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**SCHOOL OF BUSINESS**

**KNUST**

**TOPIC:**

**ENVIRONMENTAL ASSESSMENT AND COLLABORATION AS DETERMINANTS  
OF SUPPLIER'S ENVIRONMENTAL COMMITMENT**

**BY**

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**DECLARATION**

I hereby declare that this submission is my work toward the Master of Science and that to the best of my knowledge, it contains no material previously published by another person nor material that has been accepted for the award of any degree of the University, except where due acknowledgment has been made in the text.

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## DEDICATION

I dedicate this thesis to the glory of God through his undeserved kindness and strength; I was able to complete this work. I also dedicate it to my family for their unwavering support throughout my entire education.

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## ABSTRACT

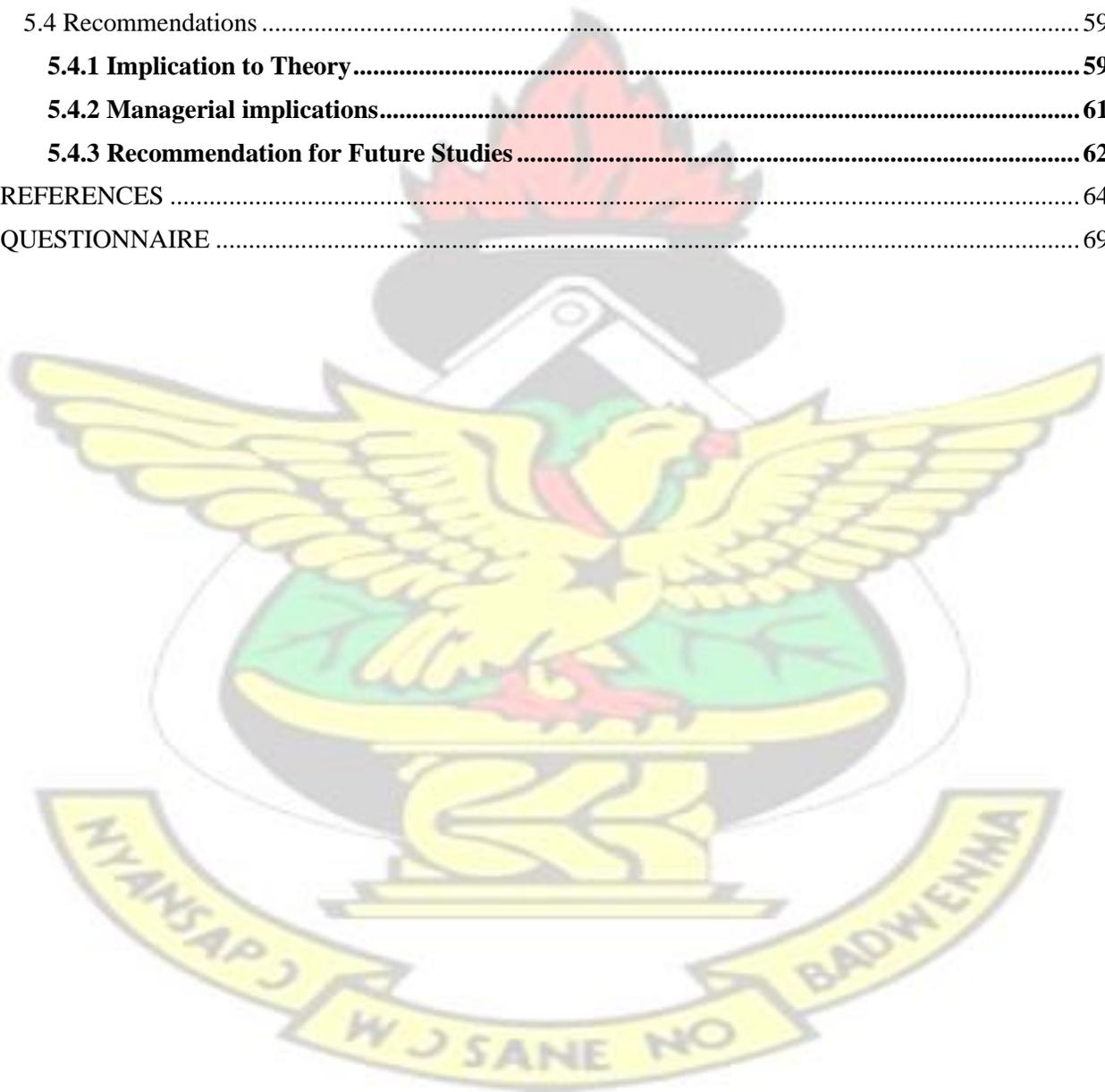
This study examines how two green supply chain management practices – environmental assessment and environmental collaboration affect suppliers’ environmental commitment. The study adopted the quantitative research design. A structured questionnaire was developed which was used in the collection of data from 80 respondents. The data were analyzed using both descriptive and inferential analysis. The results reveal that environmental collaboration positively influences suppliers’ environmental commitment; the impact of environmental assessment on suppliers’ environmental commitment is also positive and statistically significant. Furthermore, the analysis shows that both environmental assessment and collaboration have no interaction and significant impact on suppliers’ environmental commitment. The study offers insight into the psychological background of the suppliers' decision to support the environmental management activities of their procuring counterparts by concentrating on the function of suppliers' views. Based on the findings of the study, it was recommended that purchasing companies' supply chain managers should use caution when using their methods for evaluating their suppliers. Performing environmental audits on suppliers and asking them to submit self-assessment reports, third-party certifications, or both may not be the most effective means to gauge suppliers' commitment to environmental concerns, buying businesses should aggressively market the desirability of their relationships with suppliers to enable seamless and efficient management of environmental concerns across the supply chain and supply chain managers of purchasing firms to concentrate on strategies and processes designed to enhance the system depending on their supplier chain interactions.

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## LIST OF ABBREVIATIONS

<b>SSCM</b>	Sustainable Supply Chain Management
<b>GSCM</b>	Green Supply Chain Management
<b>PES</b>	Proactive Environmental Strategies
<b>EP</b>	Environmental Performance
<b>GTS</b>	Greening the supplier
<b>IGI</b>	Internal Green Integration
<b>GSCI</b>	Green Supply Chain Integration
<b>EP</b>	Economic Performance
<b>EnP</b>	Environmental Performance
<b>SP</b>	Social Performance
<b>SCI</b>	Supply Chain Integration
<b>NRBV</b>	Natural Resource-Based View Theory
<b>RDT</b>	Resource-Dependence Theory



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# CHAPTER ONE

## INTRODUCTION

### 1.1 Background

Any environmental issues upstream endanger not just the buying firm's ability to do regular business, but may also have a major "butterfly impact" on the whole supply chain and whole industries, perhaps on a worldwide scale. This is because the supply chain is becoming more interconnected. When it comes to practicing environmentally harmful behavior, consumers and other stakeholders rarely differentiate between supply chain participants and usually hold the company that made the purchase responsible for any and all events that occur in the supply chain, a phenomenon known as the "chain liability effect" (Hartmann & Moeller, 2014). This jeopardizes the company's reputation. This encourages suppliers to support and participate in the environmental initiatives of their clients (Saghiri & Mirzabeiki, 2021). Vendors must actively embrace green practices in order for green supply chain management to be effective and achieve its goals (Alghababsheh & Gallear, 2020). In order to create supply chains that are environmentally benign, supplier environmental commitment becomes essential (Sancha et al., 2016).

Environmental evaluation and collaboration are the two main strategies used by purchasing businesses to "green" their supply chain partners, according to existing research (Alghababsheh & Gallear, 2020; Tachizawa et al., 2015). Environmental supplier evaluation entails monitoring and assessing suppliers' environmental performance through the implementation of codes of conduct or the enforcement of third-party norms in order to accomplish the goal of decreasing environmental risks in the supply chain. For example, Ford's "Supply Chain Carbon Information Disclosure Project" mandates suppliers to submit carbon emissions data and sets carbon emission objectives for them. Environmental partnerships with vendors are important opportunities for purchasing companies to work with them to boost environmental management all through the supply chain, as well as a place to find new business opportunities or achieve creative sustainability by working with them to produce green products or procedures. Sustainable supply chain

management (SSCM) is the work that businesses conduct with an emphasis on reducing the environmental and societal impacts of a company's supply chain (Carter & Easton, 2011).

There is mounting evidence that the partners upstream and downstream of the target business have a major impact on the supply chain's economic, social, and environmental performance (Ageron et al., 2012). By streamlining the supply chain, waste, emissions, and risks can be reduced (Wieland et al., 2016). However, new metrics and indicators are needed because the ones currently in use are primarily focused on the financial aspect, and other problems can occur when performance in one area is improved at the expense of performance in another (BeskeJanssen et al., 2015).

The industrial sector must use environmental assessment and environmental collaboration techniques to achieve effective and efficient performance. The aforementioned research concerns are taken into account in the study. Manufacturing firms place a lot of attention on the local market and are, in comparison, less integrated into the global value chain. The main objectives of this study are the deployment of environmental assessment and environmental collaboration as a factor of supplier environmental commitment.

## **1.2 Problem statement**

The deployment of green supply chain management efforts is expected to increase suppliers' environmental management competencies and encourage them to support purchasing organizations' environmental perspectives. The "Schaeffler Incident" demonstrates that this is not always the case. The Schaeffler Group regularly inspects its suppliers and demands that they adhere to environmental laws, however one of those suppliers often breached the law. This shows that because of buying companies' green supply chain management attempts, suppliers' commitment to the environmental aims of their customers may be little or nonexistent. According to Nyaga et al. (2010), there are actually some disparities between suppliers' and purchasers'

perspectives on supply chain links and their effects. However, compared to the majority of studies (e.g., Danese et al., 2018; Mani et al., 2018), less research has studied the efficacy of green supply chain management from the point of view of suppliers (Chen & Chen, 2019b). Despite previous research emphasizing the importance of views in supply chain relationships (Czakon & Kawa, 2018) and supply chain research in general (Jia et al., 2021), there is a lack of in-depth knowledge of suppliers' perceptions of the capacity of buyers' environmental assessment, as well as cooperative procedures to influence suppliers' environmental commitment.

A variety of other factors may impact the linkages involving green supply chain management and supplier environmental commitment. Earlier research focused on the efficacy of both the internal and external motivators of environmental evaluation and collaboration. Tachizawa et al. (2015) and Sancha (2016) investigated, among other things, the acceptance of environmental assessments and collaborative techniques. Sancha (2016) investigated the moderating influence of contextual circumstances (i.e., product difficulty, relationship rigidity, and relational flexibility) on the links between client supply chain management activities and suppliers' environmental commitment. Tachizawa et al. (2015) investigated the impact of top management support, as well as repressive, imitation, and normative pressures. The study contributes to this body of work by extending on past requests for a more behavioral method for strategy research (Powell et al., 2011) and conforming to the current study's focus on suppliers' perspectives. The study's starting premise is that opinions matter when it comes to environmental commitment and that suppliers' perspectives, in particular, have a significant influence on how they comply with environmentally friendly efforts and international standards of procurement organizations (Shumon et al., 2019). The article argues that in order to properly manage a green supply chain, it is critical to understand the vendor's environmental commitment in relation to their commercial relationships with customers. When suppliers expect substantial profits from their supply chain interactions and believe that those

interactions are equitable to them, they are more likely to follow their customers' green supply chain management recommendations and value assigning their financial resources to those goals.

Overall, the purpose of this study is to fill a gap in the literature in existing supply chain research by investigating the relationship between environmental assessment and environmental collaboration, with a particular focus on the influence of supplier environmental commitment on that relationship in Ghana's manufacturing sector.

### **1.3 Research Objectives**

The main objective of the study is to investigate the effect of environmental assessment and environmental commitment of some selected manufacturing companies and the moderating role of suppliers' environmental commitment. The research specifically intended to accomplish the following goals:

- i. To assess the influence of environmental assessment on suppliers' environmental commitment.
- ii. To examine the impact of environmental collaboration on suppliers' environmental commitment.
- iii. To examine how the interaction between environmental assessment and environmental collaboration affects suppliers' environmental commitment.

### **1.4 Research Questions**

- i. What is the relationship between environmental assessment and a supplier's environmental commitment?
- ii. What is the relationship between environmental collaboration and a supplier's environmental commitment?
- iii. Does the interaction between environmental assessment and environmental collaboration affect the supplier's environmental commitment?

## 1.5 Significance of the Study

The research advances understanding of "environmental assessment, environmental collaboration, and supplier's environmental commitment" and discusses its applications in underdeveloped nations. Collaboration and environmental evaluation in business are essential to promoting supply chain management that is environmentally friendly. Environmental evaluation is a tool that businesses may use to examine the environmental friendliness of their suppliers and pinpoint areas for improvement. Through the use of data-driven decision-making, businesses may select environmentally responsible suppliers, promote sustainable production methods, and lessen their total environmental effect. Companies may attain better levels of sustainability in their operations as suppliers place an increased emphasis on environmental performance. This will reinforce their environmental image and improve their brand's reputation among environmentally sensitive consumers.

These elements are important for academic study and intellectual endeavor. Scholars may help to improve sustainable supply chain management theories and methods by investigating and comprehending the environmental performance of suppliers. A significant insight into the relevance of partnerships and cooperation between businesses and environmental stakeholders may also be gained by looking at the impact of collaboration on suppliers' environmental commitment. Such information may improve academic literature and guide future research, enabling the academic community to suggest sustainable business strategies with confidence.

Suppliers' environmental commitment has a big financial impact on a number of stakeholders. Through resource efficiency and waste reduction, embracing environmental assessment and collaborative techniques can result in cost savings. In addition to protecting businesses from legal liability, sustainable supply chain policies can lower the likelihood of regulatory compliance

problems and associated fines. By encouraging an ecosystem of eco-friendly businesses and behaviors, which are necessary for a greener, more prosperous future, it may also help the economy's overall resilience and competitiveness.

