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The Effects of Innovation Orientation on Sustainable Procurement Practices: The Mediating Role of Circular Procurement.

By

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DECLARATION

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

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DEDICATION

This thesis is dedicated to the people who have supported me throughout my education. Thanks for making me see this adventure to the end.

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This is to thank for the prayers and for the following people listed: To Almighty God for the gift of wisdom and knowledge and for giving me the courage for the accomplishment of the study.

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To my lovely wife and all my love once, who served as my inspiration, motivator and provider of my financial expenses.

ABSTRACT

The main objective of this study is to investigate the indirect role of circular procurement in the direct link between innovation orientation and sustainable procurement practices with evidence from mining firms in Ghana. The study employed a cross-sectional research design. This survey was conducted using a quantitative approach. Stratified sampling was used to choose 381 participants. A prepared questionnaire was the main tool used for data collection. Both SPSS v26 and SmartPls v4 were used for the statistical analysis. Both descriptive and inferential approaches were used to analyse the data. The finding revealed that innovation orientation had a significant direct influence on sustainable procurement and circular procurement. The finding concluded that circulars have a direct effect on sustainable procurement. The finding also indicated that circular procurement positively and partially mediates interactions between innovation orientation and sustainable procurement. The study concluded that managers should reuses procurement resources, recycles procurement resources, and regenerates resources through purchase to seek operations management innovations and embrace innovation in their activities to enforce procurement rules, practices sustainable development, include sustainability in their purchase procedures, acquire sustainable products, services, and works according to their procurement policy, and contracts for sustainability.

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LIST OF ABBREVIATIONS

EPI	Environmental Performance Index
SP	Sustainable Procurement Practices
CSR	Corporate Social Responsibility
GE	General Electric
SPP	Sustainable Public Procurement
GPP	Green Public Procurement
CPP	Circular Public Procurement
PP	Public Procurement
SD	Sustainable Design
LMP	Lean Management Practices
SOI	Sustainability-Oriented Innovation
CSR	Corporate Social Responsibility
HR	Human Resources Managers
CEO	Chief Executive Officer
CMV	Common Method Variance
KMO	Kaiser-Meyer-Olkin
HTMT	Heterotrait-Monotrait Ratio

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Although the global mining industry contributes significantly to the gross domestic product of economies around the world, there are a lot of serious adverse effects that mining operations have on the environment and the health of humans (Emmanuel, Jerry, & Dzigbodi, 2018). The negative effect of the mining industry on the environment includes poisonous chemicals which enter the food chain resulting in the lack of safe water for drinking and for irrigation purposes (Chan & Hsu, 2016); creating health challenges for human lives. In response to these threats the government of Ghana implemented an environmental performance rating and disclosure initiative - the AKOBEN Programme - in 2010 with the aim of improving environmental performance of mining companies (Bedu-Addo, Ofori-Kuragu & Arthur 2019). However, Bawua and Owusu (2018) indicated that for three periods from 2009 to 2011, mining companies failed to meet the required standards falling afoul of Dumont et al.'s (2017) earlier recommendation that organizations adapt their HRM practices to help them achieve economic, social and environmental goals. The Environmental Performance Index (EPI) in which Ghana was ranked 168th out of 180 nations in 2020 attests to the generally poor management of the environment and negative impact of industries including mining on the environment (Ahakwa, Yang, Tackie, & Asamany, 2021). Ghana clearly needs to up the ante on the environmental protection front, hence the urgent need to review how sustainable procurement may be leveraged for better environmental performance.

Similarly, despite the very significant role the retail industry plays in the socio-economic development of Ghana, Sarra (2022) contends that it is a major source of carbon emissions generation and impacts negatively on the environment. In fact, Omondi, (2021) claims that the retail industry is one of the top five most polluting industries in the world. Explaining this

further, Howell (2021) points out that daily packaging waste is relatively high across the world, and this consequently contributes significantly to increasing plastic pollution which is a major threat to marine life. In response to this pressure, organizations around the world have adopted different strategic plans aimed at minimizing the impact of organizational operations on the environment in relation to production, business processes and environmental policies such as reduction in energy consumption and waste, clean energy introduction, the adoption of environmental management systems and green initiatives (Schmitz, Baum, Huett, & Kabst, 2017). One such green initiative that has been advocated by scholars in the past two decades is sustainable procurement.

Sustainable procurement is a process whereby the client and participating organization meet design and development requirements in a way that achieves value for money on a whole life basis so as to generate benefits not only for project stakeholders but also to society and the economy, while minimising any environmental damage (Yu et al., 2020; Ogunsanya et al., 2022). Despite the increased trend in sustainable procurement research and practice, most organizations in developing economies are yet to fully adopt sustainable procurement (Islam et al., 2017). Procurement officer play a critical role in selecting the other stakeholders along the supply chain including consultants, contractors and determining products (Wilkinson et al., 2015). If they were to demand sustainability in procurement, a considerable amount of progress could be made towards the attainment of sustainable development (Wong et al., 2016). Sustainable procurement provides the vehicle for the industry to address economic advancement and social equity in the construction industry while minimizing impact on the environment and contribute to the larger effort of achieving sustainable development (Meehan and Bryde, 2015). Despite the increased trend in sustainable procurement research and practice, the implementation of sustainable procurement faces many challenge (Qazi and Appolloni,

2022; Agyekum et al., 2022). Industrial waste continues to cause multiple threat to the environment and human lives. In order to properly dispose of this garbage, firms must employ waste management strategies (Bungau et al., 2018). Given the industry's significance to societal well-being, Innovation orientation remain crucial.

Innovation orientation is one of the capabilities that helps firms to build resilience to disruption (Kamalahmadi and Parast 2016).

In the pursuit of environmental, economic, and social development, innovation and sustainability are crucial links (Michelino et al., 2019). Sustainability has been viewed as a goal that may be attained through innovation (Adams et al., 2016). Due to the size of production growth, which is mostly related to excessive consumption and excessive use of natural resources, the extraction and use of resources continues to increase in absolute terms. Therefore, innovation systems that are focused on sustainability and enable more sane consumption are required by society and companies. Numerous studies stresses both the objectives of sustainable development and the significance of innovation for sustainability (Hallenga-Brink and Brezet, 2005; McLaughlin et al., 2008; Nill and Kemp, 2009; Nidumolu et al., 2009; Barbieri et al., 2010; Christensen, 2019). Due to the number of resources consumed and the amounts of pollution generated during production, innovation is acknowledged as the world's primary driver of industrial expansion as well as one of the primary causes of social and environmental disturbance (Hall and Vredenburg, 2003). Innovation focus is a crucial development tool, particularly if businesses want to source sustainably. This study is therefore conducted to examine how innovation influence sustainable procurement practices among mining firms in Ghana.

1.2 Problem Statement

The mining industry constitutes essential backbone of economic progress and are recognized to be key driver to economic growth and the sustainable development agenda (Muriithi 2017).

Despite the role of the industry on growth, it has serious environmental implication when not properly handled. In this regard, circular procurement remains essential if nations desire to continue enjoying the support of the industry and keeping the environment safe. Procurement in the mining industry makes the sector prone to many environmental impacts. Hence, procurement plays a very important role for mining firms because of its role in advancing the sustainability agenda, given its position and ability to influence external organizations in the supply chain (Seuring 2004) through organizational policies and practices (Renukappa et al. 2016). Unfortunately, the implementation of environmentally firmly procurement practices require innovation.

Despite the belief that innovation fosters sustainability, innovations should simultaneously produce favorable economic, social, and environmental results. Given the uncertainties that innovations entail, especially when they are radical, disruptive, or very fresh to the mainstream, those consequences are difficult to demonstrate (Hallenga-Brink and Brezet, 2005; Nill and Kemp, 2009; Barbieri et al., 2010). Both the scale of the effect in the organizational contexts where it happens and the number of studies evaluating the effects of innovation orientation on sustainable procurement are not shown by the mapping done in earlier studies (Jin et al., 2018; Orji & Liu, 2019; Borsato et al., 2020). This study offers information on the impact of innovation on mining companies' sustainable procurement practices.

Studies have been conducted on a variety of topics, including the transition from innovation to sustainability (Leach et al., 2012), environmental innovation and the transition to sustainability (Truffer and Coenen, 2012), social sustainability and supply chain innovations (Beltagui et al., 2019), the key drivers of lean innovation-led approaches to achieve sustainability in manufacturing supply chains (Orji and Liu, 2019), and the impact of lean and sustainability oriented innovation on sustainability.

Meanwhile, prior studies (Ruparathna and Hewage, 2015; Molin et al., 2021; Sönnichsen et al.,

2020; Yu et al., 2020; Lăzăroiu et al., 2020; Adjei-Bamfo et al., 2019; Qazi, A.A. and Appolloni, 2022) on procurement sustainability have highlighted numerous gaps especially regarding the role of contemporary strategies including circular procurement as a driver of sustainable procurement practices in the mining sector. Apart from the lack of clear understanding of regarding innovation orientation may influence sustainable procurement practices in the mining sector, earlier studies are largely reviewing and lack empirical and theoretical support (Xenophon et al., 2012). Though mining firms may have innovative strategies, it remains essential that they actually practice green purchasing in addition to the policies they have formulated in the operations or production process, without which this innovation orientation may not produce fruitful outcomes in achieving the desired sustainability in procurement. This study seeks to fill the theoretical gap by examining how innovation orientation and circular procurement may directly influence sustainable procurement practices in the mining sector through the natural resource-based view perspective. Circular procurement represents the process where firms procure a circular solution, this is a solution that contributes to two of the three goals such as protecting the environment, the stock of materials and the existing values (Platform CB'23, 2021). Oppen et al. (2018) further noted that not only should procuring circular goods be considered with circular procurement, but the purchaser should also consider the circularity of use of a material or service, because to obtain the maximum achievable circularity, the use of materials, design, production and reuse for the future all needs to be considered (Sprakel, 2022). Though the concept of circular procurement is new in many developing economies, it has received increased global attention in both academic and industrial discourse (Bak, 2020; Volodymyr and Oksana, 2021; Gyori, 2021; Kristensen et al., 2021; Sprakel, 2022; Zijp et al., 2022; Qazi and Appolloni, 2022; Xu et al., 2022). Although the concept has seen increased trend in circular procurement research and practice, the implementation of circular economy is still low in developing economies (Qazi and Appolloni,

2022; Agyekum et al., 2022). Till date, it is unclear how circular procurement may indirectly influence sustainable procurement via innovation orientation in emerging economies like Ghana.

This study closes the aforementioned gaps by examining how circular procurement may indirectly influence sustainable procurement via innovation orientation in in the mining sector and the indirect role of green purchasing practice in the direct link between circular procurement and sustainable procurement practices. Being among few attempts to examine the phenomena, this study makes a twofold contribution to sustainable procurement literature. The direct relationship between circular procurement, innovation orientation and sustainable procurement practices which has not yet been empirically validated is explored in this study and further expand the theoretical lens of procurement literature on how procurement officers may take decisions to enhance sustainable procurement practices in emerging economies. Secondly, this study introduces circular procurement as a mediating variable, which expands the context of research on sustainable procurement practices discourse and facilitates the understanding of the indirect routes that promote sustainable procurement practices.

1.3 Objectives of the study

The main objective of this study is to investigate indirect role of circular procurement in the direct link between innovation orientation and sustainable procurement practices with evidence from mining firms in Ghana. Based gaps identified and discussed in the problem statement three specific objectives were put forward. These objectives include

i. To examine the effect of innovation orientation on sustainable procurement practices mining firms in Ghana.
ii. To evaluate the relationship between innovation orientation and circular procurement.
iii. To investigate the mediating role of circular procurement in the relationship between innovation orientation and sustainable procurement practices.

1.4 Research Questions

i. What is the effect of innovation orientation on sustainable procurement practices among mining firms in Ghana?

ii. What is the relationship between innovation orientation and circular procurement?

iii. What is the mediating role of circular procurement in the relationship between innovation orientation and sustainable procurement practices?

