KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI

THE MEDIATING ROLE OF GREEN PROCUREMENT ON THE RELATIONSHIP BETWEEN ENVIRONMENTAL KNOWLEDGE AND PROCUREMENT SUSTAINABILITY: EMPIRICAL STUDY OF FIRMS IN THE WESTERN REGION OF GHANA

BY

ENNIN, MICHAEL
(B.tech. Procurement Management)

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DECLARATION

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

Ennin, Michael (PG9456621)	.....	.....
Student and ID	**Signature**	**Date**

Certified by

Dr. Samuel Bruce Rockson	.....	.....
(Supervisor)	**Signature**	**Date**

Certified by

Prof David Asamoah	.....	.....
(Head of Department, SCIS Dept)	**Signature**	**Date**

ABSTRACT

In recent times, sustainable practices have become a necessary necessity due to numerous environmental issues, including land degradation, global poverty, human rights absence, general health deficiencies and corporate governance. The general objective of the study was to assess the mediating role of green procurement on the relationship between environmental knowledge and procurement sustainability: empirical study of organizations in the Western region in Ghana. The study therefore focused on managers and senior staffs as representatives of their firms to collect data to test the relationships among the research model. A sample size of 200 was selected out of which questionnaires were administered to in order to gather data to measure the three main variables and test their relationships. All 200 questionnaires returned representing 100% response rate. This is an excellent percentage and it is based on these returned responses that findings of the study were obtained from, analysed and discussed. The findings revealed that there is a positive and significant relationship between environmental knowledge and procurement sustainability. Also, it was found that that there is a positive and significant effect between environmental knowledge and green procurement. However, it was realized that there is a negative effect between green procurement and procurement sustainability but it was statistically significant. Finally, in relation to the mediating effect of green procurement on the relationship between environmental knowledge and procurement sustainability, using the Sobel Test, it was found that the mediation effect of green procurement on the relationship 0 between environmental knowledge and procurement sustainability was significant as the p-value is close to zero (p = 0.69908891). However, From the findings, it was found that the effect of green procurement on procurement sustainability was negative though there was a positive effect between environmental knowledge and green procurement. This implies that green procurement does not positively mediate the relationship between environmental knowledge and procurement sustainability. As such, it can be said that green procurement does not positively mediate the relationship between environmental knowledge and procurement sustainability. It is therefore recommended that firms should

thus increase their environmental knowledge as they offer even more potential for differentiation than manual sourcing and procurement, which are still important.

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DEDICATION

This thesis is dedicated to my former boss in the person of Madam Dorothy Kwesie of Bompeh Senior High Technical School,Takoradi.

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First and foremost, I would like to thank God Almighty for giving me the strength, knowledge, ability and opportunity to understand this research study and to preserve and complete it satisfactorily, without his blessings, this achievement would not have been possible. Secondly, I would like to express my gratitude to my supervisor Dr. Samuel Bruce Rockson for the useful comments, remarks and engagement.

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Green procurement refers to the creation of lower-than-average carbon impacts on goods and services (Ahsan and Rahman, 2017). According to Zeppel (2014), green procurement is focused on the assumption that businesses should simultaneously take advantage of elements of economics, climate and society. Bao and Zhao (2018), on the other hand, describes green procurement as a consideration of the natural, social and economic implications of nature, manufacturing methods (renewable and non-renewable), logistics and disposal materials used. Nderitu and Ngugi (2014) assert that the use of green procurement was very limited in such a way that only a few high-profile organisations, primarily chemical companies and/or companies in the consumer goods sectors, had specifically felt the demand of green consumers to do so.

As one of the Green Human Resources Management (GHRM) techniques (Yusoff et al., 2015), environmental knowledge contributes to the creation of sustainable culture and environmental management practices (Jabbour et al., 2013), as well as well-trained environmental consciousness staff who are able to identify and reduce waste (Renwick et al., 2013). Well-trained, environmentally aware workers, for instance, may identify and reduce waste (Renwick et al., 2013).

Interest in the field of green supply chain management (GSCM) has evolved in both academic and business settings and GSCM has emerged as a tool to help companies reduce their environmental risks and impacts, achieve greater competitiveness, higher market share and increase their eco-efficiency (Zhu et al.,

2008). In recent years, corporations have adopted sustainability in their business strategies, and the lack of renewable capital in the supply chain is an obstacle that has placed businesses in an uncomfortable position (Dubey and Gunasekaran, 2015).

Sustainable procurement, one of the activities of GSCM, already plays an important role in the implementation of corporate sustainability policies: it has become a resource for environmental protection and economic and social development, since it involves environmental, economic and social considerations in the recruitment phases of companies, and it is necessary to train managers and public servants to critically assess evaluate purchases, including factors such as product life cycles (Ruparathna and Hewage, 2015).

In recent times, sustainable practices have become a necessary necessity due to numerous environmental issues, including land degradation, global poverty, human rights absence, general health deficiencies and corporate governance. This required the development of the concept of sustainable procurement management practices to assist as a key enabler that could push organizations to focus on mitigating these environmental issues while providing economic and social benefits (Haavisto and Kovacs, 2014). Sustainable business practices are not only fundamental to an organization's fate, but also to the benefit of who and what is to come. Sustainable practices encourage organizations to develop reasonably, both profitably and responsibly.

Extended studies have revealed the potential of sustainable efforts to increase organizational performance in terms of cost, delivery, quality and speed, which are operational performance indicators (Wong et al., 2016; Kotler, 2004; Hinton,

2003). For most organizations increasing firm performance is a daunting task. There have also been little studies to investigate the relationship between sustainability of procurement and company operational efficiency.

Promoting sustainable development by procurement would resolve the number of deficiencies found in conventional procurement processes (Ruparathna and Hewage, 2015). Several scholars have pointed out that choosing the lowest bid is a major limitation in conventional procurement approaches, not the best value alternative (Walker and Hampson, 2008).

Interest in the GSCM field is growing in both academic and business fields, according to Sarkis et al. (2011). The researcher highlighted Srivastava (2007) among the various management concepts of GSCM, who argued that GSCM integrates environmental thinking into supply chain management, including product design, outsourcing and procurement equipment, manufacturing processes, customer final p roduct distribution and inventory management at the end of the product life cycle.

These claims are in line with Walker and Brammer (2012), who argued that procurement managers should promote social responsibility for organizations with sustainable procurement practices in supply chains, as sustainable public procurement is compatible with the principles of sustainable development and the public sector is responsible for using taxpayer money to achieve social and environmental performance.

From review of extant studies, there seems to be limited studies that explores how environmental knowledge influences procurement sustainability and even how green procurement mediates this relationship. Also, the few studies that looks at

environmental knowledge, green procurement and sustainable procurement are carried out in advanced economies with much gap in the Sub Saharan sub-region and Ghana in particular.

The goal of this study is to define the status quo of procurement sustainability within the Ghanaian business sector. Furthermore, this research examines business environmental knowledge in implementing sustainable procurement practices in Ghana. The study finally studies how green procurement mediates the relationship between environmental knowledge and procurement sustainability. This research leads to an understanding about what and how to adapt the characteristics of sustainable procurement into the operation of the Ghanaian industry. This study further analyzes the potential of existing procurement activities to achieve sustainability in procurement.

1.2 STATEMENT OF THE PROBLEM

In recent years, environmental issues have become a matter of urgent concern for industry worldwide, according to Test et al. (2016). In view of rising waste management costs, environmental degradation, public health problems, climate change, lack of resources and persistent global poverty, the supply management profession is increasingly called upon to contribute to broader sustainable development organizational goals by integrating social and environmental criteria into pro-global poverty (Raj et al., 2020).

Procurement sustainability refers to the act of incorporation of procurement carried out by government or private sector bodies as a consideration for broader social and environmental impacts (Preuss, 2009; Walker and Brammer, 2012). Several researches have contributed to the debate on achieving procurement sustainability,

especially in the public sectors of the African sub-region. However, the current procurement processes and framework continue to pose problems in developed countries (Boomsma, 2008), of which Ghana cannot be excluded.

Procurement sustainability is a concept that is not widely used in academic literature, but has a number of related concepts, including green procurement (Chen, 2005; Ochoa et al., 2003), environmental procurement (Murray and Cupples, 2001; Zsidisin and Siferd, 2001), green supply chains (Klassen and Johnson, 2004; Rao and Holt, 2005) and green supply chain management (Sarkis, 2003; Zhu et al., 2005). The studies above have concentrated on environmental concerns, with only more recent attention given to social and economic priorities (Walker and Phillips, 2009).

Nevertheless, recent calls have been made to consider the long-term economic, social and environmental benefits of the procurement activities of governments towards continuous growth (Preuss, 2007; Kjöllerström, 2008; Walker & Brammer, 2009; Brammer & Walker, 2011). The interest in this sustainability aims to ensure that both investors and businesses are highly interested in corporate social responsibility, conservation and increasing the environmental impacts of their development activities (Chin et al., 2015).

Consistent participation of digital objectives in the public service as well as in the procurement and supply system has been identified as sustainability of procurement and is consistent with achieving the goal of sustainable development through procurement and procurement, political integration, both environmentally and economically.

Recent research has shown that green procurement is related to a number of positive benefits for both individuals and organisations, including minimizing waste and/or hazardous material management costs, enhancing employee safety, reducing solid waste, water conservation, and natural resource security (Martinsons, 2010).

Despite the introduction of international agreements on green and procurement best practices, there are still issues relating to the local economy in various areas such as climate, economic and social. Cost savings, decreased carbon emissions, less waste, lower energy and fuel usage, better health outcomes, expanded skills, apprenticeships and training, and more contract incentives for small and medium-sized companies are some concrete reasons to consider and provide in procurement.

Academics and practitioners have been increasingly interested in how companies and their suppliers are influencing the climate, culture and economy in recent years (Walker and Phillips, 2009). There is a prevalent view that economic and social growth must be limited in order to mitigate negative environmental impacts. Besides environmental concerns, companies should choose suppliers to tackle socioeconomic imbalances (e.g. purchasing from domestic minority small businesses) and internationally (e.g. sourcing suppliers in developed countries) (Walker and Phillips, 2009).

Kennard (2006) said sustainability in procurement is the mechanism by which economic growth, social progress, and environmental conservation are balanced against business needs. He outlines the advantages of implementing a sustainability procurement approach as a cost restraint, raising internal and external quality

through performance assessment and compliance with environmental and social legislation. According to Bobis and Staniszewski (2009), green procurement as it is, is not a modern trend but rather a continuing idea. It is noted that sustainability of the procurement has emerged as a major planning concept.

There have been a number of positive developments recently with respect to procurement sustainability. However, there seems to limited studies that explores the mediation effect of green procurement on the relationship between environmental knowledge and procurement sustainability. For this reason, this study seeks to fill this gap and become a novelty in this Sub Saharan African context to explore the extent of this relationship so as to suggest to academia and policy makers for policies and implementation.

