM Adoption ($\beta = 0.465$, $t = 8.396$, $p < 0.0005$), supporting hypothesis 3. That is to say higher Institutional Pressures first result in the development of GSCM Capabilities, which subsequently result in higher GSCM Adoption.

The study found that the effect of GSCM Capabilities on GSCM Adoption was moderated by the type of organizational culture present in the organizations ($\beta = 0.066$, $t = 2.022$, $p < 0.05$), meaning hypothesis 4 was also supported. This means that firms with a strong organizational culture are better able to utilize their GSCM capabilities to achieve higher levels of GSCM adoption.

Finally, it was observed that the level of GSCM adoption of firms varied based on industry group (with manufacturing firms having higher levels of GSCM than extractive firms) and firm ownership (limited liability firms had the highest level of GSCM adoption).

6.3 Conclusions of the Study

Based on the findings of the study, the researcher makes the following conclusions. Manufacturing and extractive firms in Ghana have begun adoption of GSCM practices, particularly Green Manufacturing and Packaging practices. Investment Recovery practices and environmentally sustainable packaging practices are however lesser practiced and represent aspects of GSCM adoption that Ghanaian manufacturing and extractive firms should focus effort in improving.

The study also concludes that institutional pressures within the Sub-Saharan business environment consist not only of coercive, mimetic, and normative pressures,

but also custodial pressures - which was initially proposed in this study and represents the influence from chiefs and traditional authorities. The new four-pronged institution pressures construct found statistical support.

The study concludes that the coercive pressure, mimetic pressure, normative pressure and custodial pressure emanating from the business environment of Sub-Saharan African countries compel manufacturing and extractive firms to develop stronger GSCM Capabilities (Environmental Participation and Green Eco-Design). The study also concludes that GSCM Capabilities enhance the extent to which manufacturing and extractive firms adopt GSCM practices, meaning firms with better developed GSCM Capabilities adopt GSCM practices to a higher level. It is further concluded that GSCM Capabilities is a mediator of the effect of Institutional Pressures on GSCM Adoption. This means that Institutional Pressures both directly and indirectly enhance the GSCM Adoption of manufacturing and extractive firms in Sub-Sahara Africa.

The study finally concludes that, organizational culture significantly moderates the effect of GSCM Capabilities on GSCM Adoption. This means that a flexibility oriented cultural practices enable firms to achieve higher levels of GSCM adoption from their GSCM capabilities.

6.4 Recommendations of the Study

Based on the findings and the conclusions of the study, the researcher makes the following recommendations.

When exploring the level of GSCM adoption of the surveyed firms, it was revealed that the surveyed firms performed relatively poorly in investment recovery

practices and green packaging. It is therefore recommended that manufacturing and extractive firms operating in Ghana and beyond should begin to explore avenues for improving environmental packaging and investment recovery. The researcher recommends that manufacturing and extractive firms should consider the feasibility of using bio-degradable packaging materials such as paper, card boxes, and bamboo instead of rubber and plastics which are mostly used currently. The researcher also recommends that manufacturing and extractive firms also consider selling off or finding alternative use for scrap, used materials, excess inventory and excess capability. Doing this will enhance the GSCM Adoption levels of the firms and enable them to more fully enjoy the benefits of GSCM.

Given that institutional pressures were found to directly and indirectly enhance GSCM Adoption, it is recommended that all relevant stakeholders continue to exert pressures on manufacturing and service firms to adopt environmentally sustainable practices in their operations. Coercive pressures from governments and regulatory bodies, normative pressures from industry associations, mimetic pressures from industry leaders, and custodial pressures from chiefs and traditional authorities should be intensified to compel manufacturing and extractive firms to adopt GSCM practices to an appreciable level.

