

**SUSTAINABLE PROCUREMENT PRACTICES IN THE REAL ESTATE INDUSTRY
IN GHANA**

Amoah Esi Ohenewaah (Bsc. Real Estate)

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ABSTRACT

The exhaustible nature of natural resources has called for a global strive to develop sustainably. The 1992 Rio Summit, Kyoto Protocol and Agenda 21 are some global efforts put in place to develop sustainably. Amidst these efforts, sustainable procurement is very essential. Sustainable procurement is the process whereby organizations meet their needs for goods, services, works and utilities in a way that achieves value for money on a whole life basis in terms of generating benefits not only for the organization, but also for the society and the economy, whilst minimizing damage to the environment. Sustainable procurement has greatly contributed to the achievement of sustainable development goals by encouraging more sustainable purchasing and production. Ghana together with other 192 countries embraced this practice which came into practice in January 2016. The adoption of this practice aims at achieving economic growth, social inclusion and also clean and sustainable environment. Real estate players in Ghana have a great role to play in helping Ghana achieve Sustainable Development through sustainable procurement. Regardless of the increasing interest in sustainable procurement, evidence of the organizational performance in implementing sustainable procurement practices is not encouraging. A clear understanding of how sustainability concept can be related to the procurement process is absent especially when it comes to developing countries. Ghana's procurement Act, Public Procurement Act 663 (2003) as it stands now has no specific outlined measures to ensure sustainability in procurement of goods, works and services hence the elements of sustainable procurement are not factored in most procurement activities. Business firms in the country remain ignorant of the best sustainable procurement practices since literature on this study is limited. The case is intensified by the recent increase in the activities of real estate developers within the country due to population increase and demand for housing. Though sustainable procurement potential and risk for the industry is

high, there are “considerable differences from country to country”. Yet, sustainable procurement practices in the real estate sector have not been critically examined. This study therefore explores sustainable procurement practices in Ghana’s Real Estate industry. This dissertation made use of research findings and data collected from respondents. Structured questionnaires were circulated targeting the procurement department in the various real estate firms registered by GREDA in Ghana. Qualitative data was also sorted by means of an interview conducted at the various institutions who play vital roles when it comes to procurement and real estate in Ghana, and was analyzed using the thematic analysis approach. The Likert scale was used for most of the questions in the questionnaire. The scale measures respondent attitude towards sustainable procurement practices in the real estate industry. A link was generated for the questionnaire using the Survey Monkey form application, where the link was sent to 154 companies of which 126 were received and analyzed. It was realized from the study that; majority of the respondents do not prioritize sustainability issues when it comes to procurement. They are only interested in getting value for the money spent in procurement. Moreover, no effective monitoring and evaluation on procurement activities were done. For sustainable procurement activities to be done in the various firms in Ghana, the Procurement Act should be amended to favor not only the public sector but also the private sector in the country in order to achieve effective monitoring and evaluation of procurement activities of firms, both in the public and private sectors in Ghana. Through the amendment of the Procurement Act, new procurement policies and procedures will be generated, which will go a long way to help attain Sustainable Development in the country.

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DEDICATION

This write-up is dedicated to my mum and dad: Madam Cecilia Kudzedzi and Mr. Frederick Annoh, all Real Estate Companies, GREDA, *PPA Western Region zone*, and to everyone who helped this project in one way or the other to make this project a success.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

Natural resources drive development but they are exhaustible. This reality has necessitated the global strive and focus on sustainability in all sectors of development (Sachs & Schmidt-traub, 2015). Undoubtedly, the construction sector to which real estate industry belongs is recognized as a major contributor to the depletion of non-renewable resources due to population increase, resulting in housing and development demands. Growth Opportunities indicate that if current trends continue, the construction industry will reach an estimated \$10.5 trillion by 2023 with an annual compounding growth rate of 4.2% from 2018 to 2023 (Yu, Cheng, Ho, & Chang, 2018). Prior to this observation, the Worldwatch Institute data indicated that 40 percent of all raw materials are used in the global construction sector yearly (Bazar, 2011).

These estimates are consistent with reports from Organization for Economic Co-operation and Development and studies conducted in the developed regions where 80 percent of energy produced is used for heating, cooling and operational requirements in the construction industry (OECD, 2015); (Procurement & Countries, 2017); (Khang et al., 2018)). Further attempts have been made by some researchers to evaluate the contribution of real estate to this general resource depletion and environmental pollution. According to the other studies, about 40% of total consumption of energy can be attributed to real estate industry, especially in the developing world with over 60 percent CO₂ emissions (Albatici, Gadotti, Baldessari, & Chiogna, 2016; L, Stijn, & Amaryllis, 2015).