1.5 Significance of the Study

This study is of significance due to the contributions that it seeks to make towards policy formulation, practice and theory.

First of all, environmental regulatory bodies such as the Environmental Protection Agency is anticipated to benefit from this study. This is because the outcome of the relationship between IO and SPP would aid the Environmental Protection Agency to assess the significant role of IO in enhancing the sustainable procurement practices in the mining sector which has been a major concern in the recent years. Additionally, it would also aid environment-focused organizations such as the Environmental Protection Agency to formulate the right policies to ensure that green initiatives such as circular procurement are properly adopted by industries including the mining and the retail industries instead of just going through the motions with greenwashing.

Furthermore, non-governmental organizations and pressure groups involved in the advocacy for the protection of the environment would also benefit from this study. This is because the findings of the study would help them carry out more advocacy campaigns and also mount pressure on organizations to adopt sustainable procurement practices. In addition to the above, managers such as supply chain managers and sustainability managers stand to gain from the results the study. An improvement in the environment by the adoption of sustainable procurement practices on the outcome of the study would help these managers to maximize environmental performance and enforce policies that would support sustainable procurement

practices implementation. Additionally, managers and top management members in other industries who are yet to adopt sustainable procurement practices could also be influenced to adopt sustainable procurement practices as a tool for achieving environmental performance. Furthermore, the findings of the study would afford managers the opportunity to understand how sustainable procurement practices may be achieved via innovation orientation and circular procurement.

1.6 Research Methodology

The study employed positivist research approach which made use of a quantitative methodology. Again, the study also employed a cross sectional survey design. The design enabled the researcher to describe the study variables in the Ghanaian context and also explore the relationship among different mining firms over a period of time. The study population comprised all procurement officials of mining firms in Ghana. A sample of 200 firms were drawn for the study. Respondents in this study (procurement managers and officers) were purposively sampled. The study conducted extensive literature review to help to discover the academic writings supporting the relevant of topic and the research hypotheses. Again, the study used primary source of data to validate the results produced in literature through field survey using questionnaires adopted from previously validated instruments. After the data collection, the primary data that has been gathered from the field will be vetted for accuracy and reliability. The questionnaires that have been adequately filled will be coded into excel for analysis. This study will employ two data analysis approach i.e. descriptive and inferential analysis using multivariate data analyzes such as Environmental Performance Index (EPI) and factor analyzes in order to fulfil set objectives in chapter one. Descriptive analysis will be based on information provided by respondents concerning their organization (demographical data), which include profile of the organization and the respondents. The essence of the descriptive analysis is to test for normality and this included frequencies, percentages, means, skewness

and kurtosis statistics. The motive of this analysis is to ensure that data gathered are suitable for covariance based-SEM analysis. It is done to check for missing data, outliers, and data distribution (Hair et al., 2017). Inferential analysis will be used to test the hypothesis in the study.

1.7 Scope of the study

The scope sets the context and boundaries of the research. Contextually the study focused on procurement units of mining firms across the country. Though procurement sustainability is affected by several factors, relationship between IO, CP and sustainable procurement practices which has not yet been empirically validated is explored in this study.

1.8 Limitation of the study

The study has some limitations. Though prior studies recommend the use of single respondent in a study of this nature, however, in practice no single person controls or manages the entire SC, this study therefore is limited by using single respondent. Additionally, including a mediator in the the relationship would be more robust and valid in contexts specific to service delivery or public sector. It would have been useful to employ a longitudinal research design in understanding the relationship. Though the study had no issues of common method bias despite using single respondent, it is important that future studies consider multiple respondents from each firm. Again, future researchers can also investigate the conceptual model using other sectors of the economy of Ghana such as service sector and nonprofit organizations.

1.9 Organization of the study

The study is structured into five chapters. The Chapter One introduces the background to the study, the research problem, research objectives, research questions, justification or significance of the study, scope of the study, limitations of the research and overview of the research methodology. The Chapter Two, reviews relevant literatures related to social capital theory, innovation and firm performance. The literature review encompasses both theoretical

and empirical sections. The various concepts about the study will also be reviewed in the Chapter Two. The Chapter Three elaborates on the research methodology. The chapter discusses the study design, population of the study, sampling, data collection, data processing, data analysis and ethical consideration. The Chapter Four of the study present analyses the data and discuss the result. The Chapter Five summarizes the research result, make the necessary conclusions and recommend appropriate and feasible policy and managerial measures for improving procurement in Ghana.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Chapter two of this thesis is organized into four main sub-headings. The chapter provides information organized under conceptual review, theoretical review, empirical review, and finally the research model and hypotheses development. The Conceptual review section provides definitions, operationalizations, and how the constructs have been used in this study. The theoretical review section also provides the theoretical underpinnings of the study. The various prepositions proposed in this study were depicted using a conceptual framework and various relationships were well discussed. The Chapter ends with research gaps highlighted in the study.

2.2 Conceptual Review

Definitions, operationalizations, and an explanation of how the constructs were applied in this study are provided in this section. There are three main constructions in the model (Innovation Orientation, Sustainable Procurement Practices, and Circular Procurement). The following sections made these constructions operational (see **2.2.1**-**2.2.3**).

2.2.1 Innovation Orientation

Organizational survival in the present economic and social environment is becoming more difficult. Moreover, the ambiance has undergone a significant transformation, requiring businesses to possess stronger management features, one of which is the ability to innovate (Scuotto et al., 2019). Concisely, increased innovation-based competition is necessary for businesses to succeed (Shen et al., 2022). In particular, innovation orientation is a cultural characteristic that serves as a road map for all organizational activities and procedures, driving them to be more inventive (Zaman et al., 2020). In addition, increasing the firm's ability for long-term creativity and adaptability as well as its openness to "fresh concepts." Moreover, it is acknowledged that innovation encompasses more than simply a radically new good or service; rather, the Pisicchio et al. (2021), which demonstrates guidelines for all studies in the

field of innovation, defines innovation as a new or improved product or process (or a combination thereof) that differs materially from the unit's preceding products or methods and has been made accessible to or put into use by the component. In addition, innovation orientation is conceptualized by Kwiotkowska and Gebczynska, (2021) as a dimensional concept with three elements: the launch of new goods, R&D expenditures (products and processes), and the sequence of entrance into the industry. These writers contend that a variety of factors provides a more accurate picture of an organization's capability for innovation than methods based on a single factor (Sonmez Cakir and Adiguzel, 2019). Alternatively, an organization's level of innovation is indicated by its innovation orientation, and the findings imply that this perspective offers a setting in which purposeful economic expansion initiatives may be put into action (Klassen et al., 2020). For the purpose of this study, the definition of Innovation orientation by Kwiotkowska and Gebczynska, (2021) will be adopted by the study. It states that innovation orientation is conceptualized into dimensional concept with three elements: the launch of new goods, R&D expenditures (products and processes), and the sequence of entrance into the industry.

2.2.2 Sustainable Procurement Practices

The procedure through which businesses get the commodities, components, goods, skills, or other capabilities they need to carry out their activities is known as procurement (Lukacs de Pereny Martens, 2022). In addition, the three parameters of cost, quality, and delivery are the major focus of the procurement system. Moreover, since it incorporates sustainability impacts into supply chain administration choices, sustainable procurement practices (SP) are strategies for achieving resilience (Ghadge et al., 2019). According to Leal Filho (2019), sustainable procurement is sometimes referred to as an "ecologically responsible purchasing strategy that decreases inefficiencies and encourages reuse and recovery of acquired material." In order to prevent further environmental conditions and conserve the rapidly decreasing natural resources,

SP has received substantial attention from the commercial and academic worlds (Tiwari et al., 2019). Moreover, the incorporation of Corporate Social Responsibility (CSR) concepts into one company's procurement procedures and choices while guaranteeing that they continue to satisfy the needs of consumers is known as sustainable procurement (Boruchowitch and Fritz, 2022). Furthermore, Sustainable procurement practices incorporate standards, standards, and parameters that are congruent with safeguarding the environment and society at large. It covers a wide range of concerns, such as those that go beyond child labor or the use of hazardous substances that can harm both individuals and the environment (Ogunsanya et al., 2022). For the purpose of this study, the definition of sustainable procurement by Leal Filho (2019) will be adopted by the study. It states that sustainable procurement is sometimes referred to as an "ecologically responsible purchasing strategy that decreases inefficiencies and encourages reuse and recovery of acquired material.

2.2.3 Circular Procurement

Nevertheless, a key finding from Alhola et al. (2017) stated that full circularity in procurement is not feasible since there is little chance that all goods and services would become circular, and not all marketplaces can provide a fully circular economy. Moreover, this justifies the notion that businesses need to strive to be as circular as feasible (Qazi and Appolloni, 2022). Due to the fact that CE-based operations are incorporated into the procurement process, purchasing plays a significant part in CE. In addition, these tasks include choosing suppliers carefully, establishing strong supplier alliances, adopting green business practices internally, and receiving green accreditation (Hartley et al., 2020). Concisely, a strategy known as "circular procurement" acknowledges the part commercial and governmental institutions may play in assisting the shift to resource efficiency (Alhola et al., 2019). Alternatively, the phrase "circular procurement" refers to transactions that uphold the spherical economy's core values, which include limiting resource consumption and minimizing ecological impact (Sönnichsen and

Clement, 2020). Moreover, establishing commitments to ensure that the items that are purchased for companies are made in accordance with the circular economic growth central tenets and will be further processed after use is known as circular procurement (Khan et al., 2021). For the purpose of this study, the definition of circular procurement by Sönnichsen and Clement, (2020) will be adopted by the study. It states that the phrase "circular procurement" refers to transactions that uphold the spherical economy's core values, which include limiting resource consumption and minimizing ecological impact.

2.3 Theoretical Literature Review

An abundance of knowledge and information in the scope of innovation makes the research process to become challenging, difficult, and lengthy (Norris and Ciesielska, 2019). Thus, to focus the research direction, three underpinning theories were used as a research foundation in supporting and addressing the gap, and as a guide to align this research into an appropriate direction. The researcher examines underlying ideas in this part, as well as the effects of innovation orientation on sustainable procurement practices: The mediating role of circular procurement. The innovation orientation theory and its extension to the institutional theory serve as the foundational theories for this investigation. Theoretical frameworks provide a clear prism or context through which a subject is studied; it explains the context and the connections between the various factors and dimensions.

2.3.1 Innovation Orientation Theory

Long-term sustainability via innovation, according to Siguaw et al. (2006, p. 558), "makes it appear predicated not on unique, discrete discoveries or on a single market or learning orientation but rather on an encompassing, organization-wide knowledge structure, dubbed innovation orientation." In order to conceptualize the innovation orientation theory and identify a variety of prior elements for scientific inquiry, researchers in the systematic literature review

(SLR) sample employed Siguaw et al. (2006) 11 studies (e.g., Simpson et al., 2006; Stock and Zacharias, 2011; Altindag and Zehir, 2012 etc.) cited their definition and discussed elements like learning ideology, corporate strategy, and train functional adjustment. Since a significant amount of the studies in the SLR sample and the innovation orientation domain has been conducted after Siguaw et al. (2006) published their conceptual framework, it is crucial to acknowledge some significant advancements that have been empirical evidence shown to have an impact on creativity orientation but were not included in their definitions. The influence of idealized affect (Engelen et al., 2014), the essential components of Sustainable Procurement Practices (Stock and Zacharias, 2011; Talke et al., 2011), and firm effectiveness (Salim, and Sulaiman, 2011) are a few of these significant developments that should be included in a multivariate regression construct of innovation orientation (Dobni, 2010). For the purposes of this study, innovation orientation will be characterized as a multifaceted construct with a focus on promoting innovation-based practices and values across the organization. Much research has found the beneficial effect of innovation orientation on Sustainable Procurement Practices (Zhou et al., 2005; Ngo and O'Cass, 2011).