The research indicates that chiefs and traditional leaders are an important part of the institutional environment of Sub-Saharan African firms. The findings indicate that chiefs exert custodial pressure on firms to adopt environmentally sound practices, and are involved in shaping the green policy of the firms, but are not actively involved in the execution of these green policies. The researcher recommends that chiefs and traditional leaders should be actively involved in the push to have greater GSCM adoption in Ghana and the sub-region. Whilst some chiefs have by themselves taken

some initiatives to combat pollution, illegal mining and natural resource depletion in their traditional areas, this has been on a piecemeal approach, often underfunded, and has yielded relatively little success. The researcher recommends that a clear national strategy should be developed and implemented which will put chiefs and traditional leaders in the forefront of the fight against illegal mining, natural resource depletion and environmental degradation in their traditional areas to complement the efforts of governments and regulatory bodies.

The study observed that GSCM Capabilities had a large and strong impact on the GSCM Adoption of firms. As such, it is recommended that manufacturing and service firms operating in Ghana and beyond dedicate themselves to developing their Environmental Participation capabilities and Green Eco-design capabilities, as this is a sure way to enhance GSCM Adoption in their organizations.

6.5 Implications of the study

There are implications of the study both for research and practice. By way of implications for research, first, the study proposed and empirically confirmed the validity and reliability of a new dimension of institutional pressures in Sub-Saharan African environments, which has been named Custodial Pressure. The measurement model results for the Custodial Pressure construct was sound, confirming it as a valid and reliable construct within the Sub-Saharan African context. Additionally, Custodial Pressure was statistically confirmed to be a sub-dimension of the broader second-order Institutional Pressures construct. The new four-pronged institutional pressures framework presented in this study captures the influence of chiefs and traditional leaders in Sub-Sahara Africa, which does not fit well within any of the three traditional institutional pressures. Expanding institutional theory in this way

contributes to the development of institutional theory, and provides researchers in Sub-Saharan Africa with a new, more expansive way to measure institutional pressures in Sub-Saharan Africa.

The study also addressed a research gap in the GSCM literature, which was the lack of empirical studies exploring GSCM adoption within the Sub-Saharan African context. The study confirmed mixed results for level of GSCM adoption, with Green Manufacturing being fairly high, Investment Recovery being lower than average, and Green Purchasing being higher than average. This is somewhat contradictory to the notion that GSCM implementation in Sub-Saharan African countries and other developing regions is low (Bonini and Gorner, 2011). The study also revealed that institutional pressures both directly and indirectly impact positively on GSCM adoption and GSCM Capabilities also impact positively on GSCM Adoption. These findings are relevant for research as they provide new insight, and can be compared with GSCM studies from other regions to gain new insights on GSCM adoption and implementations. The findings of the study also point to the fact that the culture of the organization is an important consideration in adoption of GSCM practices, as it moderates the effect of GSCM Capabilities on GSCM Adoption.

In terms of implications for practice, the study provide insights for governments, regulatory bodies, industry associations, chiefs, and other relevant stakeholders on how GSCM adoption within the Sub-Saharan African region can be further enhanced. The study suggests that institutional pressures in the form of coercive pressures, normative pressures, mimetic pressures and custodial pressures directly and indirectly positively affect the extent to which firms adopt GSCM practices, meaning governments, regulatory bodies, chiefs, and other stakeholders can

enhance GSCM in the region by continuing to exert higher levels of institutional pressure of firms.

The study also has practical implications for business managers as findings of the study point to how they can achieve higher levels of GSCM adoption in their firms. Managers who want to enhance GSCM adoption in their firms should focus on developing GSCM capabilities such as Green Manufacturing and Green Eco-Design as doing this has a large effect on the level of GSCM adoption.

6.6 Limitations of the study

There are few limitations of the study that was conducted. First, the sole source of data for the study is from questionnaire responses received from managers of the sampled organizations. Whilst great care was taken to develop sound items to capture relevant GSCM concepts, the researcher had no way to verify whether the responses given by the respondents are the true representation of GSCM in their firms. There may be likelihood of respondent bias as respondents themselves were required to estimate the level of GSCM practice adoption in their firms.