Clearly, global sustainable actions such as Agenda 21, the Kyoto Protocol and 1992 Rio Summit were worthy efforts necessary to ensure the environment is protected. Amidst these numerous actions, sustainable procurement is critical. The concept of Sustainable Procurement (SP) became very noticeable at the 2002 United Nations World Summit on Sustainable Development, which was held in Johannesburg. Unlike the traditional procurement practice, it transcends erstwhile traditional procurement practice which focused on economic considerations or value for money to making choices which evaluates real life-cycle costs of environmental and social risks. It therefore leads to a balance in economic, planetary, environmental and social /cultural considerations (Borland, 2009).

Several nations have accordingly designed initiatives to ensure sustainable procurement practices which are entrenched by legislation and have thereby provided a description of what constitutes sustainable procurement. The United Kingdom established a Sustainable Procurement Task Force in 2005 in line with this global agenda. This task force in the line of duty provided a broad description of sustainable procurement to which the Australian Procurement and Construction Centre and United Nations consent. The Task Force defined sustainable procurement as a “process whereby organizations meet their needs for goods, services, works and utilities in a way that achieves value for money on a whole life basis in terms of generating benefits not only for the organization, but also for the society and the economy, whilst minimizing damage to the environment” (Newell & Manaf, 2008). Since 2006, sustainable procurement has greatly contributed to the achievement of sustainable development goals by encouraging more sustainable purchasing and production (Islam, 2017).

Ghana as a country together with other 192 countries embraced this practice which came into practice in January 2016 (UN Resident Coordinator’s Office, RCO, 2018). The adoption of this

practice aims at achieving economic growth, social inclusion and also clean and sustainable environment (UN RCO, 2018). Ghana is therefore on the verge of achieving the SDGs with the help of Civil Society Organizations (CSOs) and the private sector organizations (UN RCO, 2018).

Real estate players in Ghana have a great role to play in helping Ghana achieve Sustainable Development through sustainable procurement. Procurement and other supply chain partners are currently expected to plan and integrate sustainable procurement practices in their procurement activities (Kalubanga, 2012). Adoption of sustainable procurement practices has direct influence on activities of the real estate sector on the environment by reducing the general construction industry's carbon footprint while initiating information systems for efficient building management (Khang et al., 2018). In advanced nations, product lifecycle assessment and employing of tools to track contents of products to ascertain whether there are significant environmental, safety and health risks have contributed greatly to the achievement of sustainable development. Some organizations have also re-assessed and consequently redesigned to reduce the presence of polluting chemicals in materials used in the construction industry (Ofori, 2006).

These issues are important to managers as stakeholders are progressively demanding that organizations address and manage the environment and social issues sustainably (CIPS, 2009). Ultimately, sustainable procurement practices can help save money, improve market conditions, protect natural resources and create job opportunities which in a long run contribute to the development of countries (Islam, 2017).

This study therefore seeks to assess sustainable procurement practices in the real estate industry in Ghana.

1.2 PROBLEM STATEMENT

Per the literature, procurement is sustainable when organizations meet their needs for goods, services, works and utilities which helps to achieve value for their money and enhance positive outcomes for the organization, the economy and the society as a whole (Sustainable Procurement Guide, 2013). Regardless of increasing interest in sustainable procurement, evidence of the organizational performance in implementing sustainable procurement practices is not encouraging (Brammer & Walker, 2011). Shen, Zhang, & Zhang, (2016) aptly contend that sustainable procurement practice is in its “infant” stage in developing nations as developers and contractors purchase their items considering the lowest prices, whilst disregarding environmental costs. Thus, not everyone in the industry has accepted this notion.

Mensah & Ameyaw, (2012) agree that the case of Ghana is not too different from that of the other developing nations but focuses on the general construction sector which has several other interrelated parts. For proper awareness creation and legislation enforcement, different sectors in the construction industry must be studied to unearth the gaps for proper action. Environmental and other sustainability issues on procurement are considered from a competitive point of view. A clear understanding of how sustainability concept can be related to the procurement process is absent especially when it comes to developing countries (Kalubanga, 2015).

Additionally, the Public Procurement Act 663, (2003), makes no provision for the private sector organizations in their procurement policy formulation, focusing primarily on the public sector. It has no specific outlined measures to ensure sustainability in procurement of goods, works and services hence the elements of sustainable procurement are not factored in most procurement activities. Business firms in the country remain ignorant of the best sustainable procurement practices since literature on this study is limited (Muniru, 2013). The case is exacerbated by the

recent increase in the activities of real estate developers within the country due to population increase and demand for housing. Though sustainable procurement potential and risk for the industry is high, there are “considerable differences from country to country” (Vanags & Butane, 2013). Yet, sustainable procurement practices in the real estate sector have not been critically examined. It is therefore necessary to ascertain the level of sustainable procurement practices within the real estate sector in Ghana in order to identify mechanisms which can be used to further promote it. This is the focus of the study.