1.3 OBJECTIVES OF THE STUDY

The general objective of the study is to assess the mediating role of green procurement on the relationship between environmental knowledge and procurement sustainability: empirical study of organisations in the Western region in Ghana. However, the specific objectives are to;

1. Examine the effect of environmental knowledge on procurement sustainability among organisations in the Western region in Ghana.
2. Assess the effect of environmental knowledge on green procurement among organisations in the Western region in Ghana.
3. Investigate the effect of green procurement and procurement sustainability among organisations in the Western region in Ghana.

4. Examine the mediating effect of green procurement on the relationship between environmental knowledge and procurement sustainability among organisations in the Western region in Ghana.

1.4 RESEARCH QUESTIONS

1. What is the effect of environmental knowledge on procurement sustainability among organisations in the Western region in Ghana?
2. What is the effect of environmental knowledge on green procurement among organisations in the Western region in Ghana?
3. What is the effect of green procurement on procurement sustainability among organisations in the Western region in Ghana?
4. Does green procurement mediate the relationship between environmental knowledge and procurement sustainability among organisations in the Western region in Ghana?

1.5 SIGNIFICANCE OF THE STUDY

A study on the mediating role of green procurement in the relationship between environmental awareness and sustainability of procurement is important as it would provide the required information for policy-makers of business organizations in the country on the extent of environmental awareness and how they influence their sustainability of procurement. The results will make an enormous contribution to the various stakeholders in Ghana's business arena.

Secondly, the study's significance is to fill the literature gap in Ghana and other developing countries by providing insight to other researchers for comprehensive field research to explore the adoption of green procurement practices among

Ghanaian businesses and how it affects sustainability in organizational procurement.

This study is also significant as it is expected to contribute significantly to initiatives aimed at green procurement policies at both departmental and corporate levels in organizations.

Lastly, the study would bring to light critical information and academic breakthrough that would fill the literature gap in sub-Saharan Africa with regard to the subject. The research will be of great benefit to different stakeholders in the supply chain of an organization as well as to academia as a whole

1.6 OVERVIEW OF METHODOLOGY

The study used a survey research design and a quantitative analysis methodology to assess the mediating role of green procurement in the relationship between environmental knowledge and procurement sustainability. Therefore, because quantitative research attempts to quantify a specific phenomenon, the study developed a conceptual framework portrays the relationships that the study intends to test and evaluate. Environmental knowledge is the study' s independent variable while procurement sustainability is the dependent variable. Green procurement is the mediating variable. In quantitative survey, the conceptual model was tested using a questionnaire to collect data and check the relations. The questionnaire items were adapted from Chan et al. (2012), Blome et al. (2014) and Meehan and Bryde (2014) studies to measure the variable independent, mediating variable and dependent variable respectively. Simple random and convenience sampling techniques was employed to select a sample of respondents for the study with firm-level unit of analysis. Secondary data were collected for the purpose of key

literature review on environmental knowledge, green procurement and sustainable procurement publications including journal articles, organizational policies and reports, among others. Primary data, however, is the dominant source of data through the use of controlled questionnaires. The data collected were quantitatively analyzed using specific statistical methods such as frequency tables, mean and dispersion measurements, among others. To check the relationships among the variables, a simple linear regression was adopted. Finally, the data were interpreted and summarized to draw conclusions, and some useful suggestions were suggested.

1.7 SCOPE OF THE STUDY

This research is limited to evaluating the impact of environmental knowledge on procurement sustainability. The top-level management of Ghanaian companies in Ghana' s Accra metropolis are the subjects of the analysis. Many of the selected firms include Ghana' s education sector, health sector, financial services, legal and revenues, and local government. However, due to limited resources and time constraints regarding the researcher, only selected companies in the Accra metropolis have been contacted and chosen for this study.

The study had environmental knowledge as the independent variable with two dimensions (internal knowledge and external knowledge), with green procurement as the mediating variable and procurement sustainability as the dependent variable.

1.8 LIMITATIONS OF THE STUDY

Since the study' s unit of analysis was the top executives of the selected companies, there were instances where some of the respondents displayed apathy for filling out the questionnaires they were given. The questionnaire also included

instances of unfilled spaces returned to the researcher. Such limitations, however, did not affect the consistency of the research regarding validity and reliability.

1.9 ORGANISATION OF THE STUDY

This work is divided into five (5) chapters. Chapter One covers the introduction, background of the study, and problem statement, research objectives, research questions, study significance, methodology summary, study scope, study limitations and study organization. Chapter Two also includes the research theoretical structure and analysis of the literature. Comprehensive research on this thesis will be achieved by reading books related to this research; excerpts from other similar long essays, journals, newspapers, the internet and other relevant sources. Chapter Three introduces the methods used in this study. The approach should include study design, population, sample size, method of sampling, test instrument, analytical methods used and organization profile. Questionnaires will be created and sent to the organization's respondents, seeking their views. Chapter Four addresses the analysis of the data and the results of the study that would be a definitive result. The questionnaires given to the respondents will be examined and analyzed critically. Chapter Five is the final section of the report, where the whole research results are summarized; make suggestions and conclude.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter provides a scholarly analysis of past studies pertaining to environmental knowledge, green procurement and procurement sustainability. As such, it discusses ideas like this and the conceptual framework ends with it. These have been captured in the next sub-sections in line with the study.

2.2 THE CONCEPT OF ENVIRONMENTAL KNOWLEDGE

Knowledge is generally seen as a requirement for a person' s behaviour. In keeping with this, most educational approaches depend on transfer of information (Frick et al., 2004). It has been argued that environmental awareness must be present in order to bring about environmentally responsible consumer behavior (Barber et al., 2009).

Environmental knowledge is characterized as "general knowledge of the facts, principles, and relationships of the natural environment and its major ecosystems" (Fryxell & Lo, 2003, p. 48). Environmental knowledge also includes comprehension of the environment and the main relationships that lead to environmental impacts (Mostafa, 2007). Environmental knowledge, such as understanding environmentally friendly items or more comprehensive information on topics such as recycling or carbon offset schemes, can be general in nature (Schahn & Holzer, 1990). However, the nature of the study indicates that customers do not fully appreciate global warming or how it relates to their behavior (Bulkeley, 2000).

Specific methods were used empirically to test the environmental literacy of consumers. Some work has attempted to assess factual awareness of the world, where customers take factual assessments to determine their level of knowledge (Barber et al., 2009; Tanner & Kast, 2003). Some researchers assess the awareness of consumers regarding environmental problems or the effect of information linked to practice (Tanner & Kast, 2003), but do not find empirical knowledge (Diamantopoulos et al., 2003; Schlegelmilch et al., 1996). However, if environmental awareness values are incorrect, consumers' actions will be unacceptable (i.e. actions do not fix the underlying environmental issues).

Again, this would mean people may act because they think an action would be beneficial while their opinion is incorrect. This research focuses on the analytical perception of consumers rather than their more general thinking about behavior, in order to determine what consumers actually know about the environment in general (Maloney et al., 1975), and specifically about carbon offsets. Getting reliable knowledge allows consumers to make informed choices, i.e. adjust their behaviors to reduce their effect on the environment. Therefore, this study shows that basic environmental awareness can be related to particular decisions (Thøgersen and Olander, 2006) and that empirical environmental knowledge is most relevant for determining the degree of consumer knowledge.

Past research suggests that customers with a greater understanding of the environment are more likely to behave favorably (Flamm, 2009; Gram-Hanssen, 2010; Mostafa, 2007; Pickett-Baker & Ozaki, 2008; Thøgersen and Ölander, 2006). Attitudes are believed to be modified by increased knowledge in the context of pro-environmental behaviour, and both environmental knowledge and attitudes are presumed to affect environmental buying behavior (Barber et al., 2009; Flamm,

2009). For example, Arcury (1990) shows that environmental knowledge has a positive effect on consumers' environmental attitudes, and Flamm (2009) finds substantial associations in the context of vehicle ownership between environmental awareness, attitudes and behaviours. Barber et al. (2009) explores the relationship between general environmental knowledge and wine-specific environmental knowledge of environmental practices, and thus the ability of customers to purchase environmentally friendly products. In fact, this influences their strategy to buy environmentally friendly products. This study shows that both general and specific environmental awareness should be taken into consideration when evaluating the empirical environmental knowledge of consumers, particularly when the information relates to different types of behaviors (i.e. general and specific), with many previous studies being very context-specific. For instance, Flamm (2009) found that fuel-efficient vehicles were more likely to be used by clients with a greater understanding of the climate. This implies that environmental knowledge is a prerequisite for sustainability, and the procurement sustainability in terms of this study.

2.3 THE CONCEPT OF PROCUREMENT SUSTAINABILITY

The term sustainability is a multi-dimensional, multi-scale, interdisciplinary topic which has been delved into from several angles like procurement sustainability. Procurement sustainability has gained considerable attention in research over the past decade, especially in the literature on supply chain management (Linton et al., 2007). Sustainability efforts have become unavoidable in this volatile and dynamic market climate and are high in different fields, incorporating environmental, social and economic dimensions into procurement management. Throughout today’ s dynamic and global business climate, where sustainability is increasingly at the

forefront throughout different fields, environmental, social and economic considerations can also not be overemphasized in corporate procurement management as well as supply chains and environmental literature (Linton et al., 2007; Steurer and Kondard, 2007; Koplin et al., 2007).

A sustainability procurement activity includes purchasing decisions that ensure the procurement of entities within the economic, social and environmental dimensions (Koplin et al., 2007). Thus; the products procured comply with the criteria of the entity's budget and are economical, fulfill the needs for which the products were purchased and do not cause environmental harm. Therefore, the sustainable practice of public procurement involved incorporating into public procurement decisions; the concept of balancing the economic, social and environmental goals of public deliverables. Sustainable supply includes green purchases which take into account the objectives of minimizing environmental impacts. The environmental costs of obtaining raw materials and processing, transport, storage, handling, usage and disposal of the commodity are considered manageable in the procurement process (Linton et al., 2007).

In addition, the United Kingdom Working Group on Procurement Sustainability reported in 2006 that agencies must ensure that procured products do not cause harm to potential consumers and are readily degradable whilst at the acquiring agent's budgetary pace. Public contractors are also aimed at ensuring that value is generated through their procurement operations, thus seeking to align society's quests and priorities and attain the economy while mitigating environmental harm (Linton et al., 2007; Koplin et al., 2007).

Sustainability of procurement encompasses many principles, including social, environmental and economic, ethical standards, governance, production and logistics, renewable and recycled choices, recycling and disposal, creation, selling and promotion of future generations, and social responsibility (Walker et al., 2012; Wright, 2002).