### **1.6 Summary of Methodology**

In order to assess the moderating effect of the supplier's environmental commitment in some Ghanaian manufacturing enterprises, this thesis used a quantitative research approach with 80 respondents to look at and analyze field data to determine the impact of environmental assessment and environmental collaboration. Using deliberate and snowball sampling techniques, a sample from the entire population was taken from the industrial sector. Questionnaires were the primary data gathering method used for the study. The data from the survey questionnaires (different categories) and the sensory test questionnaires were examined using the statistical program SPSS. Using SPSS 21, specific data was displayed visually where applicable. Both descriptive statistical techniques, like frequencies and percentages, and inferential statistical tools, like regression and correlation, were used to evaluate the data.

### **1.7 Scope of the Research**

The study's conceptual scope is limited to environmental assessment, environmental collaboration, and assessing the moderating role of the supplier's environmental commitment. It focuses on firms in Ghana's manufacturing industry in parts of the Greater Accra and Ashanti regions.

### **1.8 Limitations of the Study**

The study examined the link between environmental assessment and environmental collaboration in select Ghanaian manufacturing enterprises and how the supplier's environmental commitment influences that relationship. The Greater Accra and Ashanti areas, which geographically constrain the research to Ghana, are home to several Ghanaian industrial businesses. This is because some

people refused to divulge certain personal details. More significantly, the results' generalizability could be impacted by the small sample size.

### **1.9 Organization of the Study**

The study is divided into five major chapters. Chapter 1 introduces the research. It concentrated on the study's background, problem statement, research objectives, research questions, study rationale, research methodology, study scope, study limits, and study organization. The second chapter contains a review of the relevant literature divided into four sections: conceptual, theoretical, and empirical analysis, as well as a conceptual framework and hypothesis development. Chapter 3 describes the methodology used in this inquiry. Chapter (4) discusses data presentation, analysis, and interpretation, while Chapter (5) summarizes the most important results, conclusions, and recommendations.



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## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Introduction

This chapter presents works related to the research review. Particularly, the following issues have been discussed: the conceptual review including environmental assessment, environmental collaboration, and supplier's environmental commitment, followed by the theoretical review including resource dependence theory and natural resource-based theory; the empirical review, which consists of the relationship between the constructs. The final section consists of the conceptual framework and hypothesis development.

#### 2.2 Conceptual Review

This section reviews how various authors define the key variables in the study and how they relate to the study. This section will therefore review various literature concerning the area of study, identify key concepts, and determine which key concept will be adopted for the study.

##### 2.2.1 Environmental Assessment

Environmental assessment attempts to ensure suppliers conform to their buyers' environmental standards, which may meet or even exceed legal requirements (Chen & Chen, 2019). Purchasing businesses are responsible for developing environmentally conscious company regulations, establishing them on vendors, collecting and analyzing data on the seller's environmental performance to detect discrepancies, and proposing or enforcing corrective actions (Gualandris &

Kalchschmidt, 2015; Sancha et al., 2016). Instead, environmental cooperation aims to use truly collaborative buyer-supplier interactions on environmental concerns to create commercial possibilities and competitive advantages for both purchasing and providing organizations. To develop organizational abilities associated with sustainability, purchasing organizations collaborate with their suppliers by imparting knowledge to them, providing them with guidance and assistance on environmental issues, collaborating with them to establish environmentally conscious procedures or products, and supporting them in creating an environment of commitment to the environment (Yadlapalli et al., 2018).

To save money, reduce energy consumption, protect the environment, and maintain their environmental friendliness, businesses engage in GTS operations with the aid of control activity and risk management (Vachon & Klassen, 2008). Zhang et al. (2019) claim that by paying close attention to a supplier's pollution and waste levels, businesses may close the information gap between them and their ecologically opportunistic behavior. Audit selects, supplier certification, an exit mechanism, and performance appraisal are all examples of monitoring that may be used to lower the number of high-risk suppliers. In order to encourage suppliers to safeguard the entire production phase, it is necessary to continuously educate them about environmental challenges and provide them with solutions for the environment (Chiou et al., 2011). Reducing waste emissions and energy use may help the company's environmental performance, and green changes can help suppliers increase their output and competence. Shabbir and Kassim (2018) concentrated their research on the role that green integration of supply chain played in mediating the link that developed between the primary supply drivers for the chain and supply chain environmental responsibility in Pakistani SMEs. Khan and Qianli (2017) investigated how performance of organizations in Pakistani manufacturing businesses was impacted by five green supply chain practice characteristics. the upstream and downstream organizations must invest time and

resources to comprehend one another's operations and communicate technical information (Song et al., 2017).

The performance of many firms has evolved to include a large amount of supplier selection and evaluation, according to (Zhang et al., 2019). Providers help with the delivery of raw materials, which has a substantial influence on the design and quality of the finished product, needing careful analysis and supply chain management to get the best results (Gawronski et al., 2011). As a response to changing environments, revived customer needs and desires, and the ability to adapt to changing environmental advancements preceded by immense new technologies as well as protection of the environment systems, establishments are constantly working to form a system of teamwork with providers. Companies, for instance, have advanced and increased the production of environmentally friendly goods and services, which has resulted in an environmental collaboration with suppliers and implies several important responsibilities (Eltayeb et al., 2011). Since vendors act as the foundation for the manufacture of goods, one of GSCM's most significant duties is to select suppliers that value environmental performance. Therefore, it is essential to work with a supplier who uses sustainable alternatives. You can accomplish this by supporting your vendor's use of environmental techniques and by enabling them to perform training and education initiatives related to environmentally friendly operations.

Many businesses use an environmental management system (EMS) to comply with institutional rules set by governmental organizations and local environmental legislation. The three most important organizational characteristics in practice are a company's reputation, image, and legitimacy. The environmental management structures and related productions for the majority of big, publicly traded firms are subject to public scrutiny, mostly from outside stakeholders. Therefore, there may be some pressure to improve "company status" or "business image" to show these investors their dedication to the environment. Ecological corporate reputation pressures (CRP) are prevalent when organizations place a high focus on enhancing their corporate image

and complying with laws and regulations for their environmental policies. EMS systems use a variety of management techniques to pinpoint, curtail, and lessen activities' detrimental effects on the environment (Daddi et al., 2016a). This methodology offers a methodical method for establishing environmental aims, outlining how to accomplish these targets, and proving that ecological marks have been fulfilled (Giorgos Papagiannakis, 2019). Additionally, EMSs offer a collection of eco-friendly policy notes, eco-friendly procedures, and tools for training and educating staff as well as tracking operations' effects on the environment (Giorgos Papagiannakis, 2019). EMSs improve businesses' corporate reputations by giving off the impression that they are eco-friendly (Daddi et al., 2016a). Better supply chain interactions with consumers, suppliers, neighborhoods, and other stakeholders can be facilitated by EMSs (Morrow & Rondinelli, 2002). Customer environmental pressures (CEP) are the rising expectations of customers for environmental compliance. Examples include environmental issues supplier authorization (Lee, 2019; Weingarten et al., 2018), client environmental investment in companies (Pagell et al., 2013), and the client environmental working relationships (Castromán-Diz et al., 2018). From the perspective of industrial companies, these stringent customer environmental demands place a tremendous burden on environmental management procedures and the capacity to show environmental results. The coercive character of consumer expectations about an organization's acceptance of an EMS in conjunction with customer environmental elements has been shown in the literature (Yang et al., 2021). Many manufacturing businesses must conform to such normative norms in order to draw genuine investment from supply chain members (Liu et al., 2010). A manufacturer may be forced by customers to comply with environmental norms enforced by their networks. There are normative constraints on certain multinational firms to emphasize their compliance with institutional rules and regional environmental restrictions. Environmental supply chain management is discussed in the literature in terms of environmental knowledge generation and environmental collaboration (Pham & Pham, 2021). Customers utilize and anticipate that suppliers' manufacturing facilities will adopt environmental vendor certification (Riillo, 2017);

customers directly invest in cleaner production (Aanet al., 2016); and customers engage in environmental co - operation (Agyemang et al., 2018). All of these clients' demands and expectations provide normative and coercive forces that increase the adoption of EMS.

Customers typically use environmental supplier certification to check if environmental vendor certification procedures are followed by other suppliers or to check the environmental performance of suppliers (from the buyer's perspective). Third-party green certifications, such as the International Standard Organization ISO14001, assist firms in building their reputations by showing environmental commitment and explaining organizational efforts to varied stakeholders (Martin-de Castro et al., 2017). In response to these normative constraints from stakeholders such as consumers and regulatory agencies, manufacturers are becoming more comfortable with ISO 14001 certification to verify their EMS processes (Martin-de Castro et al., 2017). Customers that demand ISO 14001 certification from manufacturers show that they have integrated environmental issues into their organization's subsequent environmental goals. This method generates several cooperative actions that improve industrial companies' environmental awareness.

### **2.2.2 Environmental Collaboration**

The design and implementation of a cooperative strategic approach to environmental management by a company and its suppliers are referred to as environmental collaboration (Grekova et al., 2016). This is seen as a crucial mentoring culture that directs and aids a company's suppliers in their efforts to manage the environment. The environmental collaboration strategy of a company is seen as a determined attempt to commit financial resources to support the environmental management plans of its suppliers. As a result, supplier environmental capabilities and obligations are fully understood via an environmental partnership (Grekova et al., 2016). The effect of environmental alliance on a variety of outcomes, including business performance (Large & Thomsen, 2011), environmental capacities (Lee & Klassen, 2008), and buying performance, has been studied in the past (Large & Thomsen, 2011). This research has significantly advanced our

knowledge of the effects of environmental cooperation. Relatedly, earlier studies looked at the causes of environmental cooperation (Hollos et al., 2012). These research findings imply that environmental dedication and attitude are key factors that motivate environmental collaboration. It may be suggested that adopting environmental cooperation with supplier partners might result in responsible innovation in addition to these results of environmental collaboration as demonstrated by empirical study (Grekova et al., 2016). Responsible innovation is the belief that new goods should not be harmful to the general public and customers' health. It also means that any new methods of manufacturing products and services should be secure and free of environmental pollution (Voegtlin & Scherer, 2017). The UN Sustainable Development Goals aim to safeguard the planet's biosphere and enhance living standards (Griggs et al., 2013). These objectives can be attained in part through innovation, which is defined as "the invention, adoption, and application of new ideas, procedures, goods or services" (Thompson, 1965). Consequently, it has been proposed that companies that are viewed as key sources of innovation have a social obligation to effectively handle environmental challenges (Voegtlin & Scherer, 2017).

According to the idea of "responsible innovation," businesses should take the lead in influencing how society's members think and act about socio-ethical issues (Ceicyte & Petraite, 2018). Although the notion of responsible technology is not new, its main originality and practical applicability lie in its explicit tying of innovation to accountability (Genus & Iskandarova, 2018). According to some research, environmental cooperation entails businesses working with their partners to find environmental solutions that will lessen the environmental effect of the items they sell (Adomako, 2020). Thus, it may be claimed that a company can encourage the responsible growth of innovation when it accesses suppliers' expertise and ideas regarding environmental management and responsibility. This may be accomplished by involving a larger society to assist innovation's results to become (ethically) desirable, sustainable, and aesthetically pleasing (Von Schomberg, 2013).

Collaborative planning considerably enhances supply chain performance, claim Petersen et al. (2005). Soosay et al. (2008) defined various supply chain cooperation methods as alliances of strategic importance, joint ventures, cooperative agreements, online cooperation, and vertical as well as horizontal and lateral integration. The aforementioned partnership models each have unique characteristics and benefits, but they might all be connected to environmental difficulties. Cooperation in the supply chain may take many different forms, including information sharing, goal alignment, decision coordination, motivation coordination, the exchange of resources, collaborative communication, and the creation of common knowledge (Zhang, 2011). Their function in dealings with suppliers may be an important study topic. According to Barratt (2004), failure to pay attention to front-end agreements and the selection of a partner to work with are the two main obstacles to supply chain cooperation.

Practices of working closely with vendors to develop their skills to significantly increase performance are known as "supplier cooperation practices" (Rodriguez et al. 2016). Purchasers seek to enhance company policies or designs for goods through cooperative practices, which not only encourage employee satisfaction and ensure a safe workplace but also open up possibilities for introducing cutting-edge, environmentally friendly products to the marketplace, which could give them an ongoing competitive advantage (Huq and Stevenson 2018). Buying companies utilize a range of techniques and instruments to do this, requiring varying degrees of commitment and expenditure (Alghababsheh 2018). For instance, purchasing companies can build up supplier education and development programs where they teach the staff of suppliers technical, managerial, and other skills at their amenities or those of the dealers (Yadlapalli et al. 2018; Yawar and Seuring 2018). Other common collaboration strategies include developing mutually beneficial contact patterns for sharing expertise, allocating "sustainability-specific" investments, organizing mutually beneficial meetings, and offering financial incentives to suppliers to obtain third-party certification (Marshall et al. 2017). As a result, fostering two-way discussion and emphasizing

long-term beneficial partnership among the client and the vendor are two major aspects of the cooperation approach (Alghababsheh et al., 2018).

According to Vachon and Klassen (2008), there is a positive relationship among environmental collaboration and numerous metrics of industrial success. On the other side, Green et al. (2012) demonstrates how supply chain partners' environmental collaboration and monitoring techniques have been found to increase organizational and environmental performance. Additionally, Albino et al. (2012) provide evidence in favor of the claim that developing cooperative relationships with a company's suppliers and enhancing the latter is environmental performance is mutually beneficial. According to a study paradigm created by Gunasekaran et al. (2015), environmental collaboration is the greatest level of connection with suppliers. The unanswered issue is whether there may be other, more advanced degrees of supplier engagement, such as environmental supplier integration and environmental supplier development.