1.3 AIM OF STUDY

The aim of this research is to explore sustainable procurement practices in the real estate industry in Ghana.

1.4 OBJECTIVES OF THE STUDY

Specifically, the study seeks;

1. To assess the current state of sustainable procurement application in the real estate industry in Ghana.
2. To identify difficulties encountered by the industry in implementing the sustainable procurement practices in the real estate industry.
3. To identify critical success factors that would enable the implementation of sustainable procurement practices in the real estate industry.

1.5 RESEARCH QUESTIONS

This study seeks to know;

1. What is the current state of sustainable procurement in the real estate industry?

2. What difficulties are encountered by the real estate industry in implementing the sustainable procurement practices?
3. What critical success factors enable the implementation of sustainable procurement practices in the real estate industry?

1.6 SCOPE OF STUDY

The scope of this study explored sustainable procurement practices within the confines of the real estate industry in Ghana. The research focused on the environmental issues associated with procurement done in the various activities undertaken by the firm. This is because the natural state of the environment is altered during the operation of the firms. To achieve environmental balance for human habitation, there is the need to pay much attention to these environmental issues in order to achieve that goal. The study was conducted on the real estate firms in Ghana registered under GREDA.

1.7 SIGNIFICANCE

The study revealed sustainable procurement challenges which need to be attended to and provided a basis to enhance these processes. It also adds to the academic knowledge on the sustainability discourse in general and the real estate industry in particular. By reviewing literature, the study also brings out successful adoption strategies which have led to reduction of emission footprints in other nations for learning. Real estate developers will benefit greatly by understanding the real purpose of the need for sustainability and consciously implementing and adopting strategies for the uptake of sustainable procurement practices. The study results will also aid in improving the sustainable procurement policy formulation and practices in the real estate industry and contribute to achieving sustainable development as a country. Finally, it is expected that it will serve as a

stepping stone to researchers to further develop the literature on this concept as it is still a developing phenomenon.

1.8 LIMITATIONS TO STUDY

For effective management of time and resources, the following limitations were made to achieve the objectives of the study within the stipulated time frame for completion of the work.

1. The study is limited to the real estate companies registered under GREDA since the total number for all the real estate firms in Ghana is unknown.
2. Emphasis is made on the procurement activities that takes place in the real estate firms.
3. The study is also limited to the environmental sustainability issues in the procurement activities of the real estate industry

1.9 METHODOLOGY

This study first reviews existing literature on sustainable procurement practices, where data was obtained through previous thesis, journals and books on sustainable procurement. The data obtained helped generate important primary information with the aid of a questionnaire and interviews conducted on the key stakeholders of the study area. The SPSS (Statistical Package for Social Sciences) software was used to analyze the quantitative data obtained whiles thematic and content analytical methods were used to analyze the qualitative data obtained from respondents.

1.10 STUDY OUTLINE

This dissertation is grouped into five different chapters with each chapter dedicated to a specific section of the research;

1. Chapter one is dedicated to providing background information, problem statement, scope of study, aim and objectives, methodology and the significance of the study.

2. Chapter two helps to review relevant literature around the subject and increase knowledge base on a wider scope of the study.
3. Chapter three is dedicated to the research design and methodology selected.
4. Chapter four analyzes data collected from respondents. Analysis was done using standard deviation, frequency distribution and standard mean.
5. Chapter five presents the summary, research findings, recommendations and conclusion of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter is a review of works of other authors on the research subject. It touches on definitions and concepts of the study among other relevant variables. It is tailored to the objectives of this research in order to gain wide-range discernment into sustainable procurement in Ghana's Real Estate. For that reason, a collection of important facts, similar and divergent ideas on sustainable procurement are compared. It delves into the concept of sustainability, sustainable procurement concept, challenges associated with sustainable procurement and its benefits. It summarizes the sustainable procurement approaches in the growing demands of the real estate industry, and also discusses procurement practice in Ghana and other countries.