Procurement sustainability management is implemented by binding environmental, regulatory, economic and social constraints put on purchase decisions by the customers and stakeholders (Koplin et al; 2007). Voluntary adoption by the business community as a result of positive returns on sustainable practices in procurement, including improved productivity, decreased costs, improved internal and external customer loyalty, increased revenue and market share, and more efficient risk management (Linton et al., 2007; and de Man and Burns, 2006).

Sustainability of procurement means the acquisitions of building and construction resource products that do not necessarily emit gasses but can support them. While deciding on the type of building design and the material to use, the environment and the social circumstances of the people are taken into account (Barber et al. 2009). Linton et al. (2007) suggested that when companies seek to fulfill their buying needs, this must be focused on providing some advantages for the business, but also for citizens and the economy. Tregidga and Milne (2006) suggested that there are competitive supply factors that should be investigated that influence effective procurement practices. For example, when buying professionals (with tremendous purchasing power for their organization) decide to purchase a product or service, there are decisions that relate to the green supply route and make these

big decisions that that impact not only the procurement institutions but the entire society as a whole.

2.3.1 DRIVERS OF PROCUREMENT SUSTAINABILITY PRACTICES

Crespin-Mazet and Dontenwill (2012) indicated that governments should use their procurement budget and power to stimulate market growth for sustainable goods and services. Furthermore, by using policy instruments such as tax incentives, legislation and the provision of resources and information, the government can do more to regulate the environment that confuses, empowers or enables the private sector to adopt sustainable procurement practices. The author also suggested that governments would recommend implementing a realistic approach to their procurement activities to comply with the requirements of the EU procurement directives. It will combine with the government the strategic procurement elements found in the private sector.

As Belfitt et al. (2011) said if businesses are legally required to buy sustainably, for instance, this would cause them to look at their supply chain to at least satisfy the regulatory requirements. McCrudden (2004) further stressed the government's role in procurement sustainability, arguing that governments should use their power embedded in public procurement activities to support social and environmental policy goals by placing special emphasis on the importance of the environment of national procurement sustainability policies, facilitating factors that include the organizational environment, ensuring that relevant procurement management policies and legislation are effectively enforced.

It has a role to play in incorporating and encouraging sustainability in procurement, explicitly referring to Ghana and the government as a major buyer and distributor

of goods. Ghana will be in a stronger position to encourage and realize sustainability of procurement as well as a significant move towards understanding and the effect of the supply chain on our environment.

2.3.2.1 MARKET DIFFERENTIATION

Belfit et al. (2011) acknowledged market differentiation as a catalyst that allows organizations to promote procurement sustainability practices. If there is an incentive for a company to promote itself as having a truly sustainable supply chain, the business will want to take advantage of these opportunities to gain business from consumers that value this. Competition among businesses is at a cut throat in today's business world; very high and intense. Competition is characterized, among other things, not only by traditional values of price, quality, reliability, accessibility, but also by greener issues. The organization wants to make itself stand out from others to draw more consumers and sustainability has become the latest trend in the business world. One way of separating them from the rivals is to be environmentally friendly.

In certain cases, consumers are the ones who want special treatment or special products. Increased stakeholder aspirations and awareness generate greater pressure on companies to take the environmental, economic and social aspects of business into account and adopt sustainable initiatives. Organizations will understand the need to cultivate goodwill among stakeholders, and resolve perceptions and concerns about sustainability of procurement proactively and effectively. And an organization has to tackle environmental problems in order to attract and maintain its customers. Several companies, such as Unilever, are leading the way in Ghana in incorporating green strategies into their production and development.

2.3.2.2 GREEN SUPPLY CHAIN MANAGEMENT

In addition, because competitors have already implemented Green Supply Chain Management (GSCM), the organization is under pressure to adopt it and it is a good idea to introduce GSCM regardless of whether or not the competitors have implemented it. The customers also control the decision of the organization to follow the GSCM.

Numerous studies support that implementing GSCM will lead to financial gains; deliver operational cost savings through more effective products, works and services; challenge source demand to ensure need; rising end-of-life costs; improve supply chain efficiency; and build market power, creativity, and competitiveness. Sustainability of procurement would minimize waste which, in effect, would reduce costs (Duber-Smith, 2005; Stevels, 2002). Other factors include rising productivity, reducing waste and pollution and creating brand awareness. Duber-Smith (2005) reported that in some green initiatives such as health programs and ergonomic work climate, more sustainability increases employee productivity in terms of human resources.

There are several articles on the causes or advantages that make the client's GSCM relevant. Zhu and Sarkis (2007) examined the relationship between GSCM practice, environmental and economic performance, combining 3 demand moderating powers, regulatory and competent forces in their survey of 341 Chinese producers. Results showed that they had raised external pressure to adopt GSCM activities. We have been affected by market and policy pressures through legislation to boost environmental efficiency. Another such study is (Wang et al., 2013); they are developing a collection of critical factors of GSCM practices which managers may use. They surveyed the electrical and electronics industries in

Taiwan. Four significant factors were seen in the results: manufacturer management, material recycling, organization and participation, and life cycle management.

Zhu et al. (2008) suggest that there are varying reasons and drivers for implementing GSCM in different industries. Green Supply Chain Management Implications for "Closing the Loop" established a survey of four Chinese industries to assess and link their perceived GSCM activities to the closure of the supply chain loop. Zhu et al. (2008) suggest that there are varying reasons and drivers for implementing GSCM in different industries. Green Supply Chain Management Implications for " Closing the Loop" established a survey of four Chinese industries to assess and link their perceived GSCM activities to the closure of the supply chain loop.

2.3.2.3 BRAND REPUTATION AND IMAGE

Sustainability purchases have been attributed to a raise in brand awareness, as both negative brand exposure and positive attention to their products can be avoided by sustainability purchases (Koplin et al., 2007). Consequently " free publicity" provides greater brand reinforcement and visibility through sustainability campaigns than paid ads (Strandberg and Robinson, 2009).

2.3.2.4 STRONG MEDIA ATTENTION

Macharis et al. (2014) argue that companies are now closely watching throughout their supply chain to implement sustainable practices, and in fact these organizations fear being caught in unethical or illegal practices.

2.4 THE CONCEPT OF GREEN PROCUREMENT

Environmental or green procurement was defined by the United Nations Development Program (UNDP) (2008) as 'purchasing products and services that have less impact on the environment and human health than competing products or services for the same purpose. There are however, those who may say that green procurement may also be based on a green procurement system, not just a green product purchase. Where a supplier is chosen because of (e.g.) its environmental accreditation (e.g. the implementation of ISO (International Standardization Organization, 14001) or its environmental policy, it can be obtained during the supplier assessment.

If this 'green' criterion results in a manufacturer's increased market, it allows them to continue incorporating 'greenness' into their processes and even into their products, and also allows rivals to implement green business processes (New et al., 2000). While fairly recent, green procurement is an excellent way to raise awareness of the environment, which then allows consumers to buy environmentally friendly products (Environmental Protection Agency, 2007). Many benefits of green procurement are that it improves the market place of environmentally friendly products and acts as an impetus for technological advances towards green goods as demand for green goods increases (Brander et al., 2003).

In addition, buying green goods will lead to lower operational costs, such as purchasing energy-efficient goods and water-efficient products will result in lower energy and water costs (Emmett and Sood, 2010). As suppliers/manufacturers are under pressure to supply environmentally friendly equipment, green procurement affects the whole supply chain. To this end, manufacturers prefer to design and

produce easily disassembled and recycled machinery, and source raw materials and other goods and services that take environmental considerations into account, often in collaboration with their suppliers (Emmett and Sood, 2010).

Finally, the basis of the finished product or producer used would not necessarily be the possession of green certificates. Among other considerations, we could be used as a prequalification during the selection process. The final determining factor of the producer or commodity could therefore be a criterion other than its 'greenness'. Although this does not contribute to a meaningful environmental result, it informs suppliers that green aspects need to be integrated into their business or products. This approach is reasonably straightforward, and the best way to start a green procurement journey can be considered by a business (New et al., 2000). Other factors for an organization's implementation of green procurement include mitigating potential negative publicity and green public procurement programs and/or schemes (European Commission, 2011).

It is difficult to decide how to do so if an organization wishes to incorporate environmental standards into its procurement processes, since there are many different ways and methods of gathering information. The European Commission (2011) recommends that the organization should start small and run gradually. For example, starting with the purchasing of office paper, a business can start by buying paper with 10 percent recycled content and raise the percentage by 10 percent -20 percent increments in each purchase cycle until they reach their final target of 100 percent recycled content. In fact, it should be done in such a way that prospective bidders are not discriminated against when assessing the environmental criteria used during the procurement process. For example, requiring suppliers to provide a difficult-to-use environmental certificate that can be region-specific, thus

denying international suppliers the right to sell (Palmujokki et al. 2010). It is also necessary to guarantee that the acquisition is of great value.

2.4.1 GREEN PROCUREMENT PRACTICES

Practices refer to a term supporting what's really happening in an organization; how people are functioning. Various ways of working make sense to individuals, and so activities will vary (Mosgaard, 2014). The green procurement activities concentrate on how, in a given case, green procurement takes place in organisations. If there is, for example, a tradition of using local suppliers, this practice may continue even if an alternative practice is stated in the procurement procedures.

One of the factors influencing the existence of a company in green procurement is supply chain strain, such as customer demands (Preuss, 2002). The pressure from the supply chain against green procurement is less likely to directly influence the habits of consumers when buying small goods (Hall, 2000).

2.5 RELATIONSHIP AMONG ENVIRONMENTAL KNOWLEDGE, GREEN PROCUREMENT AND PROCUREMENT SUSTAINABILITY

Sustainable development and the effect of industry on society and the environment are becoming increasingly of concern. This is clear from media patterns, industrial practices and scientific literature (Walker and Brammer, 2012). With global warming reaching unprecedented rates (Abanda et al., 2010), the urgent need for scarce resources to be conserved and a healthy environment has pushed governments and several companies worldwide to adopt environmentally friendly practices and goods (Salam 2008).

When the SCM activities evolve, policymakers work with businesses and their supply chain partners to reduce environmental issues with a view to eliminating waste, energy and emissions, mitigating environmental risks and increasing community goodwill. The collaboration will encourage shared learning for the environment (Damall and Edwards, 2006). Companies adopting GSCM activities benefitted from cost savings (conservation of resources, decreased energy and water consumption), enhanced public image and decreased environmental liability (Wisner et al., 2012). Bad environmental performance can have significant environmental impacts and contribute to monetary losses for businesses, such as lower stock prices. According to Flammer (2013), the eco-friendly behavior of companies is directly linked to large stock price rises, whereas companies with an eco-harmful behavior face stock price decline.

Businesses are also prone to environmental impact, potentially drawing capital from socially conscious investors. Global warming mitigation will cause businesses to demonstrate significant dedication to green practices such as recycling, reuse and materials reduction. In actuality, businesses respond actively to social values for their long-term survival and competitiveness may gain a social identity and social credibility (Hoffman, 2000). In support, Uchida and Ferraro (2007) found that businesses can build a competitive advantage by integrating environmental and operational practices to improve competitiveness, access to new market, reinforce consumer relationships and gain competitive edge. As such, other businesses can also mimic environmental policies implemented by influential leading firms.