2.3.2 Institutional Theory

According to institutional theory, firms build durability and a sense of security through time, which aids in long-term success, but this process of "formalization" also breeds resistance to disruption and stagnation (Amenta and Ramsey, 2010). Organizations formalize their objectives and routinely carry out their tasks in order to live, getting extremely "reliable" and "responsible" for their deeds (Larsen and Lomi, 1999). Similar to other services, procurement functions are susceptible to institutionalized. Procurement's "trustworthiness" has shifted to a greater emphasis on finding the correct items at the proper price, quality, and timing, and its "accountability" is based on proving value for cash. A new dimension to the price, quality, and time triad might be added by including sustainability in judgment about a purchase (Tina Dacin

et al., 2002). Due to organizational conservatism, businesses may be less willing to embrace these new procurement processes as they get older and larger. According to expertise in other sectors, systemic inertia may be addressed. General Electric (GE), a venerable US electrical manufacturer, was examined by Fleck (2007), who came to the conclusion that in order to counteract institutional resistance, GE institutionalized those practices that allowed procedures to change and their connection with the environment to be redefined. An initial lens through which to view inertia is suggested by previous arguments that the sustainability concept is intricate and challenging to actualize (Suddaby, 2010). This lens is the interplay between organizations and specific procurement representatives in charge of carrying out organizational plans. Van der Steen (2009, p. 738) explains how staff members' "regular stiffness" prevents them from quickly embracing new risk management regulations.

2.4 Empirical Literature Review

This section assessed the research on prior studies that addressed the study's objective. These include the effects of innovation orientation on sustainable procurement practices: The mediating role of circular procurement. Literature related to the study's goal of the effects of innovation orientation on sustainable procurement practices: The mediating role of circular procurement in previous and ongoing research projects was evaluated.

Grandia and Voncken (2019) did a study to examine the link between aptitude, drive, and possibility and six different sustainable public procurement (SPP): green public procurement, social return on investment, circular economy, bio-based public procurement, innovation-oriented procurement, and international social criteria. Moreover, online polls were given to interested parties employed by Dutch government agencies. In addition, research indicates that chance, talent, and desire all have an impact on green public procurement (GPP). Moreover, green public procurement, innovation-focused procurement practices, and circular economy were all impacted by opportunities, whereas the other categories of sustainable public

procurement (SPP). In addition, the study demonstrates that there is a need for investigation into the causes of social kinds of SPP and that conclusions based on GPP could be immediately transferred to certain other types of SPP. Moreover, after considering the findings and the survey's shortcomings, the researcher made the following recommendations: in future research, SPP and GPP should not be employed indiscriminately; academics should offer explicit operationalizations of their notions.

Kristensen et al. (2021) undertook research to determine the study's goal to investigate Danish locality's circular public procurement procedures. Moreover, the study employed a qualitative case study. The causes and obstacles for transitioning from public procurement (PP) practices to circular public procurement (CPP) can be better understood using qualitative methodologies. In addition, a thorough examination of the present procurement procedures was made possible by the selection of just eight Danish municipalities. Moreover, a deliberate case decision was undertaken to get the largest representative sample from the small number. Moreover, instead of choosing randomly, the case selection was information-driven. In addition, the study is focused on practices and learning theory to comprehend how folks genuinely function inside an institution. Public procurement procedures diverge from regulations in that the incorporation of green and circular components depends on the capabilities of each specific procurement agency while rules set basic principles. Moreover, an obstacle to greater adoption is the lack of circular public procurement instruments, which are essential for successfully employing public procurement to assist environmental issues, such as through the use of Eco labels. Concisely, while there are not many examples of circular public procurement, those that do tend to be endeavored and managed by leadership. In many of the cases examined, green public procurement practices are driven by terminal desires. Depending on the outcome and the study's drawbacks, the researcher hypothesized that this study's accomplishments can be discovered in the knowledge of various public procurement (PP) practices as well as the forces that influence

and pose obstacles to the development of procedures for circular public procurement (CPP). On the basis of this information, suggestions are made for future study as well as for the subnational financial companies.

Loosemore and Reid (2019) carried out a study to explore the study's goal to investigate the social procurement procedures used by Australia's top-tier construction industry. Moreover, the classification scheme of social procurement was utilized as a theoretical model to gather information about the many forms of social procurement employed in building projects, the kind of social value being generated, and the obstacles to execution. In addition, despite the currently no proof that it has been observationally tested, this was chosen because it represents the most recent typology that is presently available and has developed as a progressive sophistication of earlier typologies. In addition, the information was gathered through semistructured interviews with senior managers from eight different Tier-1 building organizations in Australia to evaluate the paradigm in a construction setting. Furthermore, these findings also show that practices to social procurement in the Australian property sector are frequently guided by a philosophy of mitigating risk rather than advantage maximization, are limited to reduced and minimal building projects, and are hindered by a lack of resources for generating economic in both existing and new distribution networks. Concisely, the researcher proposed that future research might seek to relate results and experiences of adopting community procurement policies in nations having shared societal issues and contemporaries depending on the study's findings and shortcomings.

Lenderink et al. (2019) performed a study that examines methods for public procurement that are innovation-focused in civil construction and engineering. Moreover, a large multiple case study of eight projects in the Netherlands includes the three chosen projects. The decision was made after researching various methods for obtaining innovations for use in civil engineering and construction. In addition, qualitative studies with participating public bodies and proposers

and an assessment of venture, purchasing, and preliminary contract documents make up the data collection process. Moreover, the philosophical framework was utilized for the study and evaluation of development procurement methodologies. The results show a significant correlation alone between purchasing strategies employed and the initiative's goals, targets, and scope. As a result, the applicability of the sourcing strategies heavily depends on the project's goals. In order to support various organizational, organizational, and project goals, a range of development procurement methodologies are required. The author asserted that this has profound consequences for the deployment of innovation-oriented procurement techniques in action in light of the results and constraints. To fully utilize the corporate governance of innovation to support their policy ideas, strategic performance, and desired outcomes, public institutions need to become acquainted with a variety of innovation-oriented procurement methodologies.

Shashi et al. (2018) conducted research to look at the study's goal to examine how SME's supply chain connectivity and sustainability orientation (SO) initiatives affect their efforts in sustainable design and procurement (SP). Additionally, this study investigates how SMEs' SP and design impact their cost and ecological effectiveness. Now at the level of SMEs, the researchers develop a complete model to explore the connections between SC, SC integration, SP, sustainable design (SD), sustainability practices, and CP. Moreover, the data collection comprised of 358 Indian manufacturing SMEs is used by the researchers to study the correlations between the aforementioned characteristics. According to the findings, SO positively affects both SP and SD in the context of SMEs, collaboration helps improve, internal integration significantly improves SD, SP significantly improves EP but has no effect on CP, and SD positively influences both EP and CP. The author stated that future research might examine the reliability of the proposed methodology when relevant research is studied along with secondary data (provided by government publications, websites, books, journal articles,

internal records, etc.) depending on the study's results and constraints. Furthermore, we gathered survey data from SMEs operating in six diversified sectors, allowing us to test our approach in future studies by focusing on only one sector to comprehend the sustainability vulnerability in that area.

Marrucci et al. (2019) conducted a study that sought to investigate the thorough review and future research agenda of the circular economy's convergence with sustainable consumption and production technologies. Moreover, a comprehensive evaluation was done on the 455 studies that made up the content that was reviewed. In addition, the study identified EMS and Ecodesign as the tools with the highest level of integration with CE, whereas the other tools appear to be distinguished by a "purpose-built" strategy, based on a comprehensive analysis of 35 studies. Furthermore, an in-depth investigation of the findings, nevertheless, revealed that researchers' contributions to the combination of SCP tools and CE still need to be improved. For the purpose of advancing scholarly and professional discussion, we have chosen three key topics for future study. In addition, to encourage more scholarly and expert discussion, the study suggested three key themes for the systematic review in the future. The first significant area focuses on the role of EMS in enhancing organizations' circularity; the second significant area covers the environmental guideline and ETV in the package's design process; and the third significant area concentrates on GPP, Ecolabel, and Energy Label in promoting more environmentally friendly usage by establishing circular standards for products. Future studies may focus on quantitative, according to the researcher's suggestion, which was predicated on the study's limits and conclusions. The adoption of SCP technologies to promote CE in nations, regions, or towns is yet an uncharted subject that merits additional study.

Dey et al. (2020) carried out a study to examine the effects of sustainable innovation and lean business practices on the sustainable performance of small- and medium-sized businesses.

Moreover, in addressing the query of how lean management practices (LMP), sustainabilityoriented innovation (SOI), corporate social responsibility (CSR) practices, sustainability, and economic performance are interrelated, this research fills in these information gaps. In addition, this study explores the effects of LMP, SOI, and CSR (environmental and social responsibility) practices on sustainability and economic performance through theory testing with structural equation modeling. Furthermore, the study makes use of information from 119 SMEs in the manufacturing sector in the UK's Midlands. The investigation shows that SOI mediates LMP to achieve sustainability initiatives, while LMP facilitates both economic and sustainable effectiveness. Furthermore, whereas CSR policies somewhat mediate SOI to achieve sustainable achievement, it only marginally does the same for LMP. The study's limitations and conclusions led the author to recommend that further research should consider the distinctions and similarities between each of these factors.

De et al. (2022) conducted a study to comprehend the joint effect of lean methods and innovation that is focused on sustainability on the sustainable supply chain growth of Companies. Moreover, an information envelope is used in the investigation and analysis (DEA)-based model and implemented in a collection of SMEs in India's eastern region. In addition, efficiency and creativity focused on sustainability are taken into consideration as input criteria, and the conceptual framework considers economic, technical, ecological, and social factors as output criteria. DEA separates ineffective SMEs and encourages at least one of them to evaluate. The study then employs a descriptive approach to provide remedial actions for the underperforming SMEs. The findings show that combining lean and SOI contributes to Supply chain efficiency for SMEs. The results can assist lawmakers, as well as the owners and directors of specific SMEs, take action to improve durability. Fundamentally, this study provides a DEA-based framework for examining how lean and SOI operate together to improve sustainability initiatives in SMEs. Future studies might perhaps investigate looking further into researching

other economies and places. This research will be fascinating to observe how lean and SOI are affected by policy, finance, and law with regard to the sustainability of the supply chain.

Afum et al. (2021) carried out a study to explore the mediating functions of green radical product innovation and sustainable supply chain management in the relationship between sustainable organizational orientation and corporate sustainability. In addition, using information gathered from 248 managers of small and medium-sized businesses in Ghana, the complete research methodology created in this study is experimentally evaluated. Moreover, to examine all of the significant associations, partial least square structural equation modeling is used as the methodology. The study's findings show that SEO directly and significantly improves environmental and social performance but not financial performance. Nevertheless, SEO tends to have a major influence on all key sustainability parameters via sustainable management of supply chains and GRPI (both mediating factors) (environmental, financial, and social performance). The researcher argued that future research might broaden the study to different regions to make confirmatory or contradictory conclusions to the results and findings and the study's shortcomings. Furthermore, only SSCM and GRPI were examined in this study as mediating roles in the Digital marketing connection.