The capacity to earn income is what makes a partnership desirable. In buyer-seller relationships, the supplier's appraisal of how desirable the connection is reflects the supplier's perspective on the benefits that a relationship with a certain client may provide (Toth et al., 2015). Based on previous encounters with a customer, the supplier examines many relationship benefits and concludes that the partnership is beneficial to the degree that the advantages match its standards (Pulles et al., 2016). According to the findings of the current study, two factors influence how attractive a partnership is: first, the projected financial rewards for the central organization; and second, the perceived excellence of the connection and the degree of closeness and connectedness between the parties. When suppliers expect substantial profits from their supply chain relationships and a sense that their interactions are fair to them, they are going to cooperate with their clients' green supply chain management initiatives and be more willing to devote financial resources to their counterparts' sustainability objectives.

Collaborative actions are positively associated with relationship outcomes, according to a model created by Nyaga et al. (2010). They also show that buyers may profit from collaborative partnerships with suppliers in terms of performance. According to Fawcett et al. (2012), trust catalyzes cooperative partnerships with suppliers. Johnston et al. (2004) provide more support for the need of developing trust to form cooperative relationships with suppliers. Collaboration among supply chain participants can advance efforts to reduce pollution and advance environmental practices (Vachon & Klassen, 2008). More precisely, working with suppliers can help manufacturing companies find environmentally hazardous resources (technology, materials, and standards) (Oelze, 2017). Sharing knowledge and insights across organizational boundaries may help all parties comprehend various approaches, make environmental improvements, create and protect environmentally friendly goods, devise sustainable manufacturing methods, lower costs for parties, and provide win-win outcomes.

Customers typically use environmental supplier certification to discover whether other suppliers follow environmental vendor certification criteria or to evaluate environmental performance (from a commercial perspective). Green certifications from third parties, such as the International Standard Organization ISO14001, help firms improve their reputation by demonstrating their commitment to the environment, according to Martn-de Castro et al. (2017). In response to these normative constraints from stakeholders such as customers and regulatory agencies, manufacturers are increasingly accepting ISO 14001 certification to validate their EMS practices (Martn-de Castro et al., 2017). Customers that request manufacturers get ISO 14001 certification demonstrate that they have included environmental concerns in their organization's ensuing environmental objectives. This approach leads to several coordinated efforts that raise the environmental consciousness of industrial firms and are connected to efficient environmental processes and effectiveness (Aboelmaged, 2018). According to Gualandris and Kalchschmidt (2016), when customer businesses participate directly in environmental initiatives, it strengthens linkages

between supply chain participants and develops partnerships characterized by dedication and trust. These include choosing cleaner and preventative technology, working directly with manufacturers to produce environmental solutions, and collaborating on environmental issues (Carballo-Penela et al., 2018). In several studies, tactical information sharing is explored as a way to promote visibility and support teamwork for environmental targets and processes (Wong et al., 2020). These environmental cooperation programs and a common awareness of environmental solutions can have a positive impact on EMS procedures by directing product design or procedure improvements toward more ecologically feasible prerequisites and strategies for reducing waste in the logistics process (Xu et al., 2018).

### **2.2.3 Supplier's Environmental Commitment**

An organization's readiness to identify, state, and manage its duties toward the environment is referred to as having an environmental commitment (Simpson et al., 2007). The supplier's environmental commitment refers to the producer's efforts to acknowledge the responsibility for the environment and then accept ecologically sound behaviors that are in line with the sustainability requirements of its customers, such as implementing green practices and providing environmentally friendly products (Awan et al., 2018). Suppliers who commit to environmental awareness will concentrate on sustainable practices and create eco-friendly capabilities, lowering environmental risks and addressing sustainability challenges. According to earlier researchers, dedication is essential to sustaining long-lasting and worthwhile connections and benefits both the firms involved in buyer-supplier interactions (Patrucco et al., 2020; Shahzad et al., 2018). Suppliers who make significant efforts to adhere to buying firms' environmental requirements do so to ensure the relationships' continuity and stability, as well as their capacity to produce profitable economic, environmental, and social performance outcomes for the organizations that are involved (Chen & Chen, 2019b). Green supply chain management is being used more frequently by purchasing organizations to effectively boost suppliers'

environmental commitment. For this essay, supply chain management refers to supplier management strategies used by purchasing companies concerning environmental concerns, such as environmental evaluation and cooperative activities (Gualandris & Kalchschmidt, 2015).

The firm's and workers' dedication to and knowledge of the environment may grow because of the adoption of proactive environmental strategies (PES) (Zhang et al., 2019). The projects started by Mariadoss et al. (2016) with the suppliers' cooperation and involvement are the consequence of the company's environmental awareness and orientation. For instance, vendors must guarantee that components and goods do not contain hazardous chemicals to participate in Huawei's Green Partner Certification Program. It develops action plans in addition to environmental evaluation criteria for vendors. Organizations may increase their environmental awareness and ability to protect the environment by integrating environmentally friendly vendors into their supply chain, synchronizing their activities with their suppliers, and creating strategic environmental goals (Dai et al., 2015). Compliance companies get essential environmentally friendly resource assets and expertise from supplier partners to enhance their environmental performance (EP). Where EP varies amongst industries and businesses, there is a risk, and this must be handled. Environmental risk and EP have a negative relationship (Dobler et al., 2014). Dynamism, generosity, and intricacy are examples of contextual characteristics that might enhance the EP (Hartmann & Vachon, 2018). Greening the supplier (GTS) and internal green integration (IGI) are anticipated to be significant strategies to improve EP through PES (Zhu & Sarkis, 2007). The transformation of IGI into sustainable supplier integration may be guaranteed by businesses with outstanding cooperation skills (Gölgeci et al., 2019).

Collaboration among supply chain participants can advance efforts to reduce pollution and advance environmental practices (Vachon & Klassen, 2008). More precisely, working with suppliers can help manufacturing companies find environmentally hazardous resources (technology, materials, and standards) (Oelze, 2017). Sharing knowledge and insights across

organizational boundaries may help all parties comprehend various approaches, make environmental improvements, create and protect environmentally friendly goods, devise sustainable manufacturing methods, lower costs for parties, and provide win-win outcomes.

According to Danese et al. (2019), organizations with a pro-environmental perspective are more likely to take these issues into account and include green initiatives into their objectives, strategies, and strategic planning. They also take a lot of internal steps to decrease their negative environmental consequences. Business executives that take into account environmental plans while making choices are rewarded financially, encouraging them to follow the route to becoming successful industrial leaders. Wong et al. (2015) noted that environmental objectives and performance obligations are frequently combined in models. This integration helps all workforces develop a shared environmental sagacity and motivates them to look for solutions to minimize harmful environmental consequences in their everyday operations (Zhang et al., 2019). For instance, different divisions might actively share their environmental expertise with one another. In order to coordinate and handle environmental issues in the connections between procurement, production, and transportation, an integrated cross-functional management of the environment team may be developed. Additionally, companies that wish to develop an effective environmental management strategy should begin by giving out green signals to establish a working environmental status. They become more approachable to interested, relevant personnel, allowing them to increase the structure's environmental orientation and boost the effectiveness of their internal green integration (IGI).

Fairness can successfully lower the perceived risk in economic contact, according to an organizational justice study (Chang & Hsiao, 2008). The fear of being taken advantage of among suppliers is reduced, and their propensity for dependable and proactive behavior is increased, by purchasing organizations that show concern and regard for the dignity and rights of the other party (Zaefarian et al., 2016). The advantages of the partnerships are more apparent to

the suppliers, which encourages a more favorable attitude toward each other and the relationships and improves the effectiveness of any environmental evaluation or cooperation activities that may be used. As a result, the client is encouraged to be committed to the relationship, actively participate in information exchange, and engage in other pairing actions (Liu et al., 2012). In sustaining with this theme, we argue that the connection between environmental assessment/collaboration and vendor environmental commitment will be strengthened when suppliers believe that their relationships with the companies that make purchases are further separated by a reasonable distribution of results, reasonable procedures, proper treatment of individuals, and balanced information.

When buyer-supplier relationships are distinguished by an atmosphere of openness and respect, and suppliers believe that partnering with purchasing firms can increase their competitive advantage, suppliers are less likely to worry about potential advantageous actions on the other side and are more likely to invest in order to boost their ability to meet their clients' environmental requirements (Alghababsheh et al., 2018; Goffnett, 2018). Even though meeting the other party's sustainability requirements may increase their transaction costs, suppliers are strongly encouraged to reduce environmental risks by improving their procedures and machinery, adopting environmental training for their employees, and acting quickly on any environmental anomalies that may emerge from assessment sessions.

First-tier vendors are the direct connection to transfer sustainability standards to further n-tier suppliers since focus firms frequently encounter significant obstacles to affecting n-tier vendors with whom they do not have a direct contract (Sancha et al., 2016). Focused organizations adopt various strategies to manage the connection with their suppliers to incorporate social and environmental considerations into supplier development and selection processes (Büyüközkan & Karabulut, 2018). Specifying sustainability criteria via a Code of Conduct is a common initial step (Burritt & Schaltegger, 2014). In terms of social and environmental concerns related to their

activities, the focus company's top suppliers are expected to adhere to a code of conduct (e.g., Harmset al., 2013). The focal firm might compel a supplier to adhere to the stated sustainability criteria by inserting the Code of Business Conduct in the contract. However, simply meeting sustainability standards does not yet ensure that the supplier's actual sustainability performance is attained or enhanced (Beske et al., 2006). Therefore, focus enterprises must be able to evaluate supplier sustainability performance to ensure that it complies with the sustainability criteria.

## **2.3 Theoretical Review**

In the theoretical review, the theory underpinning the inquiry is offered, along with a discussion of how it illustrates the notions linked to this study. It serves as the basis upon which the hypothesis of a scientific analysis may be built or confirmed (Solomon & Ayebale, 2017).

### **2.3.1 The Natural Resource-Based View (NRBV)**

Hart first proposed the Natural Resource-based View (NRBV), a development of the business's prior Resource-Based View (RBV), in 1995. (Barney, 1991). A theoretical framework called the RBV describes how to exploit a company's valuable assets. NRBV suggests three interconnected environmental strategies: product stewardship (reducing product life cycle costs by redesigning), avoidance of pollutants (minimizing environmental damage and degradation through, for example, emissions discounts, reducing packaging, etc.), and eventually sustainable improvement (reducing the company's environmental impact on the plant environment). Particularly unskilled supply chain management systems may be essential for putting those solutions for the environment's natural resource problems into practice. Techniques and outcomes for supply chain control that lack expertise. The definition of GSCM provided by Carter and Rogers (2008) is "the tactical, apparent cooperation and achievement of an organization's social surroundings and financial desires in the methodical integration of key inter-organizational business practices that enhance the financial health over the long term of each corporation and its supply chains."

According to this definition, the study concurs with Tachizawa et al. (2015) contention that, to achieve a long-term competitive advantage, GSCM as a conceptual approach has to be distinguished from GSCM's distinctive and inimitable resource methods (Barney,2015). Strategic assets of a corporation have a distinctive quality that distinguishes them from rivals. A corporation to differentiate itself from rivals uses strategic resources. According to Hart (1995), the RBV theory assumes a disproportionate dependence on internal capabilities and fails to adequately take into consideration the impacts of the natural environment. Organizations need to think about more than just their resources; they also need to think about how those resources interact with the environment. Organizations need to think about more than just their resources; they also need to think about how those resources interact with the environment. Hart (1995) asserts that this transition between an organization and its natural environment can reconcile internal and exterior flaws in RBV theories and that NRBV had a better comprehension of this transformation. Like other ideas, NRBV will only benefit green supply chains if it is managed and kept up to date properly. Using the NRBV theory, this study investigates the factors that influence environmental assessment, environmental collaboration, and the impact of suppliers' environmental commitment.

## 2.4 Empirical Review

The empirical analysis presents a summary of recent research that has looked at the interactions between different constructs in the studies, their contexts, and the relevant factors that relate to the constructs.

