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**EXAMINING THE EFFECT OF SUSTAINABLE PRACTICES ON
ORGANISATIONAL PERFORMANCE – THE MODERATED-MEDIATION
ROLES OF TOP MANAGEMENT COMMITMENT AND PROCUREMENT
CAPABILITY**

BY

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**A THESIS SUBMITTED TO THE DEPARTMENT OF DEPARTMENT OF
SUPPLY CHAIN AND INFORMATION SYSTEMS, INSTITUTE OF DISTANCE
LEARNING, IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR
AWARD OF DEGREE OF
MASTER OF SCIENCE (LOGISTICS AND SUPPLY CHAIN MANAGEMENT)**

NOVEMBER, 2023

DECLARATION

I hereby declare that this thesis is the result of my original work toward the MSc in Logistics and Supply Chain Management and that, to the best of my knowledge, it neither contains materials published by another person, nor materials that have been accepted for the award of any other degree of the University, except where due acknowledgments have been made in the text.

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ABSTRACT

Sustainable practices have become a necessary need in recent times because of numerous environmental issues including land degradation, global poverty, absence of human rights, general health deficiencies and corporate governance. As such, this study sought to explore the relationships among sustainable practices, procurement capability, top management commitment and firm performance: empirical study from the public sector in the Greater-Accra region of Ghana. This was done by selecting sample of respondents who were top officials in the public sector institutions in the Greater-Accra region of Ghana of which a response rate of 50.5% from a sample size of 200 was achieved using appropriate methodological approaches. The study revealed that social practices and environmental practices are sustainable practices which influence organisational performance. However, these sustainable practices do not contribute to procurement capability. The findings also revealed that procurement capability does not mediate the relationship between sustainable practices and organisational performance. Finally, it was found that at high levels of top management commitment, the indirect effect of sustainable practices on organisational performance through procurement capability is weakened. This implies that top management commitment does not moderate the relationship between sustainable practices and organisational performance through procurement capability. It is therefore incumbent on all stakeholders in the public sector to ensure socially and environmentally sustainable practices that would improve performance of public sector institutions in Ghana. It is therefore recommended that top management in the public sector should involve themselves in activities and programmes which would bring improvement in the social welfare of staff and the communities they serve as well as been environmentally-conscious so as to improve their performance.

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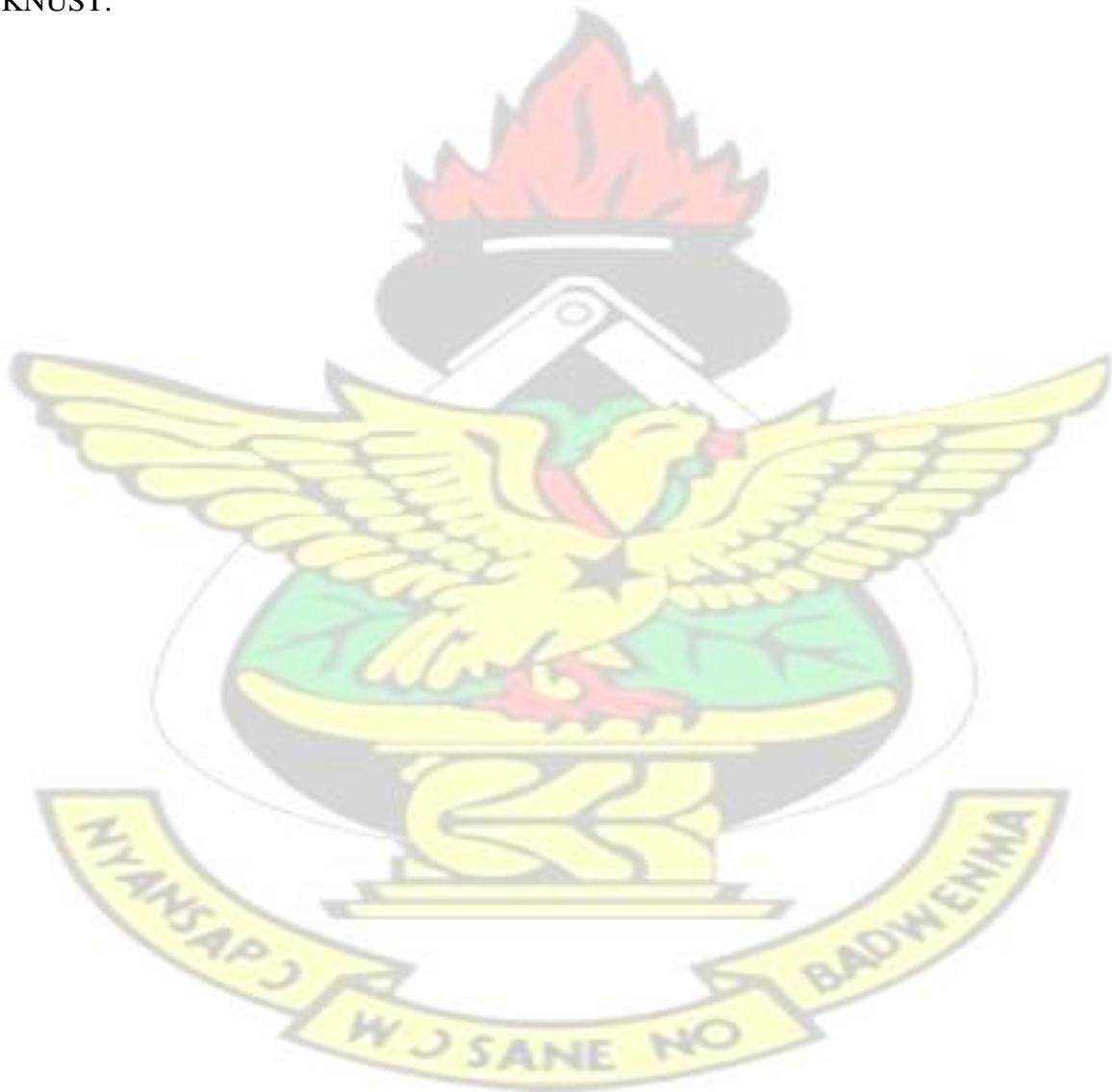
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DEDICATION

This research work is dedicated to my lovely father and my daughter for their love, support, and understanding throughout the study of this Programme.

To my accomplice in all and to the Gyan family for their massive support and encouragement that led me to the completion of my study. And also, to everyone who one way or the other aided and impacted in my life while I passed through my days in the KNUST.



ACKNOWLEDGEMENTS

Thank you to God Almighty for the gift of life, family, and everything else. My heart is filled with gratitude for your grace and mercy which have brought thus far. My father and my lover, you walked me through the shadow of death and made me fear no evil for which, I remain exceedingly appreciative of everything. Glory to your Holy name.

I do express my appreciation to Prof Jonathan Annan my supervisor and his assistant Dr. Rockson for their wonderful supervision throughout this thesis.



CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The rapid changes in time and the environment have resulted in great competitive pressures on organisations. In order to survive in this turbulent environment as grow, at lot of organisations are actively looking for means to develop capabilities and enhance their competitive advantages to cope with the changes in this globalized era (Zhang et al., 2012). Modern businesses have become service-oriented and organisations providing a single product or service can no longer attract customers. Sustainability issues have become apparent and a key to combine corporate products and services to create economic value (Sheng et al., 2010). As such many organisations have realized the importance of sustainability and seeks to promote competitiveness by enhancing the level of service quality (Zhang et al., 2012).

The idea of managing supply chains has been examined in the management and engineering literature since the mid twentieth century (Svensson, 2007; Carter and Easton, 2011; Sarkis et al., 2011). In spite of the fact that definitions of SCM contrast among authors, before the 1980s these definitions essentially centred around logistics and operational efficiency issues, for example, manufacturing performance, stock control, distribution, and trans-shipment issues (Mentzer et al., 2001; Cousins et al., 2006). By the mid-1980s, the acknowledgment of the strategic importance of supply chains brought about a shift in focus from a smaller to an expansive and involving one.

Sustainable practices have become a necessary need in recent times because of numerous environmental issues including land degradation, global poverty, absence of human rights, general health deficiencies and corporate governance. This has necessitated the

development of the concept of sustainable practices to help as a key enabler that could push organisations to focus on alleviating these environmental issues while providing economic and social benefits (Haavisto and Kovacs, 2014). Creating sustainable business practices is not just basic to the fate of an organization, yet in addition for the advantage of who and what is to come. Sustainable practices are driving organisations to reasonable development, both profitably and responsibly.

Extant studies have revealed that sustainable efforts have the potential to increase organisational performance in terms of cost, delivery, quality and speed, which are indicators of organisational performance (Byaruhanga, 2016; Kotler, 2004; Hinton, 2003). Increasing organisational performance is a daunting task for most organisations. There have been different studies which have argued on the measurement and relevance of organisational performance to organisations. Also, there has not been much studies to explore the relationship between sustainable practices and organisational performance of firms especially in the business sector in Ghana. The extent to which this relationship is also influenced by procurement capability and top management commitment has not been empirically explored much in this contextual setting.

As such, sustainability efforts have been envisaged as a business strategy that drives long term corporate growth and profitability vis-à-vis incorporating environmental and social issues into the business model. However, the question then is, to what extent sustainable practices been integrated in the business sector in Ghana and how it affects organisational performance? How does high levels of top management commitment influence this relationship? Also, to what extent does procurement capability mediate the relationship between sustainable practices and organisational performance? These are millennium

dollar questions which have not been answered through scholarly work as far the researcher is concerned.

Therefore, this study is set to ascertain the relationships among sustainable practices and organisational performance within the context of the business sector in Ghana, as well as how they are influenced by procurement sustainability and top management commitment in a Sub-Saharan country. To the best of the researcher's knowledge, there has not been empirical studies in Ghana to ascertain the extent to which sustainable practices affect organisational performance in the business sector. Based on this, this study seeks to investigate extent to which sustainable practices are employed in the business sector in Ghana; and the association between same and organisational performance.

1.2 Statement of the Problem

There has been great concern on studies related to sustainability and in recent times, much emphasis has been placed on sustainable supply chain management (SSCM). Most of these studies have attempted to establish SSCM's theoretical/conceptual framework, based on comprehensive literature review.

Interestingly, several case studies have been performed on sustainable practices. Formentini and Taticchi (2016) conducted an empirical study to examine seven case studies through the lenses of contingency theory, strategic alignment, and the resource-based view of organizations. Characterization of three sustainability profiles, namely sustainability leaders, sustainability practitioners, and traditionalists; classification of governance mechanisms based on their level of collaboration and formalization; and identification of factors that enable governance mechanisms are among the findings (Formentini and Taticchi, 2016).

Many literature-based empirical studies on SSCM deal with the environmental and economic aspects (Golicic and Smith, 2013; Esfahbodi et al., 2016). Esfahbodi et al. (2016) limited their analysis to the trade-offs between environmental and cost-effectiveness and did not integrate social efficiency in the same way. There are few empirical studies in the supply chain that have considered only social sustainability (Lu et al., 2012; Mani et al., 2016a; 2016b; Zhu et al., 2016), and have not considered either an economic or an environmental aspect.

The goal of the study of Pham and Kim (2019) was to determine the moderating role of leadership competences on the relationship between integrative supply chain practices and firm performance. According to the authors, the understanding of leadership and its relationship to sustainable construction is still insufficient, necessitating further research.

As a result, this research developed a survey questionnaire and used Structural Equation Modeling (SEM) to empirically investigate the relationships between sustainable practices (environmental, economic, and social) and sustainability performance, as well as the moderating effect of construction managers' leadership competences on these relationships.

Combining the research models of the studies of Dobrzykowski et al. (2012) and Pham and Kim (2019), this study makes a contribution to their models by considering sustainable practices (environmental, economic and social) as the key independent variables and examine its effect on organisational performance with procurement capability as a mediator.

The study focuses on the public sector institutions in Ghana, and how they can build procurement capability through effective sustainable practices to impact on their organisational performance and how top management support conditions the effect of sustainable practices on procurement capability.

1.3 Objectives of the Study

The general objective of the study is to examine the effect of sustainable practices on organisational performance – a moderated-mediation roles of top management commitment and procurement capability in Ghana. However, specifically, the study seeks;

1. To examine the effect of sustainable practices on organizational performance.
2. To examine the effect of sustainable practices on procurement capability.
3. To examine the procurement capability on organizational performance.
4. To examine the moderating effect of top management commitment on the relationship between sustainable practices on organizational performance.
5. To examine the mediating role of procurement capability on the relationship between sustainable practices and organizational performance.

1.4 Research Questions

1. What is the effect of effect of sustainable practices on organizational performance?
2. What is the effect of sustainable practices on procurement capability?
3. What is the effect of procurement capability on organizational performance?
4. Do higher levels of top management moderate the effect of sustainable practices on organisational performance?
5. Does procurement capability mediate the relationship between sustainable practices and organizational performance?

1.5 Justification of the Study

In spite of investments made by most companies in developing countries, supply chain management holds important position in maintaining the flow of the raw materials to the processing units up to supplying finished goods to the end consumer. In the business sector as well, the concept of supply chain management with its elements such as sustainable practices are gradually gaining grounds because of its relevance.

The study by Dobrzykowski et al. (2012) sought to determine the mediating role of procurement capability on the relationship between integrative supply chain practices and firm performance. The aim of their research was to look at the IT practices and collaborative methods used by businesses in dealing with customers and suppliers in the sense of procurement through the prism of Service-Dominant Logic (SDL). Similarly, Pham and Kim (2019) sought to determine the moderating role of leadership competences on the relationship between integrative supply chain practices and firm performance. According to the authors, the understanding of leadership and its relationship to sustainable construction is still insufficient, necessitating further research. As a result, this research developed a survey questionnaire and used Structural Equation Modeling (SEM) to empirically investigate the relationships between sustainable practices (environmental, economic, and social) and sustainability performance, as well as the moderating effect of construction managers' leadership competences on these relationships.

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organisational performance and how top management support conditions the effect of sustainable practices on procurement capability.

It is evident from most studies that there are limited studies on sustainable practices in the business sector especially in Ghana. This study thus seeks to fill this gap and consequently ascertain the relationship between sustainable procurement management practices and operational performance in the construction sector in Ghana.

1.6 Overview of Methodology

This study adopts both an explanatory survey research design. A quantitative research method for data gathering as questionnaires was relied upon. The fundamental sources of data were primary and secondary sources. The primary data was wholly captured from the selected public sector institutions in the Accra metropolis in Ghana through the administration of questionnaires. The secondary data were collected from books, journals, internet and other research works on the subjects of sustainable practices as well as procurement capability, top management commitment and organisational performance.

The collected data were analysed with the aid of statistical tools such as descriptive statistics, factor analysis as well as ordinary least square regression. Hayes Macro Process Macro was used to test the mediation and interaction effect. The study then drew conclusions from the findings and suggested effective and efficient recommendations for stakeholders of our ports for policy making and implementation.

1.7 Scope of the Study

This study is limited to assessing the effect of sustainable practices on organisational performance. The moderating variable is top management commitment and the mediating variable is procurement capability. Therefore, relevant literature in line with the study objectives and the conceptual framework were used for the study. The respondents of the

study covered the procurement and estate officers of the public sector institutions as the study context. However, because of limited resources and time constraints with respect to the researcher, only the selected public sector institutions in the Accra metropolis were contacted for this study.

1.8 Limitations of the Study

There is no research that does not have some potential drawbacks. This research is no different. One key drawback was that the topic under investigation is a grey area in Ghana, making it difficult to compile literature from local studies. There have also been cases of respondents to the survey displaying apathy when the questionnaires were given to them. The data collection procedure was slowed as a result of this. The researcher faced certain practical problems, such as a lack of time and funds to broaden the scope of the study to include all of Ghana. As a result, the study was limited to the Accra metropolitan area. However, the study's validity and reliability were unaffected by these limitations.

1.9 Organisation of the Thesis

The study is divided into five chapters. The first chapter provides a broad summary of the study, including background of the study, statement of the problem, research aims, significance, overview of methodology, scope of the study, limitations of the study, and organization. The review of related extant literature on the subject under inquiry is presented in Chapter Two. It digs into theoretical and empirical studies on the topic in the sub-region and around the world. The methodological approach and procedures used in the study are discussed in detail in Chapter Three. It examines the research design, study population, sample size and sampling techniques, data sources, data collection methods, data management and analysis, and ethical considerations. The findings, analysis, and discussion of data acquired for the study are presented in Chapter Four. This chapter is

divided into two parts: a description of the findings and a discussion of the findings based on the literature review. Finally, in Chapter 5, the findings, conclusions, and suggestions of the research study are summarized and presented in accordance with the study's objectives.