2.2 THE SUSTAINABILITY CONCEPT

The importance of developing sustainably seem to have come to light in recent years, due to the growing concern for the environment and change in climate, coupled with social inequalities and issues of poverty (Giovannoni & Fabietti, 2010). Sustainability according to the European Commission, (2007) is the achievement accomplished when all living things on earth are comfortable without compromising the quality of living for the future generations. The concept of sustainability originated from the Brundtland Commission's Report of 1987, where much importance was placed on the quality living of mankind and the effect it has on the environment (Kuhlman & Farrington, 2010). Generally, this term is used interchangeably in literature with sustainable development but there exist a mild contestation in literature on their definitions (Waas, Huges, Verbruggen, & Wright, 2011). Some scholars contend that sustainable development leads to sustainability while others argue that sustainable development is more holistic than

sustainability which is skewed towards environmental protection (Waas, Hoge, Verbruggen, & Wright, 2011; Plessis, 2015). In this study, the use of sustainability as defined by the European Union which suggest holistic development is adopted. In emerging studies, sustainability is affectionately labelled Green. Sustainability revolves around three key pillars which are environment, society and the economy (Kuhlman & Farrington, 2010).

2.2.1 Environmental Sustainability Concept

The use of the word ‘environmental’ is associated with the effect on the natural system. It is used in reference to the human interaction with the ecosystem (Ginevicius & Podvezko, 2009). Environmental sustainability therefore denotes practices that minimizes the use of energy and prevents pollution of water bodies, resulting in a smaller carbon footprint. Current innovative efforts are to reduce, reuse and recycle limited resources (Principles, 2010).

The global ecosystem provides raw materials to support life indefinitely. Protecting human life is the ultimate reason to sustain the environment (Goodland, 2018). Some factors that poses threat to environmental sustainability include (Sutton, 2004):

- Destruction of the habitats of native species
- Discharge of harmful chemicals and other polluting materials into the environment
- Emission of greenhouse gases into the atmosphere which results in climatic change
- Depletion of low cost oil and other fossil fuels.

When these issues arise, there will be an irreversible loss of the quality of the environment valued by the society.

2.2.2 Social Sustainability Concept

Social sustainability occurs when systems, structures and relationships actively support the capacity of the current and future generation to create a healthy and livable communities. Social sustainable communities are equitable, diverse, connected and provide a good quality life (Sustainability, 2011). Social sustainability looks at how individuals, society and the community interact among themselves in a manner that aids expectations and provision for individual autonomy and realization of individual potential, participating in governance and rule of money, citizenship and service to others, maintaining justice in the society, knowledge propagation, and distribution of resources that will enhance the development of the society with time (Paper & Group, 2015).

There are number of elements which contribute to the social sustainability of a community. These are discussed in the succeeding sections.

- Social justice element of social sustainability

Social justice refers to the state of a society, where there is equal or just distribution of resources, rights and with equal opportunity for all (Ketschau, 2017). Social justice creates a reference bases for equitable allocation of wealth and resources. It plays a vital role in self-fulfillment among members in the society based on set down objectives and reasonable modus (Ketschau, 2017).

- Social capital element of social sustainability

Social capital measures the ability for local problems and opportunities to be managed by an organization or the people in the society (Paldam, 2001). There is an increase in the interest of social capital in recent years, where the idea or notion of social bonds and norms are captured. These are very crucial when sustainability is involved (Pretty & Smith, 2001).

Social capital reduces the cost involved in working together and improves cooperation. There are four features of social capital which are relations of trust; reciprocity and exchanges; common rules, norms, and sanctions; and group connection and networking (Pretty & Smith, 2001).

- **Pride/ sense of place element of social sustainability**

The emotions and meanings given to a geographical space is termed as the sense of place. This involves how different a place can be from other places with respect to their attributes (Sullivan et al, 2009). Sustainable human spaces is concerned with desired physical spaces where the social issues are addressed within the perspective of sustainability (Eizenberg & Jabareen, 2017). Social sustainability helps to achieve sustainable urban forms, which will improve the social aspects of the community and the neighborhood. When these social aspects are enhanced, the society achieves the sense of attachment or the sense of belongingness (Eizenberg & Jabareen, 2017).

- **Safety and security element of social sustainability**

Safety under social sustainability talks about the right to be secured and protected in situations of vulnerability. Safety as proposed, is a right of every individual and groups, irrespective of their health, gender, age, societal status, and race. Therefore for the safety of society to be accomplished, there is the need to include the society in developmental issues in a sustainable way (Eizenberg & Jabareen, 2017).

2.2.3 Economic Sustainability Concept

In an economic view, sustainability looks at the need to maintain a permanent income for humankind, generated from non-declining capital stocks (Bromwich & Macve, 2008). Thus in the view of economic sustainability, constant stock of human, man-made, natural and social capital

are considered necessary and sufficient criteria of sustainable development (Vetenskapsakademien, 2015).