**Table 2.1 Empirical Review Table**

Author/ Year	Findings
Ferri and Pedrini, (2017)	There is an advantageous link between social and environmental elements and enterprise fulfillment in both dimensions, but the electricity of this relationship varies

	<p>depending on how the criteria are combined. When dealer relationship control, danger discount, and competitiveness are incorporated into the supplier choice segment, an environmental issue contributes to monetary performance.</p>
<p>Vachon and Klassen, (2018)</p>	<p>Vachon and Klassen also regarded and establish evidence for tremendous relationships between clients, suppliers, and more than a few operational performance metrics, consisting of nice, transport, flexibility, fee, and environmental effect. Pullman et al. (2019) discovered evidence of a relationship between environmental and quality performance, as well as cost performance, of ecologically sustainable measures including conservation and land management. Green practices and customer happiness and quality are connected to operational success, according to Azevedo et al. (2017), and green practices aid to increase economic and environmental performance. Environmental management techniques, both internal and external, are favorably associated with environmental performance, but not with a company's economic success, according to De Giovanni (2016).</p>
<p>Joanne Jung-Eun Yoo et al. (2021)</p>	<p>The researchers conducted a study to determine the impact of dynamic capabilities on the adoption of green practices by comparing event planner requests to supplier capabilities. By examining the moderating effects of green</p>

	<p>company image and public pressure, the study intended to give insights into the adoption of strategic sustainability strategies. Data were analyzed based on 207 usable responses from event planners. Polynomial regression and surface response analysis were used to confirm the hypothesized connections. Furthermore, hierarchical regression analysis was utilized to see if the green company's reputation and the increased scrutiny had any moderating influence on the predicted connections. Green practices were found to have a positive relationship with product flexibility fit; however, this impact was not seen in the quantity flexibility fit model. The favorable impact of product flexibility on green behaviors was magnified by public pressure, according to the research. The green organization image, on the other hand, was shown to have no significant moderating influence.</p>
<p>Ebenezer Afum et al., 2020,</p>	<p>The explanatory link between green supply chain integration (GSCI) and sustainable performance was investigated by Ebenezer Afum and colleagues. The investigation was carried out using the explanatory research approach. Information from 178 industrial small and medium-sized firms (SMEs) in Ghana was gathered using structured questionnaires. To develop and evaluate hypotheses, partial least square structural equation modeling (PLS-SEM) was used. The results of the study</p>

	<p>revealed that GMPs significantly improved long-term performance (EP, EnP, and SP). Again, GMPs had a large beneficial impact on GSCI. Long-term success and ecologically friendly practices are connected by the GSCI.</p>
<p>Saumyaranjan and Vijayvargy, (2020),</p>	<p>The research was conducted to look at the effects of five different GSCM practices (investment recovery, eco-design, client cooperation, green purchasing, and internal environmental management) on three different aspects of an organization's performance (i.e., economic, environmental, and operational performance). The data was compiled using a cross-sectional survey of 160 manufacturing company managers in India. The impact of GSCM practices on each of the overall organizational outcomes was investigated using structural equation modeling. All other GSCM elements, except for microenvironment management and green buying, are found to have a considerable influence on at most one of the performance metrics, either directly or indirectly. The findings show that investment recovery practices are important predictors of environmental performance, whereas eco-design is a significant predictor of operational success. The results of structural equation modeling further imply that, although GSCM does not directly affect economic performance, it might indirectly benefit it.</p>

<p>Yaw Agyabeng-Mensah et al., (2020).</p>	<p>The impact of green logistics management practices logistical consciousness, and Yaw Agyabeng-Mensah et al., (2020), investigated supply chain visibility on long-term performance. Sustainable integrated logistics principles have become a crucial determinant of organizational performance due to the high value put on green practices in increasingly competitive markets. Data was collected from 274 executives of industrial businesses in Ghana using standardized questionnaires. The data was investigated using a partial least square structural equation modeling technique to assess the hypotheses. According to the findings of the study, GLMPS has a favorable impact on environmental stewardship. On the other side, GLMPS has a negative influence on business performance. The data also demonstrate that employing the mediation effect technique, logistics irregularity, and distribution network traceability may assist GLMPS to increase both firm production and environmental sustainability significantly.</p>
<p>Al-Shboul et al. (2018)</p>	<p>The study evaluated best practices of supply chain management applied that are implemented in medium and large-sized Gulf manufacturing firms. The study examined seven supply chain management practices, namely cooperation with suppliers, flexibility with partners, use of the Internet, customer orientation, production optimization, internal integration, and quality management. T-tests and</p>

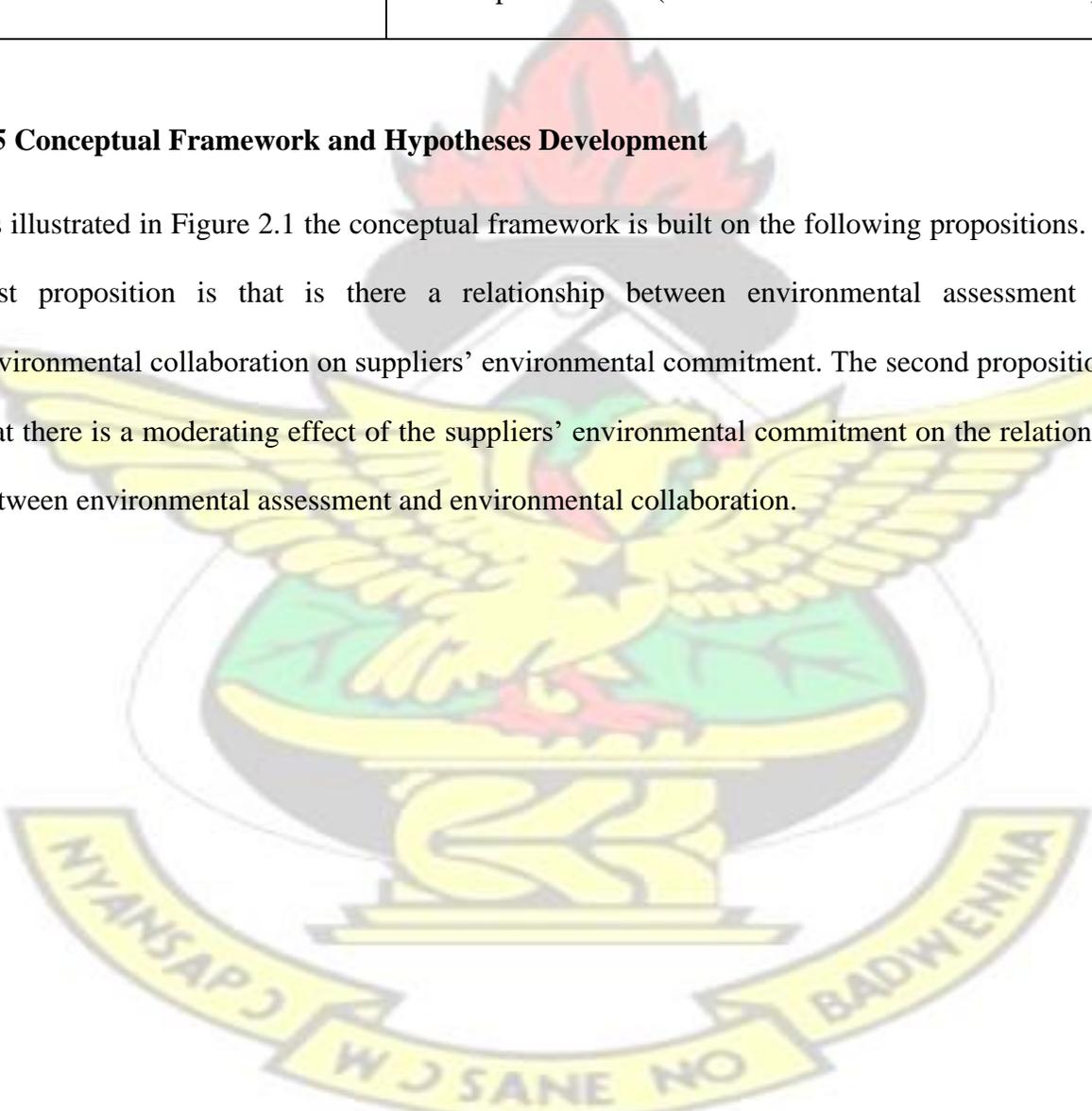
	<p>multiple linear regression analysis were used to identify the best practices of medium and large manufacturing companies in the Gulf region. The results showed that quality management, customer orientation, and supplier cooperation are considered best practices of supply chain management in manufacturing companies in the Gulf region. The use of the internet was perhaps a good practice in the past, but this is no longer the case today. Lean manufacturing cannot yet be described as such, but it could become the best practice of supply chain management.</p>
<p>Aswini et al. (2019)</p>	<p>The study identified the impact of SCMP (i.e., strategic relationship with suppliers, relationships with customers, information exchange level, information exchange quality, risk, and benefit sharing) on business performance, i.e., commercial and FP. The tool is accepted and managed by 115 people from 6 organizations in Chennai. A reliable sample of 100 people was gathered for further investigation, and multiple regression analysis was used to pinpoint the study's goal. The findings demonstrated that SCMP (i.e., collaborative arrangements with suppliers, customer relationships, level and quality of information sharing, deferral, and the distribution of risks and rewards) has a positive impact on an organization's effectiveness (i.e., business and financial performance).</p>

<p>Arora et al. (2020)</p>	<p>Environmental partnership has been recommended as a mediator between ecological strategic purchasing and corporate sustainability performance in a recent study by Arora et al. (2020). Collaboration enhances social and environmental performance as well as economic and social performance (Camilleri, 2021; Miemczyk, 2019; Wang, 2018); however, environmental performance is not always enhanced by collaboration (Pakdeechoho, 2018). Wang and Dai (2018) and Agyabeng-Mensah et al. (2020), in contrast, discovered that collaboration had no effect on social performance. The study proposes collaboration as a mediator to strengthen the link between sustainable practices and social performance and to determine the important effect of sustainable practices on social performance.</p>
<p>Sancha et al. (2015) &amp; Sancha et al. (2016)</p>	<p>The study concluded that for purchasers to improve supplier compliance with human rights, decrease the use of child labor, and enhance safety and working conditions at their facilities, cooperation and supplier development methods should be used. The study's findings also support earlier research by Huq et al. (2016), which revealed that by developing social management capabilities through collaboration with vendors and other stakeholders, buyers provide the foundation for better suppliers both internally and in conditions (e.g., NGOs). Contrary to assessment</p>

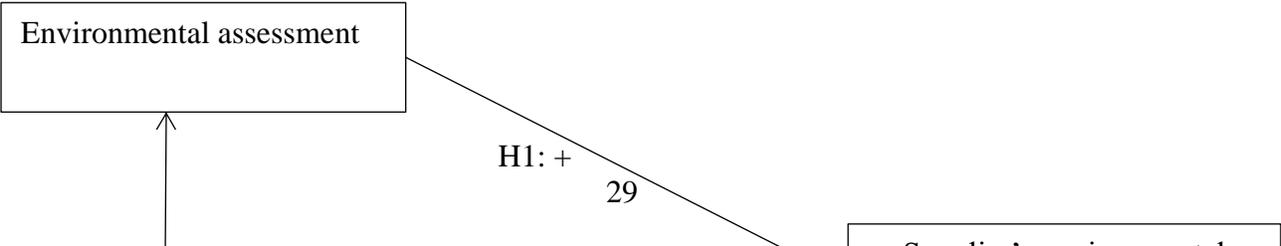
	<p>practices, it is conceivable to assert that collaboration practices have a favorable effect on suppliers' social performance due to the interaction patterns established between buyer and supplier that promote shared learning, resource sharing, and knowledge exchange, permitting suppliers to develop particular capabilities to improve their social performance (Gualandris and Kalchschmidt 2016).</p>
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**2.5 Conceptual Framework and Hypotheses Development**

As illustrated in Figure 2.1 the conceptual framework is built on the following propositions. The first proposition is that there is a relationship between environmental assessment and environmental collaboration on suppliers' environmental commitment. The second proposition is that there is a moderating effect of the suppliers' environmental commitment on the relationship between environmental assessment and environmental collaboration.



**Conceptual Framework**



## **Figure 2.1 Conceptual Framework**

**Source: Author's Construct (2023)**

### **2.5.1 Environmental Assessment and Supplier's Environmental Commitment**

Typically, the objectives of the participating organizations do not correspond to those of the buyer and supplier partnerships. On the one hand, buyers expect more from vendors in terms of quality, service, innovation, and sustainability. Vendors, on the other hand, work hard to meet their customers' demands while increasing their sales or profit margins. Contractual governance, according to Shahzad et al. (2018), has the potential to increase goal alignment among participants in inter-organizational cooperation. Goal alignment boosts anticipated returns and decreases behavioral uncertainty, which incentivizes participating firms to engage in partnerships financially (Maestrini et al., 2018). As a result, it has been observed that relationships between buyers and suppliers and goal alignment increase information and resource exchange, motivate relation-specific efforts to share and tackle common problems, and, ultimately, promote commitment on the part of both parties, particularly the supplier (Yan & Dooley, 2013). Extending this perspective to green supply chain management, environmental assessment can be viewed as a transactional

mechanism through which purchasing firms not only impose environmental standards on suppliers but also conduct regular environmental reviews and provide timely feedback on the results to the suppliers (Sancha et al., 2016). As a result, there are fewer information gaps between customers and vendors, suppliers may better align their environmental goals with those of their competitors, and behavioral inconsistency in the partnerships is finally reduced, encouraging suppliers to become more environmentally committed. Assessment methods may help with goal alignment and supplier commitment in two ways: by aiding suppliers in satisfying the buyers' environmental criteria and motivating them to internalize those standards and build their own environmentally friendly practices.

On the one hand, purchasing companies limit exhaust gas emissions, limit sewage and waste emissions in suppliers' manufacturing operations, and encourage suppliers to use recyclable and nontoxic packaging materials as part of their assessment efforts (Danese et al., 2018). Purchasing organizations do this to encourage suppliers to deliver goods that adhere to their environmental criteria (Shumon et al., 2019). As a way to lessen their negative environmental effects, suppliers are encouraged to participate in assessment activities to improve their knowledge of products management systems, strengthen process control, and keep an eye on waste generation and transportation (Sancha et al., 2019; Sancha et al., 2016). All of this lower transaction costs brought on by return of goods and rework and lowers transactional uncertainty.

On the other hand, certain third-party vendors lack the environmental management tools, expertise, and information necessary to correctly assess their environmental weaknesses and take appropriate action (Sajjad et al., 2015). Suppliers can learn about the detrimental effects that their existing production, procurement, and transportation activities may have on the environment in such situations by participating in evaluation procedures that enable buyers and suppliers to communicate about environmental management concerns (Liu et al., 2018). This not only helps suppliers in their attempts to follow the environmental requirements of the customers, but it also

enables them to align their environmental requirements and procedures with the objectives of their counterparts (Shumon et al., 2019). The researchers proposed the following hypothesis:

*H1: Environmental assessment is positively associated with the supplier's environmental commitment*

### **2.5.2 Environmental Collaboration and Supplier's Environmental Commitment.**

Both purchasing and supplying businesses' individual players must often connect with one another in order for close inter-organizational coordination on environmental concerns to occur (Gölgeci et al., 2019). As a result, the reciprocal duties and requirements of fairness and honesty are established over time and become woven into a rich tapestry of social interpersonal links that cut over the limits of the participating organizations (Larson, 1992). This, in turn, increases the efficacy of organizational actors on both sides in engaging in collaborative activities related to the environment, laying the framework for the development of trust and respect between each other at the inter-organizational level (Capaldo, 2014).