The subject of company success has changed to the global environmental demands of today. It previously concentrated primarily on the development of wealth through higher economic performance in terms of asset growth, liabilities and overall market strength, but now focuses on environmental and social performance while achieving high economic performance (Carter and Rogers, 2008). To achieve maximum productivity for sustainability. Sustainability is an organizational policy that is directly connected to social responsibility for corporations. Organizational sustainability requires the intersection of economic, environmental and cultural superiority to achieve a long-term competitive advantage (Thoo et al., 2011; Paulraj, 2011). This means companies will concentrate on long-term sustainability that could reduce environmental and social risks at the same time (Porter and Kramer, 2006). Therefore, GSCM practice is in a prime position to leverage economic, environmental and social sustainability performance.

However, very little academic work was done procurement sustainability and how environmental knowledge impacts it. There has been no study that looks at green procurement' s mediating role on the relationship between environmental knowledge and procurement sustainability. This research is therefore a novelty that closes the literature gap.

2.6 CONCEPTUAL FRAMEWORK

The goal of this study is to establish a theoretical framework for enhancing procurement sustainability through environmental knowledge and green procurement from the review above.

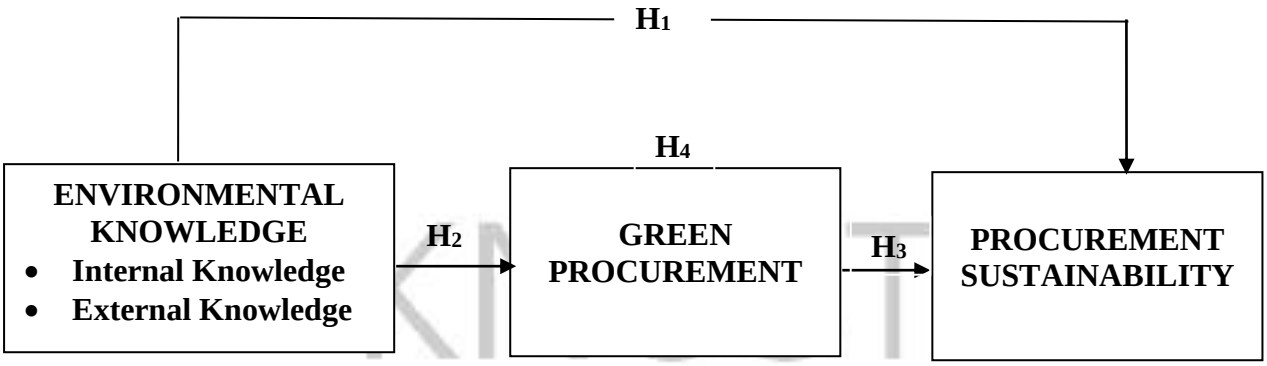

Figure 2.1: Research Model

Source: Author' s Construct, 2022

2.6.1 ENVIRONMENTAL KNOWLEDGE AND PROCUREMENT SUSTAINABILITY

Environmental knowledge is a strategic, internal and proactive capability that has the potential to drive sustainable development through an organisation' s value (Aboelmaged, 2018). An organization' s ability to turn cluttered environmental initiatives into an obvious environmental knowledge for both internal and external stakeholders is focused on different prerequisites that connect this initiative with a strategic vision (Lubin and Esty, 2010), organisational resources, and positive environmental culture (e.g., managerial attitudes, values, routines, commitments, standards, and responses) (Dibrell et al., 2011) to pursue environmental opportunities (e.g., product stewardship and pollution prevention) (Paulraj, 2011). Prior environmental knowledge research has concentrated primarily on determinants of environmental knowledge (e.g. stakeholder strain, resources and capacities, environmental conditions) (Garces-Ayerbe et al., 2012; Murillo-Luna et al., 2011) and findings (e.g., financial performance, environmental performance) (Ates et al., 2012).

Previous supply chain research has also shown that the internal environmental policies of the organization are incorporated into business activities and can also boost performance results (Green et al., 2012). Similarly, the correlation between environmental knowledge and competitiveness has been suggested to be well known and Wong et al. (2012) and Linsky et al. (2010) indicated that the implementation of proactive environmental practices based on well-defined environmental strategies may enhance the quality of products and services, delivery, cost, and the overall competitiveness level. The complex environmental knowledge potential therefore enables businesses to adapt and cope better with an unpredictable world and achieve competitive advantages (Clarkson et al., 2011).

In addition, Stegerean et al. (2014) found that positive environmental knowledge has a beneficial impact on profitability and the ability to achieve long-term objectives. The current research follows previous studies by distinguishing the effects of the internal and external dimensions of environmental knowledge (Banerjee et al., 2003). This is done because they have previously been found to cause divergent effects, making it worth studying these effects separately (Banerjee, 2002; Banerjee et al., 2003; Dickel et al., 2018). The need for detailed analyses of trade-offs between environmental knowledge and organizational performance is therefore discussed in this study (Hahn et al., 2010). As such, the first hypothesis and the sub-hypotheses are posited as follows;

H1: Environmental knowledge is positively and significantly related to procurement sustainability.

2.6.2 ENVIRONMENTAL KNOWLEDGE AND GREEN PROCUREMENT

From the resource-based perspective, a firm's strategic knowledge (e.g., environmental knowledge) can be conceptualized as its valuable intangible resource that guides strategic practices, and consequently enhances performance (Aboelmaged, 2018). Empirically, prior marketing and business researchers also found evidence to support this knowledge to strategy proposition. For instance, Murray, Gao, and Kotabe (2011) demonstrated that export ventures in China with higher levels of marketing knowledge are more apt to undertake strategic activities in areas of pricing, new product development and marketing communication. Likewise, Chan (2010) also showed that both internal and external environmental knowledges serve as important determinants for firms' practices of environmental strategies at the strategic level and within the marketing functional area. In short, the above discussion provides both theoretical and empirical support for the positive influence of these two types of environmental knowledge on corporate environmental practices such as green procurement. Despite the plausibility for both internal and external environmental knowledges to positively influence green procurement, the fact that these two knowledges originate from two different sources (i.e., internal vs. external) suggests that their respective influence on green procurement may be derived from different pathways.

Regarding internal environmental knowledge, organizational learning theory suggests that its influence on green procurement is largely attributed to intra-organizational learning and knowledge sharing among firm members. From this perspective, internal environmental knowledge can be conceived as part of the core corporate values and beliefs of a firm. It is often initiated by corporate leaders out

of their own pro- environmental ideology. Owing to the exhortations of these leaders, this personal ideology will eventually be fused throughout the entire firm (Dickel et al., 2018; Magon et al., 2018). In short, the above analysis suggests that internal environmental knowledge will help firm members develop a collective consciousness of the importance of ecologically responsible operations, and eventually motivate them to seek ways to minimize environmental impacts of these operations (Banerjee et al., 2003).

As regards external environmental knowledge, its influence can be best explained by institutional theory. According to this theory, firms need to tackle different constraints imposed by various important institutions (Dickel et al., 2018). If firms operate within the constraints permitted by these institutions, they will enhance their stability and legitimacy, and ultimately the likelihood of survival (Magon et al., 2018). In environmental management research, these institutions can further be construed as salient external stakeholders that impose formal (e.g., regulations) or informal (e.g., norms) rules on how firms should manage their relationship with the natural environment (Banerjee, 2001). From this perspective, it is likely that managers who perceive a strong need to respond to environmental demands of salient stakeholders will be more inclined to engage in pro-environmental practices (e.g., green procurement) to cope with these demands. As this managerial perception, in turn, falls into the definition of Banerjee's (2001) external environmental knowledge, it is thus probable that this knowledge exerts a positive impact on green procurement. Taken together, the above discussion suggests the following hypotheses:

H2: Environmental knowledge is positively and significantly related to green procurement.

2.6.3 GREEN PROCUREMENT AND PROCUREMENT SUSTAINABILITY

By integrating environmental policy into the strategic plans of businesses, companies can secure support from their stakeholders (Solomon, 2018). The extension of sustainable techniques to the supply chain is one of the most successful ways to be environmentally oriented (Sarkis, 2011). Green procurement not only helps businesses respond effectively to the needs of stakeholders, but also builds a strong reputation and establishes green capabilities (e.g. clean manufacturing, non-polluting and minimal waste production processes, green R&D and green products) that generate competitive advantage and increase company performance (Bu et al., 2020; Feng et al., 2018).

In summary, according to the stakeholders theory, various actors in society expect companies to contribute to the safety of the environment (Zailani et al., 2012). Companies should incorporate environmental problems into their corporate plan in order to respond to this pressure by either concentrating on internal or external organisations (Bu et al., 2020). Companies should invest in building green capabilities in operating and management processes from the viewpoint of internal organizations (e.g. building green facilities and equipment, participating in green R&D activities, and developing green capabilities) (Feng et al., 2018). Companies may also create a green image and a good credibility with external stakeholders from the viewpoint of external organizations (e.g., supporting the environmental conservation community or participating in citizenship behaviors) (Cousin et al., 2019). Both internal and external activities will improve the search, monitoring and cooperation of companies with suppliers to create green capacity, because companies need to combine internal operations with external supplier activities (Cousins et al., 2019). In particular, businesses can procure green materials and

components from suppliers and secure green resources, which are essential factors in building green capacity (Caniëls et al., 2016). Therefore, it is expected that when firms participate in green procurement, they will aim to cooperate and partner with suppliers to develop green capability. Companies will manufacture more environmentally friendly goods to meet the needs of consumers. This leads to improvement in procurement sustainability. This introduces the last hypothesis as follows;

H3: Green procurement is positively and significantly related to procurement sustainability.

2.6.4 THE MEDIATING EFFECT OF GREEN PROCUREMENT ON THE RELATIONSHIP BETWEEN ENVIRONMENTAL KNOWLEDGE AND PROCUREMENT SUSTAINABILITY

Greening the supply chain has many advantages for an enterprise, from lowering costs to bringing suppliers into a participatory decision-making process that facilitates environmental creativity (Rao and Holt, 2005). Consumers have now submitted details on product sustainability to assist in buying decisions (Grunert et al., 2014; Marucheck et al., 2011). Actually, however, consumers generally acquire some knowledge on sustainability by finding trustworthiness and reference groups (of other green consumers) and achieving personal effectiveness in doing something for the community' s mutual benefits (Gupta and Ogden, 2009). Compared to wasteful goods, the higher prices of environmentally friendly products are largely attributable to the introduction of green practices and the certification of cost-induced processes and products (Gallaud and Laperche, 2016). In addition, studies also show that customers are willing to pay price premium with

complete accountability for all goods (Owusu and Anifori, 2013; Xu et al., 2012). This introduces the last hypothesis as follows;

H4: Green procurement mediates positively and significantly the relationship between environmental knowledge and procurement sustainability.