2.3 THE CONCEPT OF SUSTAINABLE PROCUREMENT

Procurement is generally defined as the process of acquiring goods, services, or works outside an organization. It is the business management that ensures identification, sourcing, access and management of the external resources that an organization needs or may need to fulfil its strategic objectives (CIP, 2005). Okyere (2016) believes that it involves identification of needs risk assessment, stakeholder specification, supplier selection, evaluation and awarding of contract, supplier management, and management of contract. Drucker (2012) also opines that it comprises of complete range of events right from the identification of the need for a good, service or work, through to the execution of the project. It specifically includes acquisition and management of people, buildings, land, transport, energy, water, materials, food, waste and outsourced service (Drucker, 2012). These processes indicate that stakeholder and supplier's engagement or participation is needed in every stage throughout the procurement life cycle. It takes place in both private and public institutions in the country.

According to a study by Soleymani Sardu, (2014), procurement of goods and services by government is a core element of their operations requiring effectiveness and efficiency for its purpose to be realized. For effectiveness, there should be a high level of transparency and accountability in established processes to obtain value for money. For efficiency, transparency, and fair use of funds and resources are necessary (Faculty, 2012). In all of these organizations decisions on procurement has an effect on the economy, society and the environment as a whole, necessitating that procurement should be done sustainably (ISO 20400 Sustainable procurement, 2017).

So, Sustainable Procurement is a process whereby organizations meet their needs for goods, services, works and utilities in a way that achieves value for money on a whole life basis in terms of generating benefits not only to the organization, but also to society and the economy, whilst minimizing damage to the environment (Defra, 2006). In essence, Brammer & Walker, (2011) consent that sustainable procurement *“is consistent with the principles of sustainable development, such as ensuring a strong, healthy and just society, living within environmental limits, and promoting good governance”*. Thus, sustainable procurement should involve planning for a changing climate, resources and a carbon constrained future which is socially beneficial to all. Committing to sustainable procurement policies is about ensuring that the core values of the organization is transferred through the supply chain into the life cycle of the organization’s product and services (Drucker, 2012).

In measuring sustainability, Kramar, (2014a) suggested that the following three level indicators must be considered. Cost and waste reduction and alleviation of risk, Legal requirements and Brand or reputation protection. According Drucker (2012), all sustainable products have superior energy and water efficiency, lowest hazardous material content available, longer life and greater upgradability, reduced packaging and waste and increased recycling capability. These characteristics results into lower running of the product and lower costs of disposal leading to financial savings and protects reputation of the brand. It is important that a product for work is assessed and known to have satisfied these characteristics. When a decision is made to purchase such products, it is said that the organization is practicing sustainable procurement (Kramar, 2014b).

Some organizations treat ideas of sustainable procurement with careless considerations and compromise the way sustainable procurement practices can improve the existing procurement practices (Kramar, 2014b). A similar situation is corroborated by Oliveira & Santos (2014) as they noted that sustainable procurement criteria are incorporated in few organizations even in the public sector.

2.3.1 Benefit of Sustainable Procurement

Procuring sustainably as mentioned in general comes with a lot of benefits. These benefits help to improve the quality of the environment, the quality of our social life and the development of our economy. Yet, some earlier scholars argued that no outcome of precise benefits accrue from practicing sustainable procurement, despite several studies conducted (Islam, 2017). In an attempt to delve into the specifics of the benefits, Islam (2017) categorizes benefits derived from practicing sustainable procurement into financial and non-financial benefits.

2.3.1.1 Financial Benefits of Sustainable Procurement

In contrast to earlier doubts, recent studies demonstrate that sustainable procurement practices can result in improved financial performance (Brito, 2010; Stock et al., 2010). A study conducted on Indian manufacturing companies by Surajit confirmed that sustainable procurement improved the firms' financial performance through the increase in sales (Bag, 2016). Chan & Wong also stated that purchasing sustainably can help increase organization's net income and reduce the overall cost of production, thereby improving the organizations financial performance by reducing the cost of production and providing innovative ways of production to organizations (Wong, 2012; Bobis & Staniszewski, 2009). Through transparency, efficiency and reuse of natural resources, Chile has achieved economic development (Ban Ki-moon, 2013).

2.3.1.2 Non- Financial Benefits of Sustainable Procurement

Organizational working environments conditions have improved through sustainable procurement practices (Jokinen, 2016). Past studies found out that the quality of operations of Jordanian food industries have improved through sustainable procurement (Chiu & Hsieh, 2016). It is also reported in India that apart from the financial benefit of procuring sustainably, Indian manufacturing companies have achieved the targets and strategic goals, and company's reputation through sustainable procurement (Bag, 2016).

Practicing sustainable procurement according Kalubanga (2012) brings about the following merits:

- Whole life cost analysis consideration leads to regulation of project costs,
- Outcome projects become relatively predictable (Tucker, Rayme, Masuri, Nazali, & Noor, 2012), and
- laws regarding social and environmental issues are factored (Defra, 2006).