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CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter examines the extant literature on sustainable practices, procurement capabilities, top management commitment, and organizational performance. It begins with a conceptual examination, then moves on to a theoretical examination, an empirical examination, and lastly, a conceptual framework. The term “sustainable practices” is reviews, as well as theories like Transaction Cost Economics (TCE) and the firm's resource-based view (RBV). The conceptual framework was developed after an empirical examination of similar studies.

2.2 Conceptual Review

The conceptual review of a study comprises a researcher's appraisal of the topic's breadth and organization (Khattak, 2014). It's about how a researcher may best characterize the natural progression of the subject under examination (Camp, 2001). In this study, the researcher's purpose was to connect concepts, theories, and actual research on a topic of interest to him. It is ordered in a logical manner to help create a picture or visual representation of how the ideas in a study relate to one another (Grant and Osanloo, 2014).

This research emphasizes essential study themes such as sustainable practices, procurement capabilities, top management commitment, and overall organizational success. These are covered in the following sections.

2.2.1 Definitions and Overview of Sustainable Practices

Sustainability is a broad topic that can be tackled from a variety of perspectives, such as sustainable cities, societies, and so on. In this dissertation, the concept of sustainability was reduced to the business level, and it was regarded as integrally tied to the concepts of corporate social responsibility (CSR) and the triple bottom line, which means economic, environmental, and social sustainability.

There is a long history of research in this topic. Barnard (1968) studied corporate social responsibility at the organizational and executive levels. Carroll (1979) defined corporate social performance as a company's society obligation in terms of economics, law, ethics, and discretion. Clarkson (1995) developed a corporate social responsibility framework based on the company's stakeholder ties. The economic, environmental, and social sustainability of a firm, according to Elkington (1997), are all interconnected. These three pillars of a business's long-term survival may interact. Dyllick and Hockerts (2002) extended on Clarkson's approach by not only recognizing the need of stakeholder participation, but also providing a conceptual model and related criteria for narrowing down corporate sustainability.

Furthermore, they attempted to incorporate short- and long-term economic, ecological, and social factors. More restrictions are being implemented at the industry level to encourage businesses to become more sustainable. The International Organization for Standardization (ISO) created ISO 26000 in 2010 to provide new recommendations for businesses and organizations on how to function effectively in an environmentally and compassionate manner (Lu et al., 2013). Special policies for encouraging environmental and social responsibility, such as the Renewed 2011–14 European Union Strategy for CSR, are in place for EU countries. This strategy aims to include environmental and social factors into the company's main business plan and day-to-day operations (Crane et al., 2013; Lu et al.,

2013). In a global context, the United Nations Guiding Principles on Business and Human Rights, the United Nations Global Compact, the International Labour Organization's Declaration of Principles Concerning Multinational Enterprises on Social Policy, and the Organisation for Economic Co-operation and Development (OECD) Guidelines for Multinational Enterprises are all popular guidelines for shaping companies' sustainable operations.

The focus of this research on sustainability is mostly on the public sector institution's boundaries. When a supply chain is analyzed, the impact of suppliers on the institution is examined, with the same's perspectives highlighted in terms of economic, social and environmental dimensions.

2.2.1 Economic Practices

The economic dimension includes all profits earned by the members of the chain as well as the economic benefits realized by the host nations, regions and communities of those members (Sloan, 2010). It relates to the efficient use of resources, the competitiveness and the viability of the sector as well as its contributions to the viability of communities. Efficient production structures, appropriate technologies as well as the diversification of income sources for agents are important elements of this dimension (European Commission, 2001). According to Votano, et al. (2004b), economically, sustainability means providing economic welfare with the future in mind. Using ICT has various outcomes in business, which includes improved products and services quality, decreased costs, enhanced decision-making and improved innovation. In supply chain, it leads to decreased scrap and reworks expenses, reduced planning expenses, decreased inventory expenses, optimized inbound and outbound fleet and warehouse activities, decreased energy usage, enhanced physical security, enhanced quality control, decreased out of stocks, enhanced fleet operation and optimized assortment activities (Noronha et al., 2014).

Harris (2000) states that an economically sustainable system must be able to produce goods and services on a continual basis; to maintain manageable levels of government and external debt and to avoid extreme sectorial imbalances which damage agricultural or industrial production. As a pillar, economic sustainability entails more than internal profits of the companies or agents involved in the network. A number of studies suggest that ignoring economic outcomes would be irresponsible (Carter and Rogers, 2008; Seuring, 2008), and that managers have a fiduciary responsibility to adopt sustainability practices based on business self-interest and return on investment (ROI) principles (Siegel, 2009). Sustainable practices entail the more efficient use of resources, which, according to the RBV (Barney, 1991), improves economic performance and engenders competitive advantage. Likewise, proponents of sustainability agree that when aligned with economic objectives and a long-term strategy, sustainability can create a difficult-to-imitate competitive advantage (Carter and Rogers, 2008). Empirically, Paulraj et al. (2017) reveal that SSCM practices improve economic performance including return on assets (ROA), earnings before interest and taxes (EBIT), and profit as percentage of sales.

Sloan (2010) distinguishes four main categories of economic dimension of sustainability as economic performance which includes order fill lead time, product defect rate, transportation cost per unit, productivity and market value; financial health which includes profitability ratio, cost of goods sold and return on working capital; market and structure which involves the degree of vertical integration, depth of supplier pool, breadth of customer base and market share; and institutions or systems which involves regulatory compliance, standards certification and quality management system in use.

Ho and Choi (2012) indicate that all activities that seek to promote profits, create jobs, attract customers, reduce costs, anticipate and manage long-term risks whilst fostering long-term competitiveness encapsulates economic sustainability. Economic sustainability

is therefore used to identify various strategies that make it possible to use available resources to their best advantage. The idea is to promote the use of those resources in a way that is both efficient and responsible and likely to provide long-term benefits. In the case of a business operation, it calls for using resources so that the business continues to function over a number of years, while consistently returning a profit. For economic indicators, Increase in Return on Assets (ROA) and improvement in cash sales (Paulraj et al., 2017). Chen et al. (2004) opine that increase in return on investment. Mefford (2011), argues that increase in shareholder's equity. Increase in profit as a percentage of sales (Chen and Paulraj, 2004). Increase in earnings before interest and tax (EBIT) (Ameer and Othman, 2012). Increase in cost savings due to reduction in material use, increase in cost savings due to reduction in energy consumption and increase in cost savings due to waste reduction (White, 1996; Zhu et al., 2013).

2.2.2 Social Practices

The organizational side of such social actions is captured by the dimensions of ethics, human rights, and philanthropy and social welfare. The employee side of social SCM is represented by the dimensions of safety and health, equity and employee welfare. The dimensions of the supply and demand side consist of supplier responsible purchasing and customer social responsibility, respectively (Ravindra, 2020; Rakesh et al., 2020). Improving sustainability with respect to the social dimension involves developing and maintaining business practices that are fair and favorable to the labor, communities, and regions touched by the supply chain (Sloan, 2010). Social well-being encompasses improving labor standards and conditions, enhancing communities and creating and delivering socially responsible products and services (Mahler, 2007). Torjman (2000) states social sustainability to include such key issues as poverty reduction, social investment and the building of safe and caring communities. To this,

Sloan (2010) expresses three categories of social dimension of sustainability work place/internal conditions including wages, employee contracts, healthcare, opportunities for career development, number of accidents and/or deaths per person-hour of work; community/external conditions including product liability and healthcare benefits; and institutions/systems which involves supplier evaluation including social factors, hours of safety training per employee, regulatory compliance, health and safety management system in use.

To Schneider (2007), every decent social activity should not only aim at productivity but must also provide job security, respect for labor rights and workers well-being particularly with information, consultation, social dialogue, union freedom, workers health, collective bargaining and participation. It should also offer adequate incomes and must focus on social protection. Hence, social sustainability encompasses human rights, labor rights and corporate governance. A socially sustainable network is equitable, diverse, connected and democratic; with the aim of providing a good quality of life for members. Although the importance of the social aspect has been stressed in the literature, empirical research remains scarce, since an understanding of how to measure non-economic elements of sustainability is still emerging (Hart and Dowell, 2011; Beske-Janssen et al., 2015). Consequently, a considerable number of studies use the term “sustainability” when only economic and environmental dimensions are examined. A recent review also found that the majority of SSCM research from 2002 to 2014 did not address the social dimension (Walker et al., 2014). In fact, there exist no comprehensive indicators for measuring social performance in supply chains (Searcy, 2012; Yawar and Seuring, 2017). Therefore, among the three dimensions, we put the foremost focus on researching and developing the social dimension and its performance measures – another distinct contribution of this study. Due to its broad scope, we divide social performance into two groups: human capital and

societal capital (Dyllick and Hockerts, 2002). Human capital concerns fairness in the working environment and the fair treatment of employees across SCs including benefits, workforce diversity, health and safety, skills, motivation, job satisfaction, stress, and loyalty of employees (Porter and Kramer, 2006; Carter and Rogers, 2008; Krause et al., 2009). To the extent that investment in human capital is a defining characteristic of sustainable supply chains (Pagell and Wu, 2009), the level of employee commitment, turnover, absenteeism, and productivity as well as cost reduction in recruitment, health, and safety claims are some key indicators of the human capital (Aguilera et al., 2007; Carter and Rogers, 2008; Jennings, 2013).

2.2.3 Environmental Practices

Environmental practices in SCM promote the reduction in usage at source, lower emissions, cleaner technology and improvement in logistics – all of which logically contribute to an improvement in environmental and operational performance. Per definition, the performance measures of a sustainable supply chain include not just operational and environmental parameters but also financial and social (Ravindra, 2020; Rakesh et al., 2020). Environmental sustainability involves making decisions and taking actions that are in the interests of protecting the natural world, with particular emphasis on preserving the capability of the environment to support human life (Miemczyk et al., 2012). Environmental sustainability forces businesses to look beyond making short term gains and look at their long-term impact on the natural world. It is therefore the maintenance of the factors and practices that contribute to the quality of the environment on a long-term basis. Environmental sustainability considers the physical inputs used in production (Kaufmann and Carter, 2010), emphasizing environmental life-support systems without which neither production nor humanity could exist.

These life support systems include atmosphere, water, food, soil, minerals, materials and energy resources; all of which need to be healthy; their environmental service capacity needs to be maintained (Goodland, 1995; Sloan, 2010). Environmental impact is a rising corporate concern due to regulations, contractual compliance, public perception, and corporate environmental stewardship. Waste, including external waste, inflicts internal cost (Sarkis et al., 2011). Even in the absence of regulations, wasteful use of materials and energy, excessive packaging, unfriendly disassembly design, and neglect of greenhouse gases are not only harmful to the environment but also costly to business operations. Indicators of environmental performance may include reduced air and water pollution, reduced disposal of solid and toxic waste, decreased consumption of natural resources, and the extent of conservation (Zhu and Sarkis, 2004; Porter and Kramer, 2006; Carter and Rogers, 2008; Paulraj et al., 2017). Compliance with environmental regulations, reduction in process waste, and increase in re-use and recycling can all contribute to environmental performance and corporate reputation (Rao, 2002; Rao and Holt, 2005; Hoejmosé and Adrien-Kirby, 2012).

Environmental sustainability is vital because the source capacities that support global life are large but finite. Overuse of a capacity impairs its provision of life support services; sustainability therefore requires that they are maintained rather than run down. It is important to strike a balance between the needs of a growing and changing population and the ability of natural resources to support this growth; sustainable environmental practices are needed in order to support smart growth. Hence, environmental sustainability is especially relevant for sustainability because it is the environment that provides humankind with the needed resources for its economic capital as a means to make ends meet. Therefore, for human beings to perpetually meet their needs, it will require that nature does not get depleted than it can regenerate.

2.2.4 Organisational Performance

An organization is a social entity that is made up of two or more parties in order to achieve its objectives. Organisational performance is thus a measure of how well an organization achieves its desired objectives. Johnston et al. (2004) demonstrates performance as financial and non-financial gains such as: improvement in profit margin, return on investment, growth in sales, lead time performance, growth in market shares, customer loyalty, improved responsiveness, innovation, quality products, improvements in process/product design, reduction in inventory and overall competitive position. Organisational performance is thus a non-financial indicator of performance which in a manufacturing set up is an organization's execution measured against recommended pointers of natural obligation, proficiency and adequacy, for example, process duration, efficiency, squander lessening and administrative consistence (Inayatullah et al., 2012).

Organisational performance has a significant impact on organizational performance therefore organizations need ways of assessing performance of its operations function and operations management. Organisational performance measures include customer satisfaction, quality, speed of delivery, productivity, flexibility, cash flow, market share, innovation and learning. Quality is consistent conformance to customer expectations. Quality is a fundamental measure since it's a major influence on customer satisfaction and loyalty. Speed of delivery is critical in choosing goods and services for customers and its' greatly affected by speed of decision making and flow of materials and information in all operations involved in product or service production (Slack et al., 2010).

As far as sustainable procurement is concerned, performance indicators can be in terms of delivery performance, cycle time (speed) and cost and customer satisfaction. A potential supplier alliance leads to improvements in access to technology, reductions in transaction costs and technology transfer. This study adopted organisational performance indicators in

terms of level of efficiency, timeline in service delivery, cost reduction and quality products.

2.2.5 Sustainable Practices and Organisational Performance

As previously said, there have been decades of dispute about the relationship between CSR and financial performance. Griffin and Mahon (1997), Roman et al. (1999), Orlitzky et al. (2003), and Lu et al. (2003) undertook meta-reviews of the literature in the topic (2014). According to their research methodology, extant empirical studies on sustainability and firm performance have been separated into two streams: secondary data analysis and survey. The majority of contributions in this subject are based on secondary data analysis. The ability of secondary data to minimize some biases, such as common techniques bias and principal informant bias, could be one reason for this supremacy (Gattiker and Parente, 2007; Hofer et al., 2012). Another reason why many researchers use secondary data is that it cuts down on the amount of time and money required to complete the study.

When looking at the existing research, it is clear that the majority of it has concentrated solely on the relationship between CSR and financial performance, ignoring other dimensions of business performance such as operational and innovation performance. In terms of the relationship between sustainability and firm performance, the findings from these studies are mixed. One reason for the disparity in results could be that corporate social performance can be judged in a variety of ways. The measurement outcomes of corporate social performance can vary when the measurement indicators and scales are different. As a result, a synopsis of the literature from the 1970s to the present is offered below, highlighting the four main research streams. These findings are in line with those of Orlitzky et al. (2003) and Chen et al. (2015).

2.2.6 Top Management Commitment

Suppliers can help in a variety of ways, including offering novel components and product or process technologies (Walter, 2003), as well as taking part in cooperative product development projects (Schiele, 2012). When it comes to dealing with suppliers, research typically reveals numerous nuances of top management commitment, such as supplier involvement, development, and integration (e.g., Soosay et al., 2008). However, Wagner (2012) notes that involving suppliers in collaborative innovation is difficult, and empirical studies have found both positive (e.g., Petersen et al., 2005; Hong and Hartley, 2011) and negative (e.g., Koufteros et al., 2007) relationships between procurement capability, top management commitment, and organizational performance.

Several factors, including (i) external enabling drivers (Wagner and Hoegl, 2006), (ii) relational enabling drivers (Handfield et al., 1997; Wasti and Liker, 1999; LaBahn and Krapfel, 2000; Song and Di Benedetto, 2008), and (iii) internal enabling drivers (Handfield et al., 1997; Wasti and Liker, 1999; LaBahn and Krapfel, 2000; Toon et al., 2015).

The following in Table 2.1 are some definitions of top management commitment.