CHAPTER THREE

METHODOLOGY OF THE STUDY

3.1 INTRODUCTION

The chapter is a description of the methods used to produce results for the report. This chapter offers extensive information about how the work was performed and how the objectives were achieved. The Chapter gives specifics of the research design, data sources, data collection methods, population and sampling techniques, data analysis techniques adopted and ethical considerations.

3.2 RESEARCH DESIGN

Research design refers to the general structure that was adopted for conducting a test. It places focus, according to Saunders et al. (2009), on the intent of the analysis, the strategy and the method.

A research goal affects the study's strategy and methodology (Saunders et al., 2009). A research study's intent can be as descriptive, exploratory, or explanatory. According to Saunders et al. (2009), descriptive work merely asks questions about what happens. In addition, Yin (2003) notes that either exploratory or descriptive research methodology may be followed when research questions are focused on " what" . Some of the research questions in this research related to " what" questions (e.g., what impact environmental knowledge have on procurement sustainability). Seven methods are noted for carrying out the research, according to Saunders et al. (2009). It includes case studies, surveys, tests, action analysis, fundamental science, ethnography, and archival studies. In the Accra Metropolis an explanatory survey study method was used to administer questionnaires to specific respondents. According to Yin (2003), if research questions focus primarily on "what," it is possible to follow either exploratory or descriptive research (survey). In

addition, current literature was reviewed to help the investigator focus on topics under review and provide in-depth expertise and understanding of Saunders et al (2009). Saunders et al. (2009) notes that analysis in nature can be either deductive or inductive. As such, for this study, a deductive approach was adopted as deductive approach often leads to testing of hypotheses, whereas inductive approach aims at gathering data and developing theory based on the results.

3.2.1 RESEARCH APPROACH

The quantitative method methodology was the analysis approach used for this review. In other words, both methods of quantitative analysis were used to collect and interpret data. The quantitative method allowed the use of questionnaires to collect and analyse data to meet the objectives of the study.

3.3 POPULATION OF THE STUDY

Broadly, the study' s population is made up firms in the Accra metropolis been represented by their procurement officers and professionals who are at least having some minimal educational level and work experience in the Accra Metropolis. Given this criterion, and within the context of Accra Metropolis, the researcher considered firms (key individuals) who were available and willing to participate in the study. Though the study was firm level, the researcher used the procurement officer or personnel in charge of procurement activities per firm to be the key respondent for data collection. The population size was unknown as there are several firms in Accra metropolis comprising manufacturing, service, among others.

3.4 SAMPLING TECHNIQUES AND SAMPLE SIZE

There is no single rule in reaching a suitable sample size for any analysis, according to Singh (2006). The research takes a realistic view of the sample size

rather than the 'text-book formulae' . In this view, the suitability of 200 sample size was determined based on the needs and requirements of the study (Hair et al., 2014). The sample size of 200 selected was also guided by the use of ordinary least square regression to determine the relationships among the constructs. For example, number of concepts and their indicators in the study, the complexity of the relationships to be examined/tested, and the type of statistical tools to be applied to data or method of estimation technique, statistical power and effect size should largely inform the researcher' s decision of sample size (Hair et al., 2014; Khine, 2013). The sampling technique adopted for the study was therefore the purposeful and convenient sampling techniques required for the sampling of respondents using non-probability techniques. The purposive sampling technique was used to identify respondents in their respective organizations who were in charge of procurement activities and had some specific experience and understanding of the study subject matter. The convenience sampling technique was used to pick those respondents who were willing and accessible while collecting data.

3.5 DATA COLLECTION

Data can be gathered from either primary or secondary sources for an analysis. Although primary data refers to first-hand data collected specifically for a particular study, secondary data refers to current data collected for various reasons, but may become significant for a specific study (Saunders et al., 2009). Primary may be obtained through questionnaires, interviews, observations, or experiments. Secondary data, on the other hand, may include data from books, journals, and other academic questions. Only primary data were used to attain the study objectives. That was done while questionnaires were being administered.

3.5.1 DATA COLLECTION INSTRUMENTS

The research relied on primary data only. Such data were gathered and distributed to individual procurement practitioners in the Accra Metropolis, using both physical and online questionnaires. The key variables identified by the questionnaire are displayed in Table 3.1.

Table 3.1: Constructs Measures and their Sources

Construct	Sub-Construct	Number of Items	Sources
Environmental Knowledge	Internal Knowledge	5	Chan et al. (2012)
	External Knowledge	4	Chan et al. (2012)
Green Procurement	None	5	Blome et al. (2013)
Procurement Sustainability	None	10	Meehan and Bryde (2014)

Source: Author' s Construct, 2022

The Appendix displays the steps and the scales for these.

3.6 DATA ANALYSIS

The research has adopted statistical tools to evaluate the impact of strategic purchasing on supply chain performance: empirical study in the Accra metropolis among Ghanaian firms. Tables were developed using the Ordinary Less Square (OLS) regression to analyze the perception of respondents from the administration of the questionnaire. The design of the research allowed quantitative methods to be utilized in the analysis of collected data. Descriptive statistical methods were employed such as means, frequency, and percentages. The research was carried out using Statistical Product and Service Solutions (version 20 of the SPSS).

3.6.1 MODEL ESTIMATION

To achieve the study' s second objective, the research model had to be performed using regression analysis. It has also been reported that green procurement has a direct and significant impact on the sustainability of procurement. As such, the

effect of green procurement mediation on the relationship between environmental knowledge and procurement sustainability was ascertained. The Regression approach for Ordinary Least Square (OLS) was introduced and a regression model was estimated.

3.6.2 MODEL ESTIMATION TECHNIQUE

In this research, the key estimation method used is ordinary least square (OLS) regression analysis. Hair et al. (2014) propose that 100 observations are acceptable while retaining 80 percent statistical power and 5 percent significance point. A sample size of at least 100 was sufficient along that line of reasoning.

Nevertheless, there is general agreement that the greater the sample size, the better (Pallant, 2007) and that the greater the number of independent variables used in a regression model will allow more observations (Hair et al., 2014). Simple random sampling technique was used for the administration of the questionnaire to pick a cross section of respondents using both physical and online questionnaires.

3.7 VALIDITY AND RELIABILITY OF THE STUDY

Validity is the degree to which the constructs will measure what they should be measuring (Apa and Dieste, 2014). On the other hand, reliability is the degree to which, in repeated trials, a test, experiment or other measuring technique yields identical results and can therefore be generalised. It is its accuracy that appears to produce identical results in repeated experiments or measurements (Apa and Dieste, 2014). The questionnaire used for this study went through rigorous procedures before it was finally developed with reference to section 3.5 of this chapter. The researcher pre-texted the data collection instrument by adapting the measurement scales from past studies to ensure validity of the instrument. Also, the

instrument was piloted on few respondents to ensure if the responses are similar and congruent. Furthermore, other statistical approaches were used to check if there was any bias, as well as the validity and reliability of the instrument.

Finally, the test of reliability and validity were done using Cronbach' s Alpha values and exploratory factor analysis (EFA) for all the variables of the study and were presented in section 4.4 in Chapter Four.

3.8 ETHICAL CONSIDERATION

There was a need to put a lot of attention on ethical concerns relating to the research for a report of this nature. In this respect, the researcher' s supervisor authorized the research questionnaire requesting the permission of the respondents for the study to be carried out at their respective firms. The introductory letter assured the individuals that the study was for academic purposes only, as well as the respondents' confidentiality. This was enough for the researcher to be allowed to conduct the study at the selected companies in Accra Metropolis.

CHAPTER FOUR

PRESENTATION OF FINDINGS, ANALYSIS AND DISCUSSIONS

4.1 INTRODUCTION

This segment presents the results of the field survey to assess the relationships between the study variables. It sought to present the descriptive statistics of the variables, the inferential statistics, the exploratory and confirmatory factor analysis, the model test analysis as well as the discussion of findings and implications. These are presented in the subsequent sub-sections.

4.2 RESPONSE RATE

Though the study was firm level, the researcher used the procurement officers or personnel in charge of procurement activities per firm to be the key respondent for data collection. In all, the questionnaire was administered to 200 respondents and a response rate of 100% was achieved as 200 questionnaires were returned. The researcher entered the data into Microsoft Excel spreadsheet and used Statistical Product and Service Solutions (SPSS) version 20 software to run the results.

The results from the field are presented in the next section beginning with the demographic information of respondents.

4.3 DEMOGRAPHIC STATISTICS OF RESPONDENTS

This section sought to determine the extent to which the respondents were able to answer the questions posed to them in the questionnaire to ensure face validity of the instrument. Thus, the characteristics of the key respondents were ascertained to determine whether they were knowledgeable and understand the questions posed to them. Table 4.1 presents the demographic information of the respondents.

Table 4.1: Demographic Information of Respondents

Variable	Categories	n	%
Gender of Respondents	Male	33	16.5%
	Female	167	83.5%*
Age of Respondents	Less than 30 years	10	5.0%
	31 - 40 years	49	24.5%
	41 - 50 years	103	51.5%*
	Above 50 years	38	19.0%
Number of Years Worked	Less than 1 year	6	3.0%
	1 - 3 years	2	1.0%
	4 - 6 years	92	46.0%*
	7 - 9 years	64	32.0%
	10 years and above	36	18%
Educational Qualification of Respondents	JHS	3	1.5%
	SHS	55	27.5%
	HND	69	34.5%*
	Degree	54	27.0%
	Masters	19	9.5%
Existence of Procurement/Supply Chain Department in Firm	Yes	89	44.5%
	No	111	55.5%*

*Modal Response

Source: Field Survey, 2023

Table 4.1 above reveals the demographic information of the respondents of the study. The first demographic variable was the gender of respondents. It is revealed that most of the respondents were females (n=167) representing 83.5% of respondents with the remaining 33 (16.5%) been males. This implies that interestingly, more women are trusted to manage procurement activities among firm in Ghana.

Secondly, the ages of respondents were ascertained to determine their level of maturity. From Table 4.1, it was revealed that majority of the respondents were with the ages of 41 – 50 years (n=103, 51.5%), followed by those from 31 – 40 years (n=49, 24.5), then those above 50 years (n=38, 19%). Only a few were less than 30

years (n=10, 5%). This implies that the respondents were quite mature and qualify for their respective positions in their firms and understood the content of the responses posed to them.

In terms of number of years spent at their respective firms, it was realized that most of the respondents have been with their firms between 4 – 6 years (n=92,46.0), followed by those who have worked from 7 – 9 years (n=64 32%) and then those who have worked from 10 years and above (n=36, 18%). This implies that the respondents were experienced with the procurement activities of their respective firms and understood the content of the questionnaire posed to them.