Khang et al., (2018) further details some of the specific benefits which can be achieved per the various pillars of sustainability when sustainable procurement policies and practices are well followed. In environmental sustainability lens, it is expected that from "cradle to cradle" of construction the most efficient material and products will be selected through an intentional design. When this is done at the initial part of real estate activities, air, water and soil pollution will reduce significantly. This is because when sustainable procurement practices are pursued stakeholders will exercise control over purchase and handling of hazardous chemicals. Contractors will be informed of raw material arrangements and among other things (UNEP, 2012);

- Source for logs which are legally harvested, recycled steel and glass, while shifting to renewable alternatives such as rubber and bamboo to reduce greenhouse gas emissions

- Manage incessant releases into water bodies, consequently reducing pollution of watercourses by chemicals.
- Construct energy efficient buildings with natural cooling options to reduce energy consumption as well as water usage, runoff to sewers and other solid wastes.
- Install commercial solar panel system which uses renewable energy to power buildings.

Thus, quality of life of humans and other living organism will be enhanced through significant reductions in probability of accidents, safety and health costs as there will be healthier and ambient work spaces for workers. This will specifically limit headaches, asthma and allergies. Also, indoor air quality will enhance workers' productivity. Roof systems will be designed to conserve and designs will include on-site gardens which will protect the roof from Ultra Violet light (Association, 2015).

Economically, contractors will spend less but cumulatively experience incremental benefits during general lifecycle of projects. According to the Samari et al., (2013) sustainable procurement leads to construction of buildings which save funds on utility costs and maintenance. It also has the potential of reducing environmental technologies with gradual low demand for conventional materials while driving innovations for newer technologies. Consequently, it leads to the production of new products which require less energy and generates less waste but ultimately lasts longer. It is however worthy to also note that the initial costs of implementing these strategies seem higher due to upfront costs (Commission, 2014).

2.4 LIFE CYCLE ASSESSMENT, WHOLE LIFE ANALYSIS AND SUPPLIER PRE-QUALIFICATION IN SUSTAINABLE PROCUREMENT

An environmentally preferable product is one that results in the minimum environmental impacts throughout its life cycle, compared with other products or services using the same purpose and having the same functional qualities (Drucker, 2012). According to British Standards Institute's BS 8903 principles and framework for procuring sustainably, Lifecycle Assessment (LCA) addresses the potential environmental impacts throughout a product's life cycle - from raw material extraction and acquisition through to production and manufacturing to use and end-of-life treatment, recycling and final disposal (from cradle to grave).

Whole Life Cost (WLC) analysis is required to be performed on a product a potential supplier would deliver should contract be awarded to find out how it meets the sustainability requirements (Mensah & Ameyaw, 2012). Whole Life Cost Analysis is used to determine the total cost of owning a product (Drucker, 2012). It is designed to determine all elements of cost of a product and subsequently can help produce a spending profile of a product or service over its expected lifespan. WLC analysis of a product is one way to determine whether procuring such product is sustainable or not (Berry & McCarthy, 2011). This can be applied at two levels; asset and/or multiple asset levels. WLC analysis is either used at the sourcing strategy stage to help decide between competing procurement options and/or at the tender evaluation stage to ensure that contract award decisions are made on cost assumptions over the life of the goods, works or service and not just on the up-front capital cost (Mensah & Ameyaw, 2012).

Procurement specifications is fundamental and must incorporate detailed sustainable requirements (Drucker, 2012). An organization engaging a supplier must require the supplier to provide

information of the product to be procured and be examined to know if it satisfies the organization's sustainable procurement policies in Mensah & Ameyaw, (2012).

This can be achieved in Ghana's real estate if the industry influences the scope, the risk and impact assessment and the extent of supply chain activity. Mensah & Ameyaw (2012), stated that procurement practices in Ghana has neglected the sustainability considerations. This is because procurement policies focus on the public sector and unequal emphasis placed on the different variables of sustainable procurement (Brammer & Walker, 2011). Therefore, it is needful to develop sustainable procurement policies that suit both public and private institutions especially in Ghana.

2.5 SUSTAINABLE SUPPLY CHAIN MANAGEMENT

In recent times, global population growth trends have provided opportunities for the real estate industry in particular and the construction industry in general (Vanags & Butane, 2013). The real estate industry attempts to bridge housing deficits in developing nations but their activities need to be controlled in the era when sustainability is a global agenda. This has generated sustainability concern with studies conducted to evaluate how sustainability strategies are adopted in various stages of the supply chain management demand and supply interactions.