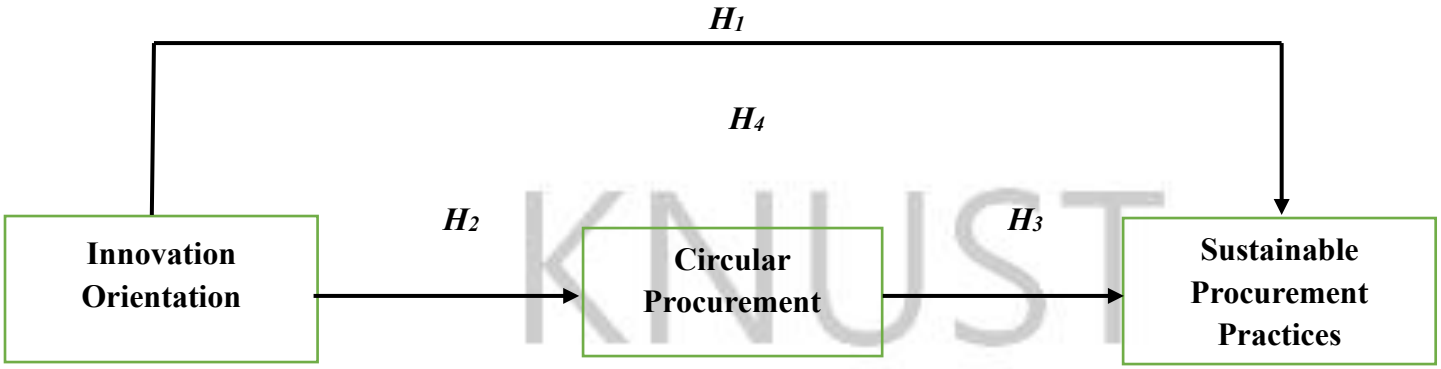
Berkel and Schotanus (2021) performed a study to examine the immediate effects of a new procurement policy document on the inclusion of sustainability impacts and ecological award criteria in bids. Moreover, a quantitative analysis of national government bids during the six months before and after the publication of the new policy on the incorporation of ecological issues was conducted. Depending on how considerations were included in the specifications and reward procedures, this conclusion was reached. In addition, on a municipal level, where the new policy document does not apply, the same was done as a control group. The four trials, sum to a total of 120 applicants, each. The European government procurement network TED was used to collect the data. A chi-square test was performed in the study to see whether there

is a significant distinction between the two periods for each group. Findings suggest that after the publication of "Procurement with impact," the federal government has carried out purchases with greater consideration for the environment. From 30% to 55% in a year, the federal government's use of green bids dramatically grew. Municipally, there was no discernible change. The author concludes that more investigation into the other factors is required to fully evaluate policy theory in connection to the long-term implementation of SPP policy based on the study's results and drawbacks.

2.5 Conceptual Model/ Framework

The two major pillars of the theoretical model are the innovation orientation theory and its extension to the institutional theory (see Figure 2.1). In order to compel providers to help them accomplish their stated goals, public organizations across the world have created sustainable public procurement (SPP) regulations (Brammer and Walker, 2011). Public term "procurement" describes how businesses in the governmental sectors acquire products and services. Procurement is a growing instrument for policymaking in the European Union, with public organizations spending around 16% of the GDP on it each year (Edler et al., 2011). Public procurement, for instance, is implemented in the Netherlands to encourage innovation, encourage the creation and purchase of environmentally sustainable goods, and shorten the short or medium unemployed access to the job market. Independent (Innovation Orientation), dependent (Sustainable Procurement Practices), and mediating variables are all included in the overall idea of (Circular Procurement). In this study, three types of variables were employed.

It is anticipated that the effects of innovation orientation on sustainable procurement practices: The mediating role of circular procurement.



`Figure 2.1 Conceptual framework

H1. *Innovation Orientation has a positive and significant effect on Sustainable Procurement Practices*

H2. *Innovation Orientation has a positive and significant effect on Circular Procurement*

H3. *Circular Procurement has a positive and significant effect on Sustainable Procurement Practices*

H4. *Circular Procurement mediates the relationship between Innovation Orientation and Sustainable Procurement Practices*

2.6 Hypotheses Development

This segment discusses the five key hypotheses as shown in Figure 2.1 above. Subsections have been created and discussed for each of the hypotheses as illustrated by the research model.

2.6.1 Hypothesis 1: Innovation Orientation on Sustainable Procurement Practices

Researchers concur that sustainable procurement practices (SPP) are a sequential, highly regimented procedure whose implications on innovation are still debatable (Cheng et al., 2018). Nevertheless, the study of the town of Aalborg results demonstrates how sustainable procurement methods may be used to foster the ideal environment for innovation orientation (IO). Prior studies have highlighted the need of enhancing collaboration between suppliers and customers in order to promote innovation orientation and establish more ethical purchasing procedures (Witjes and Lozano, 2016). For instance, Sonnichsen and Clement (2019) assert that well processes and agreements have major advantages as they enable suppliers and purchasers to share risk, which in turn encourages innovation orientation in SPP. According to some researchers (Lember et al., 2015; Caravella and Crespi, 2020), policymakers frequently

lack the intellectual and technical abilities necessary to deal with new sustainable procurement practices and must seek outside assistance to resolve these issues. Hence, it is anticipated that a positive influence of Innovation Orientation on Sustainable Procurement Practices:

H_1. *Innovation Orientation has a positive and significant effect on Sustainable Procurement Practices*

2.6.2 Hypothesis 2: Innovation Orientation on Circular Procurement

Either circular procurement (CP) and "Innovation Orientation" may be described as multidisciplinary techniques that place a focus on long-term and worldwide developments. Each urge for the fusion of organizational difficulties with "developmental" concerns, subtly emphasizes innovation as a means of change (Kanger and Schot, 2018; Kern et al., 2019). The use of innovation orientation as a transition tool for CP is a delicate path to sustainable development that calls for the convergence of a number of sociocultural dimensions at the micro, meso, and macro levels, including marketing strategies, distribution networks, sharing platforms, and commodity as a service (Neessen et al., 2021). In the shift towards a "clean harmony," CP may, therefore, more specifically relate to really systemic innovation (which we understand as fundamental innovation orientation) (De Jesus et al., 2018). It demonstrates redesign as opposed to just enhancing resource utilization (Costantini et al., 2017). From the extreme, it entails a shift toward innovation orientation, which emphasizes environmentally conscious innovation that solves sustainability issues and has a beneficial circular procurement (Qazi and Appolloni, 2022). Contrarily, CP also necessitates the reform of social frameworks in terms of explicit and implicit laws, as well as individual and group behaviors, promoting the formation of fresh business models (De Angelis et al., 2018; Pieroni et al., 2020).

Hence, it is anticipated that a positive influence of Innovation Orientation on Circular Procurement:

H_2. *Innovation Orientation has a positive and significant effect on Circular Procurement*

2.6.3 Hypothesis 3: Circular Procurement on Sustainable Procurement Practices

Using previous research by Petljak et al. (2018), Kirchoff et al. (2016), and the Sustainable Procurement Practices (SPP) construct is constructed in this study and consists of eight components. As a result, these encompass a number of sustainable procurement practices, including enhancing the acquisition process to facilitate upstream circular procurement conditions, improving the procurement process to adapt to the state of the downstream CE, working to improve the development process to improve resource productivity and thus save energy, staying in touch methodically with transmission and distribution collaborators to improve effectiveness and flexibility to volatility. In light of the aforementioned talks, circular procurement can result in sustainable procurement practices in a way that improves resource efficiency, maximizes economic value creation, reduces emissions and waste extends product lifecycles, and encourages innovation. As a result, doing so may assist businesses in lowering operational and ecological expenses, enhancing competitive edge and credibility, and improving market efficiency. Hence, it is anticipated that a positive influence of Circular Procurement on Sustainable Procurement Practices:

H_3. *Circular Procurement has a positive and significant effect on Sustainable Procurement Practices*

H_4. *Circular Procurement mediates the relationship between Innovation Orientation and Sustainable Procurement Practices*

Table 2.1 : Research/Literature

Author/Year	Country	Purpose	Theory	Method	Findings	Future studies

Lenderink et al. (2019)	Netherlands	The research examines methods for public procurement that are innovationfocused in civil construction and engineering.	Not Clearly Stated	Qualitative	The results show a significant correlation alone between purchasing strategies employed and the initiative's goals, targets, and scope. As a result, the applicability of the sourcing strategies heavily depends on the project's goals. In order to support various organizational, organizational, and	The author asserted that this has profound consequences for the deployment of innovation-oriented procurement techniques in action in light of the results and constraints. To fully utilize corporate governance of innovation to support their policy ideas, strategic performance, and desired outcomes, public institutions need to become

					project goals, a range of development procurement methodologies are required.	acquainted with a variety of innovation-oriented procurement methodologies.
Shashi et al. (2018)	Netherlands	The study's goal is to examine how SME's supply chain connectivity and sustainability orientation (SO) initiatives affect their efforts in sustainable design and procurement (SP). Additionally, this study investigates how SMEs' SP and design impact their cost and ecological effectiveness.	Organizational capability theory	Quantitative	According to the findings, SO favorably effects both SP and SD in the context of SMEs, collaboration helps improve, internal integration significantly improves SD, SP significantly improves EP but has no effect on CP, and SD positively influence	The author stated that future research might examine the reliability of the proposed methodology when relevant research is studied along with secondary data (provided by government publications, websites, books, journal articles, internal records, etc.) depending

					s both EP and CP.	on the study's results and constraints. Furthermore, we gathered survey data from SMEs operating in six diversified sectors, allowing us to test our approach in future studies by focusing on only one sector to comprehend the sustainability vulnerability in that area.

Marrucci et al. (2019)	Denmark	The study's goal is to investigate Danish localities circular public procurement procedures.	Learning theory	Qualitative	The study is focused on practices and learning theory to comprehend how	Depending on the outcome and the study's drawbacks, the researcher hypothesized that

					folks genuinely function inside an institution. Public procurement procedures diverge from regulations in that the incorporation of green and circular components depends on the capabilities of each specific procurement agency while rules set basic principles. A obstacle to greater adoption is the lack of circular	this study's accomplishments can be discovered in the knowledge of various public procurement (PP) practices as well as the forces that influence and pose obstacles to the development of procedures for circular public procurement (CPP). On the basis of this information, suggestions are made for future study as well as for the subnational financial

					public procurement instruments, which are essential for successfully employing public procurement to assist environmental issues, such as through the use of ecolabels. While there aren't many examples of circular public procurement, those that do tend to be endeavor and managed by leadershi	companies.

					p. In many of the cases examined, green public procurement practices are driven by terminal desire.	

Loosemore and Reid (2019)	Australia	The study's goal is to investigate the social procurement procedures used by Australia's top-tier construction industry.	Not Clearly Stated	Quantitative	These findings also show that practices to social procurement in the Australian property sector are frequently guided by a philosophy of mitigating risk rather than advantage maximization, are limited	The researcher proposed that future research might seek to relate results and experiences of adopting community procurement policies in nations having shared societal issues and contemporaries depending on the study's findings and

					to reduced and minimal building projects, and are hindered by a lack of resources for generating economic in both existing and new distribution networks.	shortcomings.
Kristensen et al. (2021)	Italy	The study sought to investigate the thorough review and future research agenda of the circular economy's convergence with sustainable consumption and production technologies.	Resource-based View (NRBV) theory	Qualitative	To encourage more scholarly and expert discussion, the study suggested three key themes for the systematic review in the future. The first significant area	Future studies may focus on quantitative, according to the researcher's suggestion, which was predicated on the study's limits and conclusions. The adoption of SCP

					focuses on the role of EMS in enhancing organizations' circularity; the second significant area covers the environmental guideline and ETV in the package's design process; and the third significant area concentrates on GPP, Ecolabel, and Energy Label in promoting more environmentally friendly usage by establishing circular	technologies to promote CE in nations, regions, or towns is yet an uncharted subject that merits additional study.

					standards for products.	
Grandia and Voncken (2019)	Netherlands	Therefore, the aim of this paper is to examine the link between aptitude, drive, and possibility and six different SPPs: green public procurement, social return on investment, circular economy, bio -based public procurement, innovationoriented procurement, and internatio nal social criteria.	Theory of Planned Behavior	Quantitative	The study demonstrates that there is a need for investigation into the causes of social kinds of SPP and that conclusions based on GPP could be immediately transferred to certain other types of SPP.	After considering the findings and the survey's shortcomings, the researcher made the following recommendations: in future research, SPP and GPP should not be employed indiscriminately; academics should offer explicit operationalizations of their notions.

Dey et al. (2020)	UK	The study examines the effects of sustainable innovation and lean business practices on the	Comple mentarity theory	Quantitative	The investiga tion shows that SOI mediates LMP to achieve sustainab	The study's limitations and conclusio ns led the author to recommen d that
		sustainable performance of small- and medium-sized businesses			ility initiative s, while LMP facilitate s both economi c and sustainab le effective ness. Furtherm ore, whereas CSR policies somewha t mediate SOI to achieve sustainab le achieve ment, it only marginal ly does the same for LMP.	further research should consider the distinction s and similaritie s between each of these factors.