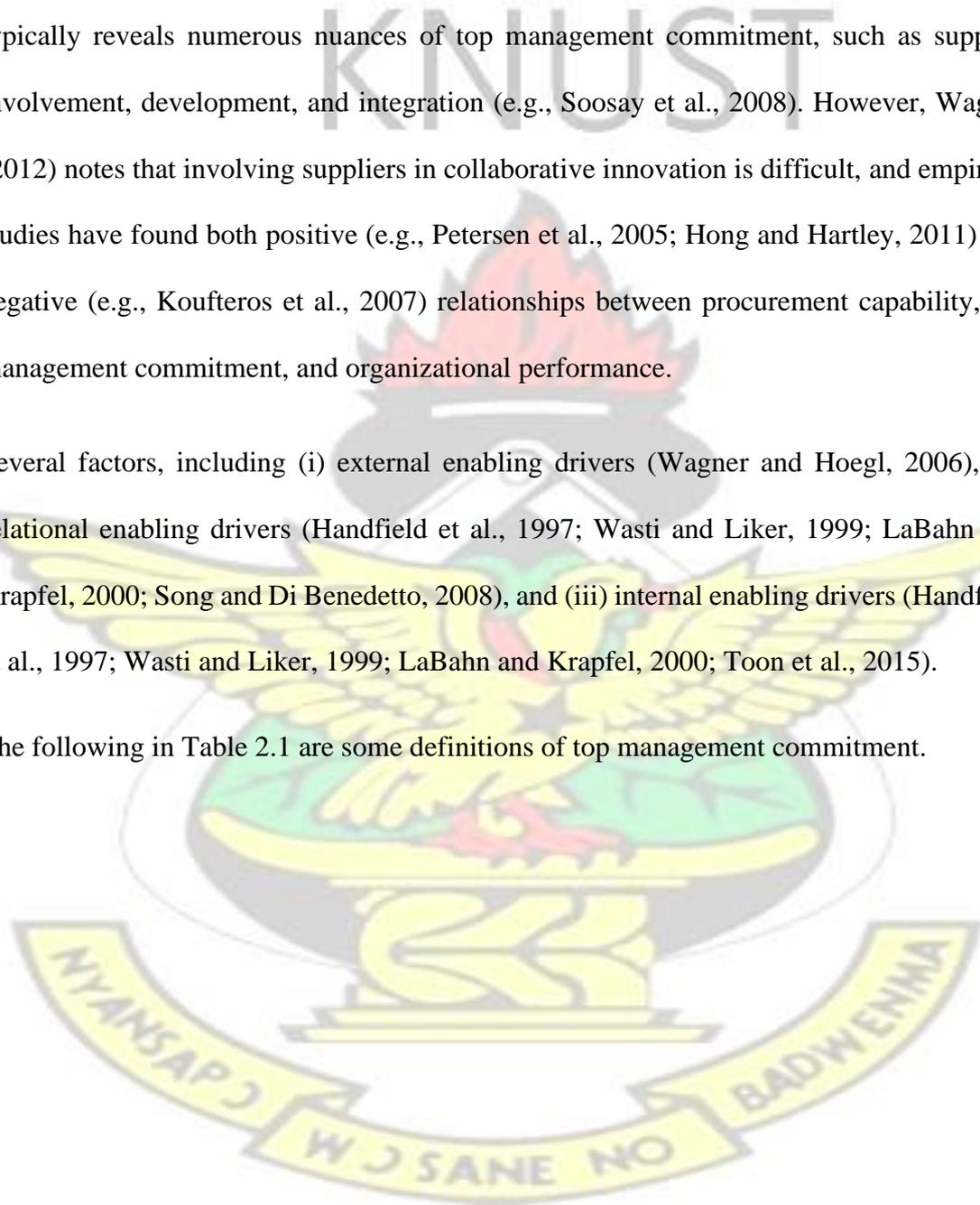


Table 2.1 Definitions of Top management commitment

Author(year)	Definitions
Gunasekaran et al. (2015)	the relationship developed for a long time between supply chain members to lowering cost and risk as well as improving quality and market value.
Singh and Power (2014)	an exchange of essential information between firms, which have some long-term relations with a great number of suppliers or customers
Fawcett et al. (2012)	Top management commitment as an agreement is for parties to work together to create and implement better approaches to solving problems and delivering the value customers want.
Cao and Zhang (2011)	a partnership process where two or more autonomous firms work closely to plan and execute supply chain operations towards common goals and mutual benefits
Whipple et al. (2010)	Top management commitment is defined as a long-term partnership in which parties interact, share information, and collaborate to plan and even change their business processes in order to increase joint performance
Flynn et al. (2010)	the degree to which a business strategically collaborates with its supply chain partners and collaboratively accomplishes intra and inter-firm processes, with a view to achieving effective and efficient flows of goods and services, information, finances, and decisions to deliver the supreme value to the customers
Samaddar and Kadiyala (2006)	where organization initiates and implements a knowledge creation endeavor, and a collaborating organization shares the expense and benefits of newly created knowledge, including its joint ownership through patents and licenses
Hardy et al. (2005)	A cooperative, inter-organizational relationship in which participants rely on neither market nor hierarchical mechanisms of control to gain cooperation from each other.
Narus and Anderson (1996)	Cooperation between independent but related companies that share resources and capabilities to meet the needs of their customers.
Ellram and Hendrick (1995)	Continuing partnerships between two firms requiring a long-term commitment and mutual information exchange, as well as the risks and advantages of the relationship

Source: Researcher's Construct, 2022

2.2.7 Procurement Capability

Procurement is a critical supply chain operation (Bahkoo and Chan, 2011). According to Ordanini and Rubera (2008), procurement capability has two key characteristics that contribute to the firm's value creation. These dimensions are concerned with the potential to cut expenses and increase speed (Lambert and Cooper, 2000; Skjott-Larsen et al., 2003; Christopher and Gattorna, 2005; Wisner, 2003; Piramuth, 2005). As a result, the current study uses this definition and defines procurement capability as the extent to which a

company's procurement lead time and costs are lower than those of its primary competitors (Lambert and Cooper, 2000; Skjott-Larsen et al., 2003; Christopher and Gattorna, 2005; Wisner, 2003; Piramuth, 2005; Ordanini and Rubera, 2008).

The procurement function's overarching goal is to create value in order to support company performance (Porter, 1985; Percy and Dobrzykowski, 2012). For a long time, a company's ability to interact and exchange information with suppliers and customers has been critical to its value creation (Vargo and Lusch, 2004; Vargo and Akaka, 2009; Callaway and Dobrzykowski, 2009). While such collaborative exchanges appear to be common sense as a means of generating value in procurement, many companies fail to succeed in this area (Vereecke and Muylle, 2006). This is a conundrum that has been exacerbated by the internet's rise, as it's unclear how the use of electronic tools for information exchange affects supply chain activities like procurement (Davila et al., 2003; Presutti, 2003; Lancioni et al., 2003; Devaraj et al., 2007).

2.3 Theoretical Review

A theory is a set of logically linked concepts, definitions, and propositions that are offered to explain and predict occurrences or facts (Cooper & Schindler, 2014). The research on the effect of sustainable practices on organizational performance in Ghana is guided by two primary theories. The study is based on two theories: Sustainable Development theory and Resource-Based View (RBV) theory.

2.3.1 Resource-Based View (RBV) Theory

The resource-based view holds that firms can earn sustainable super normal returns if and only they have superior resources which are protected by some form of isolating mechanism preventing their diffusion through industry (Barney, 1991). Resource-Based View (RBV) provides a good theoretical foundation to discuss the contribution of resources

and capabilities to firm's performance. The theory gives an insight on the relations among internal resources, capabilities and performance. The principal idea of the RBV is that for a firm to achieve competitive advantage then it all depends on its heterogeneous resources, which are inimitable, valuable and non-substitutable. It is perhaps one of the most influential frameworks for environmental management (Barney, 1991).

Environmental innovations may as well lead to complex, environmentally friendly technologies, products and processes. These, in turn, lower overall company costs, ensure long-term competitive advantage and finally boost financial performance (Christmann, 2000). Researchers should use resource-based view to investigate sustainability issues (Dowell, Hart & Yeung, 2000; Hart, 1995).

2.3.2 Sustainable Development Theory

The World Commission on Environment and Development (1987) defines sustainable development as types of advancement that meet current needs without jeopardizing future generations' ability to meet their own. As a core prerequisite, this definition of sustainability emphasizes the importance of future orientation. The emphasis on future consequences requires careful planning and utilization of natural resources, as well as consideration of the environmental footprint.

However, sustainability is not exclusively concerned with the environment or the 'green' element; the social effects must also be taken into account (Elkington, 2004). The abbreviation Triple-P (People, Planet, and Profit) or triple bottom line illustrates this. The harmony of economic, social, and environmental sustainability should be taken into account (Elkington, 2004). Overall, these theories serve as a foundation for this research, since the sustainability-organizational performance link can be accomplished when there is a high level of resource utilization, and it should be evaluated holistically as a system.

2.4 Empirical Review

The focus of an empirical review of literature is on past research results that the researcher wants to investigate, compare, or cite. For example, a construct's reliability, validity, correlations, and strength of relationship between constructs are all factors to consider (Saunders et al., 2009). The relationship between sustainable practices, procurement competence, top management commitment, and organizational success is examined in this study.

Table 2.2 highlights empirical research on the topic in terms of context, constructs/measures findings, and future research recommendations.



Table 2.2: Empirical Studies on sustainable practices, procurement capability, top management commitment and organisational performance

Author(s) and Year	Country	Purpose of the Study/Research Objectives	Construct(s)/ Concept(s) Used	Underlying Theoretical Framework	Methodology	Findings	Identified Gap (From Area of Further Research)
Dobrzykowski, D. D., Hong, P.C. and Soon Park, J. (2012)	23 countries	The purpose of this study is to explore four integrative supply chain practices – customer information technology (IT) integration, supplier IT integration, customer collaboration, and supplier collaboration – using a service-dominant logic (SDL) lens to inform their relationships with procurement capability and ultimately firm performance. The study goes on to examine how firms with high and low procurement capability differ in their use of these practices, thus informing curiosity regarding “best practices”.	Customer Collaboration, Supplier Collaboration, Customer IT Integration, Supplier IT Integration, Procurement Capability, and Firm Performance	Service-Dominant Logical (SDL) view	<ul style="list-style-type: none"> - Data was collected from 711 firms in 23 countries during the International Manufacturing Strategy Survey (IMSS). - Exploratory factor analysis established simple factor structure and construct validity. - Stepwise regression was employed to analyze relationships among customer collaboration, supplier collaboration, customer IT integration, supplier IT integration, procurement capability, and firm performance. T-tests examined differences between the practices employed by firms with high and low procurement capability 	Findings reveal positive relationships among customer collaboration, supplier collaboration, customer IT integration, and procurement capability. Supplier IT integration is not found to be significantly related to procurement capability. Procurement capability is in turn found to be positively associated with firm performance. All four variables emerge as best practices of firm's demonstrating high procurement capability.	Future research should explore the potential relationships among the collaboration and IT integration variables conceptualized herein. This has the potential to extend the work of Ordanini and Rubera (2008) and also shed additional light on the current incomplete understanding of SDL

Salam, M. A. (2017)	Thailand	The mediating role of supply chain collaboration on the relationship between technology, trust and operational performance: An empirical investigation	Trust Technology Operational Performance Supply Chain Collaboration	Empirical Review	<ul style="list-style-type: none"> - Based on extant literature, a hypothesized model was developed and tested using structural equation modelling (i.e. AMOS). - A survey was conducted to collect data from the supply chain managers of fast-moving consumer goods (FMCG) companies (more precisely in the food and beverage sector) in Thailand 	The study findings suggest that through an ongoing relationship, trust evolves and is shaped over time and can form a competitive capability that may not be easy for competitors to replicate. Both trust and technology are found to have significant impact on supply chain collaboration and on firms' operational performances	Future research could use multi-informant research designs. Future research should incorporate more comprehensive enablers of collaboration. Other enablers could include the level of commitment displayed by managers
Rosli & Songip (2016)	Malaysia	The research proves that the factors affecting the success of e-procurement system sharing between supply chain integration, information sharing and partner relationships. Based on the understanding those factors the research provides suggestions on how to improve e-procurement system in TM Berhad	Relationship of Partner E-Procurement Information Sharing Supply Chain Performance Supply Chain Integration	Empirical review	<ul style="list-style-type: none"> - Survey research method with questionnaire as the instrument for data collections 	<ul style="list-style-type: none"> - This research shows how E-procurement benefit has on the performance of supply chain in Group Procurement, TM Berhad. - E-procurement system is the high-tech elements that have of the procurement system containing 4 aspects; that is electronic 	E-procurement system should ensure that the flow of information and movement are synchronized between partners in supply chain

						<p>evaluation, electronic sourcing, electronic design, and electronic negotiation.</p> <p>These 3 intermediate variables play an important role to ensure the success of e-procurement and supply chain management</p>	
Chirchir, Ngeno, & Chapkwony (2015)	Kenya	The purpose of this study was to establish the influence of e-procurement adoption on supply chain management practices	E-procurement adoption Partnership, information sharing and supply chain integration practices	Diffusion of Innovation theory and Resource Based Theory.	<ul style="list-style-type: none"> - The research design adopted during the study was explanatory. - From 12 tea firms a target population of 4200 respondents was set. Purposive and proportional sampling was used to select a sample size of 365 respondents among the staff, top management and suppliers. - Questionnaires and structured interview schedule were used to collect data. Pearson product moment correlation coefficient and linear regression were used to test strength of the 	<ul style="list-style-type: none"> - E-procurement adoption positively influence partnership, information sharing and supply chain integration practices. - The e-procurement adoption positively influenced the partnership relationship, information sharing and supply chain integration practices. 	Tea firms should embrace the sound supply chain management practices to enhance the firms' supply chain performance which consequently lead to profit maximization

					relationship between variables.		
Wu & Chien (2016).	Taiwan	This study aims to explore the effects of participant motive, system integration, and value-added services on supply chain performance, and the role of E-Procurement Value as a mediating role	Participant motive, system integration value-added services, supply chain performance and E-Procurement Value	Empirical review	<ul style="list-style-type: none"> - Data was collected via a cross-industry questionnaire, with total 127 survey instruments available. - Data was analyzed using regression model. 	<ul style="list-style-type: none"> - The results show that participant motive, system integration, and value-added services have a positive effect on E-Procurement Value and further affect the supply chain performance 	Hi-tech manufactures must think that E-Procurement is essential for an industry to retain competitive advantage, rather than taking it as a sufficient requirement as traditional manufactures suppose.
Mafini, Dhurup & Madzimure (2020)	South Africa	This study investigated the relationship between e-procurement, supplier integration and supply chain performance in retail SMEs in South Africa	e-procurement, supplier integration and supply chain performance	Empirical Review	<ul style="list-style-type: none"> - A quantitative research approach was followed in which a sample of 283 owners and managers of SMEs in Gauteng Province, South Africa, were surveyed - Using a structured questionnaire. - The study considered five e-procurement components, namely e-sourcing, e-negotiation, e-informing, e-design and e-evaluation. - The collected data were analysed using 	<ul style="list-style-type: none"> - The results of the study showed that two e-procurement components, namely e-design and e-negotiation, exerted a significant positive influence on supply chain integration. The other three e-procurement components, namely e-sourcing, e-evaluation and e-informing, were statistically insignificant in 	<p>Further research could apply different SCP dimensions, such as the SCOR model, output resources and flexibility, amongst other</p> <p>Consideration of other e-procurement functions, such as e-payment, e-catalogue, e-tendering, e-tailing, e-purchasing</p>

					structural equation modelling.	influencing supply chain integration. The study further revealed that supplier integration exerts a positive and significant linear relationship with both the tangible and intangible dimensions of supply chain performance (SCP)	and e-transportation, amongst others
Chang, Tsai, and Hsu (2011).	Taiwan	The aim of this study is to discuss the relationship between e-procurement and supply chain performance.	E-procurement, Information sharing, Partner relationships, Supply Chain Integration, Supply Chain Performance	Empirical Review	<ul style="list-style-type: none"> - Both interviews with practicing managers and an empirical study were conducted in the current study. - Interviews with four practicing managers were conducted to gather the practical insights of the theoretical framework. - Empirical data were collected from 108 Taiwanese enterprises 	<ul style="list-style-type: none"> - The paper found that partner relationships, information sharing, and supply chain integration can represent the processes through which e-procurement contributes to supply chain performance. Supply chain integration has the highest standardized total effect on supply chain performance 	Future studies can focus on other e-business applications and analyze the influences systematically to enhance the generalization of the results.