Inter-organizational trust causes parties to put more money and psychological effort into the connection since it lessens the risk of opportunistic conduct on the other side (Capaldo & Giannoccaro, 2015; Chan & Ma, 2020). Particularly buying businesses are comfortable making investments in their suppliers, sharing their understanding of environmental challenges with them more openly, or even working together to produce new information about environmental management (Yen, 2018). Buyers, for example, pass explicit [manuals or processes] or tacit [know-how] environmental information to suppliers, or they directly contribute capital, equipment, and employees (Chen & Chen, 2019a; Sancha et al., 2016). Buyers also give environmental training and education to suppliers. In certain instances, buying companies even work with suppliers to build inter-organizational procedures for collaborative pollution management (Tachizawa et al., 2015) or to (re)design green goods or production processes. Suppliers are both encouraged and equipped (and sometimes even obligated) to respond in like,

particularly by embracing the buying businesses' environmental idea, increasing a sense of responsibility for the environment, and developing environmental management capabilities. This is because their clients help them understand environmental challenges and engage in green collaborative activities, and they are supplied with the resources they need to do so. Customers' engagement in collaborative activities is seen by suppliers as an investment made by the other party to expand the suppliers' knowledge base and minimize transaction costs. As a result of this impression, customers' participation in mutually advantageous endeavors is particularly helpful in fostering supplier commitment (Patrucco et al., 2020). The researchers proposed the following hypothesis:

**H2.** *Environmental collaboration is positively associated with supplier environmental commitment*

### **2.5.3 Supplier's Environmental Commitment, Environmental Assessment, and Environmental Collaboration.**

Environmental assessment, environmental collaboration, and the environmental commitment of a supplier are all linked and mutually reinforcing. Environmental evaluation gives a complete picture of a supplier's environmental effect and performance. It assists in identifying areas for improvement, setting targets, and developing measurements to track progress toward environmental goals. Suppliers may identify environmental risks and possibilities through environmental assessments, allowing them to build plans and activities to reduce negative impacts and strengthen their environmental commitment. The evaluation method encourages suppliers to accept accountability for how they treat the environment and make improvements to comply with sustainability targets (Patrucco et al. 2020).

Collaboration with consumers, those who matter, and supply chain partners encourages a team approach to environmental responsibility. It fosters a shared knowledge of the value of

sustainability and stimulates collaboration in the search for new solutions. Collaborative approaches provide information sharing, best practice exchange, and access to resources and experience that may support and increase a supplier's environmental commitment. cooperative efforts and collaborations, such as shared sustainability programs, cooperative initiatives for research and development, and supply chain integration for sustainable practices, can contribute to the creation and execution of more successful environmental strategies (Cheng, 2020).

Environmental assessments lay the groundwork for information and data that can be shared and used in collaborative activities. Assessment findings can educate and steer collaborative activities toward areas of growth and agreed goals. Collaboration improves the efficacy of ecological assessments by bringing in new views, knowledge, and resources to solve identified environmental concerns. The combined effort of environmental evaluation and cooperation results in a cycle of continual improvement. The outcomes of evaluations influence cooperation, which in turn drives more assessments and improvements, establishing a beneficial feedback cycle for environmental commitment.

Environmental assessment and collaboration are inextricably linked to a supplier's environmental responsibility. Environmental assessment equips suppliers with the knowledge and awareness they need to evaluate their environmental effects and make changes. Collaboration allows for the exchange of information, resources, and cooperative activities that may support and deepen a supplier's environmental commitment. These characteristics, when combined, foster a culture of sustainability, motivate environmental stewardship, and lead to a greener, more responsible supply chain.

**H3:** *There is a positive interaction between environmental assessment, environmental collaboration, and suppliers' environmental commitment.*

# KNUST



## **CHAPTER THREE**

### **RESEARCH METHODOLOGY AND PROFILE OF STUDY**

### **3.1 Introduction**

This chapter examines the approach or general strategy used to investigate the impact of environmental assessment and environmental collaboration of some selected manufacturing businesses, as well as the moderating role of suppliers' environmental commitment. The research design, research procedure, study population, sample size, and method, data types and sources, data collection method, data analysis method, validity and reliability tests, ethical considerations, and study profile are all thoroughly detailed.

### **3.2 Research Design**

According to Bryman and Bell, (2007), is a logical collection that mixes empirical statistics, studies questions, and conclusions. A research layout must specify the overall shape and path of examination, besides the framework within which records may be accrued and processed. Studies can be categorized into three kinds based on the objective of the observation: exploratory, descriptive, and explanatory studies (Creswell, 2008). Using a descriptive and explanatory technique, this study investigated the influence of environmental assessment and environmental collaboration on the overall performance of selected industrial businesses, as well as the moderating function of suppliers' environmental commitment. The descriptive portion helps researchers to explain and extend general awareness of the topics being investigated, whereas the explanatory section assesses the causes and effects of the variables used in the study (Mouton, 1996). To obtain data from respondents, the study employed a survey method. This was accomplished by creating structured questionnaires and handing them out to the respondents to complete. Using a survey approach, the effect of environmental assessment and environmental collaboration on the overall performance of selected industrial businesses, as well as the moderating function of suppliers' environmental commitment, was explored. Because it is most suited for quantitative research, this survey style was chosen.

### **3.3 Research Method**

Research techniques are step-by-step procedures for collecting and analyzing data. It describes the research's nature, organization, and strategy for obtaining answers to the study's objectives (Kassu Sileyew, 2019). The data gathered in the field for this study was analyzed and evaluated by the student using a quantitative technique. Quantifying associated replies to the questionnaire and certain interviews were done using the quantitative approach. The Statistical Package for Social Sciences (SPSS) software was used to conduct the statistical analysis. Because of their capacity to reinforce and improve the validity of the findings, these strategies were chosen.

### **3.4 Study Population**

According to Osoro et al. (2015), population refers to the larger group of every participant from which a sample is drawn. According to Pernecky (2016), a population is a bigger grouping of all persons from which a sample is obtained. Cooper and Schindler (2010) define the unit of analysis as the participant or the object being assessed. The study's population consists of small and medium-sized firms (SMEs) in Ghana's Ashanti and Greater Accra regions that have been in operation for at least four years. Criteria for determining what firm size are numerous (Dabebneh and Tukan, 2007). In this study, SMEs refer to autonomous business entities that engage between five and one hundred full-time employees (Ghana Statistical Service 2015; Dabebneh and Tukan, 2007). The study's main goal is to investigate the influence of environmental assessment and environmental collaboration on the overall performance of selected industrial businesses, as well as the moderating function of suppliers' environmental commitment. The target population of the study included Computer, electronic, and electrical products, basic metals, transportation equipment, textile, chemicals, and chemical products, paper and paper products, food products, and leather and related products. Specifically, procurement officers, account officers, finance officers, inventory managers, and senior administrative staff were involved in the study. The target respondents were estimated around 100.

### 3.5 Sample Size and Sampling Technique

According to Ary et al. (2018), sampling is the process of selecting a fraction of a population to serve as an unbiased representation of that group. The goal of sampling is to save money and time. In this experiment, snowball and purposeful sampling were both utilized. Purposive sampling's ability to specialize in a population's unique qualities is its key attribute. The snowball technique also has its attribute to provide a referral to recruit samples required for the study. According to Naderifar et al. (2019), this type of method makes it easier to find subjects as they come from reliable sources. These techniques were painstakingly considered because of the heterogeneous nature of the firms in the manufacturing industry.

A sample is a subset of the target population that a researcher wishes to interview to draw broad conclusions about the target population (Etikan, 2016). The research participants were chosen at random using the probability sampling approach. The study used a stratified sample approach to choose 100 manufacturing companies for the investigation. The manufacturing companies were further divided into eight (8) strata (computer, electronic, and electrical products, basic metals, transportation equipment, textile, chemicals, and chemical products, paper and paper products, food products, and leather and related products.). More specifically, 15 firms were randomly selected from each stratum. The stratified sampling technique was used because it provides a fair representation of respondents. The study was conducted on all who answered the questionnaires and this brought out meaningful responses. The sample breakdown is set out in the table below.

Categories of Respondents/Respondents type (s)	Total number of Sample
Computer, Electronic, and Electrical product	10

Basic metals	10
Transportation equipment	10
Textile	10
Chemicals and chemical products	10
Paper and paper products	15
Food Product	15
Leather and related products	10
<b>Total</b>	<b>100</b>

**Table  
3.1**

### **Classification of Respondents and Sample Size**

*Source: authors' construct 2023*

### **3.6 Types and Sources of Data**

Primary and secondary data are the two types of data used in research. Neil J. Salkind, (2010) defines a key data source as "a first-hand data source obtained by the researcher for a specific study aim or project". Primary data may be amassed in several ways. The most commonplace methods encompass self-administered surveys, interviews, discipline remarks, and experiments. Information gathered from other resources, which includes educational articles, library searches, and so on, is referred to as secondary data. Records and information from past programs, such as courses and training materials, economic records, student/client information, group of workers' performance reports, and so forth, may also be in pre-present statistics. This study's sources of data, or sorts of data, were a big component of it. As a result, primary sources were used to acquire relevant data for the study.

### **3.7 Data Collection Method**

Data collection is a time-consuming activity that comprises obtaining, calculating, and interpreting data in order to receive answers to your queries. Cooper and Schindler (2013) state that data collection techniques are used after the researcher determines the type of data required, the

questionnaire questions to be answered, the necessary information types (such as nominal, order, gamma, or order has inversely related data for each of these questions), and the characteristics of the sample (such as whether the participant is able to articulate their ideas, thoughts, and experiences). The researchers used structured questionnaires to collect firsthand information from the field. The standardized questionnaires were delivered to the respondents, who were asked to reply willingly. The structured questionnaire served as an instrument for data collection. Questionnaires from previous studies were retrieved and changed, and some measures were taken to ensure that the processes were consistent with the research objectives, such as assessing the consistency of results with objectives and objectives. The various sources of the measurement instruments have been shown at the bottom of each construct in the questionnaire as stated in Appendix 1. The measurement scale for the study was a 5-point Likert scale where 5 implies strongly agree and 1 implies strongly disagree.

**Table 3.2 Variables, Number of Measures, and Sources of Measures**

Variables	Number of Measures	Sources of Measures
Environmental Assessment	6	<ul style="list-style-type: none"> <li>• Tachizawa et al. (2015)</li> </ul>
Environmental Collaboration	6	<ul style="list-style-type: none"> <li>• Tachizawa et al. (2015)</li> <li>• Gölgeci et al. (2019)</li> </ul>
Supplier's Environmental Commitment	4	<ul style="list-style-type: none"> <li>• Sancha et al., (2016)</li> </ul>

### 3.8 Data Analysis

Exploring, organizing, manipulating, and visualizing data to give relevant information, ideas, and decision assistance is what data analysis is all about (Etikan, 2016). According to Kothari, (1990), data analysis involves a series of closely related operations to summarize and organize the collected data to answer researchers' questions. Using SPSS version 23, the study conducted both descriptive analyses e.g., Mean and standard deviations, and inferential analyses, e.g., correlation

and regression. The reliability of the measurement instruments was assessed using the Cronbach alpha test.

### **3.9 Validity and Reliability**

An instrument's reliability is the degree of accuracy assigned to the quantities to be measured (Shaba, 2008). According to Chapman, (2018), data analysis is the method of examining, reorganizing, adjusting, and converting data to abstract valuable information from it. Reliability reflects the degree to which evaluations are carried out efficiently. Because of the independence of the test instruments, the standards for reliability are. They should offer a particular case free of the same outcome. Two analysts applying the same method would inevitably confer on the same result at the point where the reliability is high. Validity establishes if the data was gathered accurately and spreads conclusive questions. The researcher provided fundamental reliability and validity factors in this investigation. First, the research supervisor, appointed by the university to scrutinize the form and type of inquiries, was given the questionnaire guide. The reasoning behind this was that they were transparent and fair, breaking down on the off chance. Once more, we distributed the survey in advance to give our responders time and an opportunity to be ready. To limit the likelihood of mistakes and failures, the information acquired was thoroughly coded and analyzed. The data collection tool, the research questionnaire, was tested for validity and reliability. By validity, the best indicators or questions were chosen to test the definition after a serious inspection of several indicators. This was activated by a pre-test. In addition, metrics were tested to see accuracy in evaluating the definition at hand to fulfill the need for reliability. Linguistic ambiguity and ambiguous questions on selected indicators were subsequently eliminated or corrected. Each set of measures was tested for reliability using Cronbach's alpha, and their validity was determined then by evaluating the level of correlation across the scales (Hair et al. 2014).

### **3.10 Ethical Considerations**

According to Lewis et al. (2007), ethics are the principles or standards of behavior that guide moral judgements about our acts and relationships with others. Greener and Martelli (2018) argue that researchers, especially in primary research, must follow ethical concepts such as non-maleficence, beneficence, autonomy, and fairness. Only a few of the essential principles for data collecting that Newman et al. (2014) highlighted include informed permission, voluntary participation, the right to confidentiality, combating copying and pasting maintaining anonymous and privacy concerns. The directors and the respondents are both aware of their participation in the data collection exercise in terms of informed consent. Initially, this was accomplished by requesting an introductory letter from the firms of the several institutions under investigation. All needed material from various sources was paraphrased and properly referenced to avoid plagiarism. The study was then subjected to a duplication test to determine whether or not there was any possible plagiarism. To safeguard their anonymity, any personally identifiable information that may be used to identify people, such as names and other private information that is sensitive, was erased. These safety precautions were put in place to keep the respondents' identities private. Confidentiality was ensured by ensuring that all information was kept private and was only used for this study. Finally, the study provided adequate thought to all ethical considerations.