For their educational background, it was realized that most of the respondents were HND holders (n=69, 34.5%), followed by SHS graduates (n=55, 27.5%), Degree holders (n=54, 27%) and Masters holders (n=19, 9.5%) respectively.

Finally, the respondents were asked if they had a procurement/supply chain management department existing in their respective firms. It was realized that out of the 200 respondents, 111 (55.5%) did not have such department/unit whereas the remaining 89(44.5%) had a procurement/supply chain management unit in their respective firms.

Overall, it can be inferred that the demographic information of respondents is good to ensure face validity of the research instrument (questionnaire) as the respondents were knowledgeable, astute and experienced enough to qualify to represent their firms to provide the needed information from the questionnaire administered to them.

4.4 DESCRIPTIVE STATISTICS OF VARIABLES

The study had three main variables with environmental knowledge been the independent variable, green procurement as the mediating variable and procurement sustainability as the dependent variable. This section presents the descriptive statistics for each of these variables.

4.4.1 ENVIRONMENTAL KNOWLEDGE

The main independent variable for the study was environmental knowledge. However, it was measured in two dimensions, namely internal knowledge and external knowledge. Items used to measure these variables were adapted from the study of Chan et al. (2012). Tables 4.2 and 4.3 presents the descriptive statistics for internal knowledge and external knowledge respectively.

Table 4.2: Descriptive Statistics of Internal Knowledge

Measures	Min	Max	Mean	Std. Dev.
1. Our firm makes conscious effort to let all employees understand the importance of protecting the environment.	1	5	2.46	.869
2. There is a clear policy regarding environmental awareness in every aspect of operations in our organisation.	1	5	3.91	.765
3. Environmental protection is a high priority by all members of our organisation	2	5	3.22	.664
4. Environmental protection is central in our corporate strategy in our organisation.	2	5	4.40	.851
5. Our organisation' s responsibility to preserve the environment affects our financial performance	3	4	3.23	.419
Composite Average	**2.40**	**4.00**	**3.44**	**.297**

Source: Field Survey, 2023

Using a 5-point agreement Likert Scale, internal knowledge was measured with 5 items adapted from the study of Chan et al. (2012). The overall mean of 3.44 (SD=.297) implies that the respondents agree that there is a level of internal environmental knowledge in their respective firms. However, among the 5 items measuring internal knowledge, the highest mean was obtained from Item 4 with mean of 4.40 and SD=0.851. Unfortunately, the first item had mean value of less than 3.0 implying disagreement with mean value of 2.46 and standard deviation of .869. This implies that overall, there is high level of internal knowledge about the environment among the respective firms.

Table 4.3 shows the descriptive statistics of external knowledge of the environment.

Table 4.3: Descriptive Statistics of External Knowledge

Measures	Min	Max	Mean	Std. Dev.
1. Any changes in the natural environment has influence on our business activities.	1	5	4.07	.715
2. The financial well-being of our firm depends on the state of the natural environment.	1	5	1.87	1.090
3. Environmental protection is vital to our organisation' s survival.	2	5	4.59	.771
4. Several stakeholders expect our organisation to protect the natural environment	2	5	4.02	.661
Composite Average	**2.50**	**4.50**	**3.64**	**.439**

Source: Field Survey, 2023

Using a 5-point agreement Likert Scale, external knowledge was measured with 4 items adapted from the study of Chan et al. (2012). The overall mean of 3.64

(SD=.439) implies that the respondents agree that there is a level of external environmental knowledge in their respective firms. However, among the 4 items measuring internal knowledge, the highest mean was obtained from Item 3. This implies that overall, there is high level of external knowledge about the environment among the respective firms.

4.4.2 GREEN PROCUREMENT

The mediating variable for the study was green procurement. Items used to measure this variable were adapted from the study of Blome et al. (2013). Tables 4.4 presents the descriptive statistics for the green procurement variable.

Table 4.4: Descriptive Statistics of Green Procurement

Measures	Min	Max	Mean	Std. Dev.
1. Our purchasing department participates in the design of products for disassembly	1	5	2.84	1.361
2. Our purchasing department participates in the design of products for recycling or reuse	1	3	1.93	.282
3. Our purchasing department actively contributes to the reduction of packaging material	1	5	1.66	1.044
4. Our purchasing department seeks suppliers with low energy consumption	1	4	1.37	.732
5. Our purchasing department asks suppliers to commit to waste reduction goals	2	5	4.58	.732
Composite Average	**1.60**	**3.60**	**2.48**	**.523**

Source: Field Survey, 2023

Using a 5-point agreement Likert Scale, green procurement was measured with 5 items adapted from the study of Blome et al. (2013). The overall mean of 2.48

(SD=.523) implies that the respondents disagree that there is a practice of green procurement in their respective firms. However, among the 5 items measuring green procurement, the highest mean was obtained from Item 5 with mean of 4.58 and SD=0.732. All other items which had responses of disagreement. This implies that overall, there is low level of green procurement implementation among the respective firms.

4.4.3 PROCUREMENT SUSTAINABILITY

The dependent variable for the study was procurement sustainability. Items used to measure this variable were adapted from the study of Meehan and Bryde (2014). Tables 4.5 presents the descriptive statistics for the procurement sustainability variable.

Table 4.5: Descriptive Statistics of Procurement Sustainability

Measures	Min	Max	Mean	Std. Dev.
1. My organization has a sustainability policy	1	5	3.78	.929
2. My organization assesses the impact of procurement policy on the local economy	1	5	3.30	.809
3. My organization has a waste reduction plan	1	5	3.34	.805
4. My organization ensures the safe incoming movement of products	1	5	3.26	.767
5. My organization trains staff in sustainability	1	5	3.30	.763
6. My organization purchases from local suppliers	1	5	3.59	.967
7. My organization only uses suppliers that do not contribute to human rights abuse	1	5	3.37	1.093
8. My organization purchases from small to medium sized suppliers	1	5	3.78	.949
9. My organization only uses suppliers that do not contribute to local eco-systems destruction	1	5	2.74	.910
10. My organization works with/donates to charities or third sector organizations	1	7	3.02	1.163
Composite Average	**1.20**	**4.90**	**3.35**	**.436**

Source: Field Survey, 2023

Using a 5-point agreement Likert Scale, procurement sustainability was measured with 10 items adapted from the study of Meehan and Bryde (2014). The overall mean of 3.35 (SD=.436) implies that the respondents fairly agree that there is achievement of procurement sustainability in their respective firms. However, among the 10 items measuring procurement sustainability, the highest mean was obtained from Item 1 with mean of .378 and SD=0.929. All other items which had responses of agreement. Unfortunately, the ninth item had mean value of less than 3.0 implying disagreement with mean value of 2.74 and standard deviation of .910. This implies that overall, there is fairly level of achievement of procurement sustainability at the respective firms.

4.5 INFERENTIAL STATISTICS OF VARIABLES

After the descriptive statistics of the variables were ascertained, it was necessary to determine the suitability of the variables to perform the model test analysis. As such, it was necessary to perform some inferential statistics including reliability and validity tests as well as correlations among the variables. The tests performed in this section include reliability tests using Cronbach' s Alpha, Exploratory Factor Analysis (EFA) and ends with the correlations among the variables.

4.5.1 RELIABILITY TEST USING CRONBACH' S ALPHA

Table 4.6 presents the Cronbach' s Alpha (CA) value of the main variables of the study to determine their reliability. As per Nunnaly (1978), a minimum threshold of 0.70 CA value is suitable to pass the test of reliability. As can be seen from Table 4.6, not all variables passed the initial test of reliability. This is because internal environmental knowledge could not meet the minimum required threshold of 0.70. The CA value for internal environmental knowledge was 0.515. Similarly, the CA value for green procurement was 0.501. However, when the items were scaled by

dropping Items 1 and 5 for green procurement, the CA value increased to 0.859. This can be seen in Table 4.6.

Table 4.6: Cronbach's Alpha Value of Variables

Variable	Number of Items	Cronbach's Alpha Value	New No. of Items	New CA Value
1. Internal Environmental Knowledge	5	0.515		
2. External Environmental Knowledge	4	0.720		
3. Green Procurement	5	0.501	3	0.859
4. Procurement Sustainability	10	0.791		

Source: Field Survey, 2023

From Table 4.6, internal knowledge failed the reliability test and as such, the items for external knowledge represented environmental knowledge and used for subsequent analysis.

4.5.2 EXPLORATORY FACTOR ANALYSIS

Following the reliability test, the uni-dimensionality of variables had to be calculated in order to determine the convergent validity of the tests. Exploratory factor analysis (EFA) was employed as such. The EFA test was conducted using Principal Component Analysis and Varimax rotation. The findings can be seen in Table 4.7.

Table 4.7: Exploratory Factor Analysis Results

Variable	Code	Description	Component		
			1	2	3
External Knowledge	EXT_KN7	The financial well-being of our firm depends on the state of the natural environment.			.809
	EXT_KN8	Environmental protection is vital to our organisation's survival.			.894
Green Procurement	GREEN2	Our purchasing department participates in the design of products for recycling or reuse	.905		
	GREEN3	Our purchasing department actively contributes to the reduction of packaging material	.915		
	GREEN4	Our purchasing department seeks suppliers with low energy consumption	.793		
Procurement Sustainability	PROC1	My organization has a sustainability policy		.646	
	PROC6	My organization purchases from local suppliers		.779	
	PROC8	My organization purchases from small to medium sized suppliers		.837	

Source: Field Survey, 2023

Table 4.7 shows the EFA results of the measures of environmental knowledge, green procurement and procurement sustainability with KMO value of 0.663 which was more than the minimum threshold of 0.6 and X^2 = 635.981, df =28 and p=0.000. This was done using Principal Component Analysis with varimax rotation and all Eigen values were set to 1.

After the EFA, items that remained for each construct were EXT_KN7 and 8, GREEN2 – 4, and PROC 1, 6 and 8 respectively for environmental knowledge, green procurement and procurement sustainability.

4.5.3 CORRELATION ANALYSIS

After the exploratory factor analysis, it was necessary to determine the relationship among the variables. As such, the remaining items per construct were composited, and the new average was used for the subsequent analysis.

Table 4.8: Correlation Among Variables

Variables	1	2	3	Mean	SD
1. Environmental Knowledge	1			3.67	0.926
2. Green Procurement	.243**	1		3.37	0.887
3. Procurement Sustainability	.176*	-.247**	1	4.07	0.571

Source: Field Survey, 2023

With regard to the correlation indices, it could be seen that there were no multi-collinearity cases among the variables, all the individual correlations were less than 0.8, which is the collinearity threshold among the variables. There was a positive but weak correlation between green procurement and environmental knowledge (r=0.243) as well as a positive and weak correlation between procurement sustainability and procurement sustainability (r=0.176). However, there was a negative and weak correlation between procurement sustainability and green procurement (r=-0.247).