<p>Brandon-Jones, A. and Knoppen, D. (2018)</p>	<p>10 countries in Europe and America</p>	<p>The purpose of this paper is to report on research into the impact of two sequential dimensions of strategic purchasing – purchasing recognition and purchasing involvement – on the development and deployment of dynamic capabilities. The authors also examine how such dynamic capabilities impact on both cost and innovation performance, and how their effects differ for service as opposed to manufacturing firm</p>	<p>Purchasing Recognition Cost Performance Innovation Performance Purchasing Involvement Knowledge scanning</p>	<p>Dynamic Capabilities</p>	<p>- The authors test hypotheses using structural equation modeling of survey data from 309 manufacturing and service firms.</p>	<p>- From a dynamic capability perspective, the analysis supports the positive relationships between purchasing recognition, purchasing involvement, and dynamic capability in the form of knowledge scanning. The authors also find support for the positive impact of knowledge scanning on both cost and innovation performance. From a contingency perspective, data supports hypothesized differences caused by industry, whereby service-based firms experience stronger positive linkages in our model than manufacturing-based firms.</p>	<p>Further research is necessary to shed more light on the return effect that emerged from our data, and the potential role of environmental dynamism. Literature on learning and dynamic capabilities can help to shape research questions and hypotheses that involve reciprocal effects. In other words, we recommend a research design that includes the reflexive experience of managers, where performance outcomes are potentially back translated to purchasing involvement in company-wide processes.</p>
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						Finally, emerging from the data, the authors explore a re-enforcing effect from cost performance to purchasing involvement, something that is in line with the dynamic capabilities perspective but not typically addressed in operations management (OM) research	
Kim, Suresh, & Kocabasoglu-Hillmer (2015)	USA	The objective of this study is to investigate the relationships among strategic sourcing, e-procurement and firm performance, along with the moderating effects of business characteristics and environmental factors on these relationship	Strategic Sourcing E-Procurement Business Environment and Characteristics Performance	Empirical Review	<ul style="list-style-type: none"> - This empirical investigation relies on structured survey - Responses from 137 managers of US manufacturing firms. - The partial least squares based structural equation modeling approach is used for data analysis 	<ul style="list-style-type: none"> - The research results confirm that both strategic sourcing and e-procurement have a positive effect on firm performance. In addition, e-procurement is also found to have a positive impact on strategic sourcing. - In addition, the research results suggest that business characteristics and 	<ul style="list-style-type: none"> - Strategic sourcing and e-procurement from the suppliers' viewpoint. - Strategic sourcing, e-procurement and supply chain performance

						<p>the environment, especially the degree of competition, market turbulence, firm size, and stage in product life cycle moderate these relationships significantly.</p> <ul style="list-style-type: none"> - The positive effects of strategic sourcing and e-procurement on firm performance are particularly enhanced under the right conditions 	
Chen, I. J., Paulraj, A. and Lado, A. A. (2004)	USA	The study argue that strategic purchasing can engender sustainable competitive advantage by enabling firms to: (a) foster close working relationships with a limited number of suppliers; (b) promote open communication among supply-chain partners; and (c) develop long-term strategic relationship orientation to achieve mutual gains	Strategic purchasing Firms' financial performance	Dynamic capabilities	<ul style="list-style-type: none"> - Using structural equation modeling, the study empirically test a number of hypothesized relationships based on a sample of 221 United States manufacturing firms. 	<ul style="list-style-type: none"> - The results provide robust support for the links between strategic purchasing, supply management, customer responsiveness, and financial performance of the buying firm. The findings suggest that these supply management capabilities might produce 	It should also be noted that supply management is a multidimensional construct; thus, future research may need to include other factors, such as supplier selection, supplier certification, and supplier integration

						“synergistic” interaction effects, which could magnify their overall effects on the outcome variables	
Coban, O. (2012)	Turkey	This research examines the relationship between strategic purchasing and supply chain performance (in terms of vendor performance, material quality, and inventory level) of the bottled water industry in Turkey	Strategic Purchasing Supply chain performance	Empirical Review	<ul style="list-style-type: none"> - The study was conducted in 2012 and followed a quantitative research methodology. - Data were obtained directly from the individuals who are in charge of managing purchasing function of the bottled water companies by using a self-administered questionnaire which consists of ten questions 	<ul style="list-style-type: none"> - Strategic purchasing has a positive impact on vendor performance implying that a unit increase in strategic purchasing activities increases vendor performance. Strategic purchasing has a negative impact on inventory level stating that a unit increase in strategic purchasing activities decreases inventory level. Strategic purchasing has a positive impact on material quality expressing that a unit increase in strategic 	For further research, the study can be extended to a regional level, including not only Turkey but also some other neighbouring countries. Considering the significance of the topics, more studies should be carried out specific to bottled water industry

						purchasing activities increases material quality.	
Song <i>et al.</i> (2017)	China	Based on natural-resource-based view (NRBV), the purpose of this paper is to clarify the dimensions of green procurement and the mechanisms involved in the relationship between green procurement and firm performance	Green procurement Operational efficiency Stakeholder satisfaction Firm Performance	natural-resource-based view (NRBV)	- Secondary data were to measure all the variables in 206 Chinese A-share companies' annual reports, social responsibility reports, environmental reports, and sustainability reports, which were published by Guotai Junan Securities Co., Ltd and Wind Information Co., Ltd.	- The results indicate that although both product-based and process-based green procurement have a positive effect on firm performance, these Chinese companies focus on the impact of product-based green procurement on their operational efficiency as well as the moderating role played by stakeholder satisfaction.	Future studies could explore more theoretical implications. Also, the data in this study was cross-sectional, but future studies could use panel data as the sample



2.5 Conceptual Framework

The relationship between the independent and dependent variables in the study is explained by the conceptual framework. A conceptual framework, according to Anderson (1990), is a paradigm that allows the researcher to investigate the relationship between variables in a logical and prescribed manner.

Organisational performance is the dependent variable in this study. Sustainable practices (environmental, economic and social practices) are the independent variable. Top management commitment is the moderating variable and procurement capability is the mediating variable. As a result, it was wise to use a similar approach to investigate the effects of sustainable practices on organisational performance: the mediation-moderating role of procurement capability and top management commitment.

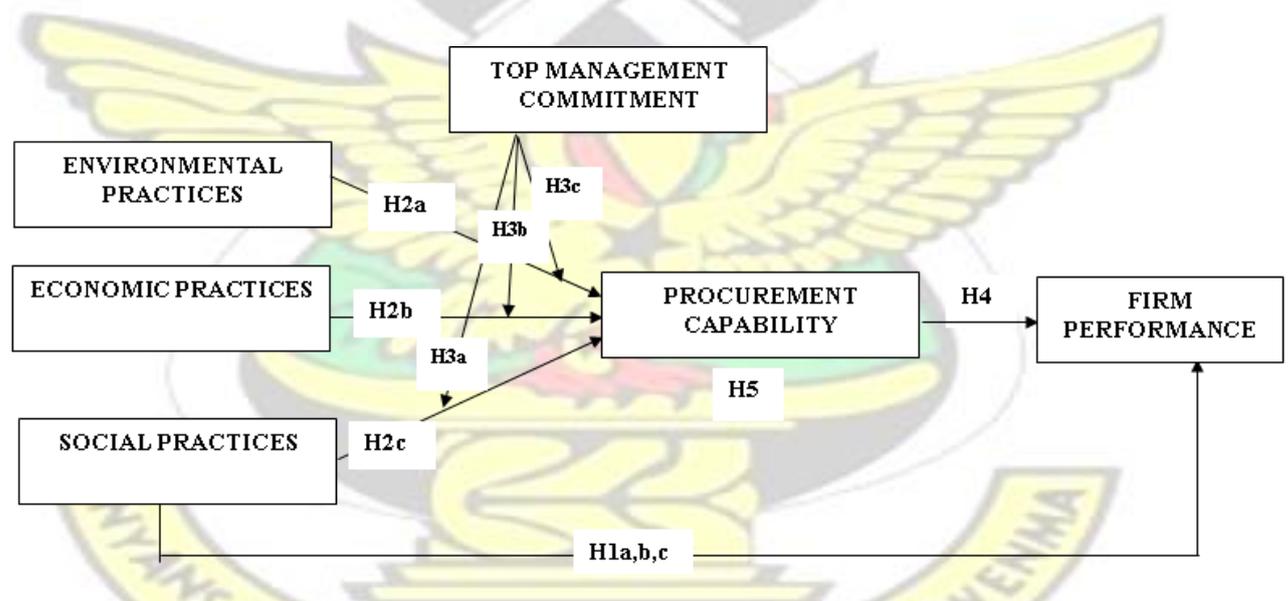


Figure 2.1: Conceptual Framework of the Study

Source: Author's Construct, 2022

2.5.1 Sustainable Practices and Organisational Performance

Firm practices have the potential to have a negative or beneficial impact on the environment, economy, and society – the three pillars of sustainability. Firms are required to adopt SPs at this period in order to promote positive and minimize negative consequences (CII, 2009). The relevance of SP implementation is now more widely recognized than in the past (Son et al., 2011). Firms that use SPs to increase resource efficiency and create a better work environment for their employees and the community are more likely to improve their competitiveness, save money, and improve their overall bottom line (Opoku et al., 2015b).

There was evidence to show that businesses who use SPs have higher profits, more productivity, higher employee and customer happiness, greater safety and health, and less environmental impact (SECBE, 2005). Many businesses also use sustainable building designs that use the least amount of water and energy, produce the least amount of waste, and conserve the local ecological biodiversity. As a result of these approaches, the developed asset's environmental impacts have been reduced.

Environmental practices, for example, can have a favorable impact on firm performance, both economically and environmentally. According to Yusof et al. (2016), adopting environmental practices such as waste management and energy efficiency throughout project implementation can result in resource efficiency and enhanced waste management, as well as a reduction in ecologically hazardous operations (Shi et al., 2016; Shen and Tan, 2002). As such, it is posited;

H1a: Environmental sustainability has a significant and positive effect on organisational performance.

Supply chain management should explicitly specify criteria to assess and choose suppliers for economic reasons, and sustainability concepts should be incorporated into the selection criteria (Chang et al., 2016). Such business procedures will go a long way toward ensuring the firm's long-term viability. This leads to the next hypothesis as follows;

H1b: Economic sustainability has a significant and positive effect on organisational performance.

Tan et al. (2011) stated that firms demonstrate their social commitment to SC through greater staff education and training, as well as health and safety management. Firms must also follow legal frameworks, laws, and regulations when it comes to SC (i.e., economic advancement, environmental and social responsibility). Finally, it is hypothesized that;

H1c: Social sustainability has a significant and positive effect on organisational performance.

2.5.2 Sustainable Practices and Procurement capability

Lemmet (2012) study revealed a diversity of environmental impacts at various stages of a product's life cycle. Vincent and Abbie (2011) proposed that sustainable procurement practices necessitate the appropriate order in pursuit of procurement activities to match with policies and best practices as to first conform with and surpass all relevant legislation and regulatory requirements including environmental, social, health and safety policies. Secondly, it is to cut on environmental impact while maximizing economic and social advantage through entrenching appropriate sustainability standards within the procurement practice. Thirdly, come up with sustainable procurement awareness and skills amongst all stakeholders and further build a stronger base on policy and strategy understanding while stimulating sustainability in the market place, involving current and upcoming suppliers on best practice in sustainability along the supply chain. That is ensuring sustainability is the

criteria in all phases of procurement through the integration of environmental, social and economic aspects in procuring supplies and services. In addition, assess the growth of sustainable procurement with a view to positive progress and work together with other organizations and to research best practice. Thus, this study posits the following;

H2a: Environmental sustainability has a significant and positive effect on procurement capability.

Sustainable practices can contribute directly to economic (financial) outcomes such as cost savings. The research proposes procuring goods and services that are more efficient to operate and thereby reduce operating costs. Examples cited are; capital procurement that achieves reduced through-life costs, e.g., through reduced annual operating and maintenance costs; re-examining requirements and where appropriate challenging demand at source, so as to avoid procurement in excess of needs; reducing end of life disposal costs and impacts and driving supply chain efficiency and developing market competitiveness, innovation and capacity.

Kotler (2004) mentioned that traditional companies were judged by their clients according to quality of their products, responsiveness in offering customer solutions and the degree of fairness. But today companies are measured and judged according to environmental ethics. Lemmet (2012) Study documented a number of direct economic impacts. These included support to small business activity in Scotland, support to local industries in Costa Rica, and financial savings done by the State of São Paulo, Brazil. Indirect impacts as well were demonstrated such as tax benefits linked to the employment of disabled people. From the above studies, it can be posited that;

H2b: Economic sustainability has a significant and positive effect on procurement capability.

Goswami et al. (2013) in their policy brief of India, argue that public buying has been used as a medium to achieve various social objectives, such as, reducing unemployment, providing employment to disabled individuals, and to backward regions in the country, promoting gender and ethnic equality, etc. The focus has largely been on social aspects of sustainability.

Lemmet (2012) researching on social impacts of SP agrees that although the social component of sustainable development has often been considered as the most neglected one, the eight case studies she carried out indicated that a strong commitment from public purchasers to tackle social issues exist and that employment and social inclusiveness issues are considered essential by the public entities. The author further argues that some of the social impacts are directly targeted by tenders, such as the participation of companies employing disabled persons.

Social impact by fair trade and ethical sourcing practices; ensuring that purchases are ethical and support fair trade and that supply chains do no harm in terms of labour standards; promoting workforce welfare (e.g., health and safety, trade union membership); creating employment and training opportunities (particularly among disadvantaged groups such as people with disability or mental illness, migrants, Indigenous); social inclusion, ensuring that marginalized groups are included and have opportunities to participate in local community and economy; diversity and equality in the supplier market, encouraging a diverse base of suppliers (e.g. minority or under-represented suppliers) and local sustainability, building and maintaining healthy, strong communities, support social inclusion and enhancing wellbeing of local residents by generating local employment.

H2c: Social sustainability has a significant and positive effect on procurement capability.

2.5.3 Procurement Capability and Organizational Performance

Procurement's core role is to rapidly secure vital resources at low costs that match the firm's needs (Porter, 1985; Percy and Dobrzykowski, 2012). It is critical for a company's cost, efficiency, execution, and innovativeness to have the right materials, parts, and process resources at the right time at the right prices. These are crucial procurement practices. Procurement's core role is to rapidly secure vital resources at low costs that match the firm's needs.

Lead time will support a firm's goals with regard to responding quickly to customers thus improving sales, while lower costs influence the overall profitability of the firm. Thus, it is hypothesized that;

H3: Procurement capability has a significant and positive effect on organisational performance.

2.5.4 Mediating Role of Procurement capability

This study analyzes the mediating function of procurement capability on the relationship between sustainable practices and organisational performance in the Ghanaian public sector institutions. Extant literatures reveal that procurement capability and integrative supply chain practices have a positive effect on organisational performance, according to Dobrzykowski *et al.* (2012), and procurement collaboration has a positive effect on procurement capability. In view of this, it is posited that;

H4: Procurement capability mediates positively and significantly the relationship between sustainable practices and organisational performance.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter is dedicated to the research methodology and methods that were employed in conducting this study. Therefore, it begins with the research design, which is basically the blueprint for conducting the entire study. The chapter further looks at the research design, sample size and sampling techniques, sources of data, data collection tools, data analysis, research quality as well some ethical consideration. The next sub-sections expound on these components.

3.2 Research Design

Research design refers to the blueprint or map which guides the conduct of every research (Bryman, 2016). Research design exposes readers to the purpose of the study and the approach that the researcher adopts to collect and analyse the required data. A research design may be exploratory, descriptive, causal or a combination of these for a particular study.

Research design refers to the general framework adopted to carry out a study. According to Saunders et al. (2009), it places emphasis on the purpose of the study, the strategy and the approach.

The purpose of a research design influences the strategy and approach of the study (Saunders et al., 2009). The purpose of a study in research can take the form of descriptive, exploratory or explanatory. According to Saunders et al. (2009), seven strategies are noted for carrying out studies. This comprises case study, survey, experiment, action research, grounded theory, ethnography, and archival studies. An explanatory survey research design

was used with the aid of administering questionnaires to various respondents in the construction companies in Accra metropolis.

Moreover, existing literature was reviewed to help the researcher concentrate on issues under review and have in-depth knowledge and understanding (Saunders et al., 2009). Saunders et al. (2009) states that research could either be deductive or inductive in nature. While deductive approach often leads to testing of hypotheses, inductive approach would aim at gathering data and developing theory based on the results. Finally, in relation to the objectives of the study and the relevant hypotheses, a deductive approach was adopted.

The research approach used for this study is the quantitative approach. Quantitative studies involve the study of a given population based on numerical data. That is to say, quantitative research methods were used to collect and analyse the 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

For every study, it is necessary to define the population. Population main refers to the members of a group people or subjects defined as a study's respondents to whom the research measurements can be ascribed to in terms of findings, results and inferences (Babbie. and Mouton, 2011). In defining the population of this study, key managers and supervisors of public sector institutions whose work relates to Sustainability practices and organisational performance were selected for the study. Looking at the number of people that resides in the western coast of the country due to the harbour and the prevalence of different business types and economic activities, the selection of respondents for this study from this scope makes incredible for this study.

3.4 Sample Size and Sampling Techniques

Sampling refers to selecting and studying a part of a group and in order to best describe the group (Creswell, 2013). According to Singh (2006), there is no single rule in reaching a suitable sample size for any study. The study adopts pragmatic view in deciding the sample size rather than following ‘text-book formulas’. In this view, the suitability of sample size was determined based on the needs and requirements of the study. 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). A sample size of one hundred (200) institutions was conveniently selected from the public sector institutions in the Accra metropolis was selected using purposive and convenience sampling techniques as the researcher wanted to be specific in the selection process but also make use of respondents who were willing and able to participate in the study.