De et al. (2022)	UK	The goal of this article is to comprehend the joint effect of lean methods and innovation that is focused on sustainability on the sustainable	Fuzzy theory	Qualitative	The findings show that combining lean and SOI contributes to Supply chain efficiency for	Future studies might perhaps investigate looking further in researching other economy and places. This

		supply chain growth of Companies.			SMEs. The results can assist lawmakers as well as the owners and directors of specific SMEs take action to improve durabilit y. Fundamentally, this study provides a DEAbased framework for examining how lean and SOI operate together to improve sustainability initiatives in SMEs.	research will be fascinating to observe how lean and SOI are affected by policy, finance, and law with regard to the sustainability of the supply chain.

Afum et al. (2021)	Ghana	This study intends to explore the mediating functions of green radical product innovation (GRPI) and sustainable supply chain management in the relationship between sustainable organizational orientation and corporate sustainability.	Resource-based View (NRBV) theory	Quantitative	The study's findings show that SEO directly and significantly improves environmental and social performance but not financial performance. Nevertheless, SEO tends to have a major influence on all key sustainability parameters via sustainable management of supply chains and GRPI (both mediatin	The researcher argued that future research might broaden the study to different regions to make confirmatory or contradictory conclusions to this results and finding and the study's shortcomings. Furthermore, only SSCM and GRPI were examined in this study as mediating role in the Digital marketing connection.

					g factors) (environmental, financial and social performance).	

Berkel and Schotanus (2021)	Netherlands	The purpose of the study is to examine the immediate effects of a new procurement policy document on the inclusion of sustainability impacts and ecological award criterion in bids.	Not Clearly Stated	Quantitative	Findings suggest that after the publication of "Procurement with impact," the federal government has carried out purchases with a greater consideration for the environment. From 30% to 55% in a year, the federal government's use of green bids dramatically	The author concludes that more investigation into the other factors is required to fully evaluate policy theory in connection to the long-term implementation of SPP policy based on the study's results and drawbacks.
					grew. Municipally, there was no discernible change.	

CHAPTER THREE

RESEARCH METHODOLOGY AND ORGANIZATIONAL PROFILE

3.1 Introduction

This chapter objectively presents the methodology of the research. The methods projected in this chapter, purpose to accomplish the study objectives and answer the research questions. The methodology chapter commenced by clearly explaining the research design, secondly, research

sampling procedures, and then the research instrument. The final stage in this section addresses the explanation of the proposed data analysis.

3.2 Research Design

The positivist research paradigm was used in this study. Because the positivist paradigm is founded on the utilization of objective data and facts rather than the researcher's subjective interpretations (Scotland, 2012; Saunders, Lewis, and Thornhill, 2015). This framework allows for scientific investigation, which in turn requires the use of statistical methods, the generation and testing of hypotheses, the provision of operational definitions, and the application of logical deduction (Iofrida, De Luca, Strano, and Gulisano, 2018). As a result, the researcher benefited from this paradigm in order to better understand the investigate the indirect role of circular procurement in the direct link between innovation orientation and sustainable procurement practices with evidence from mining firms in Ghana.

Quantitative research methods were used to make estimates about the relationships between the study variables, and those estimates were used to determine the relative frequency of each characteristic (Merriam and Tisdell, 2016). To investigate the indirect role of circular procurement in the direct link between innovation orientation and sustainable procurement practices with evidence from mining firms in Ghana, a statistical analysis was conducted (Kumatongo, et al., 2021). Quantitative models are used to shed light on the investigate indirect role of circular procurement in the direct link between innovation orientation and sustainable procurement practices with evidence from mining firms in Ghana. In addition, borrowing from Okesina (2020) the study is a cross-sectional one as opposed to longitudinal design since data was collected in a short space of time spanning one month.

3.3 Population of the study

Population is the set of individual persons or objects in which an investigator is primarily interested during a research inquiry (Igwenagu, 2016). It describes the total number of people or items that one wishes to understand. In this study the population describes all the permanent staff or employees of the selected mining companies in Tarkwa and selecting retail companies in Accra. A preliminary field survey revealed that the number of employees for the targeted retail firms was 4098 workers and that of the mining firms was 3902. This brings the total population to 8000 workers.

3.4 Sample Size and Sampling Technique

Sample size is a representation of the population utilized by the researcher and from whom inferences are made (Babbie, 2013). The study employed the stratified sampling procedure in selecting the sample size for the study. The stratified sample procedure is used when the population is divided into different heterogeneous units and there is the need to fairly represent each sub-unit in the study. The retail firms and the mining firms constituted the sub-units of the population. Thus, the study selected proportionate number from each of the stratum. In doing so, the sample size formula proposed by Yamane (1967) was adopted. In the formula, as specified in equation (1), 'N' is the population size, 'n' is the sample size, and 'e' is the margin of error which was kept at 5%. From equation (1), the study obtained a minimum sample size of 381.

$$n = N / [1 + (N \times e^2)] = 8000 / [1 + (8000 \times 0.05^2)] = 381 \quad (1)$$

The study selected a proportionate number from each of the industries - retail and mining. The procedure followed in choosing the exact sample size was that the population for each industry (mining – 3902; retail – 4098) was in each case divided by the overall population and the result multiplied by the sample size of 381. Thus, the sample size selected for the mining industry was 186 (3902/8000 × 381) while that of the retail industry was 195 (4908/8000 × 381). It must

be noted that the 381 (that is, 186 for mining and 195for retail firms) is the minimum sample size needed. In order to meet this number and being cognizant of the possibility of nonresponses and missing values, the study administered more questionnaires than the requirement for the minimum size. In this case 50% more questionnaires were administered; bringing the total for the mining industry to 279 and that of the retail firms to 293. This resulted in a total questionnaire administration of 572. The notion was to ensure that the total number of answered questionnaires will more than adequately meet the minimum sample size requirement.

3.5 Data Collection

The two key sources of data for most research is primary and secondary. While primary data consists of first-hand materials that the researcher has gathered himself or herself mainly using questionnaires (Dubey et al., 2016), secondary data in contrast is the information that has been collected by other individual (s) for other purposes (Bryman and Bell, 2007). In this study the main source of data collection is primary. To support or reject the findings from this study, data from secondary sources were reviewed. The primary source of data includes information gathered through questionnaires that were administered to the respondents sampled from pharmaceutical firms in Ghana. In gathering the primary data required in this study, a crosssectional survey design is utilized. A structured questionnaire with a mainly close-ended format was self-administered to the respondents. A team comprising the researcher and research assistants will visit the metropolitan and municipalities to administer the questionnaires in addition to the online survey. Before the questionnaires are administered, an introductory letter was obtained from Kwame Nkrumah University of Science and Technology, Department of Supply Chain and Information Systems, and presented to the selected establishment Human Resources Managers (HR)/ Chief Executive Officer (CEO). The CEO or HR manager after being satisfied with the demands of the research then issued a letter introducing the team to the workers. After obtaining the approval, the researcher will seek the consent of the respondents

before administering the questionnaire. To achieve this purpose the researcher will explain in detail the aim and importance of the study to the respondents before they decided to participate in the study. Also, part of the questionnaire preamble will reiterate the promise of confidentiality of the data. The team will distribute three hundred (300) questionnaires to compensate for non-response. For each randomly selected organization, we identified a key informant, who typically had a title such as supply chain managers who were in charge of the company's internal and external processes. The study targeted these executives and other top and middle-level managers as they are most knowledgeable about organizational issues and their application in other business functions. The questionnaire was the main instrument used to collect primary data. A well-structured questionnaire containing measurement items validated in previous studies will be employed in the study. Each of the variables was measured based on a five (5) point Likert which ranged from 1 (strongly disagree) to 5 (strongly agree). The questionnaire will be structured to reflect the relevant objectives of the research. The questionnaire helped to solicit responses to test all the key variables in the conceptual framework of the study. Using a Five-point Likert scale point (1= "Strongly Disagree" to 5= "Strongly Agree"), each item was measured. The preliminary part consisted of demographic measures which included gender, educational background, work experience, and position within the firm of the participants, of the categorization questions included in the survey, captured the kind of company. The constructs and their respective measures are shown in the appendix.

3.5.1 Pre-testing and Pilot Study

One of the important steps in developing a questionnaire is to pre-test. It is to confirm that the questionnaire has been designed effectively for the proposed study before actual data is collected. In research, a pre-test is done to validate the content and the question wording,

format, and how relevant the questions are to the objectives. Although the proposed items to be used in this research are adopted from previous research, yet, a pre-test is very important to confirm that the questions are suited to the respondents (Kumar et al., 2013). The pre-test in this research was done through discussions with people in academics who are authority in the related study area, this included academic Professors and also experts from the industry. The pre-test process focused on reviewing the proposed questionnaire with its content validity, clarity, and the timing for the respondents to answer the questionnaire. Respondents were engaged to answer the questionnaire and the feedback from the respondents within the pre-test period was used to improve the questionnaire. The experts in the field of the supply chain from Ghana were asked to point out items that are unclear to understand for rewording or elimination.

3.6 Method of Data Analysis

In this study Statistical Package for Social Sciences (SPSS) version 23 and SmartPLS 3 software will be utilized to conduct descriptive statistics and inferential statistics respectively. The data collected will be coded, cleaned, and prepared for analysis. The data will first be coded in Microsoft excel. In excel the data will be thoroughly checked to avoid possible data entry errors. After cleaning the data will then be exported to SPSS. The data checks in SPSS include missing values, reliability, descriptive statistics, and test of assumptions for multivariate analysis. Subsequently, SmartPLS version 3 (Ringle et al., 2015) will be employed to conduct inferential statistics through multivariate data analysis.

3.7 Reliability and Validity

To ensure external validity, participation in the study was purely voluntary. The selected participants were assured of the benefits of the study to the facility to ensure a minimum dropout rate. Both the content and the construct validity of this study were also ensured. The validity and reliability of a research study are two research criteria for consistency (Straus, 2017). An alpha coefficient of 0.70 is used as a cut-off point for assessing the internal

consistency of the research item and scales to guarantee study reliability (Hair, Biasutti and Frate, 2017). To eliminate logical flaws and biases in the study, the researcher emphasizes the validity and reliability of the results. This was done by adopting all of the questions and conducting a pilot study using 10 respondents

3.8 Ethical Issues

Ethics are the moral principles that a person must follow, irrespective of the place or time (Akaranga & Makau, 2016). Research ethics focus on the moral principles that researchers must follow in their respective fields of research (Fouka & Mantzorou, 2011). A consent form was presented to the authorities of all selected firms to inform them of all benefits and risks involved in the participation and further sought their consent for their inclusion in the study. Selected firms had the right to decline their participation in the study. The researcher indicated in the consent form that all forms of anonymity and confidentiality would be observed. Privacy of firms in terms of freedom to define the time, extent and the conditions of sharing information were also observed. The researcher avoided any form of actions in their relation with participants that amounts to deception. All forms of plagiarism and falsification of data were also avoided by the researcher.