4.6 MODEL TEST RESULTS

From the literature review, it was conceived that environmental knowledge has a direct impact on procurement sustainability and to some degree, the mediating role of green procurement in the relationship between the variables. These perceived relationships are not only theoretically oriented, but there is some empirical evidence between environmental knowledge and green procurement and the between green

procurement and procurement sustainability from various industries. However, this study focuses on companies providing an overview of these relationships in Ghana, a developing country, whether they adhere to current findings or prove otherwise. The theoretical framework of this study was therefore established so that the theoretical framework developed for the study sought to determine the mediating role of green procurement among organisations in a developing country such as Ghana and Ghana in the relationship between environmental knowledge and procurement sustainability.

The ordinary least square regression approach was used in testing the hypotheses. Environmental knowledge (E), which was assessed with external knowledge metrics after the reliability test, was the main outcome variable such as procurement sustainability (P) and the main predictor variable, and the mediating variable was EFA with Green procurement (G). In view of this the first model explored the direct path from environmental awareness to green procurement in two models. The second model looked at the path from both environmental knowledge to procurement sustainability. This can be seen in the following regression equations.

Model 1

Green Procurement (GP) = β_1EK + ε

Model 2

Procurement Sustainability (PS) = β_1EK + β_2GP + ε

Where: EK = Environmental Knowledge; GP = Green Procurement; PS = procurement sustainability; β = Co-efficient of variables; ε = error term

The regression results depicting the relationships among the variables can be seen in Table 4.9 below.

Table 4.9: Model Path Results

Variables:	Standard Estimates		
	Green Procurement	Procurement Sustainability	
	Model 1	Model 2	Model 3
Hypothesized			
Direct Effect			
Environmental Knowledge	.233(3.507)**	.108(2.503)*	0.154(3.629)**
Mediator			
Green Procurement			-0.198(-4.483)**
FIT INDICES			
χ^2 (df)	9.193(1)	1.963(1)	7.699(2)
χ^2/df	9.193	1.963	3.850
F-Statistics	12.297	6.264	13.488
R^2	**0.059**	**0.031**	**0.122**

Note: ⟵ Prediction path ; $^{*}p < .05$; $^{**}p < .01$

Source: Field Survey, 2023

4.6.1 REGRESSION RESULTS

It can be seen from Table 4.9 that the two models predicted green procurement and procurement sustainability respectively. Regarding **Model 1**, it had only direct effect of environmental knowledge on green procurement. It was observed that there is a **positive effect** between environmental knowledge and green procurement (β=.233; t=3.507) and it was statistically **significant** at p<0.01.

The overall R-square value of **0.059** implies that about 5.9% changes in the dependent variable, green procurement can be explained by environmental knowledge.

From **Model 2**, procurement sustainability was estimated by the independent variable, environmental knowledge. The results from Table 4.9 revealed that there is a **positive effect** between environmental knowledge and procurement sustainability (β=.108; t = 2.503) but it was statistically **significant** at p<0.05. Similarly, the results revealed that there is a **positive effect** between green procurement and procurement sustainability (β=0.014; t=0.390) but it was also statistically **not significant** at p<0.05.

From **Model 3**, procurement sustainability was estimated by the independent variable, environmental knowledge and the mediating variable. The results from Table 4.9 revealed that there is a **positive effect** between environmental knowledge and procurement sustainability (β = 0.154; t = 3.629) and it was statistically **significant** at p<0.05. However, the results revealed that there is a **negative effect** between green procurement and procurement sustainability (β=-0.198; t = -4.483) but it was statistically **significant** at p<0.05.

The overall R-square value of **0.122** implies that about 12.2% changes in the dependent variable, procurement sustainability can be explained by both environmental knowledge and green procurement.

4.6.2 MEDIATION ANALYSIS

The study of Baron and Kenny (1986) on mediation analyses emerged with three criteria for the mediation analysis of research in contemporary studies, which are necessary for mediation to be decided. According to their analysis, A should be significantly related to M for mediation to be achieved; M is significantly related to B; and the relationship of A to B should decrease significantly with the inclusion of M in the model. What this means is that each of the three variables should have a non-zero monotonic relationship with each other, and when adding M, which is also a predictor of B, the relationship of A to B should decrease significantly (Kenny et al., 1998; MacKinnon et al., 2004).

Relating to this present study, the condition for mediation was that the path from environmental knowledge (EK) to green procurement (GP) and the path from green procurement (GP) to procurement sustainability (PS) should both be positive and significant. Also, the introduction of green procurement (GP) in the path between environmental knowledge (EK) and procurement sustainability (PS) should reduce substantially.

It could be seen from the results that the path from environmental knowledge (EK) to green procurement (GP) was positive and significant. However, the path from green procurement (GP) to procurement sustainability (PS) was negative but significant. As such, **mediation**

was partially achieved. This implies that green procurement partially mediates the relationship between environmental knowledge and procurement sustainability.

4.6.3 MEDIATION ANALYSIS USING SOBEL TESTS

From the research model, environmental knowledge was the independent variable green procurement was the dependent variable with and one dependent variable (procurement sustainability). From the regression results from SPSS, the SOBEL test for mediation was tested for the mediating variable.

Table 4.10: Environmental Knowledge and Procurement Sustainability Mediated by Green Procurement

Input:			Test statistic:	Std. Error:	*p*-value:
a	0.233	Sobel test:	-2.77756384	0.01660952	0.00547681
b	-0.198	Aroian test:	-2.73605954	0.01686148	0.00621798
s_a	0.066	Goodman test:	-2.8210161	0.01635368	0.00478718
s_b	0.044	Reset all	Calculate		

Source: Field Survey, 2023

Using the Sobel test, the mediation test was conducted. The condition for mediation is that the p-value should be close to zero for the mediation effect of the mediator on the relationship between the dependent and independent variable.

For H4, it was found that the mediation effect of green procurement on the relationship between environmental knowledge and procurement sustainability was significant as the p-value is close to zero (p = 0.00547681). Therefore, green procurement is said to mediate the relationship between environmental knowledge and procurement sustainability. However, since the effect of environmental knowledge on procurement sustainability was also positive and significant, it can be said that partial mediation was achieved.

Table 4.11: Summary of Results and Hypotheses Tested

Hypothesis	Path	β	T-Value	Remarks
H1	**EK → PS**	0.108	2.503	Supported
H2	**EK → GP**	0.233	3.507	Supported
H3	**GP → PS**	-0.198	-4.483	Not Supported
		P-Value		
H4	**EK → GP → PS**	0.005		Not Supported

EK – Environmental Knowledge; PS – Procurement Sustainability; GP – Green Procurement

Source: Field Survey, 2023

4.7 DISCUSSIONS AND IMPLICATIONS

This study purposely was set to assess the mediating role of green procurement on the relationship between environmental knowledge and procurement sustainability with empirical evidence from organisations in the Western region in Ghana. This is a replicating study from other similar studies conducted in other industries across the world. However, the researcher identified a gap in the business sector using selected firms in Ghana when it comes to environmental knowledge and how it is mediated by green procurement to contribute to procurement sustainability. In recent years, environmental issues have become a matter of urgent concern for business worldwide, according to Manon (2013). In view of rising waste management costs, environmental degradation, public health challenges, climate change, lack of capital and persistent global poverty, the supply management profession is increasingly called upon to contribute to broader sustainable development organizational goals by integrating social and environmental criteria into procurement process (Srivastava, 2013).

As such the study was firm-based focusing on selected firms in the Greater-Accra region in Ghana. With a sample size of 200 participants for the study, same number of questionnaires were administered and a 100% response rate was achieved. The participants mostly constituted managers as well as senior staffs of those selected firms as they were top level heads of the company and their responses were representative of what their pertains in the company and business sector as a whole.

The study focused on the relationship that exist among the three constructs – environmental knowledge, green procurement and procurement sustainability. From the empirical findings, the following discussions and implications can therefore be made;

The first hypothesis posited that environmental knowledge is positively and significantly related to procurement sustainability. The findings revealed that there is a **positive effect** between environmental knowledge and procurement sustainability (β=.108; t = 2.503) and it was statistically **significant** at $p<0.05$. Thus, environmental knowledge leads to procurement sustainability per the findings of this study. This finding did support previous literature on the subject matter. For instance, Environmental knowledge and pro-environmental attitudes are highly interconnected; they reinforce each other, especially in the quest for information about environmental issues, according to Bamberg (2003). Kagawa (2007) notes that improving transparency is certainly necessary for good environmental knowledge so that innovative approaches are needed to effectively train learners to deal with environmental and sustainability issues.

The second hypothesis for this study was that environmental knowledge is positively and significantly related to green procurement. The findings revealed that there is a **positive**

effect between environmental knowledge and green procurement (β=.233; t=3.507) and it was statistically **significant** at p<0.01. This is in line with extant literature. A number of studies argue that people with greater environmental awareness are more likely to act responsibly to protect the environment, although cultural factors can restrict this positive impact on pro-environmental behaviour (Vicente-Molina et al., 2013; Kennedy et al., 2009). This is further endorsed by Zsóka et al. (2013), who claim that environmental consciousness and pro-environmental actions are self-reinforcing, for instance while people are looking for environmental knowledge.

The third hypothesis posited that green procurement is positively and significantly related to procurement sustainability. The results of the study revealed that there is a **negative effect** between green procurement and procurement sustainability (β= -0.198; t = -4.483) and it was also statistically **significant** at p<0.05. Thus, green procurement does not lead to procurement sustainability per the findings of this study. This finding did not find support from previous literature on the subject matter.

The last hypothesis posited that green procurement mediates positively and significantly the relationship between environmental knowledge and procurement sustainability. From the findings, it was found that the effect of green procurement on procurement sustainability was **negative** (β= -0.198; t = -4.483) though there was a **positive effect** between environmental knowledge and green procurement (β=.233; t=3.507). This implies that green procurement does not positively mediate the relationship between environmental knowledge and procurement sustainability. As such, the last hypothesis (H4) was **not supported** by findings of this study.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter summarizes all findings reported in Chapter Four according to the study' s objectives, the hypotheses of the study and in line with the research model. The chapter also includes the conclusions and recommendations suggested for the business sector in the area of environmental knowledge, green procurement and procurement sustainability to help future researchers on the study of this subject matter.

5.2 SUMMARY OF FINDINGS

The summary of the findings of the study in line with the objectives of the study are presented in the next sub-sections.

5.2.1 LEVEL OF ENVIRONMENTAL KNOWLEDGE AMONG ORGANISATIONS IN THE WESTERN REGION IN GHANA

The first objective of the study was to examine the level of environmental knowledge among organisations in the Western region in Ghana. There were two dimensions of the environmental knowledge construct – namely internal knowledge and external knowledge. The findings revealed that with an overall mean of 3.44, it implies that the respondents agree that there is a level of internal environmental knowledge in their respective firms. Similarly, the overall mean of 3.64 implies that the respondents agree that there is a level of external environmental knowledge in their respective firms. It can therefore be said that there is ahigh level of internal and external knowledge about the environment among the respective firms.