3.5 Data Collection Procedure

The study used questionnaire as research instrument to collect primary data. The questionnaire was structured into various parts. Items used to measure sustainable practices were adapted from the study of Masocha & Fatoki (2018). Similarly, items to measure top management commitment were adapted from the studies of Griffith, Yalcinkaya, and Calantone (2010) and Colwell and Joshi (2013). The items used to measure procurement capability was adopted from the study of Dobrzykowski et al. (2012). Finally, items to measure organisational performance was adapted from the studies of Asamoah et al. (2021).

The questionnaire was designed in close-ended manner for respondents to tick their preferred responses. For the main variables of the study, a 5-point Likert Scale was used with responses ranging from strongly disagree (1), neither agree nor disagree (3) and strongly agree (5) to the statements on the questionnaires.

Since the unit of analysis was individuals in a firm whose work description relates with Sustainability practices, a self-administered was given to them to fill at their convenience and later retrieved by the researcher. The data collection period lasted for about a month and was mainly done by the researcher with assistance from other research assistants. In some instances, internet-based questionnaire was designed for respondents who had smartphones and were willing to participate in the study but did not have adequate to fill at the same instance expected by the researcher but at their convenient time.

3.6 Data Analysis

The data collected had to be entered in to Statistical Package for Social Science (SPSS) software to aid in generating the results. The collected was analysed quantitatively to test the relationships among the research variables. The collected data were analysed with the aid of statistical tools such as descriptive statistics, factor analysis as well as ordinary least square regression. Hayes Macro Process Macro was used to test the mediation and interaction effect. The study then drew conclusions from the findings and suggested effective and efficient recommendations for stakeholders of our ports for policy making and implementation.

3.7 Validity and Reliability of the Study

The quantitative approach was adopted for this study in order for researcher to be as objective as possible. Based on this, the researcher used the results generated from the statistical analysis to make an interpretation. A key standard which defined the study is that, various issues concerning the study have been reviewed theoretically in the context of

the literature. The researcher reported an accurate finding in order to prevent any form of false credibility. The data was checked for accuracy and consistency through validity and reliability test in checking the internal consistency of the variables especially the independent variables. In order to do so, Cronbach's Alpha was used to check the internal consistency of these variables with a minimum threshold of 0.70 as the basis of measuring reliability. In order to achieve internal validity, the researcher drew conclusion purposely from the results generated from the data analysis. In addition, other statistical methods were employed to test if there is any existence of bias as well as checking for validity and reliability of the research instrument (questionnaire).

3.8 Ethical Consideration

For a study of this nature there was the need to place much emphasis on ethical issues related to the study. In this regard, an introduction letter was issued by the University to the researcher seeking the approval of the respondents for the research to be conducted at the selected institutions. The introductory letter assured the individuals that the research was for academic purpose only and the confidentiality of the respondents. This was enough for authorization for the researcher to conduct the study at the selected institutions in Accra metropolis.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSIONS

4.1 Introduction

This chapter presents the analysis of the field data collected and interpreted to answer the research questions for this study. The findings were discussed under the following headings in line with the objectives of the study: Demographics; descriptive statistics, inferential statistics and test of model. The result was presented in the form of descriptive tables and charts, using Statistical Package for Social Sciences (SPSS) version 25 and Microsoft Excel 2019 software.

4.2 Response Rate

Out of the two hundred (200) questionnaires administered, 101 were returned representing 50.5% response rate as shown in Table 4.1. The response rate can be described as good as it is relatively more than half. Though the response rate was low, the absolute numbers of retrieved questionnaires were enough to generate meaningful results. In all, ninety-nine (99) questionnaires, representing 49.5% were returned unanswered. The non-response was due to the following problems: time limit, ineligibility to respond and inability to locate respondents.

4.3 Respondents' Demographics

The respondents for the study included responses that were gathered from top management in the public sector institutions in the Greater-Accra region in Ghana. The details of their demographic characteristics are shown in Table 4.1 below;

Table 4.1 Breakdown of Respondents' Demographics

Gender	Categories	n	%
Gender of Respondents	Male	76	75.2%
	Female	25	24.8%
	Total	101	100.0%
Ages of Respondents	Less than 30 years	37	36.6%
	30 - 40 years	34	33.7%
	41 - 50 years	26	25.7%
	51 years and above	4	4.0%
	Total	101	100.0%
Educational level of Respondents	HND/Equivalents	27	26.7%
	Degree Holder	51	50.5%
	Masters Holder	10	9.9%
	Others	13	12.9%
	Total	101	100.0%

Source: Field Work, 2023

From Table 4.1, it could be seen that the public sector Ghana is dominated by males with 76 (75.2%) of respondents who are males and the rest 25 (24.8%) who were females. For the age range, most of the respondents were less than 30 years representing 36.6% of responses. The next was those between 30 years – 40 years representing 33.7% and those between 40 years – 50 years were represented by 25.7% of responses.

For their educational background, it could be seen that most of the respondents were Degree holders with 50.5% of responses, followed by the next 26.7% who had had HND/Equivalents. However, there were quite a number (9.9%) who were master's holders and yet involved in the public sector. Most of these respondents were cocoa purchasing clerks, district managers, quality control officers, warehouse managers, operations managers among others.

Hence, it could be concluded that the respondents were knowledgeable about the sustainable practices practices and were able to understand the questionnaires posed to them to ensure validity of the study.

4.4 Sustainable Practices in the Public sector in Ghana

The independent variable of the study was sustainable practices. In order to measure this, three sustainable practices were identified and measured using items from extant literature.

4.4.1 Environmental practices

Firstly, environmental practices were measured with items from the study of Masocha & Fatoki (2018) using a 7-point Likert Scale with 1= Strongly Disagree, 4=Neither Agree nor Disagree and a 7=Strongly Agree. The summary of responses to measure this construct can be seen in the descriptive statistics table in Table 4.2

Table 4.2: Environmental practices

Practices	Min	Max	Mean	Std. Dev
ENV1: Our sustainable business practices focus on environmental issues.	1	7	5.28	1.569
ENV2: Our sustainable business practices make the most efficient use of the resources available in the environment.	1	7	4.42	1.663
ENV3: Our sustainable business practices recycle, reuse and reduce waste.	1	7	4.79	1.681
ENV4: Our sustainable business practices are based upon environmental monitoring.	1	7	4.86	1.543
ENV5: Our sustainable business practices are increasing energy efficiency.	1	7	4.68	1.581
ENV6: Our sustainable business practices emphasise on use of renewable energy.	1	7	4.88	1.451
ENV7: Our sustainable business practices make use of reduction/replacement of hazardous chemicals or materials (e.g., substituting hazardous chemicals with less hazardous alternatives).	1	7	4.62	1.355
ENV8: Our sustainable business practices adhere to Environmental Protection Agency regulations on effluents/emissions/waste.	1	7	4.56	1.506
Overall Average	1.13	6.88	4.76	1.223

Source: Field Work, 2023

Given a mid-point value of 4.00, which indicates “Neither Agree nor Disagree” in a respondent’s perception on the issues being evaluated, the results produced in Table 4.4 concerning environmental practices as sustainable practice indicate that a top management member of public sector institution in Ghana, to some extent, agrees that environmental practices is a sustainable practice (given the overall mean value of 4.76). For the eight items

measuring “environmental practices”, the highest mean score was obtained on the 1st item: “*Our sustainable business practices focus on environmental issues*” (M=5.28; SD=1.569) while the least mean score was obtained on the 2nd item: “*Our sustainable business practices make the most efficient use of the resources available in the environment.*” (M=4.42; SD=1.663).

4.4.2 Social practices

Secondly, social practices were measured with items from the study of Masocha & Fatoki (2018) using a 7-point Likert Scale with 1= Strongly Disagree, 4=Neither Agree nor Disagree and a 7=Strongly Agree. The summary of responses to measure this construct can be seen in the descriptive statistics table in Table 4.3.

Table 4.3: Social practices

Practices	Min	Max	Mean	Std. Dev
SOC1: Our sustainable development practices take current activities in the community into account.	1	7	5.73	1.805
SOC2: Our sustainable development practices consider the social well-being of society.	1	7	5.35	1.634
SOC3: Our sustainable business practices provide entitlements to workers.	1	7	5.87	1.641
SOC4: Our sustainable business practices promote women to senior management positions.	1	7	4.98	1.685
SOC5: Our sustainable business practices focus on equity and safety of the community.	1	7	5.30	1.603
SOC6: Our sustainable business practices focus on improving the general education level.	1	7	4.97	1.552
SOC7: Our sustainable business practices promote individual rights both civil and human rights.	1	7	5.50	1.585
Overall Average	1.33	7.00	5.39	1.298

Source: Field Work, 2023

Given a mid-point value of 4.00, which indicates “Neither Agree nor Disagree” in a respondent’s perception on the issues being evaluated, the results produced in table 4.3 concerning the social practices as a sustainable practice indicate that a top management member of public sector institution in Ghana, to some extent, agrees that economic practices are sustainable practices. For the nine items measuring “social practices”, the

highest mean score was obtained on the 1st item: “*Our sustainable development practices take current activities in the community into account*” (M=5.73; SD=1.805) while the least mean score was obtained on the 6th item: “*Our sustainable business practices focus on improving the general education level.*” (M=4.97; SD=1.552).

4.4.3 Economic practices

Thirdly, Economic practices was measured with items from the study of Lee et al. (2016) using a 7-point Likert Scale with 1= Strongly Disagree, 4=Neither Agree nor Disagree and a 7=Strongly Agree. The summary of responses to measure this construct can be seen in the descriptive statistics table in Table 4.4

Table 4.4: Economic Practices

Practices	Min	Max	Mean	Std. Dev
ECO1: Our sustainable development practices rest on economic considerations such as efficiency and productivity.	1	7	5.23	1.760
ECO2: Our sustainable development practices focus on survival in the marketplace.	1	7	5.36	1.553
ECO3: Our sustainable development practices save money for the firm.	1	7	4.56	1.769
ECO4: Our sustainable development practices meet tax obligations.	1	7	4.42	1.856
ECO5: Our sustainable development practices provide products and services that are important for the community.	1	7	5.47	1.446
ECO6: Our sustainable development practices focus on long-term profitability even if it means losses in the short-term	1	7	5.21	1.437
Overall Average	1.00	7.00	5.03	1.253

Source: Field Work, 2023

Given a mid-point value of 4.00, which indicates “Neither Agree nor Disagree” in a respondent’s perception on the issues being evaluated, the results produced in table 4.2 concerning economic practices as sustainable practices indicate that a top management member of public sector institution in Ghana, to some extent, agrees that economic practices are sustainable practice. For the six items measuring “Economic practices”, the highest mean score was obtained on the 5th item: “*Our sustainable development practices provide products and services that are important for the community.*” (M=5.47; SD=1.446)

while the least mean score was obtained on the 4th item: “Our sustainable development practices meet tax obligations.” (M=4.42; SD=1.856).

4.5 Procurement Capability

The mediator variable of the study was procurement capability. In order to measure this, four items from the study of Yook et al. (2017) were adapted. The summary of responses to measure this construct can be seen in the descriptive statistics table in Table 4.5

Table 4.5: Procurement Capability Practices

Practices	Min	Max	Mean	Std. Dev
PC1: Knowledge and/know-how related to purchasing are accumulated in a systematic way.	1	7	5.13	1.324
PC2: Purchasing technologies are continuously improved through education and training	3	7	4.61	1.200
PC3: Jobs of people involved with purchasing in organisation are clearly defined and organically organised	3	7	4.72	1.078
PC4: There is trust between buyers and sellers is high	3	7	4.75	1.152
Overall Average	3.00	7.00	4.80	.948

Source: Field Work, 2023

Given a mid-point value of 4.00, which indicates “Neither Agree nor Disagree” in a respondent’s perception on the issues being evaluated, the results produced in table 4.5 concerning procurement capability indicate that a top management member of public sector institution in Ghana, to some extent, agrees that procurement capability is existent among the public sector institutions. For the four items measuring “procurement capability”, the highest mean score was obtained on the 1st item: “*Knowledge and/know-how related to purchasing are accumulated in a systematic way*” (M=5.13; SD=1.324) while the least mean score was obtained on the 2nd item: “*Purchasing technologies are continuously improved through education and training*” (M=4.61; SD=1.200).

4.6 Top Management Commitment

The moderating variable of the study was top management commitment. In order to measure this, eight items from the studies of Griffith, Yalcinkaya, and Calantone (2010) and Colwell and Joshi (2013). The summary of responses to measure this construct can be seen in the descriptive statistics table in Table 4.6.

Table 4.6: Top Management Commitment Measures

Measures	Min	Max	Mean	Std. Dev
TMC1: Top management extends full support for sustainability practices	2	7	5.73	1.148
TMC2: Top management commits to reducing sustainability issues resulting from operations	2	6	4.99	1.187
TMC3: Top management consistently assesses the sustainability impacts of business	3	7	5.13	.997
TMC4: Top management shows behavior that indicates sustainability as a firm performance	2	7	5.03	1.153
TMC5: Top management has a great understanding of competitors' sustainability practices	3	7	5.54	1.145
TMC6: Top management knows a great deal about customers' sustainability requirements	2	7	5.28	1.106
TMC7: Top management has a great knowledge of the industry's sustainability requirements	2	7	4.99	1.170
TMC8: Top management effectively communicates sustainability practices among stakeholders	2	7	5.46	1.425
Overall Average	3.63	6.50	5.27	.803

Source: Field Work, 2023

Given a mid-point value of 4.00, which indicates “Neither Agree nor Disagree” in a respondent’s perception on the issues being evaluated, the results produced in table 4.6 concerning top management commitment indicate that a top management member of public sector institution in Ghana, to some extent, agrees that top management commitment is existent among the public sector institutions. For the eight items measuring “top management commitment”, the highest mean score was obtained on the 1st item: “*Top management extends full support for sustainability practices*” (M=5.73; SD=1.148) while

the least mean score was obtained on the 7th item: “*Top management has a great knowledge of the industry's sustainability requirements*” (M=4.99; SD=1.170).

4.7 Firm Performance in the Public sector

The dependent variable of the study was firm performance. In order to measure this, three dimensions of performance were identified and measured using items from extant literature.

4.7.1 Reliability Performance

Firstly, reliability performance was measured with items from the study of Asamoah et al., (2021) using a 7-point Likert Scale with 1= Strongly Disagree, 4=Neither Agree nor Disagree and a 7=Strongly Agree. The summary of responses to measure this construct can be seen in the descriptive statistics table in Table 4.7.

Table 4.7: Level of Reliability Performance in the Public sector

Indicators	Min	Max	Mean	Std. Dev
SPREL1: Our firm offers products that are highly reliable	1	7	5.53	1.467
SPREL2: Our firm offers high quality products to our customers	1	7	5.60	1.327
SPREL3: Our firm and supply chain partners have helped each other to improve product quality	1	7	5.17	1.304
SPREL4: Our firm with supply chain partners increases the rate at which we fulfill customer orders	1	7	5.09	1.408
RPERF: Our firm with supply chain partners increases our inventory turns	1	7	5.54	1.331
Overall Average	2.20	7.00	5.36	1.091

Source: Field Work, 2023

Given a mid-point value of 4.00, which indicates “Neither Agree nor Disagree” in a respondent’s perception on the issues being evaluated, the results produced in Table 4.7 concerning the level of reliability performance in the public sector indicate that a top management member of public sector institution in Ghana, to some extent, agrees that reliability performance is high (given the overall mean value of 5.36). For the five items

measuring “reliability performance”, the highest mean score was obtained on the second item: “Our firm offers high quality products to our customers” (M=5.60; SD=1.327) while the least mean score was obtained on the 4th item: “*Our firm with supply chain partners increases the rate at which we fulfill customer orders*” (M=5.09; SD=1.408).

4.7.2 Reliability Performance

Firstly, efficiency performance was measured with items from the study of Asamoah et al., (2021) using a 7-point Likert Scale with 1= Strongly Disagree, 4=Neither Agree nor Disagree and a 7=Strongly Agree. The summary of responses to measure this construct can be seen in the descriptive statistics table in Table 4.8.

Table 4.8: Level of Efficiency Performance in the Public sector

Indicators	Min	Max	Mean	Std. Dev
EPERF1: Our firm with supply chain partners reduces inbound and outbound cost of transport	1	7	5.53	1.480
EPERF2: Our firm with supply chain partners reduces warehousing and inventory holding costs	1	7	5.46	1.338
EPERF3: Our firm with supply chain partners meets on-time delivery requirements for all product	1	7	5.67	1.386
EPERF4: Our firm with supply chain partners reach agreed costs per unit as compared with industry	1	7	5.15	1.513
Overall Average	1.50	7.00	5.47	1.072

Source: Field Work, 2023

Given a mid-point value of 4.00, which indicates “Neither Agree nor Disagree” in a respondent’s perception on the issues being evaluated, the results produced in Table 4.7 concerning the level of efficiency performance in the public sector indicate that a top management member of public sector institution in Ghana, to some extent, agrees that efficiency performance is high (given the overall mean value of 5.47). For the four items measuring “efficiency performance”, the highest mean score was obtained on the third item: “Our firm with supply chain partners meets on-time delivery requirements for all product” (M=5.67; SD=1.386) while the least mean score was obtained on the 4th item: “*Our firm*

with supply chain partners reach agreed costs per unit as compared with industry” (M=5.15; SD=1.1513).