3.9 Profile of the Mining Industry

The mining industry in Ghana predates the colonial era. In the past, Ghana was referred to as the Gold Coast. Ghana is Africa's greatest gold producer, having surpassed South Africa in 2019 with output of 4.8 million ounces. Gold is the greatest economically exploited mineral in Ghana, accounting for around 95% of mineral revenue. Manganese, bauxite, and diamonds are other commercially mined minerals in Ghana. The nation is also blessed with iron ore, limestone, columbite-tantalite, feldspar, quartz, and salt deposits, as well as minor ilmenite, magnetite, and rutile deposits. In 2018, Ghana discovered commercial quantities of lithium and is collaborating with international partners to mine and refine lithium. Historically, Ghanaian

mining production was held by the state, but beginning in the 1980s, Ghana worked toward privatization and state divestment, in part by encouraging foreign investment. American Newmont Goldcorp, as well as Chinese, Canadian, South African, and Australian mining firms, are among the largest in Ghana. Mineral rights are granted to private parties, allowing them to extract minerals from the earth. Nonetheless, the Government of Ghana is entitled to a 10% equity stake in the mineral operations, even if it makes no financial contribution. The government can enhance its interest in mineral operations through an investor agreement. The small-scale mining industry is restricted to Ghanaian nationals alone. Current investors are concerned about the localization requirements in Minerals and Mining Legislative Instrument 2431 (2020). (Local Content and Local Participation). It requires licensees to develop a localization program for the recruitment and training of Ghanaians and imposes quotas on expatriate employees (up to two in management with the General Manager position reserved for Ghanaians). It imposes time limits on other expatriates and moves gradually toward Ghanaian participation at all senior levels. In addition, it defines procurement targets and standards for local goods and services that assist the mining industry (including R&D, technical and engineering services, insurance, accounting, legal, and financial services as well as security, transport, fuel provision, etc.). Lastly, licensees may be obliged to list at least 20 percent of their equity on the Ghana Stock Exchange.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION, AND INTERPRETATION

4.0 Introduction

Data from the previous chapter is analysed in the fourth chapter. Four sections form this chapter. Exploratory data analysis results are in the first chapter, while demographic information is in the second. Descriptive and correlational research factors were analysed. Confirmatory Factor

Analysis and model fit index are in the third section. A regression model tests the study's hypotheses. Key results are addressed last.

4.1 Exploratory Data Analysis

Initial study of the data was exploratory in nature. Exploratory factor analysis assessed data quality early on. SPSS was the main tool. Subsections include response rate, non-response bias, and usual technique bias or variation. Below are the sections that describe the early data quality evaluation tests and interpretation.

4.1.1 Response Rate

Survey response rates are often presented as a percentage. To calculate it, divide the total number of questionnaires sent by the final count of respondents who completed them. Survey response rates above 50% are rare. Data was taken between October 12th and December 22nd, 2022. The study required 381 participants, but 500 were polled just in case. As shown in Table 4.1 below, a response rate of 76.2% is acceptable for analysis after analysing each questionnaire for acceptability, yielding 381 useable questions.

Table 4.1: Data Response Rate

Distributed	Collected	Percentage of Usable
Response	381	76.2
Non-Response	119	23.8
Total	**500**	**100.0**

Source: Field Survey (2023)

4.1.2 Test for Common Method Bias and Sampling Adequacy

Testing for CMB is critical in survey research because CMB issues may distort the relationship between predictors and dependent variable owing to dependence on a single respondent

(Podsakoff and Organ, 1986; Bahrami et al., 2022). Thus, wrong judgements result. According to Podsakoff et al. (2003), CMB came from consistency or social desirability. CMB may impact data output, hence several strategies can be used to mitigate it. The Exploratory Factor analysis showed that the highest proportion of variance that could be attributable to a single factor was less than 50%, validating Harman's single factor approach. The variables explained 49% of the variation using principal component analysis.

Table 4.2: Test for Common Method Variance (CMV)

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1	9.182	49.012	49.012	9.182	49.012	49.012
2	1.350	9.498	58.511	1.350	9.498	58.511
3	1.305	7.249	65.759	1.305	7.249	65.759
4	.893	4.961	70.721			
5	.692	3.845	74.566			

6	.575	3.192	77.758
7	.493	2.741	80.499
8	.467	2.594	83.092
9	.403	2.240	85.332
10	.377	2.094	87.426
11	.354	1.965	89.391
12	.330	1.834	91.225
13	.318	1.769	92.994
14	.294	1.631	94.625
15	.273	1.519	96.144
16	.258	1.434	97.579
17	.245	1.360	98.938
18	.191	1.062	100.000

Extraction Method: Principal Component Analysis.

Source: Field Survey (2023)

4.1.3 Bartlett's Test of Sphericity and KMO Test

The Bartlett sphericity test and Kaiser-Meyer-Olkin (KMO) also assessed sample accuracy. Kaiser-Meyer-Olkin Sampling Adequacy was 94.0%, and Bartlett's test showed statistical significance ($\chi^2 = 4416.514$, df: 153, $p < 0.000$) based on Table 4.3 data. This gives evidence of proper sampling.

Table 4.3: Bartlett's Test of Sphericity and KMO Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.				.940
Bartlett's Test of Sphericity	Approx. Chi-Square	4416.514	df	153
	Sig.			.000

Source: Field Survey (2023)

4.1.4 Non-Response Bias

Non-response bias was investigated. Non-response bias occurs when a survey has fewer responders than the population. Low survey response rates induce non-response bias, which may undermine sample reliability and study generalizability. In this study, early and late responders were compared to reduce non-response bias. Oppenheim (2001) specified that "early responders" and "late respondents" should not differ in any model input variables. This demonstrates that non-response bias is not a concern and that the samples accurately represent the population. Early answers were 191 and late responses were 190. T-tests checked for nonresponse bias. The t-test showed no difference (see Table 4.4). The study shows that construct data from the first and last months are identical.

Table 4.4 Results of Independent-Samples t-Test for Non-Response Bias

			Levene's Test for Equality of Variances		
	Group	**Mean**	**F**	**Sig.**	**t**
Innovation Orientation	1	12.43	1.385	0.24	2.141
	2	11.99			2.141
Sustainable Procurement	1	41.13	2.074	0.151	1.281
	2	40.34			1.281
Circular Procurement	1	20.77	0.214	0.644	1.484
	2	20.27			1.484

Source: Field Survey (2023)

4.2 Respondents Profile

The demographics of the respondents are included in this section to present information on the subject individuals and the firms that participated in the research. The key data taken from the respondent are gender, age, educational background, department of respondents, position of respondents, age of firms, number of employees, and type of ownership.

Table 4.1: Respondents Profile

Variables	Categories	Frequency	Percent
Gender	Female	103	27.0
	Male	278	73.0
Age	18-30 years	20	5.2
	31-40 years	196	51.4
	41-50 years	105	27.6
	Above 50 years	60	15.7
Level of Education	Bachelor Degree	202	53.0
	Diploma	78	20.5
	Graduate Studies (Master / Ph.D.)	101	26.5
Your Position in the Firm	Business Owner	41	10.8
	Business Owner & Manager	97	25.5
	Manager	240	63.0
	Production Manager	3	0.8
How many years have your firm been in operation?	1 - 5 years	129	33.9
	11 – 15 years	62	16.3
	16 years and above	34	8.9
	6 - 10 years	156	40.9
How many employees are in the firm?	30 – 99 employees	131	34.4
	5 – 29 employees	9	2.4
	More than 100	241	63.3
Type of ownership	Fully locally owned	339	89.0

	Fully foreign owned	29	7.6
	Jointly Ghanaian & foreign owned	13	3.4
	Total	**381**	**100.0**

4.2.1 Gender

Out of the 381 responses that were valid, 27.0% were females and 73.0 were from males. This data shows that more males than females took part in the study.

4.2.2 Age Category of Respondents

5.2% of the participants were between 18 and 30 years old, 51.4% were between 31 and 40 years old, 27.6% were between 41 and 50 years old, and 15.7% were over 50 years old. The results show that most of the participants were between 31 and 40 years old.

4.2.3 Educational Background

53.0% of the participants had a bachelor's degree, 20.5% had a diploma, and 26.5% had done graduate studies (Master's or Ph.D.). The results show that most of the participants had a bachelor's degree.

4.2.4 Position of Respondents

10.8 percent of the participants were business owners, 25.5% were business owners and managers, 63.0% were managers, and 0.8% said they were production managers. Most of the participants were managers, according to the results.

4.2.5 Age of Firms

33.9 percent of the 381 logistics service companies have been in business for 1 to 5 years, 16.3 percent have been in business for 11 to 15 years, 8.9 percent have been in business for more than 16 years, and 40.9 percent have been in business for 6 to 10 years. The results show that most of the companies that responded have been around for between 6 and 10 years.

4.2.6 Number of Employees

34.4 percent of the 381 logistics service companies had between 30 and 99 employees, 2.4% had between 5 and 29 employees, and 63.3 percent had more than 100 employees. The results show that most of the companies that replied had more than 100 employees.

4.2.7 Type of Ownership

89.0% of the participants said the business was owned entirely by Ghanaians, 7.6% said it was owned entirely by foreigners, and 3.4% said it was owned by both Ghanaians and foreigners. The result shows that most of the firms owned by respondents were fully local.

4.3 Correlation Analysis

The correlation coefficients between circular procurement and innovation orientation ($r = 0.551$, $P < 0.05$), circular procurement and sustainable procurement ($r = 0.686$, $P < 0.05$), and innovation orientation and sustainable procurement ($r = 0.620$, $P < 0.05$) are all very high in Table 4.6. A correlation value of 0–0.30 indicates a weak link, 0.30–0.70 a moderate correlation, and 0.70–1.0 a strong correlation. The variables are strongly correlated.

Table 4.6: Descriptive and Correlation Analysis

Construct	1	2	3
Circular Procurement	1.000		
Innovation Orientation	0.551	1.000	
Sustainable Procurement	0.686	0.620	1.000

Source: Field Data, 2023

4.4 Confirmatory Factor Analysis

Validity assessment of research models is crucial. The study's authors utilised Cronbach's alpha and the Composite reliability test to evaluate the model's consistency. To test the reliability of the model, we employed AVE and indication loadings. Cronbach's alpha was calculated to be 0.7, and a composite reliability score was utilised to examine the degree to which the various constructs in this research were consistent with one another. Table 4.7 shows that both

Cronbach's alpha and the composite reliability index are higher than .80 (Hair, et al., 2016). The properties of the measurement model are supported by these results. There was no sign with a loading below 0.7. Convergent validity may be established. For AVE values over 0.5, convergent validity was established. (See Table 4.7.) Table 4.7 shows that the T test found all of the variables to be statistically significant at the 1.96-percentile level and Sig. < 0.05. Check out Table 4.7 for more descriptive statistics. Calculated as: (Mean and Standard Deviation). The average in the table ranges from 3.512 to 4.016. The range of standard deviations was 1.066-1.389. Before the hypotheses testing, multicollinearity was evaluated using VIF, the result demonstrated that VIFs values recorded in this study were below the 3.3 thresholds recommended by (Kock, 2015) (see Table 4.10).

Table 4.7: Confirmatory Factor Analysis

Scale	Code	Outer Loadings	Mean	Std. Dev.	Skewness	T statistics (|O/STDEV|)	P values	VIF
Circular Procurement (CA = 0.895; CR = 0.895; AVE = 0.703)	CE1	0.832	4.076	0.852	-0.606	44.909	0.000	2.175
	CE2	0.851	4.105	0.77	-0.667	47.679	0.000	2.515
	CE3	0.829	4.118	0.79	-0.63	36.859	0.000	2.182
	CE4	0.832	4.073	0.79	-0.708	42.457	0.000	2.321
	CE5	0.849	4.15	0.771	-0.713	42.584	0.000	2.345
Innovation Orientation (CA = 0.838; CR = 0.843; AVE = 0.755)	IO1	0.860	3.979	0.81	-0.885	40.705	0.000	2.023
	IO2	0.869	4.094	0.736	-0.507	62.625	0.000	1.883
	IO3	0.878	4.142	0.767	-0.493	69.135	0.000	2.015

Sustainable Procurement (CA = 2.22	SP1	0.764	4.152	0.776	-0.576	25.311	0.000 4
0.919; CR = 0.919; AVE = 0.639)	SP2	0.773	4.118	0.766	-0.486	28.343	0.000 2.220
	SP3	0.822	4.029	0.827	-0.445	38.563	0.000 2.873
	SP4	0.830	4.105	0.78	-0.652	49.251	0.000 2.589
	SP5	0.826	4.052	0.805	-0.49	44.087	0.000 3.077
	SP6	0.797	4.081	0.743	-0.363	39.345	0.000 2.397
	SP7	0.816	4.108	0.761	-0.363	38.718	0.000 2.441
	SP8	0.764	4.157	0.778	-0.752	32.316	0.000 2.014

Source: Field Data, 2023

4.4.1 Discriminant Validity

The study also examined the differences between constructs (Hair et al., 2010; Henseler et al., 2016b). When assessing discriminant validity, each latent variable's square root of the AVE (diagonal value) must be bigger than the construct's maximum correlation. Table 4.8 shows discriminant validity. Again, multicollinearity is not present (Byrne, 2013). Discriminant validity has been proven as all of the HTMT values are below 0.90 or 0.85, as shown in Table 4.8. Discriminant Validity Using HTMT Table 4.8. HTMT and Fornell and Larcker criteria showed discriminant validity. Table 4.9 reveals that circular procurement is 0.839 with itself, 0.551 with innovation orientation, and 0.686 with sustainable procurement. Innovation

orientation was 0.869 with itself and 0.620 with sustainable procurement. Sustainable procurement correlated 0.800.