5.2.2 THE RELATIONSHIP BETWEEN ENVIRONMENTAL KNOWLEDGE AND PROCUREMENT SUSTAINABILITY AMONG ORGANISATIONS IN THE WESTERN REGION IN GHANA

The second objective of the study was to analyze the relationship between environmental awareness and the sustainability of procurement among organizations in Ghana's Western region. The correlation study showed that there is a strong but poor correlation between the sustainability of procurement and the sustainability of procurement (r=0.176). For the regression result, it was realized that there is a **positive effect** between environmental knowledge and procurement sustainability (β=0.108; t=2.508) and it was statistically **significant** at p<0.05. Thus, environmental knowledge leads to procurement sustainability per the findings of this study.

5.2.3 THE RELATIONSHIP BETWEEN ENVIRONMENTAL KNOWLEDGE AND GREEN PROCUREMENT AMONG ORGANISATIONS IN THE WESTERN REGION IN GHANA

The third objective of the study was to examine the relationship of organizations in the Western region of Ghana between environmental awareness and green procurement. The correlation analysis showed that there is a strong but poor correlation between green procurement and awareness of the environment (r=0.243). The regression results however revealed that there is a **positive effect** between environmental knowledge and green procurement (β=.233; t=3.507) and it was statistically **significant** at p<0.01. Thus, environmental knowledge leads to green procurement per the findings of this study.

5.2.4 THE EFFECT OF GREEN PROCUREMENT ON PROCUREMENT SUSTAINABILITY AMONG ORGANISATIONS IN THE WESTERN REGION IN GHANA

The last objective of the study was to determine the effect of green procurement and procurement sustainability among organisations in the Western region in Ghana. From the correlation analysis, it was realized that is a negative and weak correlation between procurement sustainability and green procurement (r=-0.247). For the regression analysis, it was realized that there is a **negative effect** between green procurement and procurement sustainability (β= -0.198; t = -4.483) but it was also statistically **significant** at $p<0.05$. Thus, green procurement does not lead to procurement sustainability per the findings of this study.

5.2.5 MEDIATION EFFECT OF GREEN PROCUREMENT ON THE RELATIONSHIP BETWEEN ENVIRONMENTAL KNOWLEDGE AND GREEN PROCUREMENT

The last objective of the study was to examine the mediating effect of green procurement on the relationship between environmental knowledge and procurement sustainability among organisations in the Western region in Ghana. Using the Sobel test, it was found that the mediation effect of green procurement on the relationship between environmental knowledge and procurement sustainability was significant as the p-value is far from zero (p = 0.00547681). However, from the findings, it was found that the effect of green procurement on procurement sustainability was negative (β= -0.198; t = -4.483) though there was a positive **effect** between environmental knowledge and green procurement (β=.233; t=3.507). This implies that green procurement does not positively mediate the relationship between environmental knowledge and procurement sustainability. As such, the last hypothesis (H4) was not supported by findings of this study. Therefore, green

procurement does not positively mediate the relationship between environmental knowledge and procurement sustainability.

5.3 CONCLUSIONS

Environmental knowledge, green procurement and procurement sustainability are key concepts in sustainability literature whose relevance for organizations cannot be overemphasized. The study therefore focused on selected firms in the Western region and used the managers and senior staffs as representatives of the company to collect data to test the relationships among the research model. A sample size of 200 was selected out of which questionnaires were administered to in order to gather data to measure the three main variables and test their relationships. All 200 questionnaires returned representing 100% response rate. This is an excellent percentage and it based on these returned responses that findings of the study were obtained from, analysed and discussed.

Based on the findings presented in previous sections, the study drawn the following conclusions.

From the descriptive statistical analysis results regarding the level of environmental knowledge, the study concluded that;

• all environmental knowledge dimensions (internal knowledge and external knowledge) were highly practices at their respective firms.

• the analysis further concluded that overall, there is high extent environmental knowledge among the selected firms.

The study concluded that there is a positive but negligible correlation between environmental knowledge and procurement sustainability with regard to the relationship between environmental knowledge and procurement sustainability.

Finally, in relation to the mediating effect of green procurement on the relationship between environmental knowledge and the procurement sustainability, the findings concludes that the relationship between environmental knowledge and procurement sustainability is not positively mediated by green procurement.

5.4 RECOMMENDATIONS

Based on the summary of findings and conclusions drawn, the study therefore recommends the following;

5.4.1 INCREASED COMMITMENT TO GREEN PROCUREMENT INITIATIVES

It is clearly seen from the findings that green procurement has a significant and positive effect on procurement sustainability. It is therefore recommended that players in the business sector should involve themselves in activities and programmes which would remove paper work and more green practices to improve procurement sustainability.

5.4.2 HIGHER COMMITMENT IN EFFECTIVE SUSTAINABILITY MEASURES

The findings revealed that environmental knowledge has a significant effect on procurement sustainability and the effect was positive. Firms should thus increase their environmental knowledge as they offer even more potential for differentiation than manual sourcing and procurement, which are still important.

5.4.3 ENHANCEMENT OF SUSTAINABLE PROCUREMENT IMPROVEMENT PROGRAMMES

It is necessary for players in the business sector to enhance sustainable procurement improvement programmes such as transparency, supplier development, supplier collaboration and risk management as to make their processes sustainable.

5.4.4 SUPPLY CHAIN COLLABORATION

Business sector players must cooperate with each other by exchanging knowledge and planning together on the requirements of each other, which is based on mutual confidence and understanding. In doing so, each actor will need to involve at least their direct (tier 1) suppliers and customers in their planning and goal-setting operations and then communicate periodically to create reliability, responsiveness and other supply chain standards.

5.4.5 SUPPLIER MONITORING/DEVELOPMENT

It is also recommended that players in the business sector continually invest resources through coaching and other appropriate platforms in the monitoring and development of their suppliers, particularly with regard to ways of improving their economic, social and environmental gains within the business sector. This is necessary in order to address the risks resulting from supplier incompetence.

5.5 RECOMMENDATION FOR FUTURE STUDIES

It is recommended that these areas be further explored in light of the results and limitations of this study:

i. Similar study could be carried out in different industries such as the service industry, transport industry, to determine the effect of environmental knowledge and procurement sustainability; moderating effect of green procurement.

ii. Carry out a similar study in other regions to validate the findings

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APPENDIX

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
QUESTIONNAIRE

I am an MSc Procurement and Supply Chain Management student of KNUST. As part of the requirements for the award of Master' s Degree, I am undertaking a research work to on ***The Mediating Role of Green Procurement on the Relationship Between Environmental Knowledge and Procurement Sustainability***. This work is purely for academic purposes and the data collected and the results will not be used in any way to jeopardize the interest of your unit and your business as a whole. I guarantee your anonymity and complete confidentiality.

SECTION A: ENVIRONMENTAL KNOWLEDGE

Strongly Disagree ---Neutral---- Strongly Agree

To what extent do you agree with these assertions, as they exist in your organisation concerning your environmental knowledge?	1	2	3	4	5
INTERNAL KNOWLEDGE					
1. Our firm makes conscious effort to let all employees understand the importance of protecting the environment.	☐	☐	☐	☐	☐
2. There is a clear policy regarding environmental awareness in every aspect of operations in our organisation.	☐	☐	☐	☐	☐
3. Environmental protection is a high priority by all members of our organisation	☐	☐	☐	☐	☐
4. Environmental protection is central in our corporate strategy in our organisation.	☐	☐	☐	☐	☐
5. Our organisation's responsibility to preserve the environment affects our financial performance	☐	☐	☐	☐	☐
EXTERNAL KNOWLEDGE	1	2	3	4	5
6. Any changes in the natural environment has influence on our business activities.	☐	☐	☐	☐	☐
7. The financial well-being of our firm depends on the state of the natural environment.	☐	☐	☐	☐	☐
8. Environmental protection is vital to our organisation's survival.	☐	☐	☐	☐	☐
9. Several stakeholders expect our organisation to protect the natural environment	☐	☐	☐	☐	☐

SECTION B: GREEN PROCUREMENT

*Using a scale of **1 – 5 [where 1=Strongly Disagree; 3=Neutral; and 5=Strongly Agree],** indicate this firm's green procurement in relation to that of key competitors for the past 3 years:*

Strongly Disagree ---Neutral---- Strongly Agree

What is the extent of green procurement implementation at your organisation for the past 3 years?	1	2	3	4	5
1. Our purchasing department participates in the design of products for disassembly	☐	☐	☐	☐	☐
2. Our purchasing department participates in the design of products for recycling or reuse	☐	☐	☐	☐	☐
3. Our purchasing department actively contributes to the reduction of packaging material	☐	☐	☐	☐	☐
4. Our purchasing department seeks suppliers with low energy consumption	☐	☐	☐	☐	☐
5. Our purchasing department asks suppliers to commit to waste reduction goals	☐	☐	☐	☐	☐

SECTION C: PROCUREMENT SUSTAINABILITY

*Using a scale of **1 – 5 [where 1=Strongly Disagree; 3=Neutral; and 5=Strongly Agree],** indicate this firm' s performance in relation to that of key competitors for the past 3 years:*

Strongly Disagree ---Neutral---- Strongly Agree

What is the extent of procurement sustainability of your firm for the past 3 years?	1	2	3	4	5
1. My organization has a sustainability policy	☐	☐	☐	☐	☐
2. My organization assesses the impact of procurement policy on the local economy	☐	☐	☐	☐	☐
3. My organization has a waste reduction plan	☐	☐	☐	☐	☐
4. My organization ensures the safe incoming movement of products	☐	☐	☐	☐	☐
5. My organization trains staff in sustainability	☐	☐	☐	☐	☐
6. My organization purchases from local suppliers	☐	☐	☐	☐	☐
7. My organization only uses suppliers that do not contribute to human rights abuse	☐	☐	☐	☐	☐
8. My organization purchases from small to medium sized suppliers	☐	☐	☐	☐	☐
9. My organization only uses suppliers that do not contribute to local eco-systems destruction	☐	☐	☐	☐	☐
10. My organization works with/donates to charities or third sector organizations	☐	☐	☐	☐	☐

SECTION D: RESPONDENT'S INFORMATION

1. Your Gender?

   Male ☐ Female ☐

2. What is your age?

   Less than 30 years ☐ 30-40 years ☐ 41-50 years ☐ 51 and above ☐

3. How long have you worked in your organisation?

   Less than 1 year ☐ 1 – 3 years ☐ 4 – 6 years ☐ 7 – 9 year ☐
   10 years and above ☐

4. What is your level of education?

   JHS ☐ SHS ☐ HND ☐ Degree ☐ Masters ☐
   ☐ Other, Please specify……

5. Does your firm have a procurement/supply chain management department?

   Yes ☐ No ☐