4.7.3 Level of Flexibility Performance in the Public sector

Thirdly, flexibility performance was measured with items from the study of Asamoah et al., (2021) using a 7-point Likert Scale with 1= Strongly Disagree, 4=Neither Agree nor Disagree and a 7=Strongly Agree. The summary of responses to measure this construct can be seen in the descriptive statistics table in Table 4.9.

Table 4.9: Level of Flexibility Performance in the Public sector

Indicators	Min	Max	Mean	Std. Dev
FPERF1: Our firm with supply chain partners offers a variety of products and services efficiently	1	7	5.37	1.347
FPERF2: Our firm with supply chain partners offers customized products and services with different features.	1	7	5.32	1.407
FPERF3: Our firm with supply chain partners meets different customer volume requirements efficiently	2	7	5.55	1.253
FPERF4: Our firm with supply chain partners has short customer response time as comparison to industry	1	7	5.44	1.299
FPERF5: Our firm with supply chain partners responds to and accommodates demand variations	2	7	5.34	1.275
Overall Performance	1.00	7.00	5.36	1.158

Source: Field Work, 2023

Given a mid-point value of 4.00, which indicates “Neither Agree nor Disagree” in a respondent’s perception on the issues being evaluated, the results produced in Table 4.5 concerning the level of flexibility performance in the public sector indicate that a top management member of public sector institution in Ghana, to some extent, agrees that the level of flexibility performance is high (given the overall mean value of 5.36). For the seven items measuring “flexibility performance”, the highest mean score was obtained on the 3rd item: “*Our firm with supply chain partners meets different customer volume requirements efficiently*” (M=5.55; SD=1.253) while the least mean score was obtained on the 2nd item:

“Our firm with supply chain partners offers customized products and services with different features.” (M=5.32; SD=1.407).

4.8 Measurement Model Analysis

Prior to estimating the theoretical framework developed for the study, it became necessary to assess the suitability of the items used in measuring the constructs. In doing this, two procedures were followed. These included (1) reliability test and (2) performing exploratory factor analysis (EFA). In all, six constructs were assessed.

4.7.1 Reliability of the Measures

In checking for reliability of the measures, Cronbach alpha was used to verify the internal consistency among the measures (Pallant, 2007). This was performed in SPSS version IBM 20. The results shown in table 4.10 indicate alpha values ranging from 0.807 to 0.938. All items for the six constructs passed the initial test of reliability as they were far above the recommended threshold of .70 (Nunnally, 1978). The summary of results could be seen from Table 4.10.

Table 4.10: Reliability Test

Variable	Number of Items	Cronbach's Alpha
1. Economic practices	8	0.855
2. Social practices	7	0.899
3. Environmental practices	6	0.914
4. Procurement Capability	4	0.807
5. Top Management Commitment	8	0.830
6. Performance	14	0.938

Source: Field Work, 2023

4.7.2 Exploratory Factor Analysis (EFA)

Although the results from the reliability test shown in table 4.6 indicate that all the scales for their respective constructs had strong internal consistency, it became necessary to perform exploratory factor analysis (EFA) to help explore the interrelationships among and the dimensionality of constructs (Pallant, 2007). Hence, to demonstrate convergent validity, it was necessary to run EFA on each sub-construct. EFA was found more appropriate as some of the items were developed by the researcher and also the sample size of the study was not large enough to allow for confirmatory factor analysis (CFA). This analysis was performed in SPSS.

Using Principal Component Analysis with Kaiser Normalization for rotation, with Varimax rotation, six factors were fixed to extract. In all the analyses, the system was set to extract components with Eigenvalues above 1.0 and also suppress coefficients with smaller loadings (thus, less than 0.50).

The Kaiser-Meyer-Olkin value was **.790** ($X^2 = 2121.788$, $df=465$, $p=0.000$) exceeding the recommended value of .6 and Bartlett's Test of Sphericity reached statistical significance, supporting the factorability of the correlation matrix (Pallant, 2007).

In stage one, to assess convergent validity, a block-wise technique was employed where each sub-construct was analysed separately to determine if the items that measures it as it should be.

In the second stage, these retained items were all analysed together. This was done to ensure discriminant validity. The extractions produced only five components with eigenvalues exceeding 1 which respectively explained 39.53%, 13.16%, 8.68%, 5.00% and 3.71% of the variance. Inspection of the inter-correlation among the components revealed the presence of many coefficients above .50.

Given a minimum loading of .50, the following items were retained. For ECONSUS, items retained were ECONSUS 1, 3, then for SOCSUS, items retained were SOCSUS1-7, for ENVSUS, items retained were ENVSUS2-8, for PCAP, items retained were PCAP2-4, for TMC, items retained were TMC5,7-8 and for PERF, items retained were RPERF1-5 and EPERF1-2. The remaining items after the EFA can be seen in Table 4.11.

Table 4.11: Factor Loadings and Validity and Reliability Results from EFA

Variable		Rotated Component Matrix ^a					
		Component					
	Item Code	1	2	3	4	5	6
Economic Practices	ECONSUS1						.532
	ECONSUS3						.504
Social Practices	SOCSUS1		.819				
	SOCSUS2		.825				
	SOCSUS3		.862				
	SOCSUS4		.718				
	SOCSUS5		.680				
	SOCSUS6		.506				
	SOCSUS7		.573				
Environmental Practices	ENVSUS2	.802					
	ENVSUS3	.751					
	ENVSUS4	.752					
	ENVSUS5	.813					
	ENVSUS6	.714					
	ENVSUS7	.845					
	ENVSUS8	.734					
	Procurement Capability	PC2				.780	
PC3					.883		
PC4					.788		
Top Management Commitment	TMC5					.789	
	TMC7					.686	
	TMC8					.844	
Performance	RPERF1			.773			
	RPERF2			.815			
	RPERF3			.760			
	RPERF4			.755			
	RPERF5			.672			
	EERF1			.778			
	EPERF2			.690			

Note:

1. Extraction Method: Principal Component Analysis.
2. Rotation Method: Varimax with Kaiser Normalization.
 - a. Rotation converged in 6 iterations.

Source: Field Work, 2023

4.8 Test of Model

In establishing the association between sustainable practices and procurement capability as well as between sustainable practices and performance, correlation and regression analysis were employed.

Three main independent variables were considered: Economic practices (A), social practices (B) and environmental practices (C); while the dependent variables were looked at two perspectives, thus Procurement Capability (Y) and Performance (Z).

The regression estimates were given as:

$$Y = b_0 + b_1A + b_2B + b_3C + \varepsilon \text{-----Model 1}$$

$$Z = b_0 + b_1A + b_2B + b_3C + \varepsilon \text{-----Model 2}$$

Where, b_0 = constant of proportionality

b_1 = coefficient of Economic Sustainability independent variable

b_2 = coefficient of Social Sustainability independent variable

b_3 = coefficient of Environmental Sustainability independent variable

ε = error term

Y = Procurement Capability [Outcome]

Z = Performance [Outcome]

Table 4.12: Correlations of Variables and Descriptive Statistics

Variables	1	2	3	4	5	6	7
1. Economic practices	1						
2. Social practices	.537**	1					
3. Environmental practices	.556**	.494**	1				
4. Procurement Capability	0.059	0.172	0.046	1			
5. Top Management Commitment	0.170	0.009	-0.047	.340**	1		
6. Interaction PCAP X TMC	0.040	-0.031	-0.006	0.000	0.000	1	
7. Performance	.228*	.461**	.356**	0.082	-0.050	-0.083	1
Mean	4.90	5.38	4.69	4.70	5.33	0.00	5.37
Standard Deviation	1.591	1.299	1.245	0.970	1.042	0.979	1.047

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Field Work, 2023

The correlation results shown in Table 4.12 above generally revealed that top management in the public sector partly attribute firm performance (outcomes) to their sustainable supply chain practices. Also, economic practices, social practices and environmental practices are sustainable practices as their associations were positive and significant at 0.01 or 0.05. However, the relationships are weak since most of the coefficients (r) are less than 0.5.

4.8.1 Model Assessment

From the reliability and validity tests run, the model estimation process began with creating composite variables and interaction term and then examining relevant assumptions underlying the method of estimation employed in the study. Relying on each of the set of retained measures, arithmetic mean was used to create the composite variables. The three dimensions of performance were treated as a composite variable by averaging their respective items remaining.

The researcher used ordinary least square regression analysis to estimate the study's new proposed model. The main outcome variable was performance and the main predictor variables were economic practices, social practices and environmental practices.

For Model 1, procurement capability was been predicted by sustainable practices – economic practices, social practices and environmental practices.

In the case of Model 2, performance was predicted by sustainable practices – economic practices, social practices and environmental practices as well as the mediator, procurement capability.

Finally, in the case of Model 3, performance was predicted by sustainable practices – economic practices, social practices and environmental practices as well as the mediator, top management commitment and the interaction effect of top management commitment and procurement capability.

The results can be seen in Table 4.13.

Table 4.13: OLS Regression Results

Variables	Standard Estimates		
	Model 1: Procurement Capability	Model 2: Firm Performance	Model 2: Firm Performance
<i>Direct Effect</i>			
Economic practices	-.018(-.234)	-.075(-.998)	-.064(-.815)
Social practices	.155(1.680)	.336(3.744)**	.328(3.603)**
Environmental practices	-.030(-.312)	.179(1.917)*	.173(1.817)
Procurement Capability		.00(.077)	.021(.199)
<i>Interaction Effect</i>			
Top Management Commitment			-.034(-.342)
PCAP × TMC			-.070(-.734)
Fit Indices			
χ^2 (df)	3.003(3)	26.577(4)	27.144(6)
χ^2 /df	1.001	6.644	4.524
F-Statistics	1.067	7.683	5.157
R²	.032	.242	.248

Notes:

1. t-values are in the parenthesis
2. * represent significant path at 5%; ** represent significant path at 1%

Source: Field Work, 2023

It can be seen from Table 4.13, three models were run predicting procurement capability and firm performance respectively.

From **model 1**, the three sustainable practices were used to predict procurement capability. It could be seen that there is a positive effect of social practices on procurement capability from the regression estimates ($\beta=.155$; $t = 1.680$). Also, there were negative effects of economic practices and environmental practices on procurement capability ($\beta = -.018$; $t = -.234$) and ($\beta=-.030$; $t= -.312$). However, none of the sustainable practices had a significant on procurement capability at $p<0.05$. Therefore, it can be said that sustainable practices have insignificant effect on procurement effects on procurement sustainability. This implies that hypothesis 2(a,b and c) was not supported by the results of this study.

Similarly, sustainable practices and procurement capability were tested on organisational performance and the results revealed that there is a positive effect of social practices and environmental practices on firm performance ($\beta=.336$, $t=3.744$) and ($\beta=.179$, $t=1.917$) and they were significant at $p<0.05$ or 0.01). However, economic practices had a negative and insignificant effect on firm performance ($\beta=-.075$, $t=-.998$). This implies that only social and environmental practices have significant and positive effect on firm performance. As such, H1a was not supported but H1b and H1c were supported by findings of this study. Similarly, procurement capability also had a negative and insignificant effect on firm performance ($\beta=-.075$, $t=-.998$). This implies that procurement capability does not significantly contribute to firm performance among public sector institutions. As such, hypothesis 3 (H3) was not supported.

For model 3, which focused on the moderating role of top management commitment on the relationship between sustainable practices and firm performance through procurement capability, it was realised that top management commitment had a negative and

insignificant effect on firm performance ($\beta=-.034$, $t=-.342$). Similarly, the interaction effect of top management commitment and procurement capability on the relationship between sustainable practices and firm performance was also a negative and insignificant effect ($\beta = -.070$; $t = -.734$). This implies that top management commitment does not have significant effect on relationship between sustainable practices and firm performance through procurement capability.

From **Model 1**, The R-square of **.032** implies that only about 3.2% changes in procurement capability in the public sector can be explained by the three sustainable practices. This implies that sustainable practices adopted may not necessarily translate to enhancing procurement capability.

On the other hand, from **Model 2**, the R-square of **.242** implies that about 24.2% changes in firm performance in the public sector can be explained by the three sustainable practices. This implies that if the public sector manages their three sustainable practices well, it would improve the firm performance of the public sector as a whole. However, procurement capability would not a contributing factor.

Finally, from **Model 3**, the R-square of **.248** implies that about 24.8% changes in firm performance in the public sector can be explained by the three sustainable practices, as well as procurement capability been moderated by top management commitment. This implies that if the public sector manages their three sustainable practices well, it would improve the firm performance of the public sector as a whole. However, procurement capability would not a contributing factor.

4.8.2 Mediation and Moderation Effects

The researcher further utilized the PROCESS technique to analyze the indirect and conditional indirect effects components of the conceptual model as it enables us to directly test the statistical significance of such effects using bootstrapping procedures (Hayes,

2018). Table 4.14 presents the analytical procedures used and results obtained. It was found that sustainable practices have significant positive indirect association with firm performance through procurement performance (indirect effect = 0.178; 95% bootstrap confidence interval: .096 to .267).

Table 4.14: Summary of Process Outputs

		<i>Unstandardized coefficients (t-values)</i>		
<i>Variables:</i>		Firm performance		
Procurement Capability (PCAP)		.6021(1.0449)		
Sustainable practices (SPRACT)		.3736(4.4051)**		
Top Management Commitment (TMC)		.2926(.6715)		
<i>Conditional effects:</i>				
PCAP × TMC		-.0914(-.9275)		
R^2		.185		
F		5.4529		
<i>Conditional indirect effects:</i>		<i>Conditions of TMC</i>	β	<i>95% bootstrap confidence interval</i>
$SPRACT \rightarrow PCAP \rightarrow$ Firm performance ¹		4.333	.019	-.0282 to .0897
		5.333	.011	-.0176 to .0516
		6.2267	.003	-.0208 to .0320
<i>Index of moderated mediation</i>			-.009	-.0440 to .0153

Source: Field Work, 2023

Further results indicate that sustainable practices have a significant positive indirect relationship with firm performance through the procurement capability link (indirect effect = .3736; 95% bootstrap confidence interval: .205 to .542).

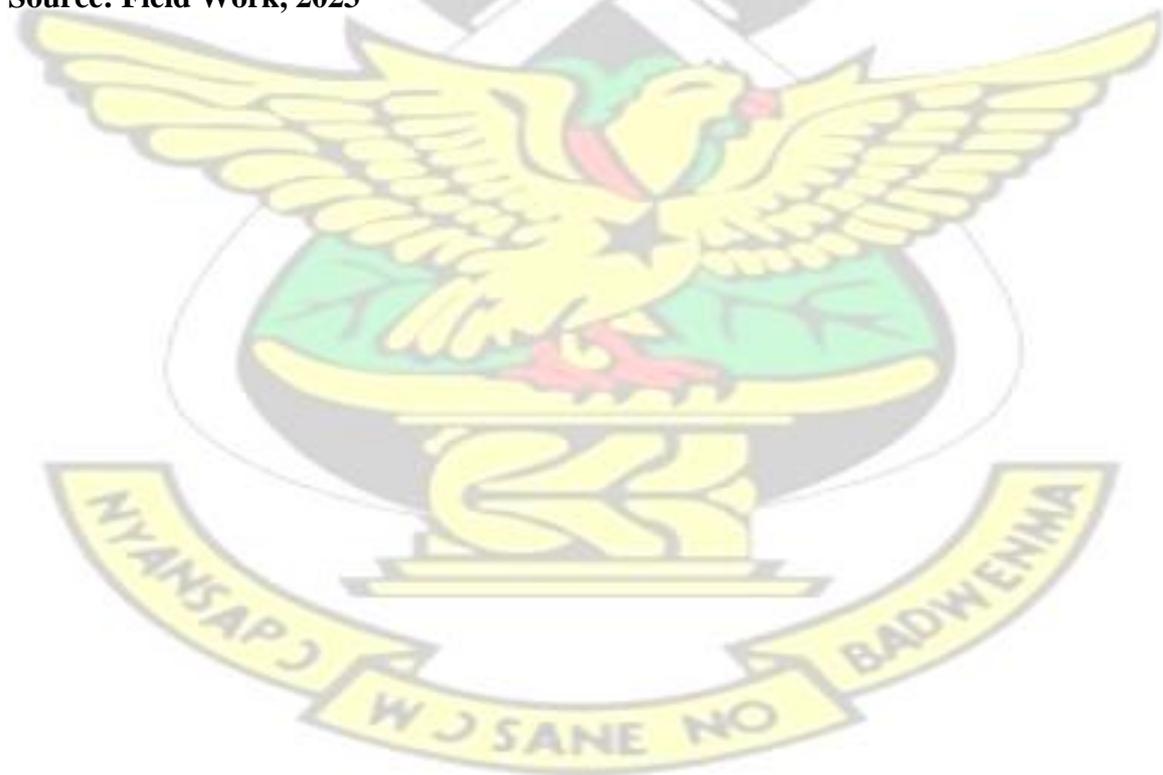
The results further reveal that top management commitment negatively moderates the indirect relationship between sustainable practices and firm performance via procurement capability given moderated mediation index of -.009 with 95% bootstrap confidence interval of -.0440 to .0153. Specifically, the indirect relationship is negative, weaker and insignificant under high values of top management commitment (i.e., at 3 standard deviations above the mean of top management commitment: $\beta = 0.003$, 95% bootstrap confidence interval of -.0208 to .0320 but stronger though insignificant under low values of top management commitment (i.e., at 1 standard deviation below the mean of top

management commitment: $\beta = 0.019$, 95% bootstrap confidence interval of $-.0282$ to $.0897$), which provides evidence in rejecting H5.