Second, whilst the arguments made in the study were made with the entire Sub-Saharan African region in mind, data collection was limited only to manufacturing and extractive firms in Ghana. Data from other Sub-Saharan African countries might impact the results of the study differently. The results, findings, and recommendations of the study should therefore be taken with this limitation in mind.

The relationship between the Institutional Pressures, GSCM Capabilities, and GSCM Adoption was explored at the higher order level. Whilst this was done to keep

the research model simple, it however meant that the effects of the sub-constructs on each other were not explored into detail in this study.

6.7 Directions for future research

The research on GSCM adoption in a Sub-Saharan Africa can be further extended in a number of ways. First, the separate effects of the four institutional pressures on GSCM Capabilities and GSCM Adoption can be explored. This might help shed light on which institutional pressures most strongly impact on GSCM Capabilities and GSCM Adoption in the region.

Data collection for this study focused on manufacturing and extractive firms in Ghana. A future research direction is to expand the scope of the work by collecting data from other Sub-Saharan African countries. Future researchers can also consider expanding the scope of the study to include service organizations and other industries beyond the manufacturing and extractive industries. This would create a more complete picture of the relationship between Institutional Pressures, GSCM Capabilities, and GSCM Adoption.

The study revealed that organizational culture moderated the effect of GSCM Capabilities on GSCM Adoption. Future studies can be conducted to explore other factors that moderate or mediate the relationships between institutional pressures, GSCM capabilities, and GSCM adoption to further our understanding on GSCM adoption in the region. Additionally, other aspects of GSCM implementation in the sub-region such as outcomes of GSCM implementation, support systems for GSCM implementation and barriers to adoption of GSCM should be explored.

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Appendix 1: Constructs, Dimensions, and Research Items for Research model

MAIN CONSTRUCT (2 ND ORDER)	SUB- CONSTRUCTS (1 ST ORDER)	RESEARCH ITEMS		SOURCE
		Code	Description	
INSTITUTIONAL PRESSURES	Coercive Pressure	CPR1	Our main customers that matter to us believe that we should adopt GSCM	(Liu et al., 2010)
		CPR2	We may not retain our important customers without GSCM	(Liu et al., 2010)
		CPR3	Our main suppliers that matter to us believe that we should adopt GSCM	(Liu et al., 2010)
		CPR4	Our suppliers that are crucial to us hotly wish us to adopt GSCM	(Liu et al., 2010)
		CPR5	The local government requires our firm to practice GSCM	(Liang et al., 2007)
		CPR6	The industry association requires our firm to use GSCM	(Liang et al., 2007)
	Custodial Pressure	CHF1	The support and approval of chiefs is important for the success of our organization	Adapted from Crook (2005)
		CHF2	Chiefs and traditional authorities in our communities are important stakeholders our organization seeks to actively engage with	Adapted from Kleist (2011)
		CHF3	Chiefs and traditional authorities in the communities our organization operates require us to act in environmentally sustainable ways	Self-developed
		CHF4	Chiefs and traditional leaders in the communities our organization operates are involved in shaping our green/environmental policies	Self-developed
		CHF5	Chiefs and traditional leaders in the communities our organization operates influence our organization's green/environmental practices	Self-developed
		CHF6	We frequently consult with chiefs and traditional leaders in the communities our organization operates when embarking on major projects or expansions	Adapted from Kleist (2011)
	Mimetic Pressure	MPR1	Our main competitors that have adopted GSCM benefited greatly	(Liu et al., 2010)
		MPR2	Our main competitors that have adopted GSCM are perceived	(Liu et al., 2010)