### **3.11 Profile of the Manufacturing Sector**

Industries with International Standard Industrial Classification (ISIC) divisions 15 through 37 are referred to as manufacturing. Value addition is the industry's net output after all outputs have been added and any intermediary inputs have been subtracted. The calculation does not account for natural resource deterioration and depletion as well as wear on manufactured assets. The third revision of the ISIC indicates the value-added source. The denominator for VAB nations is the total sum generated at factor cost. Industrial value added (% of GDP) in Ghana was estimated as 9.9205% in 2020 by the World Bank's collection of economic growth. In October 2021, data on

actual figures, historical information, forecasts, and estimations for Ghana's manufacturing industry as a share of GDP were acquired from the World Bank. The manufacturing sector's contribution to Ghana's GDP decreased from GH¢ 6772.80 million in the first quarter of 2021 to GH¢ 4612.31 million in the quarter.

The industry sector brought in GH¢133.1 billion, or 29.1% of overall revenue, and institutional agriculture brought in GH¢ 5.4 billion, or 1.2 percent. The annual production expenses for goods and services across all industries were GH¢167.5 billion. 58.3% of this was spent on goods and materials, 25.4% on other operating expenses, 8.0% on purchases for resale, and 6.0% on gasoline. The extra 2.1 percent was used to pay for things like water and electricity. Large businesses incurred the highest manufacturing expenses, which accounted for 27.5% of the total cost. GH¢107.8 billion, or 62% of all assets, is the entire value of the industrial sector's assets. According to the geographic contribution to total assets, the bulk of the assets reaching GH¢140.3 billion, or 81.1 percent of the total assets, were owned by organizations in the Greater Accra area. Assets totaling GH¢20.2 billion were sold, while assets worth GH¢ 30.1 billion were added to the existing portfolio. Of these, 99 percent were physical assets. The Greater Accra region contributed 88.7% of all contributions to fixed assets in contrast to the other regions. The majority of the GH¢30.1 billion worth of assets purchased by businesses were pieces of machinery and equipment (GH¢16.8 billion). During the past ten years, the total number of businesses in the segment more than doubled, with the production sub-sector serving as a major engine of growth. The total number of individuals employed over the ten years more than doubled, but there was no corresponding increase in the number of sector employees.

## **CHAPTER FOUR**

### **DATA PRESENTATION, ANALYSIS, AND DISCUSSION**

## 4.1 Introduction

This chapter concentrated on data analysis and discussion based on the study has collected data. The data was coded in SPSS version 21 before the data analysis. This software package could do several types of analysis on the data gathered. For the study, 100 questionnaires were distributed out of which 80 were retrieved from the respondents. The analysis began with a demographic analysis, which comprised of years of experience, products the company produces, and educational background among others. After that, the data were analyzed both descriptively and inferentially. Mean scores and standard deviations were used in descriptive statistics, while Pearson's correlation and regression analysis were used in inferential statistics. This chapter included includes a hypothesis test, as well as a summary of the analyses' findings.

## 4.2 Demographic Characteristics of Respondents.

Table 4.1 summarizes the respondent's demographic characteristics. The respondents were first asked to indicate the products their company produces. The majority of the respondents indicated that the company is into food production and recorded 35 respondents representing 43.8%. This is followed by Textile and Leather and related products recording 14 respondents representing 17.5% respectively. Those in Chemicals and chemical products recorded 6 respondents representing 7.5% whilst those in Computer, Electronic, and Electrical products also recorded 6 respondents representing 7.5%. Transportation equipment, basic metals, and Paper and paper products recorded 6 respondents representing 7.5% each respectively. Overall, it can be inferred that the selection of respondents used is familiar with the skills needed to grasp the subject and content of the questions presented in the questionnaires and have thus received their distinct opinions.

**Table 4.1: Demographic Characteristics**

Variables	Frequency (N)	Percentage %
Product of the Company		

Computer, Electronic, and Electrical product	6	7.5
Transportation equipment	6	7.5
Textile	6	7.5
Chemicals and chemical products	6	7.5
Paper and paper products	4	5.0
Food Product	35	43.8
Leather and related products	14	17.5
Basic metals	3	3.8
<b>Total</b>	<b>80</b>	<b>100.0</b>
<b>Type of Ownership</b>		
State-owned and collective firms	31	38.8
Private firms	37	46.3
Foreign-invested firms	12	15.0
<b>Total</b>	<b>80</b>	<b>100</b>
<b>Years of company existence/operation</b>		
1-5 years	31	38.8
11-15 years	11	13.8
16-20 years	5	6.3
6-10 years	15	18.8
Above 20 years	18	22.5
<b>Total</b>	<b>80</b>	<b>100.0</b>
<b>Number of the company on a full-time basis</b>		
21-30	9	11.3
31-40	2	2.5
Above 40	69	86.3
<b>Total</b>	<b>80</b>	<b>100.0</b>
<b>A dedicated supply chain management department/unit</b>		
No	21	26.3

Yes	59	73.8
<b>Total</b>	<b>80</b>	<b>100</b>
<b>People managing/supervising your supply chain function are generally well-educated</b>		
No	14	17.5
Yes	66	82.5
<b>Total</b>	<b>80</b>	<b>100.0</b>
<b>Have you been part of your organization for the past 3 years?</b>		
No	11	13.8
Yes	69	86.3
<b>Total</b>	<b>80</b>	<b>100.0</b>
<b>Highest Level of Education</b>		
Bachelor Degree	48	60.0
Diploma	1	1.3
Higher National Diploma	8	10.0
Master's Degree	21	26.3
Senior High School	2	2.5
<b>Total</b>	<b>80</b>	<b>100.0</b>
<b>Head Office Location</b>		
Northern belt (e.g., Northern Region)	4	5.0
Middle belt (e.g., Ashanti Region)	12	15.0
Southern belt (e.g., Greater Accra)	64	80.0
<b>Total</b>	<b>80</b>	<b>100.0</b>
<b>Number of Years in Position</b>		
1-5 Years	66	82.5
6-10 Years	13	16.3
16-20 Years	1	1.3
<b>Total</b>	<b>80</b>	<b>100.0</b>
<b>Position In the Company</b>		

CEO	2	2.6
Managing Director	8	10.0
General Manager	3	3.8
Sales Manager	7	8.8
Operations Manager	14	17.5
Marketing Manager	13	16.3
Supply chain/logistics Manager	13	16.3
Purchasing Manager	9	11.3
Production Manager	11	13.8
<b>Total</b>	<b>80</b>	<b>100.0</b>

**Source: Field Data (2023)**

The respondents were further asked to indicate the ownership of their company. The majority of the respondents indicated Private firms recording 37 respondents representing 46.3% and this is followed by State-owned and collective firms, which recorded 31 respondents representing 38.8% whilst Foreign-invested firms recorded 12 respondents representing 15.0%. On the number of years that the company has been in existence/operation, the majority of the respondents indicated that the company has been operating between 1-5 years, which recorded 31 respondents representing 38.8% and those above 20 years recording 18 respondents representing 22.5% follow this. Companies between 6-10 years recorded 15 respondents representing 18.8% and those between 11-15 years recorded 11 respondents representing 13.8% follow this. Those between 16-20 years recorded the least respondents of 5 representing 6.3%.

The respondents were again asked to indicate the number of company staff on a full-time basis. The majority of the respondents indicated that workers on a full-time basis are above 40 and this recorded 69 representing 86.3%. This is followed by those between 21-30 staff recording 9 respondents representing 11.3%. Those who are between 31-40 recorded the least respondents of 2 representing 2.5%. O.

### 4.3 Statistical Test

Table 4.2 displays the measurement's internal consistency results. The investigation found that all of the variables were within the permitted range of 0.7, indicating that the measurement tools were valid and trustworthy.

**Table 4.2: Internal Consistency of Construct**

Construct	Number of items	Cronbach's Alpha
Environmental Assessment	6	0.74
Environmental Collaboration	6	0.83
Supplier Environmental Commitment	4	0.73

Source: Field Survey, 2023

### 4.4 Descriptive Statistics of Study Variables.

The descriptive study of each concept is the emphasis of this section. The outcomes are provided in the next section. On a five-point Likert scale, 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, and 5=strongly agree, respondents were asked to score each variable. As a result, mean values for each item were projected to range from 1.00 to 5.00, with 3.00 being the average level.

#### 4.4.1 Environmental Assessment

The respondent's perceptions of the environmental assessment are examined in this section. Six measures were chosen based on the literature review and respondents were asked to assess their level of agreement on a five-point Likert scale. The analysis findings are shown in Table 4.3. The total mean was 3.719, according to Table 4.3. This shows that the vast majority of the respondents agreed that environmental assessments and audits are carried out by the organization. Specifically, it was realized that most of the respondents agreed, "*Our main customer(s) require us to comply with environmental regulations*" (Mean=3.700: SD=0.0988). In addition, the respondents agreed, "*Our main customer(s) conduct formal evaluations of us*" (Mean=3.525: SD=1.006). The result

again indicates, “Our company is evaluated and selected by our main buyer(s) based on environmental criteria” (Mean= 3.850: SD=0.781). Again, the respondents agreed that our main buyer(s) send its/their auditors to appraise our environmental performance and compliance (Mean=3.787: SD=0.837). The result further indicates, “Our main customer(s) provide us with feedback on evaluation results” (Mean =3.750: SD=0.921). Finally, the respondents agreed, “Our main customer(s) implement informal environmental audits on us” (Mean=3.700: SD=0.781).

**Table 4.3: Descriptive Statistics of Environmental Assessment**

<b>Statement</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>Std. D</b>
Our main customer(s) require us to comply with environmental regulations.	2	5	3.700	0.998
Our main customer(s) provide us with feedback on evaluation results.	1	5	3.750	0.921
Our main customer(s) conduct formal evaluations of us.	1	5	3.525	1.006
Our main customer(s) implement informal environmental audits on us.	1	5	3.700	0.947
Our company is evaluated and selected by our main buyer(s) based on environmental criteria.	1	5	3.850	0.781
Our main buyer(s) send its/their auditors to appraise our environmental performance and compliance.	1	5	3.787	0.837
<b>Overall Mean</b>			<b>3.719</b>	

**Sources: Field Survey, 2023**

The study's findings show that the manufacturing businesses under examination agree that their client(s) require them to abide by environmental rules and that the company has been undertaking environmental assessments. Customers of the firm do unofficial checks on them as well as official evaluations of the business. Finally, they receive feedback on the evaluation's findings from the primary customer(s).

#### **4.4.2 Environmental Collaboration**

The respondent’s perceptions of environmental collaboration are examined in this section. Seven measures were chosen based on the literature review and respondents were asked to assess their level of agreement on a five-point Likert scale. The analysis findings are shown in Table 4.4. The total mean was 3.948, according to Table 4.4. This shows that the vast majority of the respondents

agreed that environmental collaboration is carried out with the organization and its suppliers. Specifically, it was realized that most of the respondents agreed, “*Our main customer(s) cooperate with us in environmental product development and cleaner production processes*” (Mean=3.975: SD=0.913). In addition, the respondents agreed, “*Our main customer(s) provide us with design specifications that include environmental Requirements*” (Mean=4.150: SD=0.781). The result further indicates, “*Our main customer(s) provide us with training/ education.*” (Mean =3.862: SD=0.869). The respondents further agreed, “*Our main customer(s) help us reduce waste emissions*” (Mean=3.925: SD=0.776). Again, they agreed, “*Our main customer(s) support and encourage our attempts at energy conservation and efficiency improvement*” (Mean=3.925: SD=0.910). Finally, the respondents agreed, “*Our main customer(s) collaborate with us to acquire materials, parts, and/or services that support their environmental goals.*” (Mean=3.850: SD=0.956).

**Table 4.4: Descriptive Statistics of Environmental Collaboration**

<b>Statement</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>Std. D</b>
Our main customer(s) provide us with training/ education.	1	5	3.862	0.896
Our main customer(s) provide us with design specifications that include an environmental requirement	1	5	4.150	0.781
Our main customer(s) support and encourage our attempts at energy conservation and efficiency improvement.	1	5	3.925	0.910
Our main customer(s) help us reduce waste emissions.	1	5	3.925	0.776
Our main customer(s) cooperate with us in environmental product development and cleaner production processes.	1	5	3.975	0.913
Our main customer(s) collaborate with us to acquire materials, parts, and/or services that support their environmental goals.	1	5	3.850	0.956
<b>Overall Mean</b>			<b>3.948</b>	

**Sources: Field Survey, 2023**

The study's findings show that the manufacturing firms under consideration agree that they have been engaging in environmental collaboration with their suppliers and customers to obtain goods, services, and/or materials that back their environmental objectives. Customers of the business collaborate with them in the creation of environmentally friendly products and cleaner production techniques, and they aid in lowering waste emissions. Customers of the business also support and

encourage their efforts to increase efficiency and conserve energy. Once again, the firm's clients provide them with design guidelines that cover environmental criteria and give them training/education.