Table 4.15: Summary of Results of Hypotheses Testing

	Sub	Path	β	T-Value	Remarks
H1	Sustainable practices \rightarrow Performance				
	H1a	ECP \rightarrow PERF	-.075	-.998	Not Supported
	H1b	SOP \rightarrow PERF	.336	3.744	Supported
	H1c	EVP \rightarrow PERF	.179	1.917	Supported
H2	Sustainable practices \rightarrow Proc. Capability				
	H2a	ECP \rightarrow PCAP	-.018	-.234	Not Supported
	H2b	SOP \rightarrow PCAP	.155	1.680	Not Supported
	H2c	EVP \rightarrow PCAP	-.030	-.312	Not Supported
H3	Procurement Capability \rightarrow Performance		.021	.199	Not Supported
H4	Sustainable practices \rightarrow Proc. Capability				
	\rightarrow Performance		.004	95% bootstrap -.0150 to 0310	Not Supported
H5	SP \rightarrow PCAP \times TMC \rightarrow PERF		-.0914	-.9275	Not Supported

Source: Field Work, 2023



CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of findings in the previous chapter. It also presents the conclusion of the study and recommendations in relation to the findings of the study. Using a simple random and convenience sampling techniques, one hundred and one (101) responses were gathered from the top management in the public sector within the Greater-Accra region. The overall response rate was 50.5%.

5.2 Summary of Findings

The summary of the study's findings is presented in line with the research objectives as follows:

5.2.1 Sustainable Practices and Organisational Performance

The first objective of the study was to examine the effect of sustainable practices on firm performance in the public sector in Ghana. In order to achieve, this, three sustainable practices were identified and measured using items from extant literature. The results revealed that there is a positive effect of social practices and environmental practices on firm performance ($\beta=.336$, $t=3.744$) and ($\beta=.179$, $t=1.917$) and they were significant at $p<0.05$ or 0.01). However, economic practices had a negative and insignificant effect on firm performance ($\beta=-.075$, $t=-.998$). This implies that only social and environmental practices have significant and positive effect on firm performance.

5.2.2 Sustainable Practices and Procurement capability

The second objective of the study was to determine the effect of sustainable practices on procurement capability. The findings revealed that there is a positive effect of social practices on procurement capability from the regression estimates ($\beta=.155$; $t = 1.680$). Also, there were negative effects of economic practices and environmental practices on procurement capability ($\beta = -.018$; $t = -.234$) and ($\beta=-.030$; $t = -.312$). However, none of the sustainable practices had a significant on procurement capability at $p<0.05$.

5.2.3 Procurement Capability and Organizational Performance

The third objective of the study was to determine the effect of procurement capability on organisational performance. The findings revealed that procurement capability also had a negative and insignificant effect on firm performance ($\beta=-.075$, $t=-.998$). This implies that procurement capability does not significantly contribute to firm performance among public sector institutions.

5.2.4 Moderating Role of Top Management Commitment on the Relationship between Sustainable Practices and Organisational Performance

The third objective of the study was to examine the moderating effect of top management commitment on the relationship between sustainable practices on organizational performance. From the Hayes Process Macro output, it was revealed that top management commitment negatively moderates the indirect relationship between sustainable practices and firm performance via procurement capability given moderated mediation index of $-.009$ with 95% bootstrap confidence interval of $-.0440$ to $.0153$. Specifically, the indirect relationship is negative, weaker and insignificant under high values of top management commitment (i.e., at 3 standard deviations above the mean of top management commitment: $\beta = 0.003$, 95% bootstrap confidence interval of $-.0208$ to $.0320$ but stronger

though insignificant under low values of top management commitment (i.e., at 1 standard deviation below the mean of top management commitment: $\beta = 0.019$, 95% bootstrap confidence interval of $-.0282$ to $.0897$).

5.2.5 Mediating Role of Procurement Capability on the Relationship between Sustainable Practices and Organisational Performance

The last objective of the study was to examine the mediating role of procurement capability on the relationship between sustainable practices and organizational performance. From the Hayes Process Macro output, it was revealed that the mediation effect of procurement capability was 0.004 95% bootstrap confidence interval of $-.0150$ to 0.0310 implying no significant effect. As such, there was no mediation evidenced.

5.3 Conclusions

This study sought to explore the relationships among sustainable practices, procurement capability, top management commitment and firm performance: empirical study from the public sector in the Greater-Accra region of Ghana. Therefore, this study sought to examine the effect of sustainable practices on organizational performance; examine the effect of sustainable practices on procurement capability; examine the procurement capability on organizational performance; examine the moderating effect of top management commitment on the relationship between sustainable practices on organizational performance; and examine the mediating role of procurement capability on the relationship between sustainable practices and organizational performance.

This was done by selecting sample of respondents who were top officials in the public sector institutions in the Greater-Accra region of Ghana of which a response rate of 50.5% was achieved using appropriate methodological approaches. The study revealed that social practices and environmental practices are sustainable practices which influence

organisational performance. However, these sustainable practices do not contribute to procurement capability.

The findings also revealed that procurement capability does not mediate the relationship between sustainable practices and organisational performance. Finally, it was found that at high levels of top management commitment, the indirect effect of sustainable practices on organisational performance through procurement capability is weakened. This implies that top management commitment does not moderate the relationship between sustainable practices and organisational performance through procurement capability.

It is therefore incumbent on all stakeholders in the public sector to ensure socially and environmentally sustainable practices that would improve performance of public sector institutions in Ghana.

5.4 Recommendations

From the summary of findings and conclusion draw, the following recommendations are suggested for adoption and implementation;

5.4.1 Top Management Commitment towards Environmental and Social Practices

The findings show that ecologically and socially sustainable practices have a significant and positive effect organisational performance. As a result, it is advised that top management in the public sector participate in activities and programs that improve the social welfare of their employees and the communities they serve, as well as being ecologically sensitive in order to improve their performance.

5.4.2 Top Management Commitment towards Economic Practices

Economic practices did not have a substantial impact on firm performance, according to the findings. As a result, government entities should strengthen their involvement in economically sustainable initiatives and operations, as they provide even more opportunities for distinction, which would help to boost performance.

5.4.3 Improvement in Supply Chain Improvement Programmes

To make their operations sustainable, top management in the public sector must strengthen supply chain improvement programs such as transparency, supply chain integration, supplier collaboration, and risk management.

5.4.4 Enhancing Supply Chain Collaboration among partners

Management at the highest level in the public sector must work together by exchanging information and jointly preparing for each other's requirements, based on mutual trust and understanding. This would necessitate every unit of public sector organizations, as well as their suppliers and clients, planning and setting goals in their activities, and then interacting often to establish supply chain standards for reliability, responsiveness, and other factors.

5.4.5 Supplier Monitoring and Development

It is also suggested that public sector top management provide ongoing resources to the monitoring and development of their suppliers through coaching and other relevant platforms, particularly in terms of strategies to increase their economic, social, and environmental gains within the public sector. This is particularly important when dealing with the hazards posed by supplier incompetence.

5.5 Suggestions for Further Studies

Future research should conduct a replicatory study within Ghana's private sector to compare the results to those of this study. Furthermore, the study's moderating and mediating variables failed to achieve its objectives. Future research can look into why this is the case by doing a longitudinal qualitative study to look into the causes for it.



REFERENCES

- Agere, M. (2009). Evaluating contractor prequalification data: Selection criteria and project success factors. *Construction Management and Economics*, 15(2), 129-147. 25
- Ameyaw, C., Mensah, S., & Osei-Tutu, E. (2012). Public procurement in Ghana: the implementation challenges to the public procurement law 2003 (Act 663). *International Journal of Construction supply chain management*, 2(2), 55-65
- Annelie, E. (2013). *World economy, ecology & Development Project Manager for Sustainable Public Procurement*. Eldenaer Straße 60 D-10247 Berlin Germany.
- Belfitt et al. (2011). *Sustainable Procurement – Challenges for Construction Practice*. University of Reading; United Kingdom
- Brammer, S. and Walker, H. (2007). *Sustainable Procurement Practice in the Public Sector: An International Comparative Study*. University of Bath, School of Management. Working Paper Series.
- Brandon-Jones, A. and Knoppen, D. 2018. The role of strategic purchasing in dynamic capability development and deployment. *International Journal of Operations & Production Management*, Vol. 38(2), 446-473
- Byaruhanga, A. (2016). *Contractor Selection, Monitoring and performance of Road Infrastructure Projects in Uganda* (Doctoral dissertation, Uganda Technology and Management University)
- Cao, F., Yuying, Y. and Fen, Z. (2012). *Towards Sustainable Public Procurement in China: Policy and Regulatory Framework, Current Developments and the case for a Consolidated Green Public Procurement Code*. Law School of Central University of Finance and Economics, China.
- Carter, C. R., & Liane Easton, P. (2011). Sustainable supply chain management: evolution and future directions. *International Journal of Physical Distribution & Logistics Management*, 41(1), 46-62
- Carter, C. R., & Rogers, D. S. (2008). A framework of sustainable supply chain management: moving toward new theory. *International Journal of Physical Distribution & Logistics Management*, 38(5), 360-387.
- Carvalho, M.M. and Jr, R.R. 2017. Can project sustainability management impact project success? An empirical study applying a contingent approach. *International Journal of Project Management*, Vol. 35(6), pp. 1120-1132.
- Chartered Institute of Purchasing & Supply. (2014). *Sustainable Procurement*. Retrieved from:
http://www.cips.org/Documents/Products/Sustainable_Procurement_Review_%20new_1_0go.pdf.
- Chen, I. J., Paulraj, A. and Lado, A. A. 2004. Strategic purchasing, supply management, and firm performance. *Journal of Operations Management*, 22, 505–523

- Coban, O. 2012. The impact of strategic purchasing on supply chain performance of the bottled water industry in Turkey. *European Journal of Business and Management*, 4(8), 57-65
- Cousins, P. D., Handfield, R. B., Lawson, B., & Petersen, K. J. (2006). Creating supply chain relational capital: the impact of formal and informal socialization processes. *Journal of Operations Management*, 24(6), 851-863.
- de Man, R. and Burns, T. R. (2006). Sustainability: supply chains, partner linkages, and new forms of self-regulation. *Human Systems Management*, 25(1): 1–12.
- Dobrzykowski, D. D., Hong, P. C., & Soon Park, J. 2012. Building procurement capability for firm performance: a service-dominant logic view. *Benchmarking: An International Journal*, 19(4/5), pp. 567–584.
- Duber-Smith, D. C. (2005). The green imperative. SPC. *Soap, perfumery and cosmetics*, 78(8), 24-26.
- Effah Ameyaw, E., & Chan, A. P. (2013). Identifying public-private partnership (PPP) risks in managing water supply projects in Ghana. *Journal of Facilities Management*, 11(2), 152-182.
- Ghosh, M. 2019. Determinants of green procurement implementation and its impact on firm performance. *Journal of Manufacturing Technology Management*, Vol. 30(2), pp. 462-482
- Govindan, K., Rajeev, A., Padhi, S. S., & Pati, R. K. 2020. Supply chain sustainability and performance of firms: A meta-analysis of the literature. *Transportation Research Part E: Logistics and Transportation Review*, 137, 101923.
- Gunther, M. (2006). *The Green Machine*. Fortune Magazine
- Haavisto, I., & Kovács, G. (2014). Perspectives on sustainability in humanitarian supply chains. *Disaster Prevention and Management*, 23(5), 610-631.
- Hair, J. F., Gabriel, M., & Patel, V. (2014). *AMOS covariance-based structural equation modelling (CB-SEM): guidelines on its application as a marketing research tool*. Brazilian Journal of Marketing, 13(2).
- Hinton, R. W. (2003). *Best practices in government: Components of an effective contract monitoring system*.
- Hsu, C. W., Kuo, T. C., Chen, S. H., & Hu, A. H. (2013). Using DEMATEL to develop a carbon management model of supplier selection in green supply chain management. *Journal of Cleaner Production*, 56, 164-172.
- Hu, H. A., Chen, S. H., Hsu, C. W., Wang, C., & Wu, C. L. (2012). Development of sustainability evaluation model for implementing product service systems. *International Journal of Environmental Science and Technology*, 9(2), 343-354.
- Islam, M., Turki, A., Murad, M. and Karim, A., 2017. Do procurement collaboration practices improve organizational performance? *Sustainability*, 9(12), p.2281.

- Kansiime, D., Ntayi, J. M., & Ahimbisibwe, A. (2017). Contractual governance mechanisms, dynamic capabilities, transactional specific relationships and supplier performance in Uganda. In *Global Public Procurement Theories and Practices* (pp. 139-155). Springer, Cham.
- Karimi, J., Somers, T. M., & Bhattacharjee, A. (2007). The Role of Information Systems Resources in ERP Capability Building and Business Process Outcomes. *Journal of Management Information Systems*, 24(2), 221–260.
- Khine, M. S. (Ed.). (2013). *Application of structural equation modelling in educational research and practice* (Vol. 7). Rotterdam, NL: Sense Publishers.
- Kim, M., Suresh, N. C., & Kocabasoglu-Hillmer, C. 2015. A contextual analysis of the impact of strategic sourcing and E-procurement on performance. *Journal of Business & Industrial Marketing*, 30(1), 1–16.
- Kobia, M., & Bagaka, O. (2010). Enhancing Trust & Accountability in Government. *Issues in Governance, Accountability & Trust*, 56.
- Koplin, J., Seuring, S. and Mesterharm M. (2007). Incorporating sustainability into supply management in the automotive industry – the case of the Volkswagen AG. *Journal of Cleaner Production* 15(11/12): 1053–1062.
- Kotler, P. (2004). *Ten deadly marketing sins: signs and solutions*. John Wiley & Sons.
- Lawson, B., Cousins, P. D., Handfield, R. B., & Petersen, K. J. 2009. Strategic purchasing, supply management practices and buyer performance improvement: an empirical study of UK manufacturing organisations. *International Journal of Production Research*, 47(10), 2649-2667.
- Lemmet, S. (2012). *The Impacts of Sustainable Procurement*. Eight illustrative Case Studies. UNEP Division of Technology, Industry and Economics.
- Li, Y., Zhao, X., Shi, D., & Li, X. (2014). *Governance of sustainable supply chains in the fast fashion industry*. *European Management Journal*, 32(5), 823–836.
- Linton, J. D., Klassen, R., & Jayaraman, V. (2007). Sustainable supply chains: An introduction. *Journal of Operations Management*, 25(6), 1075-1082.
- Linton, J., Kalssen, R., Jayaraman, V. (2007). Sustainable supply chains: an introduction. *Journal of Operations Management* 25, 1075–1082.
- Macharis, C., Melo, S., Woxenius, J., & Van Lier, T. (Eds.). (2014). *Sustainable logistics*. Emerald Group Publishing.
- Matos, S., & Hall, J. (2007). Integrating sustainable development in the supply chain: The case of life cycle assessment in oil and gas and agricultural biotechnology. *Journal of Operations Management*, 25(6), 1083-1102.
- McCrudden, C. (2004). Using Public Procurement to Achieve Social Outcomes. *Natural Resources Forum*, 28(4):257-267.