GSCM CAPABILITIES			favourably by customers	
		MPR3	Our main competitors that have adopted GSCM are more competitive	(Liu et al., 2010)
		MPR4	Our main competitors who have adopted GSCM are favourably perceived by others in the same industry	(Liang et al., 2007)
	Normative Pressure	NPR1	GSCM has been widely adopted by our suppliers currently	(Liu et al., 2010)
		NPR2	GSCM has been widely adopted by our customers currently	(Liu et al., 2010)
		NPR3	GSCM has been widely adopted by our competitors currently	(Liu et al., 2010)
	Environmental Participation	EPA1	We provide natural environment training programs for managers and employees	(Shang et al., 2010)
		EPA2	We engage in inter-departmental cooperation for environmental improvements	(Shang et al., 2010)
		EPA3	Our organization has established benchmarks or environmental protection index of recycling, gaseous reduction and energy conservation that we seek to meet	(Shang et al., 2010)
		EPA4	We have an environmental management system in place	(Shang et al., 2010)
EPA5		Senior managers show commitment to GSCM	(Shang et al., 2010)	
EPA6		Each full-time employee understands the organization's environmental performance target	(Shang et al., 2010)	
EPA7		The company's efforts in relation to environmental matters have exceeded the requirements of the relevant regulations	(Shang et al., 2010)	
EPA8		The organization organizes natural environmental seminars for executives	(Shang et al., 2010)	
EPA9		The company participates in natural environmental programs organized by government and regulatory authorities	(Shang et al., 2010)	
Green Eco-design		GEC1	We design products for reduced consumption of materials	(Shang et al., 2010)
		GEC2	We design products for reduced consumption of energy	(Shang et al., 2010)
		GEC3	We use designs focused on reducing resource consumption and waste generation	(Shang et al., 2010)
		GEC4	We design products to avoid or reduce use of hazardous of	(Shang et al., 2010)

			products and/or their manufacturing process	
		GEC5	We design products for reuse, recycle, recovery of material, component parts	(Shang et al., 2010)
		GEC6	We design products for reduced consumption of material/energy	(Shang et al., 2010)
GSCM ADOPTION	Green Manufacturing and Packaging	GMP1	Our organization uses production planning and control focused on reducing waste and optimizing materials exploitation	(Shang et al., 2010)
		GMP2	Our organization tries to substitute polluting and hazardous materials/parts	(Shang et al., 2010)
		GMP3	Our organization uses process design focused on reducing energy and natural resources consumption in operations	(Shang et al., 2010)
		GMP4	Our manufacturing process reduces the noise pollution to the minimum	(Shang et al., 2010)
		GMP5	We use recyclable or reusable packaging/containers	(Shang et al., 2010)
		GMP6	We use filters and controls on emissions and discharges	(Shang et al., 2010)
		GMP7	We try to select cleaner transportation methods	(Shang et al., 2010)
		GMP8	We seek to avoid or reduce use of hazardous products and manufacturing processes	(Shang et al., 2010)
		GMP9	Our organization seeks to acquire clean technology/equipment	(Shang et al., 2010)
		GMP10	We use ecological materials for primary packaging	(Shang et al., 2010)
	Green Purchasing	GPU1	Our organization provides design specification to suppliers that include environmental requirements for purchased items	(Zhu et al., 2007)
		GPU2	Our organization cooperates with suppliers for environmental objectives	(Zhu et al., 2007)
		GPU3	Our organization conducts environmental audit for suppliers' inner management	(Zhu et al., 2007)
		GPU4	Our organization checks inquires of our suppliers' ISO 14000 certification	(Zhu et al., 2007)
		GPU5	Our organization evaluates environmentally friendly practices of our second-tier suppliers	(Zhu et al., 2007)
Investment	IRE	Our organization engages in sale of excess inventories/materials	(Zhu et al., 2007)	