Superficially, it can be inferred that the housing deficits have led to economic gains for all countries experiencing increase in real estate activities due to the complex nature of organizations with diverse specialties who profit from the sectors' activities, when social and environmental costs are disregarded. According to Wibowo, (2018), the situation is complex and fragmented with over hundred stakeholders who are suppliers of different items at various stages. It is therefore

necessary to have a cursory consideration of the various stages in the supply chain in relation to sustainability.

- *Planning Phase of Sustainable Supply Chain Management*

Almost all nations have respective departments in their governance composition which supervises designs of proposed buildings. The gap in developing countries within these departments in Ghana are lack of logistics and laxity in enforcement. It is critical that designs are monitored for their environmental consciousness with proper life cycle assessments. According to (Wibowo, 2018) when environmentally conscious regulations are made to enforce issues of recycling and disassembly, developers are likely to opt for structures with low complexities. In effect, materials procured will be simple, environmentally friendly and easy to take down.

In terms of material management, the necessary consideration in relation to sustainability is safety. Hence, the developer needs to be conscious in selecting and sourcing environmentally friendly materials. According to (Hervani, Helms, & Sarkis, 2005), materials should be adaptable and easy to separate. Wibowo, (2018) suggested the following with regards to selection and sourcing;

- Selecting materials and products effectively and efficiently

Reducing, reusing and recycling materials to minimize source usage, habitat and ecosystem devastation. Utilizing durable, reusable, recyclable and renewable materials that can minimize the quantity of materials used.

- Selecting materials and products that reduce contained energy and carbon

The utilization of materials that contain low energy, for instance, materials that are produced by non-fossil fuel-based renewable energy resources.

- Avoiding materials and products that can endanger human or environmental health

Materials or products from materials that contain toxins, pollutants and heavy metals should be removed or reduced.

- Selecting materials that contribute to sustainability concepts

Several materials are utilized to develop a sustainable site design feature, although they may not be ‘green’ separately.

- *Construction Phase of Sustainable Supply Chain Management*

For sustainability, the drive should be conservation of resources and utmost reduction in actions which can potentially impact negatively on the environment. Therefore, resource consumption reduction, waste reduction and emissions reduction are crucial.

- *Green Operation and Maintenance Phase of Sustainable Supply Chain Management*

Green operation and maintenance programs consist of training, clearance, work application and control to preserve ‘green’ materials in the project in accordance with environmental needs (Hong, Koo, Kim, Lee & Jeong, 2015).

2.6 BARRIERS TO SUSTAINABLE PROCUREMENT

Existing literature on sustainable procurement also suggests that there are some barriers which challenge its application in practice. Shen, Zhang, & Long, (2017) provide a detailed thematic analysis of the issues which hinders the adoption of sustainable procurement practices in the real estate industry.

2.6.1 Governmental policy on Sustainable Procurement

Governments and their relevant structures have an important role to play in promoting sustainable procurement practice through provision and enforcement of legislation. However, this necessary

action is virtually non-existent or low as the case is in most developing countries (J. Zhang, 2012). When this support is lacking, the buying and usage of sustainable building materials become unattractive (OECD, 2017). Therefore laxity in demand for quality, traceability and evidence of sustainability on the part of government makes public, consumers, suppliers disregard social responsibility (Mensah & Ameyaw, 2012b).

2.6.2 Features and Quality of Sustainable Building Materials

Several features of sustainable building materials and cost makes industry players reluctant to source and use. In terms of cost, X. Zhang, Platten, & Shen, (2011) in their specific study which focused on examining additional cost of applying sustainable building materials in the real estate industry noted that it is a major factor which influenced decision of industry players. UN, (2017) found that overall costs increase by 8.5-13.9% when sustainable building materials are procured and used. Tseng & Hung, (2014) believes that this incremental cost of using green products is a “most significant barrier”. The situation of new developers is noted to be far challenging because they have no experience in using new materials and designs (Ali, 2016). Ultimately, developers rationally decline to procure sustainable materials for construction because it affects their financial power in a highly competitive industry (Biermann et al., 2015).

In the United States, UN, (2017) studied how the attributes of sustainable procurement influences adoption in practice and found that sustainable materials were incompatible with other building components and required higher technical abilities to use in the early construction phase. The same impediment was corroborated by the (OECD, 2017). This also affects adoption of sustainable procurement practices.

2.6.3 Business Factors of an organization

Businesses require high industry professionals to make them comfortable to adopt sustainable procurement materials (Hofman & Afford, 1999). Yet, professionals in Africa do not seem to have welcomed this challenge to upgrade. According to Kalsum, Isa, Samad, & Alias, (2014) professionals in Nigeria lack the ability and tools to evaluate environmental performance of industry players and likely lead to biases in terms of initial costs estimation perceptions. Ali, (2016) noted that professionals without adequate capacity exaggerate additional costs incurred on use of sustainable materials and processes and this impedes business adoption of sustainable procurement practices.