#### **4.4.3 Supplier's Environmental Commitment**

The respondent's perception of the supplier's environmental commitment is examined in this section. Four measures were chosen based on the literature review and respondents were asked to assess their level of agreement on a five-point Likert scale. The analysis findings are shown in Table 4.5. The total mean was 3.584, according to Table 4.5. This shows that the vast majority of the respondents agreed that suppliers are committed to the environment in their operations. Specifically, it was realized that most of the respondents agreed, "*We constantly evaluate and improve our business operations to fulfill the environmental requirements of our customers*" (Mean=3.900: SD=1.851). In addition, the respondents agreed, "*We have designed a set of procedures to ensure the reliability, consistency, and timeliness of environment-related data to comply with the environmental requirements of our customers.*" (Mean=3.600: SD=1.038). The result further indicates, "*We collect and manage environment-related data in our operational processes to optimize them in accordance with the environmental requirements of our customers*" (Mean =3.487: SD=1.114). Finally, the respondents agreed, "*We constantly evaluate and improve our products and services to fulfill the environmental requirements of our customers.*" (Mean=3.350: SD=1.080).

**Table 4.5: Descriptive Statistics of Supplier's Environmental Commitment**

Statement	Min	Max	Mean	Std. D
We constantly evaluate and improve our products and services to fulfill the environmental requirements of our customers	1	5	3.350	1.080
We constantly evaluate and improve our business operations to fulfill the environmental requirements of our customers	1	5	3.900	1.851
We collect and manage environment-related data in our operational processes to optimize them in accordance with the environmental requirements of our customers.	1	5	3.487	1.114
We have designed a set of procedures to ensure the reliability, consistency, and timeliness of environment-related data to comply with the environmental requirements of our customers.	1	5	3.600	1.038
<b>Overall Mean</b>			<b>3.584</b>	

**Sources: Field Survey, 2023**

The study's findings show that the businesses under examination agree that their suppliers are dedicated to protecting the environment. In order to meet the environmental needs of their clients, the organizations have developed a series of procedures to guarantee the accuracy, completeness, and timeliness of data connected to the environment. The businesses once more gather and manage environmental data as part of their operating processes to enhance them in line with the environmental demands of our clients. Additionally, the businesses continuously review and enhance their business processes to satisfy the environmental demands of their clients, and ultimately, the businesses continuously review and enhance their goods and services to satisfy the environmental demands of clients.

#### **4.5 Correlation Analysis**

The correlation results are provided in Table 4.6. The findings show that there is no significant association between environmental assessment and environmental collaboration ( $R = 0.637$ ;  $p$ -value  $> 0.05$ ). Furthermore, there is no substantial association between environmental assessment

and the supplier's environmental commitment ( $R = 0.692$ ;  $p\text{-value} > 0.05$ ). Finally, there was no substantial link between environmental collaboration and suppliers' environmental commitment ( $R = 0.710$ ;  $p\text{-value} > 0.05$ ).

**Table 4.6: Correlation analysis**

Constructs	1	2	3
Environmental Assessment	1		
Environmental Collaboration	0.637**	1	
Supplier's Environmental Commitment	0.692**	0.710**	1

**Source: Field Survey, 2023.**

#### 4.6 Regression Analysis and Hypothesis Testing

The suggested model was estimated using ordinary least square regression analysis. SPSS version 21 was used for the OLS analysis. Table 5.1 displays the findings of the OLS analysis performed to investigate the relationship between environmental assessment and supplier environmental commitment. Additionally, the connection between environmental cooperation and suppliers' commitment to the environment was examined. The effect of environmental evaluation and collaboration on suppliers' commitment to the environment was also studied.

**Table 4.7: Regression**

	Model 1	Model 2	Model 3	P-value	VIF
	Beta(t-value)	Beta(t-value)	Beta(t-value)		
Environmental Assessment	0.692 (8.469)			0.000	1.000
Environmental Collaboration		0.710 (8.897)		0.000	1.000
Supplier's Environmental Commitment			0.919 (0.665)	0.508	1.000
<b>Model Indices</b>					
R	0.692	0.710	0.775		
R Square	0.479	0.504	0.601	0.192	
Adjusted R Square	0.472	0.497	0.590		
F Change	71.730	79.162	57.918		

#### 4.6.1 Environmental Assessment and Supplier's Environmental Commitment

The model's predictive ability was good, with an R square of 0.47. As a result, the independent variables predict a 47.90 percent variation in the dependent variable (environmental assessment) (supplier's environmental commitment). The model revealed a positive and statistically significant relationship between environmental assessment and supplier's environmental commitment (Beta =0.692; t=8.469; Sig=0.000).

#### 4.6.2 Environmental Collaboration and Supplier's Environmental Commitment

The model's predictive ability was good, with an R square of 0.504. As a result, the independent variables predict a 50.4 percent variation in the dependent variable (environmental collaboration) (supplier's environmental commitment). The model revealed a positive and statistically significant relationship between environmental collaboration and suppliers' environmental commitment (Beta =0.710; t=8.897; Sig=0.000).

#### 4.6.3 The interaction between environmental assessment and environmental collaboration on supplier's environmental commitment

The model's predictive ability was good, with an R square of 0.775. As a result, the independent variables predict a 77.50 percent variation in the dependent variable (environmental collaboration and environmental assessment) (supplier's environmental commitment). The model revealed that both environmental collaboration and suppliers' environmental commitment have no interaction and significant impact on suppliers' environmental commitment (Beta =0.919; t=0.665: Sig=0.508).

#### 5.10: Hypothesis Table

Hypothesis		Beta	t	Sig	Remarks
<b>H1</b>	Environmental assessment has a positive and significant effect on Supplier's environmental commitment.	0.692	8.469	0.000	Supported
<b>H2</b>	Environmental collaboration has a positive and significant effect on and supplier's environmental commitment.	0.710	8.879	0.000	Supported
<b>H3</b>	There is no interaction between Environmental Assessment and Environmental Collaboration and Suppliers' Environmental Commitment	0.919	0.665	0.508	Not Supported

Source: Author's construct, (2023).

#### 4.7 Discussion of Findings

The main objective of the study is to investigate the effect of environmental assessment and environmental commitment of some selected manufacturing companies and the moderating role of suppliers' environmental commitment. Specific objectives were set, and a research model was created around the study's goal, which was backed up by hypotheses. Both descriptive and inferential statistics were used to assess the data obtained for the research.

#### **4.7.1 The relationship between environmental assessment and supplier's environmental commitment.**

The first objective of the study was to assess the influence of environmental assessment on suppliers' environmental commitment. However, the analysis showed a statistically significant and positive relationship between environmental assessment and supplier's environmental commitment (Beta =0.692; t=8.469; Sig=0.000). Goal alignment lowers behavioral uncertainty and raises anticipated profits, which incentivizes participating businesses to engage in their alliances on a financial level (Maestrini et al., 2018). Accordingly, it has been found that connections between buyers and suppliers and goal alignment promote knowledge and sharing of resources, inspire relation-specific efforts to communicate and address shared challenges, and ultimately promote dedication on both sides, particularly from the provider's perspective. When applying this viewpoint to the oversight of green supply chains, the environmental review can be seen as a transaction-oriented system by which companies buying goods not only enforce environmentally friendly requirements on providers but also carry out routine environmental reviews and promptly inform the suppliers of the findings (Sancha et al., 2016). Participation in assessment activities motivates suppliers to enhance their item data management systems, strengthen process control, and monitor waste creation and transportation in order to decrease negative environmental consequences (Sancha et al., 2019; Sancha et al., 2016).

#### **4.7.2 The Relationship between environmental collaboration and Suppliers' environmental commitment**

The second objective of the study was to examine the impact of environmental collaboration on suppliers' environmental commitment. However, the analysis showed a positive and statistically significant relationship between environmental collaboration and suppliers' environmental commitment (Beta =0.710; t=8.897; Sig=0.000). Inter-organizational trust causes parties to enhance their financial and emotional involvement in the relationship since it lessens their concern

about opportunistic conduct on the other side (Chan & Ma, 2020). Particularly buying companies feel secure enough to make investments in their suppliers and to freely share their understanding of environmental challenges with them. They may even work together to co-produce new information on environmental management (Yen, 2018). For instance, suppliers receive explicit [manuals or methods] or implicit [knowledge] environmental information from buyers, or they receive money, equipment, and personnel directly from buyers. Additionally, according to Sancha et al. (2016), customers educate and inform suppliers on environmental issues. According to Patrucco et al. (2020), suppliers view customers' involvement in cooperative activities as a beginning investment by the other party aimed at expanding the suppliers' knowledge base and lowering transaction costs. This makes it particularly effective at encouraging loyalty on the suppliers' end.

#### **4.7.3 The Interaction between environmental assessment and environmental collaboration on Supplier's environmental commitment**

The third goal was to determine how suppliers' environmental commitment is impacted by the interactions between environmental assessment and environmental collaboration. The analysis found that suppliers' environmental commitment is not significantly impacted by either environmental assessment or environmental collaboration. If suppliers believe that the relationships will produce significant tangible and intangible returns, that the relationships are based on mutually beneficial cooperation, and that the participating organizations have a good fit in terms of business practices and culture, they will be more willing to take part in the evaluations conducted by buying firms and address any environmental non-conformities that may arise (Cheng, 2011). They will perform better environmentally as a result of this.

## CHAPTER FIVE

### SUMMARY OF FINDINGS, CONCLUSION, AND RECOMMENDATIONS

#### 5.1 Introduction

The findings, conclusion, and recommendations for environmental assessment, environmental collaboration, and supplier's environmental commitment are summarized in this chapter. Environmental assessment, environmental collaboration, and supplier's environmental commitment were the main areas of attention in the study.

#### 5.2 Summary of Findings

The section enumerates the findings from the analysis.

##### 5.2.1 Environmental Assessment and Supplier's Environmental Commitment.

The study's primary objective was to assess the influence of environmental assessment on suppliers' environmental commitment. To attain this goal, a literature study was done and a structured questionnaire was created to help in data collection. The analysis showed a statistically significant and positive relationship between environmental assessment and suppliers' environmental commitment.

##### 5.2.2 Environmental Collaboration and Suppliers' Environmental Commitment

The second objective of the study was to examine the impact of environmental collaboration on suppliers' environmental commitment. To attain this goal, a literature study was done and a structured questionnaire was created to help in data collection. However, the analysis showed a positive and statistically significant relationship between environmental collaboration and suppliers' environmental commitment.

### **5.2.3 The relationship between environmental assessment and environmental collaboration on suppliers' environmental commitment.**

The third objective was to examine how the interaction between environmental assessment and environmental collaboration affects suppliers' environmental commitment. To attain this goal, a literature study was done and a structured questionnaire was created to help in data collection. The investigation revealed that both environmental assessment and environmental collaboration have no interaction and significant impact on suppliers' environmental commitment.

### **5.3 Conclusion**

With a focus on the moderating effect of suppliers' environmental commitment on the relationship between environmental assessment and environmental collaboration, the study's main goal is to investigate the impact of environmental assessment and environmental commitment of a few chosen manufacturing companies. After completing the study's goals, it was shown that there is a positive and statistically significant correlation between environmental evaluation and supplier commitment to the environment. Additionally demonstrated to have a statistically significant positive correlation in the model were environmental collaboration and supplier environmental commitment. The study also found that suppliers' environmental commitment is not significantly impacted by either environmental assessment or environmental collaboration. In order to avoid potential supply delays from their providing companies and thereby protect the environment, management should gain a deeper understanding of and familiarity with environmental impact assessment procedures and environmental partnerships with key suppliers of the firm.

### **5.4 Recommendations**

#### **5.4.1 Implication to Theory**

In the study, it was observed that the supplier's environmental commitment was positively and statistically significantly impacted by environmental collaboration and showed a statistically significant connection with environmental evaluation. By expanding on the features of

environmental assessment and environmental collaboration and their impact on suppliers' environmental commitment, the study's outcomes add to the resource dependence theory and the natural resource-based perspective theory.

The investigation also shows that suppliers that have optimistic expectations for their relationships with purchasing organizations would see their customers' joint environmental efforts even more favorably, which will strengthen the suppliers' environmental commitment. The study also raises the intriguing possibility that suppliers' perceptions of their customers' environmental evaluation processes may change if they have a favorable attitude toward their buying counterparts and the interactions, they have with them. According to an earlier study (Sancha et al., 2016), environmental cooperation seems to play a significant part in motivating suppliers' environmental commitment. As a result of the findings, the study can also make a significant contribution to a debate of improving suppliers' environmental management capabilities, which is a key component of green supply chain management (Hilliard & Goldstein, 2019). The development of environment-related abilities requires suppliers to have a sincere commitment to environmental issues, even while evaluation techniques can only, at best, assure standard compliance (Chen & Chen, 2019a). In order to do this, it is necessary for buyers and sellers to communicate collaboratively. In these contacts, interpersonal bonds and trust encourage the participating organizations to exchange environmental data and work together to develop new routines and practices. As a result of their recurred participation in experience and understanding of collaborative activities related to environmental issues, suppliers eventually integrate the green practices expressed by their clientele into their organizational processes and invest in the development of (inter) organizational capabilities specifically related to environmental management. A "norm of reciprocity" (Gouldner, 1960) that encourages suppliers to give back customers' investments in collaborative organizations, which they believe to be deliberate acts of

commitment, by placing corresponding or pertinent effort, emerges as collaboration advances and the societal framework of the relationship becomes denser.

#### **5.4.2 Managerial implications**

Furthermore, our study provides advice to practitioners on how to successfully implement green supply chain management. The primary conclusion of our study, that suppliers' opinions affect the relationship between buyer-led green supply chain management approaches and suppliers' environmental commitment, has important managerial repercussions. First of all, supply chain managers of buying firms should exercise caution when using their techniques for assessing their suppliers. The best way to determine a supplier's commitment to environmental issues may not be to conduct environmental audits on them and request that they provide self-assessment reports, third-party certifications, or both. A "one-size-fits-all" approach to supplier evaluation might also easily spark pushback from the suppliers. Contrarily, supplier training and development programs, flexible practices, exchange of knowledge, and investments in relationship-specific assets are much more effective ways for purchasing organizations to build and solidify over time supply chain relationships that involve shared comprehension and reciprocal trust, which will, in turn, encourage vendors' attention to and dedication to environmental issues.