	Recovery	IRE	Our organization engages in sale of scrap and used materials	(Zhu et al., 2007)
		IRE	Our organization engages in sale of excess capital equipment	(Zhu et al., 2007)
ORGANIZATIONAL CULTURE	Flexibility Orientation	FLEX	The glue that holds our organization together is loyalty and tradition. Commitment runs high	(Liu et al., 2010)
		FLEX	Our organization is a very dynamic and entrepreneurial place. People are willing to stick their necks out and take risks	(Liu et al., 2010)
		FLEX	The glue that holds our organization together is commitment to innovation and development. There is an emphasis on being first with products and services	(Liu et al., 2010)
		FLEX	Our organization emphasizes growth through developing new ideas. Generating new products or services is important	(Liu et al., 2010)
	Control Orientation	CONT	The glue that holds our organization together is formal rules and policies. Following rules is important	(Liu et al., 2010)
		CONT	Our organization emphasizes permanence and stability. Efficiency is important	(Liu et al., 2010)
		CONT	Our organization is a very production oriented place. People are concerned with getting the job done	(Liu et al., 2010)
		CONT	Our organization emphasizes outcomes and achievement. Accomplishing goals is important	(Liu et al., 2010)
CONTROL FACTORS	Employee Size	EMP	<input type="checkbox"/> <6; <input type="checkbox"/> 6-29; <input type="checkbox"/> 30-59; <input type="checkbox"/> 60-99; <input type="checkbox"/> 100-500; <input type="checkbox"/> 500-2000; <input type="checkbox"/> 2000+	
	Firm Revenue	REV	<input type="checkbox"/> less than 80,000; <input type="checkbox"/> 80,001-200,000; <input type="checkbox"/> 200,001-1,000,000; <input type="checkbox"/> 1,000,001-10,000,000; <input type="checkbox"/> 10,000,001- 50,000,000; <input type="checkbox"/> more than 50,000,000	
	Industry Type	IND	<input type="checkbox"/> Oil & Gas; <input type="checkbox"/> Manufacturing; <input type="checkbox"/> Mining & Minerals; <input type="checkbox"/> Timber and wood; <input type="checkbox"/> Plastics; <input type="checkbox"/> Other (specify) _____	
	Organization Type	ORG	<input type="checkbox"/> State owned; <input type="checkbox"/> Privately owned	
	Ownership Type	OWN	<input type="checkbox"/> Sole Proprietorship; <input type="checkbox"/> Limited Liability; <input type="checkbox"/> Partnership; <input type="checkbox"/> Public Limited Liability; <input type="checkbox"/> Other (specify) _____	

Appendix 2: ANOVA results for Control Factors

Appendix 2a: Employee Size and GSCM Adoption

Descriptives

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
1.00	22	3.9915	.67212	.14330	3.6935	4.2895
2.00	42	3.9405	.82904	.12792	3.6821	4.1988
3.00	62	4.0111	.80681	.10246	3.8062	4.2160
Total	126	3.9841	.78740	.07015	3.8453	4.1230

ANOVA

GSCM

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.126	2	.063	.100	.905
Within Groups	77.373	123	.629		
Total	77.500	125			

Multiple Comparisons

Dependent Variable: GSCM

Tukey HSD

(I) EMP	(J) EMP	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1.00	2.00	-.05100	.20874	.968	-.4442	.3462
	3.00	-.01961	.19682	.995	-.4866	.4473
2.00	1.00	-.05100	.20874	.968	-.5462	.4442
	3.00	-.07061	.15850	.896	-.4466	.3054
3.00	1.00	.01961	.19682	.995	-.4473	.4866
	2.00	.07061	.15850	.896	-.3054	.4466

Appendix 2b: Firm Revenue and GSCM Adoption

Descriptive

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
1.00	23	3.7717	.79942	.16669	3.4260	4.1174
2.00	16	4.1367	.82797	.20699	3.6955	4.5779
3.00	30	4.1896	.69004	.12598	3.9319	4.4472
4.00	46	3.9701	.77030	.11357	3.7414	4.1989
Total	115	4.0109	.76923	.07173	3.8688	4.1530

ANOVA

GSCM

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.603	3	.868	1.485	.222
Within Groups	64.852	111	.584		
Total	67.455	114			