Table 4.8: Fornell-Larcker criterion

Construct	1	2	3
Circular Procurement	0.839		
Innovation Orientation	0.551	0.869	
Sustainable Procurement	0.686	0.620	0.800

Source: Field Data, 2023

Table 4.9: Heterotrait-Monotrait Ratio (HTMT)

Construct	1	2	3
Circular Procurement			
Innovation Orientation	0.632		
Sustainable Procurement	0.755	0.700	

Source: Field Data, 2023

4.4.2 Model fitness indices

The values for the Extracted-Index Fitness, SRMR, Root Mean Square of Approximation, and Chi-Square are all appropriate (Table 4.10). Both the rare and extracted indices are much lower than 0.9, the threshold for acceptability. Considering that the square of the residual is not close to zero, the root demonstrates that the residual is unsatisfactory. The Root Mean Square Approximation and the Total Residual Value are both unacceptable. These numbers are much larger than 0.1 and 3. This suggests that all relevant factors need to be taken into account in future research. A SRMR of 0.057 was found in Table 4.10, which is within the range of values considered acceptable in this research. Chi-square = 520.699, and the normed fit index was 0.872.

Table 4.10: Model fitness indices

Model fitness indices	Estimated model
SRMR	0.057
d_ULS	0.448

d_G	0.228
Chi-square	520.699
NFI	0.872

Source: Field Data, 2023

4.4.3 Predictive Relevance (R^2 and Q^2)

Hair et al. (2018) consider R2 values of 0.75, 0.50, and 0.25 high, moderate, and weak. However, Chin et al. (2020) suggests interpreting the R2 in the context of the connected field. Table 4.11 and Figure 4.1 show moderate model prediction accuracy (R2) for circular procurement and sustainable procurement, respectively. IO may explain 30% of circular procurement variation and 56% of sustainable procurement variance. Since its predictive power is average, the model is suitable for prediction.

A second method for validating PLS models is using Q2 (Hair et al., 2020). This statistic is generated by randomly removing a data point, replacing it with an appropriate value, then computing the model's phase (Zhang, 2022). Model explanatory power and sample data predictions are used in Q2 (Hair et al., 2020). This approximate value aids the blind method in making sense of output data. When Q2 outcomes are better than expected and estimates are near to baseline, accuracy increases (Zhang, 2022). For endogenous estimations to be valid, Q2 must be greater than zero. Q2 greater than 0, 0.25, and 0.50 generates low, medium, and low predictions from the PLS path model, respectively. (Zhang, 2022). The data show Q2 values of 0.297 and 0.378 for circular procurement and sustainable procurement, respectively (see Table 4.11). The model predicted somewhat. Since all Q-square values are over the threshold, the values have been reconstructed and the model is predictive.

Table 4.11: Predictive Relevance (R^2) and Q2

Construct	R-square	Q^2predict
Circular Procurement	0.303	0.297

Sustainable Procurement	0.555	0.378

Source: Field Data, 2022

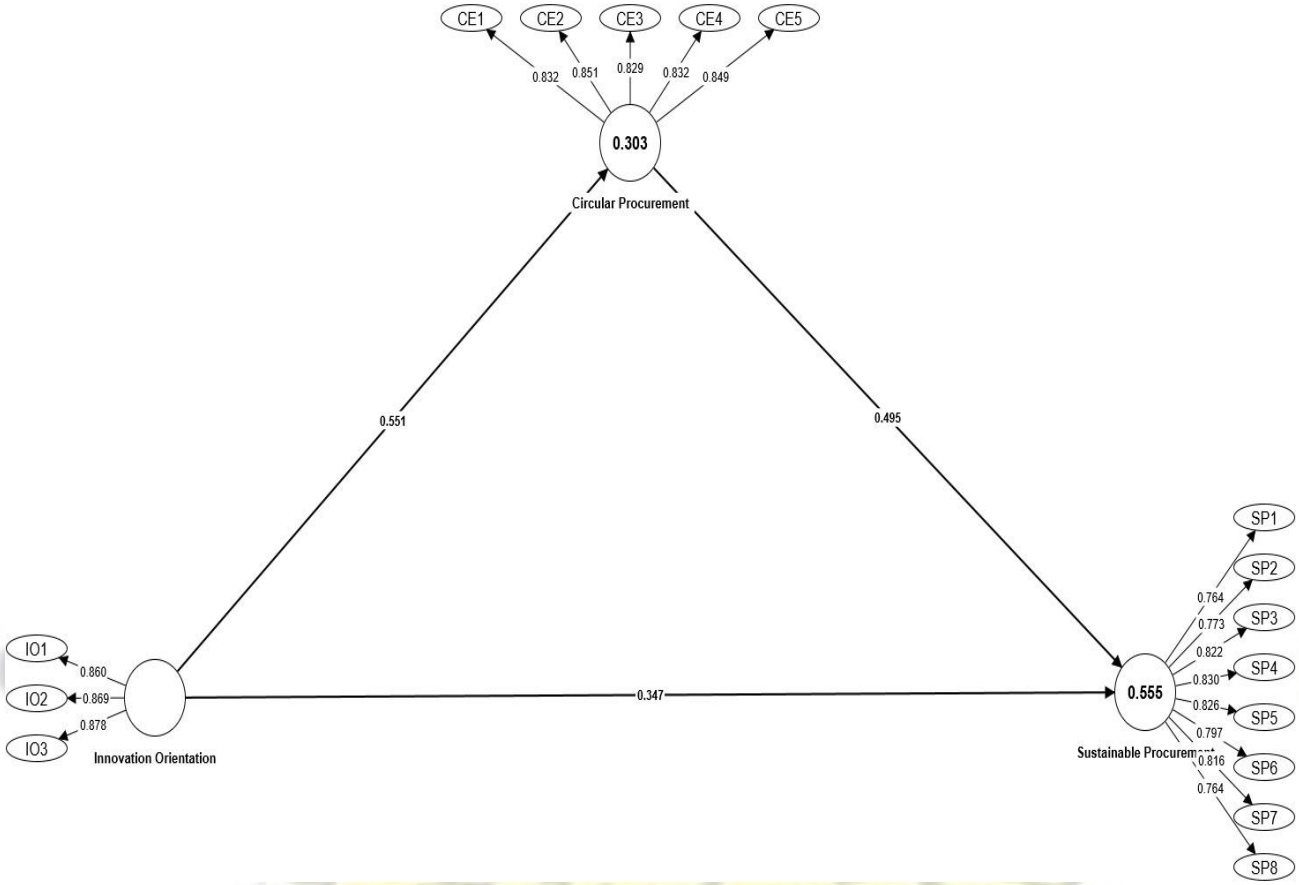


Figure 4.1: Measurement Model Assessment

4.5 Hypotheses for Direct and Indirect Relationship

The second phase of the analysis which deals with the structural model evaluation is depicted in Figure 4.2 below. The result of the structural model evaluation is presented in Table 4.11 and Figure 4.2. The PLS bootstrapping with 5, 000 samples were used in testing the significance of the four (4) paths in the model. This study analyses the impact of innovation orientation on sustainable procurement through the mediation effect of circular procurement. This section discusses the analyses of the direct and indirect relationships as shown in Table 4.12 and Figure 4.2.

Table 4.12: Hypotheses for Direct and Indirect Relationship

Path	Path Coefficient	T statistics (|O/STDEV|)	P values	Hypothesis Validation
Circular Procurement -> Sustainable Procurement	0.495	9.919	0.000	Accepted
Innovation Orientation -> Circular Procurement	0.551	12.014	0.000	Accepted
Innovation Orientation -> Sustainable Procurement	0.347	6.348	0.000	Accepted
Innovation Orientation -> Circular Procurement -> Sustainable Procurement	0.273	7.213	0.000	Accepted

Source: Field Data, 2023

Table 4.12 shows that the relationship between circular procurement and sustainable procurement is significant (B = 0.495, t = 9.919, P = 0.000, and Sig < 0.05). Given that the pvalue for H1 was less than 0.05 and the path coefficient was positive, it can be concluded that circular have a direct effect on sustainable procurement. This suggests that when the circular procurement increases, sustainable procurement also increases. Circular procurement enhance sustainable procurement by 49.5%.

Innovation orientation directly affects circular procurement (B = 0.551; t = 12.014; P = 0.000; Sig < 0.05). The path coefficient was positive and the p-value for H2 was less than 0.05, indicating a significant positive direct influence on innovation orientation to circular procurement. Innovation orientation enhances circular procurement because the path coefficient is positive. Innovation orientation accounts for 55.1% of circular procurement.

Innovation orientation directly affected sustainable procurement (B = 0.347; t = 6.348; P = 0.000; Sig < 0.05). Since the p-value was less than 0.05 and the path coefficient was positive, innovation orientation had a significant direct influence on sustainable procurement, validating the third hypothesis (H3). The positive path coefficient indicates that sustainable procurement will improve with innovation orientation. Innovation orientation boosts sustainable procurement by 34.7%.

Circular procurement indirectly affected innovation orientation and sustainable procurement (B = 0.273; t = 7.213; P = 0.000; Sig < 0.05). Circular procurement mediates innovation orientation and sustainable procurement positively since the p value for H4 was less than 0.05 and the path coefficient was positive. The positive path coefficient indicates that circular procurement positively and partially mediates interactions between innovation orientation and sustainable procurement. This also means that circular procurement mediates
40.8% of the IO-SP connection.

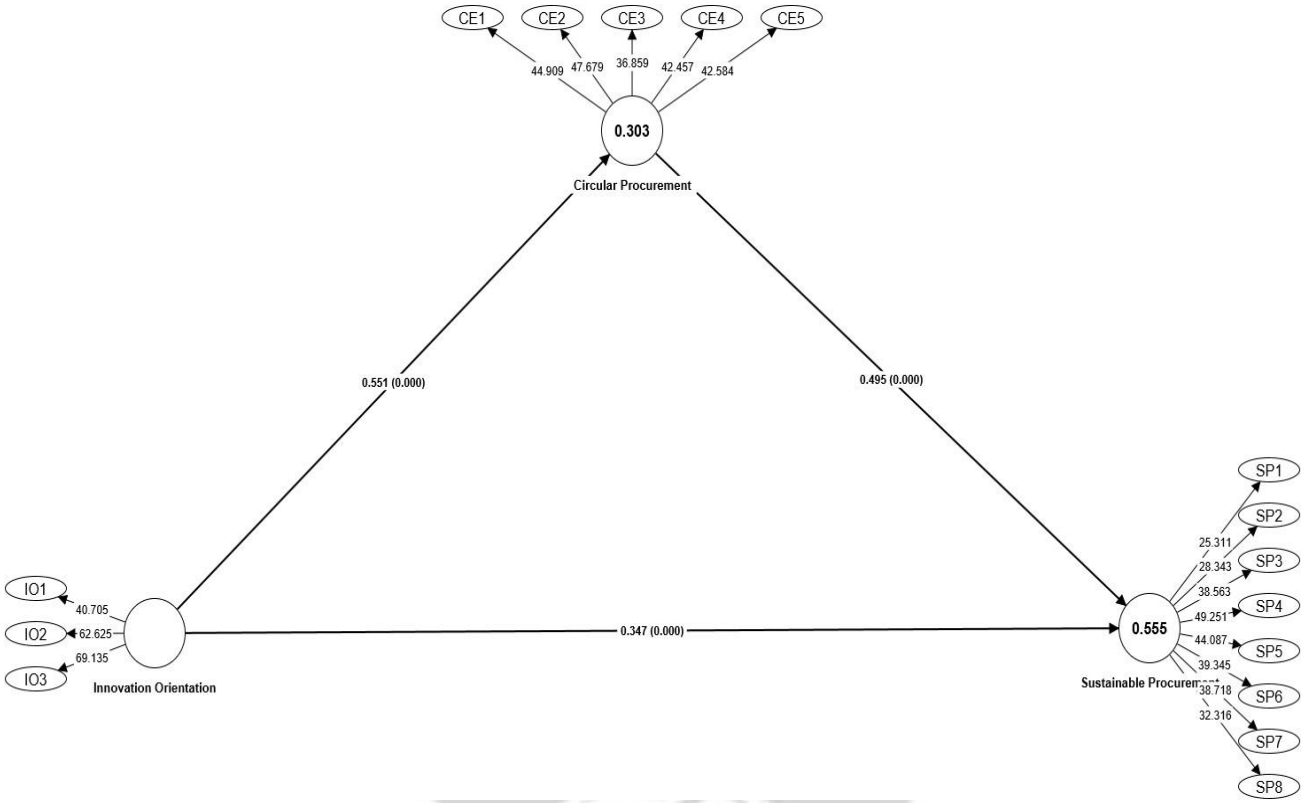


Figure 4.2: Structure Model Evaluation

4.6 Discussion of Key Findings

The purpose of this study was to investigate the relationship between total quality leadership and innovation orientation by highlighting the intervening role of quality orientation. This section has presented a discussion of the key findings in line with existing theories and studies.