Second, to allow smooth and effective management of sustainability issues across the supply chain, buying companies should actively promote the value of their relationships with suppliers. Establishing seminars and mutually beneficial factory visits, continually sharing information regarding the market and other environmental trends, and developing new business opportunities are all ways that purchasing firms can influence the opinions of their supplying partners positively and encourage profitable interactions with them. Throughout these situations, suppliers also have a propensity to expect better outcomes from their contacts with one another throughout the supply chain. The suppliers' environmental commitment will subsequently be strengthened, as will the overall beneficial impact of the acquiring companies' efforts to promote green management all

through the supply chain. As a result, suppliers will be more likely to support the green management initiatives of their customers.

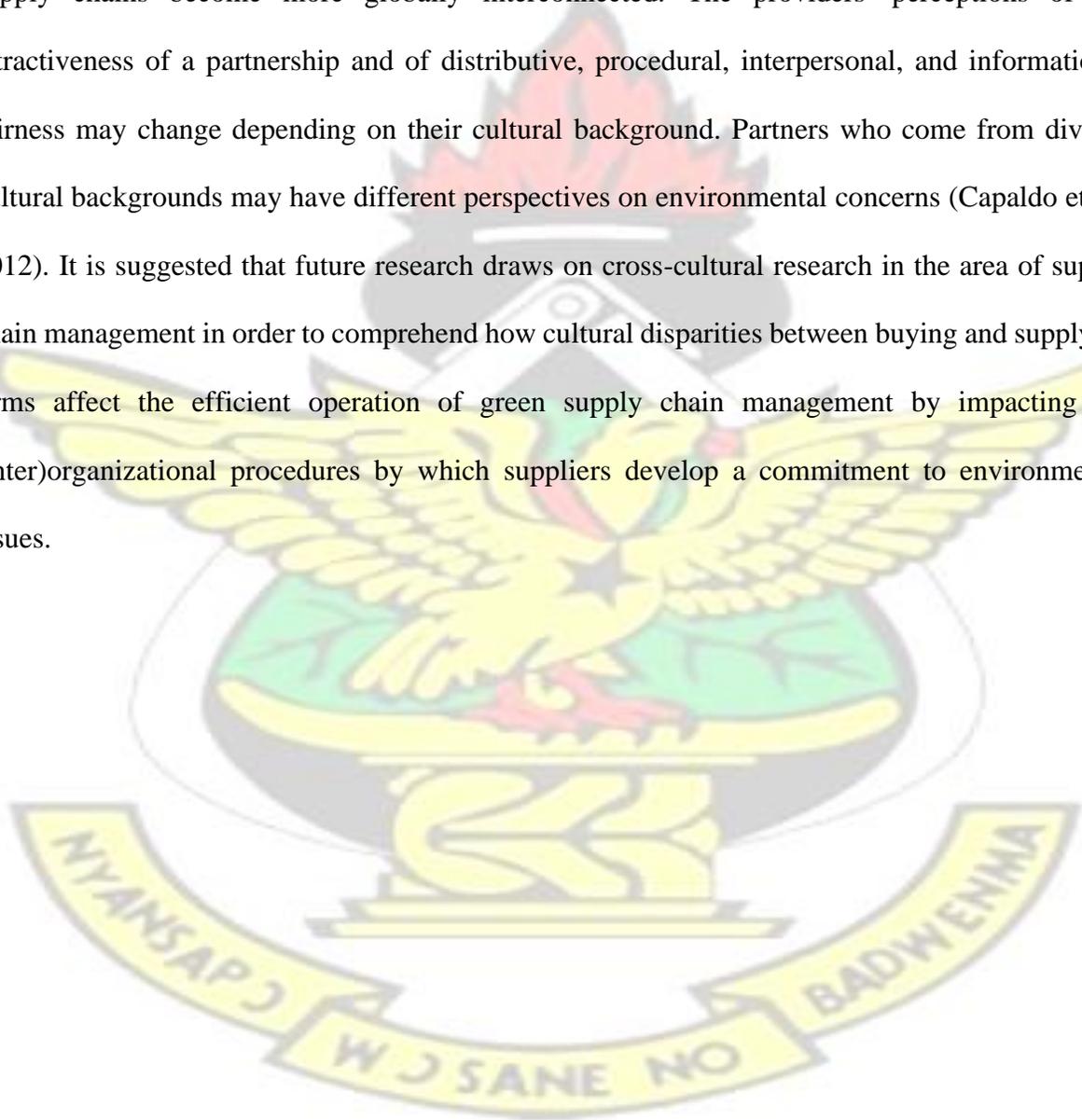
Finally, but perhaps most crucially, we recommend supply chain managers of purchasing organizations to focus on strategies and procedures created to improve the system in light of their interactions with the supplier chain. For instance, by integrating information systems and creating real-time data-sharing platforms across the supply chain, buying organizations may enhance the interchange of information with suppliers concerning cost, quality, and environmental problems. By doing this, purchasing organizations will be able to establish standardized procedures, offer suppliers incentives and resources commensurate with their efforts, and encourage transparency by minimizing prejudice in supply chain linkages.

#### **5.4.3 Recommendation for Future Studies**

The paper makes recommendations for further research. Because the current study was quantitative, its findings need to be verified by further investigation with a bigger sample size. Furthermore, only Ghanaian entities operating in two domains were included; broadening the study to include providers with a global perspective will increase the research's usefulness. Other industries, where the adoption of sustainability principles in green supply chains is essential, may do research along those similar lines. More research is recommended in these additional settings to verify this study and examine other possible variations in how SC partners use sustainable principles.

Nonresponding companies made up a large portion of the survey. The researcher advises upcoming researchers to perform follow-up surveys on nonresponding companies in order to improve the precision and validity of the findings. The study also looked at collaborative and environmental evaluation methods separately without exploring their linkages. Whether evaluation and collaboration work in tandem or separately will determine how effective green supply chain management will be, especially with regard to supplier environmental commitment.

The researcher also looked at how perceived relationship equity and attractiveness could affect the effectiveness of environmental assessment and collaboration. The theoretical stance taken in this study, which was based on suppliers' viewpoints, allowed for this inquiry. By utilizing other theoretical stances, future researchers may be able to identify and assess new elements impacting the effectiveness of green supply chain management. Our study, among others, does not address the impact of cultural difficulties, even though their significance is continuously expanding as supply chains become more globally interconnected. The providers' perceptions of the attractiveness of a partnership and of distributive, procedural, interpersonal, and informational fairness may change depending on their cultural background. Partners who come from diverse cultural backgrounds may have different perspectives on environmental concerns (Capaldo et al., 2012). It is suggested that future research draws on cross-cultural research in the area of supply chain management in order to comprehend how cultural disparities between buying and supplying firms affect the efficient operation of green supply chain management by impacting the (inter)organizational procedures by which suppliers develop a commitment to environmental issues.



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## QUESTIONNAIRE

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

#### **Environmental Assessment and Collaboration as Determinants of Supplier’s Environmental Commitment survey**

Thank you for considering participating in this research that seeks to understand environmental assessment, environmental collaboration, and the role of suppliers’ environmental commitment survey. While this research is for academic purposes, it also seeks to generate practical insights to help business executives in such companies better manage environmental issues in green supply chains to derive a competitive advantage.

For confidentiality reasons, please do not indicate your name or provide information about your organization to us. Only reflect on your personal experience (as a manager or executive in your company) and your company’s environment to respond to the statements/questions in the questionnaire. We can assure you that your responses will be anonymized and used only for statistical and academic purposes.

The questionnaire has specific instructions to follow and scales to use to indicate your responses. Every statement/question included in the questionnaire is relevant, and although some appear quite similar, they are unique in many ways, so **kindly do well to respond to each**. The questionnaire will take about **20 minutes** to complete.

All questions and concerns about the research can be directed to **Ebenezer Oduro Sakyi** (via +233 244139485), a postgraduate researcher who is leading the fieldwork. As a token of appreciation for participating in the study, you will receive a summary report of the study's key findings and recommendations. Please provide your email address here (in case you are interested in this package): .....

By continuing, you are consenting to participate. Thank you in advance for participating. Your co-operation is much appreciated.

# KNUST

## SECTION A

*This section presents different scales for evaluating different sets of statements. Using the respective scales, kindly tick/circle a number that represents your opinion on each statement. Kindly use the following scale to evaluate the statements in the subsequent table:*

Strongly disagree	Disagree	Somehow disagree	Neither agree nor disagree	Somehow agree	Agree	Strongly agree
1	2	3	4	5	6	7

<i>Please answer these questions based on the actual and current situation and not on beliefs</i> <b>(ENVIRONMENTAL ASSESSMENT)</b>	<i>Strongly disagree</i>						<i>Strongly agree</i>
Our main customer(s) require us to comply with environmental regulations.	1	2	3	4	5	6	7
Our main customer(s) provide us with design specifications that include environmental requirements	1	2	3	4	5	6	7
Our main customer(s) support and encourage our attempts at energy conservation and efficiency improvement.	1	2	3	4	5	6	7
Our main customer(s) implement informal environmental audits on us.	1	2	3	4	5	6	7
Our main customer(s) conduct formal evaluations of us.	1	2	3	4	5	6	7
Our main customer(s) provide us with feedback on evaluation results.	1	2	3	4	5	6	7

*Kindly use the following scale to evaluate the statements in the subsequent table:*

Strongly disagree	Disagree	Somehow disagree	Neither agree nor disagree	Somehow agree	Agree	Strongly agree
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1	2	3	4	5	6	7
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<i>Please answer these questions based on the actual and current situation and not on beliefs</i> <b>(ENVIRONMENTAL COLLABORATION)</b>	<i>Strongly disagree</i>						<i>Strongly agree</i>
Our main customer(s) provide us with training/ education.	1	2	3	4	5	6	7
Our main customer(s) provide us with design specifications that include environmental Requirements	1	2	3	4	5	6	7
Our main customer(s) support and encourage our attempts at energy conservation and efficiency improvement.	1	2	3	4	5	6	7
Our main customer(s) help us reduce waste emissions.	1	2	3	4	5	6	7
Our main customer(s) cooperate with us in environmental product development and cleaner production processes.	1	2	3	4	5	6	7
Our main customer(s) collaborate with us to acquire materials, parts, and/or services that support their environmental goals.	1	2	3	4	5	6	7

*Kindly use the following scale to evaluate the statements in the subsequent table:*

Strongly disagree	Disagree	Somehow disagree	Neither agree nor disagree	Somehow agree	Agree	Strongly agree
1	2	3	4	5	6	7

<i>Please answer these questions based on the actual and current situation and not on beliefs</i> <b>(SUPPLIER ENVIRONMENTAL COMMITMENT)</b>	<i>Strongly disagree</i>						<i>Strongly agree</i>
We constantly evaluate and improve our products and services to fulfill the environmental requirements of our customers.	1	2	3	4	5	6	7
We constantly evaluate and improve our business operations to fulfill the environmental requirements of our customers	1	2	3	4	5	6	7
We collect and manage environment-related data in our operational processes to optimize them in accordance with the environmental requirements of our customers.	1	2	3	4	5	6	7
We have designed a set of procedures to ensure the reliability, consistency, and timeliness of environment-related data to comply with the environmental requirements of our customers.	1	2	3	4	5	6	7

## SECTION B

*This section collects profile information about you and your company.*

- Which of the following products does your company produce/manufacture? (*Tick all that apply*)
  - Computer, Electronic, and Electrical product
  - Transportation equipment
  - Textile
  - Chemicals and chemical products
  - Paper and paper products
  - Food Product
  - Leather and related products
  - Basic metals and other products (kindly indicate): \_\_\_\_\_
- Type of ownership:  State-owned and collective firms  Private firms  Foreign-invested firms
- Which part of Ghana is your company or head office located in?
  - Northern belt (e.g., Northern Region)
  - Middle belt (e.g., Ashanti Region)
  - Southern belt (e.g. Greater Accra)
- How many years (approximately) has your company been in existence/operation? \_\_\_\_\_ years
- Firm size:  Less than 10 employees  10–20 employees  20–30 employees  30-40  More than 50 employees
- Does your company have a dedicated supply chain management department/unit?  Yes  No

- Are the people managing/supervising your supply chain function generally well-educated (e.g., have at least Higher National Diploma (HND) or bachelor’s degree)?  Yes  No
- Have you been part of your organization for the past 3 years?  Yes  No
- What is your highest level of education?  Senior high school  Diploma  Higher National Diploma (HND)
  - Bachelor’s Degree
  - Master’s degree
  - PhD
  - Other:(State) -----
- What is your position in your company?  CEO  Managing Director  General Manager
  - Sales Manager
  - Operations Manager
  - Marketing Manager
  - Supply chain/logistics Manager
  - Purchasing Manager
  - Other (kindly indicate)
- How long (in years) have you held this position?  Less Than 5 Years  5 -10years  10-15 years  Above 20years

<i>To what extent do you disagree or agree with the following statements?</i>	<i>Strongly disagree</i>						<i>Strongly agree</i>
The questionnaire deals with issues I am knowledgeable about.	1	2	3	4	5	6	7
The questionnaire deals with issues that I am interested in.	1	2	3	4	5	6	7
I am completely confident about my answers to the questions	1	2	3	4	5	6	7
I am confident that my answers reflect the organization’s situation.	1	2	3	4	5	6	7

**THANKS FOR PARTICIPATING IN THE SURVEY**

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