Multiple Comparisons

Dependent Variable: GSCM

Tukey HSD

(I)	(J)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1.00	2.00	-.36498	.24883	.461	-1.0140	.2841
	3.00	-.41784	.21184	.205	-.9704	.1347
	4.00	-.19837	.19520	.740	-.7075	.3108
2.00	1.00	.36498	.24883	.461	-.2841	1.0140
	3.00	-.05286	.23662	.996	-.6701	.5643
	4.00	-.16661	.22185	.876	-.4121	.7453
3.00	1.00	.41784	.21184	.205	-.1347	.9704
	2.00	.05286	.23662	.996	-.5643	.6701
	4.00	.21947	.17938	.613	-.2484	.6874
4.00	1.00	-.19837	.19520	.740	-.3108	.7075
	2.00	-.16661	.22185	.876	-.7453	.4121
	3.00	-.21947	.17938	.613	-.6874	.2484

Appendix 2c: Industry and GSCM Adoption

Descriptives

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
1.00	23	3.7283	.74468	.15528	3.4062	4.0503
2.00	98	4.0823	.77548	.07834	3.9268	4.2377
Total	121	4.0150	.77925	.07084	3.8747	4.1552

ANOVA

GSCM

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.335	1	2.335	3.939	.049
Within Groups	70.533	119	.593		
Total	72.867	120			



Appendix 2d: Organizational type and GSCM Adoption

Group Statistics

	OrgType	N	Mean	Std. Deviation	Std. Error Mean
GSCM	1	14	3.7232	.72296	.19322
	2	116	4.0167	.78108	.07252

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	.560	.456	1.338	128	.183	-.29349	.21938	-.72756	.14058
GSCM Equal variances not assumed			1.422	16.883	.173	-.29349	.20638	-.72914	.14216

Appendix 2e: Firm Ownership and GSCM Adoption

Descriptives

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
S.P	16	3.7031	.71789	.17947	3.3206	4.0857
L.L	91	4.1065	.76973	.08069	3.9462	4.2668
P	12	3.7396	.83336	.24057	3.2101	4.2691
PLL	9	3.4583	.72214	.24071	2.9032	4.0134
Total	128	3.9761	.78714	.06957	3.8384	4.1137

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5.823	3	1.941	3.303	.023
Within Groups	72.866	124	.588		
Total	78.688	127			

Multiple Comparisons

Dependent Variable: GSCM

Tukey HSD

(I) Ownership	(J) Ownership	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	-.40333	.20781	.216	-.9445	.1378
	3	-.03646	.29274	.999	-.7988	.7259
	4	.24479	.31940	.869	-.5870	1.0766
2	1	.40333	.20781	.216	-.1378	.9445
	3	.36687	.23543	.406	-.2462	.9800
	4	.64812	.26786	.079	-.0494	1.3457
3	1	.03646	.29274	.999	-.7259	.7988
	2	-.36687	.23543	.406	-.9800	.2462
	4	-.28125	.33803	.839	-.5990	1.1615
4	1	-.24479	.31940	.869	-1.0766	.5870
	2	-.64812	.26786	.079	-1.3457	.0494
	3	-.28125	.33803	.839	-1.1615	.5990

Appendix 3: Krejcie and Morgan's (1970) table of sample size determination

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2,800	338
15	14	110	86	290	165	850	265	3,000	341
20	19	120	92	300	169	900	269	3,500	246
25	24	130	97	320	175	950	274	4,000	351
30	28	140	103	340	181	1,000	278	4,500	351
35	32	150	108	360	186	1,100	285	5,000	357
40	36	160	113	380	181	1,200	291	6,000	361
45	40	180	118	400	196	1,300	297	7,000	364
50	44	190	123	420	201	1,400	302	8,000	367
55	48	200	127	440	205	1,500	306	9,000	368
60	52	210	132	460	210	1,600	310	10,000	373
65	56	220	136	480	214	1,700	313	15,000	375
70	59	230	140	500	217	1,800	317	20,000	377
75	63	240	144	550	225	1,900	320	30,000	379
80	66	250	148	600	234	2,000	322	40,000	380
85	70	260	152	650	242	2,200	327	50,000	381
90	73	270	155	700	248	2,400	331	75,000	382

N = population

S = Sample Size