4.6.1 Effect of Innovation Orientation on Sustainable Procurement

The initial objective of this study examines the effect of innovation orientation on sustainable procurement practices mining firms in Ghana. The finding reveals that innovation orientation had a significant direct influence on sustainable procurement. The positive path coefficient indicates that sustainable procurement will improve with innovation orientation. Innovation orientation boosts sustainable procurement by 34.7%. This implies that managers should actively seek operations management innovations and embrace innovation in their activities to enforce procurement rules, practices sustainable development, include sustainability in their

purchase procedures, acquire sustainable products, services, and works according to their procurement policy, and contracts for sustainability. Previous research has stressed the need of improved supplier-customer cooperation in fostering an environment that encourages innovation and establishing more morally sound buying practices (Witjes and Lozano, 2016). For instance, Sonnichsen and Clement (2019) state that suppliers and buyers may benefit greatly from established procedures and agreements since it allows them to share risk, which in turn supports an innovation-oriented mindset in SPP. Researchers (Lember et al., 2015; Caravella and Crespi, 2021) argue that policymakers often lack the knowledge and expertise to implement new sustainable procurement practices on their own and must instead go to experts from outside their organization for help. Suppliers are a good source of new ideas. As firms embrace sustainable, green technologies and products, innovation sources are changing. Instead of relying on their upstream supply partners for innovation, companies must increasingly go beyond their supply networks for new providers. It's important to find ideas from both established and unexpected sources as conventional industry barriers become more permeable. New techniques of sourcing innovations and procurement ambidexterity to reconcile essentially incompatible aims (i.e., cost reduction against innovation) are also hot topics today (Constant et al, 2020).

4.6.2 Effect of Innovation Orientation on Circular Procurement

The following objective evaluate the relationship between innovation orientation and circular procurement. The finding indicates a significant positive direct influence on innovation orientation to circular procurement. Innovation orientation enhances circular procurement because the path coefficient is positive. Innovation orientation accounts for 55.1% of circular procurement. This implies that managers should actively seek operations management innovations and embrace innovation in their activities to reuses procurement resources, recycles procurement resources, and regenerates resources through purchase. Adopting an

innovation orientation as a means of CP transition is a finely balanced approach to long-term sustainability that requires the alignment of several sociocultural factors at the micro, meso, and macro levels (Neessen et al., 2021). The move toward "clean harmony" suggests that CP may have a closer connection to really systemic innovation (here defined as basic innovation orientation) than was previously thought (De Jesus et al., 2018). It shows redesign beyond just increasing efficiency in the use of existing resources (Costantini et al., 2017). At its most extreme, it implies a change in focus from current procurement methods to the more efficient and ecologically friendly circular procurement model (Qazi and Appolloni, 2022). As an innovation policy tool, sustainable procurement may drive private agency innovation by sharing experiences and learning from private procurements with varied forms (Alhola et al., 2019; Arlbjrn and Freytag, 2012; Rolfstam, 2012). Modern public-private partnerships (PPPs) are an example of this notion in action (Hodge and Greve, 2007; Wang et al., 2018). Thus, information from outside one's expertise is becoming more vital. Arlbjorn and Freytag (2012) stress the need of studying personal procurement interactions to benefit from knowledge and experience exchange.

4.6.3 Mediating Role of Circular Procurement

The last objective investigates the mediating role of circular procurement in the relationship between innovation orientation and sustainable procurement practices. The finding concluded that circular have a direct effect on sustainable procurement. This suggests that when the circular procurement increases, sustainable procurement also increases. Circular procurement enhances sustainable procurement by 49.5%. This implies that managers should reuses procurement resources, recycles procurement resources, and regenerates resources through purchase to enforce procurement rules, practices sustainable development, include sustainability in their purchase procedures, acquire sustainable products, services, and works according to their procurement policy, and contracts for sustainability. The finding also

indicates that circular procurement positively and partially mediates interactions between innovation orientation and sustainable procurement. This also means that circular procurement mediates 40.8% of the IO-SP connection. This implies that managers should reuses procurement resources, recycles procurement resources, and regenerates resources through purchase to seek operations management innovations and embrace innovation in their activities to enforce procurement rules, practices sustainable development, include sustainability in their purchase procedures, acquire sustainable products, services, and works according to their procurement policy, and contracts for sustainability. The CE offers the possibility of long-term development and progress while also addressing urgent issues like the protection of natural resources and the environment (Gonçalves et al., 2022). It makes it possible to use the 3R strategy of "reduce, reuse, and recycle" to cut down on resource consumption whenever possible (Geissdoerfer et al., 2017). According to Geissdoerfer et al. (2017), factories are a major cause of global warming and the rapid depletion of non-renewable energy sources; as a result, there is an urgent need to take action, and the concept of a circular economy may help (de Sousa Jabbour et al., 2019). A potential method for making use of CE talents is to shift to sustainable manufacturing (Bag and Pretorius, 2020). Every nation and the international community is highly concerned about the degradation of resources and materials (Liu et al., 2018).

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

5.0 Introduction

This section discusses and interprets the results of this research work and presents the conclusion of the study. It summarizes the findings in connection with the objectives for the study, as per the empirical findings in the previous chapter. The main thrust of this chapter is to present the summary of findings and conclusions with regards to the contribution of the study emanating from the research objective which is to determine how innovation orientation influence sustainable procurement and further examine how circular procurement can influence the relationship between innovation orientation and sustainable procurement. The chapter further talks about the limitations of the research and also provide suggestions for future research directions.

5.1 Summary of Findings

5.1.1 Effect of Innovation Orientation on Sustainable Procurement

The initial objective of this study examines the effect of innovation orientation on sustainable procurement practices mining firms in Ghana. The finding reveals that innovation orientation had a significant direct influence on sustainable procurement. This implies that managers should actively seek operations management innovations and embrace innovation in their activities to enforce procurement rules, practices sustainable development, include sustainability in their purchase procedures, acquire sustainable products, services, and works according to their procurement policy, and contracts for sustainability.

5.1.2 Effect of Innovation Orientation on Circular Procurement

The following objective evaluate the relationship between innovation orientation and circular procurement. The finding indicates a significant positive direct influence on innovation orientation to circular procurement. This implies that managers should actively seek operations

management innovations and embrace innovation in their activities to reuses procurement resources, recycles procurement resources, and regenerates resources through purchase.

5.1.3 Mediating Role of Circular Procurement

The last objective investigates the mediating role of circular procurement in the relationship between innovation orientation and sustainable procurement practices. The finding concluded that circular have a direct effect on sustainable procurement. This suggests that when the circular procurement increases, sustainable procurement also increases. This implies that managers should reuses procurement resources, recycles procurement resources, and regenerates resources through purchase to enforce procurement rules, practices sustainable development, include sustainability in their purchase procedures, acquire sustainable products, services, and works according to their procurement policy, and contracts for sustainability. The finding also indicates that circular procurement positively and partially mediates interactions between innovation orientation and sustainable procurement. This implies that managers should reuses procurement resources, recycles procurement resources, and regenerates resources through purchase to seek operations management innovations and embrace innovation in their activities to enforce procurement rules, practices sustainable development, include sustainability in their purchase procedures, acquire sustainable products, services, and works according to their procurement policy, and contracts for sustainability.

5.2 Conclusion

The main objective of this study is to investigate indirect role of circular procurement in the direct link between innovation orientation and sustainable procurement practices with evidence from mining firms in Ghana. The study employed cross-sectional research design. This survey was conducted using a quantitative approach. Stratified sampling was used to choose 381 participants. A prepared questionnaire was the main tool used for data collection. Both SPSS v26 and SmartPls v4 were used for the statistical analysis. Both descriptive and inferential

approaches were used to analyse the data. The finding revealed that innovation orientation had a significant direct influence on sustainable procurement and circular procurement. The finding concluded that circular have a direct effect on sustainable procurement. The finding also indicated that circular procurement positively and partially mediates interactions between innovation orientation and sustainable procurement. The study concluded that managers should reuses procurement resources, recycles procurement resources, and regenerates resources through purchase to seek operations management innovations and embrace innovation in their activities to enforce procurement rules, practices sustainable development, include sustainability in their purchase procedures, acquire sustainable products, services, and works according to their procurement policy, and contracts for sustainability.

5.3 Recommendation

This section provides recommendations based on the findings of the research for various stakeholders. These ideas should be taken into consideration by management and academics.

- The findings revealed that innovation orientation had a significant direct influence on sustainable procurement. The study recommended that managers should actively seek operations management innovations and embrace innovation in their activities to enforce procurement rules, practices sustainable development, include sustainability in their purchase procedures, acquire sustainable products, services, and works according to their procurement policy, and contracts for sustainability.
- The findings indicated a significant positive direct influence on innovation orientation to circular procurement. The study therefore concluded that managers should actively seek operations management innovations and embrace innovation in their activities to reuses procurement resources, recycles procurement resources, and regenerates resources through purchase.

- The finding concluded that circular have a direct effect on sustainable procurement. The study recommended that managers should reuses procurement resources, recycles procurement resources, and regenerates resources through purchase to enforce procurement rules, practices sustainable development, include sustainability in their purchase procedures, acquire sustainable products, services, and works according to their procurement policy, and contracts for sustainability.
- The finding also indicates that circular procurement positively and partially mediates interactions between innovation orientation and sustainable procurement. The study concluded that managers should reuses procurement resources, recycles procurement resources, and regenerates resources through purchase to seek operations management innovations and embrace innovation in their activities to enforce procurement rules, practices sustainable development, include sustainability in their purchase procedures, acquire sustainable products, services, and works according to their procurement policy, and contracts for sustainability.

5.4 Limitations and Recommendation for Future Research

Numerous possible avenues for further research are obstructed by the constraints of this study. First, both managers from the analysed firms were included in the study sample. Therefore, a similar study on employees may provide more generalizable results. Causation is difficult to prove using cross-sectional research design. Future research may use longitudinal and panel data to empirically determine causality. Quantitative analysis examined innovation orientation, circular procurement, and sustainable procurement. Qualitative research methods may be needed for future comparable studies. This study suggests that future research may benefit from using other statistical analysis methods. Future research may replicate this study in other countries to verify similar results. The study recommend more research into the interplay

between supply chain and human resource issues and their effects on business sustainability and the adoption of CE.

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