- Mensah, S., & Ameyaw, C. (2012). Sustainable procurement: the challenges of practice in the Ghanaian construction industry. In *West Africa Built Environment Research (WABER) Conference 24-26 July 2012 Abuja, Nigeria* (Vol. 2, p. 871).
- Mentzer, J. T., DeWitt, W., Keebler, J. S., Min, S., Nix, N. W., Smith, C. D., & Zacharia, Z. G. (2001). Defining supply chain management. *Journal of Business logistics*, 22(2), 1-25.
- Möller, B., & Nielsen, P. S. (2007). *Analysing transport costs of Danish forest wood chip resources by means of continuous cost surfaces. Biomass and Bioenergy*, 31(5), 291–298.
- Morgan, K. (2010). Local and green, global and fair: the ethical foodscape and the politics of care. *Environment and Planning A*, 42(8), 1852-1867
- Nair, A., Jayaram, J., & Das, A. 2015. Strategic purchasing participation, supplier selection, supplier evaluation and purchasing performance. *International Journal of Production Research*, 53(20), 6263–6278.
- Pallant, J. F. (2007). *SPSS survival manual: A step-by-step guide to data analysis with SPSS*. New York, NY: McGrath Hill.
- Paulraj, A., Chen, I. J., & Flynn, J. 2006. Levels of strategic purchasing: impact on supply integration and performance. *Journal of Purchasing and Supply management*, 12(3), 107-122
- Pham, H., & Kim, S.-Y. 2019. The effects of sustainable practices and managers' leadership competences on sustainability performance of construction firms. *Sustainable Production and Consumption*, Vol 20, pp. 1 – 14.
- Porter, M., & Van der Linde, C. (1995). Green and competitive: ending the stalemate. The Dynamics of the eco-efficient economy: environmental regulation and competitive advantage, 33.
- Pressey, A., Tzokas, N., & Winklhofer, H. 2007. Strategic purchasing and the evaluation of “problem” key supply relationships: what do key suppliers need to know? *Journal of Business & Industrial Marketing*, 22(5), 282–294.
- Richard, P. J., Devinney, T. M., Yip, G. S. and Johnson, G. 2009. Measuring organizational performance: towards methodological best practice. *Journal of Management*, Vol. 35(3), pp. 718-804.
- Ruparathna, R., & Hewage, K. (2015). Sustainable procurement in the Canadian construction industry: challenges and benefits. *Canadian Journal of Civil Engineering*, 42(6), 417-426.
- Sarkis, J., Helms, M. M., & Hervani, A. A. (2010). Reverse logistics and social sustainability. *Corporate Social Responsibility and Environmental Management*, 17(6), 337-354.

- Sarkis, J., Zhu, Q., & Lai, K. H. (2011). An organizational theoretic review of green supply chain management literature. *International Journal of Production Economics*, 130(1), 1-15.
- Saunders, M., Thornhill, A. & Lewis, P. (2009). *Research methods for business students*. London: Pearson Education.
- Schmitz, J., & Platts, K. W. (2004). Supplier logistics performance measurement: Indications from a study in the automotive industry. *International Journal of Production Economics*, 89(2), 231-243.
- Seuring, S., & Müller, M. (2008). From a literature review to a conceptual framework for sustainable procurement management. *Journal of Cleaner Production*, 16(15), 1699-1710.
- Sheng, C. W., Tian, Y. F., & Chen, M. C. (2010). Relationships among teamwork behaviour, trust, perceived team support, and team commitment. *Social Behaviour and Personality: An International Journal*, 38(10), 1297-1305.
- Singh, Y. K. (2006). *Fundamental of research methodology and statistics*. New Age International.
- Song, H., Yu, K., & Zhang, S. 2017. *Green procurement, stakeholder satisfaction and operational performance*. *The International Journal of Logistics Management*, 28(4), pp. 1054–1077
- Srivastara, S. K. (2007). Green Supply-Chain Management: A State-of-The-Art Literature Review. *International Journal of Management Reviews*, 9 (1), 53-80.
- Steurer, R., & Konrad, A. (2009). Business–society relations in Central-Eastern and Western Europe: How those who lead in sustainability reporting bridge the gap in corporate (social) responsibility. *Scandinavian Journal of Management*, 25(1), 23-36.
- Stevens, A. (2002). *Green Supply Chain Management Much More Than Questionnaires and ISO 14.001*. IEEE, 96-100.
- Strandberg, C., & Robinson, A. (2009). *Small-and Medium-sized Business environmental roadmap*. Strandberg Consulting, available at: <http://corostrandberg.com/wpcontent/uploads/files/SME-Environmental-Roadmap-Sept122009.pdf>
- Su, J., & Gargeya, V. B. 2012. Strategic sourcing, sourcing capability and firm performance in the US textile and apparel industry. *Strategic Outsourcing: An International Journal*, 5(2), 145–165
- Svensson, G. (2007). Aspects of sustainable procurement management practices: conceptual framework and empirical example. *Supply chain management: An International Journal*, 12(4), 262-266.
- Telewa, R. S. (2014). Sustainable procurement practices in the public water sector institutions in Kenya. *Journal of Management and Business Studies*, 2 (3), 19–25.

- Tregidga, H. and Milne, M. J. (2006). From sustainable management to sustainable development: a longitudinal analysis of a leading New Zealand environmental reporter. *Business Strategy and the Environment* 15(4): 219–241.
- Tseng, M., Lim, M., & Wong, W. P. (2015). Sustainable procurement management: a closed-loop network hierarchical approach. *Industrial Management & Data Systems*, 115(3), 436-461.
- Walker, H., Miemczyk, J., Johnsen, T., & Spencer, R. (2012). Sustainable procurement: Past, present and future. *Journal of Purchasing and Supply Management*, Vol. 18 No. 4, pp. 201–206.
- Walley, N., & Whitehead, B. (1994). It's not easy being green. *Reader in Business and the Environment*, 36, 81.
- Wright, T. S. (2002). Definitions and frameworks for environmental sustainability in higher education. *Higher education policy*, 15(2), 105-120.
- Yang, L. R., Huang, C. F. and Hsu, T. J. 2014. Knowledge leadership to improve project and organizational performance. *International Journal of Project Management*, Vol. 32(1), pp. 40-53.
- Yin, R. K. (2003). *Case Study Research: Design and Methods*. 3rd ed., Sage Publications, Thousand Oaks, CA.
- Yook, K. H., Choi, J. H., & Suresh, N. C. (2017). Linking green purchasing capabilities to environmental and economic performance: The moderating role of firm size. *Journal of Purchasing and Supply Management*, 1 – 12
- Zailani, S., Jeyaraman, K., Vengadasan, G., & Premkumar, R. (2012). Sustainable procurement management practices in Malaysia: A survey. *International Journal of Production Economics*, 140(1), 330-340.
- Zhang, L., Luo, Y., Tao, F., Li, B. H., Ren, L., Zhang, X. & Liu, Y. (2012). Cloud manufacturing: a new manufacturing paradigm. *Enterprise Information Systems*, 8(2), 167-187.
- Zhu, Q., & Sarkis, J. (2007). The Moderating Effects of Institutional Pressures on Emergent Green Supply Chain Practices and Performance. *International Journal of Production Research*, 45 (1819), 4333-4355
- Zhu, Q., Sarkis, J., & Lai, K. H. (2008). Green Supply Chain Management Implications for "Closing the Loop". *Transportation Research*, 44, 1-18
- Zhu, Q., Sarkis, J., & Lai, K. H. (2013). Institutional-based antecedents and performance outcomes of internal and external green supply chain management practices. *Journal of Purchasing and Supply Management*, 19(2), 106-117.

APPENDIX I

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

QUESTIONNAIRE

My name is Berlinda Akpaloo. I am a Student at Kwame Nkrumah University of Science and Technology School of Business, Department of Supply Chain and Information Systems. This survey instrument has been designed to enable me carry out research required for my Master's degree. Any information provided will ONLY be used for general information, and it will be treated as **HIGHLY CONFIDENTIAL**.

SECTION A: SUSTAINABLE PRACTICES (Source: Masocha & Fatoki, 2018)

Using the 7-point Likert scale below, please indicate your level of agreement or disagreement with respect to the following statements about your organization.

1 Strongly disagree	2 Disagree	3 Somewhat disagree	4 Neutral	5 Somewhat agree	6 Agree	7 Strongly agree
Environmental Practices						
ENV1: Our sustainable business practices focus on environmental issues.						
ENV2: Our sustainable business practices make the most efficient use of the resources available in the environment.						
ENV3: Our sustainable business practices recycle, reuse and reduce waste.						
ENV4: Our sustainable business practices are based upon environmental monitoring.						
ENV5: Our sustainable business practices are increasing energy efficiency.						
ENV6: Our sustainable business practices emphasise on use of renewable energy.						
ENV7: Our sustainable business practices make use of reduction/replacement of hazardous chemicals or materials (e.g., substituting hazardous chemicals with less hazardous alternatives).						
ENV8: Our sustainable business practices adhere to Environmental Protection Agency regulations on effluents/emissions/waste.						
Social Practices						
SOC1: Our sustainable development practices take current activities in the community into account.						
SOC2: Our sustainable development practices consider the social well-being of society.						
SOC3: Our sustainable business practices provide entitlements to workers.						
SOC4: Our sustainable business practices promote women to senior management positions.						
SOC5: Our sustainable business practices focus on equity and safety of the community.						
SOC6: Our sustainable business practices focus on improving the general education level.						
SOC7: Our sustainable business practices promote individual rights both civil and human rights.						

Economic Practices	1	2	3	4	5	6	7
ECO1: Our sustainable development practices rest on economic considerations such as efficiency and productivity.							
ECO2: Our sustainable development practices focus on survival in the marketplace.							
ECO3: Our sustainable development practices save money for the firm.							
ECO4: Our sustainable development practices meet tax obligations.							
ECO5: Our sustainable development practices provide products and services that are important for the community.							
ECO6: Our sustainable development practices focus on long-term profitability even if it means losses in the short-term							

Source: Masocha, R., & Fatoki, O. (2018). The impact of coercive pressures on sustainability practices of small businesses in South Africa. *Sustainability*, 10(9), 3032.

SECTION B: PROCUREMENT CAPABILITY (Source: Yook et al., 2017)

Using the 7-point Likert scale below, please indicate your level of agreement or disagreement with respect to the following been ensured by your organization.

1 Strongly disagree	2 Disagree	3 Somewhat disagree	4 Neutral	5 Somewhat agree	6 Agree	7 Strongly agree	
Procurement Capability							
	1	2	3	4	5	6	7
PC1: Knowledge and/know-how related to purchasing are accumulated in a systematic way.							
PC2: Purchasing technologies are continuously improved through education and training							
PC3: Jobs of people involved with purchasing in organisation are clearly defined and organically organised							
PC4: There is trust between buyers and sellers is high							

SECTION C: TOP MANAGEMENT COMMITMENT (Source: Griffith, Yalcinkaya, and Calantone, 2010 and Colwell and Joshi, 2013)

Using the 7-point Likert scale below, please indicate your level of agreement or disagreement with respect to the following statements about your organization.

1 Strongly disagree	2 Disagree	3 Somewhat disagree	4 Neutral	5 Somewhat agree	6 Agree	7 Strongly agree	
	1	2	3	4	5	6	7
TMC1: Top management extends full support for sustainability practices							
TMC2: Top management commits to reducing sustainability issues resulting from operations							
TMC3: Top management consistently assesses the sustainability impacts of business							
TMC4: Top management shows behavior that indicates sustainability as a competitive advantage							
TMC5: Top management has a great understanding of competitors' sustainability practices							
TMC6: Top management knows a great deal about customers' sustainability requirements							
TMC7: Top management has a great knowledge of the industry's sustainability requirements							

TMC8: Top management effectively communicates sustainability practices among stakeholders								
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SECTION D: SUPPLY CHAIN PERFORMANCE (Source: Asamoah et al., 2021)

Using the 7-point Likert scale below, please indicate your level of agreement or disagreement with respect to the following statements about your organization.

1 Strongly disagree	2 Disagree	3 Somewhat disagree	4 Neutral	5 Somewhat agree	6 Agree	7 Strongly agree					
Reliability Performance					1	2	3	4	5	6	7
RPERF1: Our firm offers products that are highly reliable											
RPERF2: Our firm offers high quality products to our customers											
RPERF3: Our firm and supply chain partners have helped each other to improve product quality											
RPERF4: Our firm with supply chain partners increases the rate at which we fulfill customer orders											
RPERF5: Our firm with supply chain partners increases our inventory turns											
Efficiency Performance					1	2	3	4	5	6	7
EPERF1: Our firm with supply chain partners reduces inbound and outbound cost of transport											
EPERF2: Our firm with supply chain partners reduces warehousing and inventory holding costs											
EPERF3: Our firm with supply chain partners meets on-time delivery requirements for all product											
EPERF4: Our firm with supply chain partners reach agreed costs per unit as compared with industry											
Flexibility Performance					1	2	3	4	5	6	7
FPERF1: Our firm with supply chain partners offers a variety of products and services efficiently											
FPERF2: Our firm with supply chain partners offers customized products and services with different features.											
FPERF3: Our firm with supply chain partners meets different customer volume requirements efficiently											
FPERF4: Our firm with supply chain partners has short customer response time as comparison to industry											
FPERF5: Our firm with supply chain partners responds to and accommodates demand variations											

SECTION E: DEMOGRAPHIC INFORMATION

INSTRUCTIONS: Please kindly write in ink in the box which corresponds to the statement, which in your opinion is the most appropriate answer to the related question. For the following questions, kindly select by checking (√) all that apply.

Name of Company:

How long has your firm been in operation (months): 1-12[] 13-30[] 31-45[] 46-60[] >60[]

Number of Employees in the company: <6[] 6-29[] 30-59[] 60-99[] 100+[]

What is your job title/position in the Company:.....

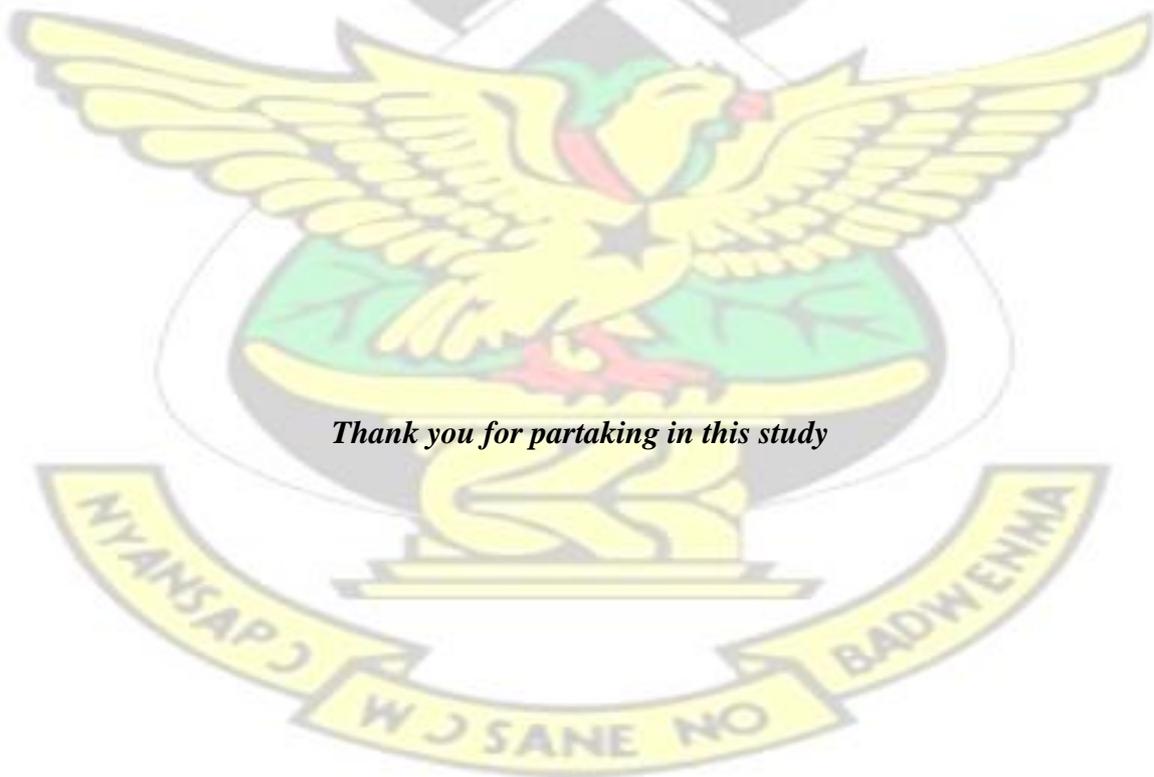
How long have you worked in the company: <1 year [] 1-5 years[] 5-10years[] above 10years

Age: [] Below 20 years [] 20-30years [] 30-40 years [] 40-50years [] Above 50years

What is your highest of education? JHS [] SHS [] Undergraduate [] Masters [] PHD []

Some professional/ vocational courses []

Gender: [] Male [] Female



Thank you for partaking in this study