According to Pratima & Kendall, (2012) attitudes towards adoption of sustainable procurement materials and practices within the whole organization can also impact the choice of an organization. When top management lack support of their subordinates or otherwise, organizations are unlikely to adopt the sustainable procurement practices because real estate businesses have different departments which are interdependent. Strategies should be developed to properly sensitize all real estate business staff on sustainable procurement and construction benefits as well as their responsibilities towards reducing social and environmental cost of actions (Tseng & Hung, 2014). Also, bad initial or first experience by real estate developers can inhibit their future choice of adopting sustainable procurement materials and services. According to UN, (2017) some developers in United States declined to subsequently use these materials because of earlier problems cost and incompatibility (Amiril, Nawawi, & Takim, 2014).

2.7.4 Nature of Real Estate Market and its Effects on Sustainable Procurement

Evidence in literature indicates that when consumers are environmentally conscious, it affects their demand for houses which are sustainably constructed. Whiles Berns et al., (2009) accepts that this

kind of demand is on the rise, it is not generally so in all countries. Tang, Mclellan, Snowden, Zhang, & Höök, (2015) considers this as an external incentive for the real estate market. In Singapore, environmentally conscious individuals demand for high energy-efficient materials and technologies in the housing sector consequently impacted on the procurement and use of sustainable materials in construction. It is estimated by An et al., (2016) that this increased property prices by 4.1–9.9%. Contrary to this finding, Shen et al., (2016) found that Chinese consumers are more influenced by location of building than the use of sustainable materials. In effect, the real estate market differs from country to country in relation to external market drives. It however suggests that with proper sustainability education, the market can be influenced towards sustainable practices and this will affect the procurement practices of developers by pulling them to adopt sustainability practices.

2.6.5 Lack of Sustainable Material Certification System and Information

The literature accounts further indicate that a lack of sustainable material certification system and existence of non-authorized standards makes real estate industry persist in the use of unsustainable materials. Similar cases were found in studies conducted in Nigeria, China, and the United States (Shen et al., 2016). This situation is further exacerbated by the limited or lack of knowledge of business leaders in the use of sustainable materials (Berns et al., 2009).

2.6.6 Lower Multi-Stakeholder Participation in the Procurement Process

Carter & Fortune, (2003) pointed out in a study that it is beneficial to involve all stakeholders from the beginning of the procurement process because it brings satisfaction with the end product. Chari, Chiriseri, Chari, & Chiriseri, (2012) consents that governments, NGO's, relevant agencies, and the general public involvement will achieve sustainability and user satisfaction. The challenge in the

Ghanaian environment is how these stakeholders could be identified and involved in the decision making process because not all developers are registered (Mensah & Ameyaw, 2012b).

In summary, Shen et al., (2017) noted the following as general inhibitors of sustainability :

- Lack of incentives from the government
- Incremental cost
- Technical concerns with using green building materials
- Lack of expertise on applying green building materials
- Lack of environmental missions and strategies within organization
- No clear definition on environmental responsibilities between departments within organization
- Low environmental awareness between managerial staff
- Bad experiences on purchasing green building materials
- B9 Low environmental awareness between housing consumers
- Lack of attractiveness of green building materials to consumers
- Lack of authoritative green building materials certification system
- Poor information dissemination on green building materials in market
- Unavailability of green building materials in local market

2.7 ENABLERS OF SUSTAINABLE PROCUREMENT

Development projects are influenced by different factors. These factors play out differently in different countries but have been noted in studies to enhance adoption of sustainable procurement in the construction sector (Nilsen, 2015).

2.7.1 Requirement, Registration and Standards for Sustainable Procurement

Studies have rightly shown the necessity of the role of government in facilitating adoption of sustainable procurement practices, outlining the need for policy legislation and enforcement (Waris, Khan, Ting, Kuang, & Darun, 2018; Bag, Ali, & Venkatesh, 2013). According to Eltayeb & Zailani, (2009) there is evidence to suggest that when these policy regulations are enforced, organizations conform to sustainable procurement practices. Key elements such as government pressure, organizational awareness through sensitizations, incentive policies and effective guidelines and standards monitoring drive organizations towards adoption of sustainable procurement (Adetunji, Price, & Fleming, 2008; Shen et al., 2016; Strandberg & Consulting, 2012). Gradually, organizations procurement activities become re-focused to prioritize sustainable purchasing and ultimately redefine organizations social and environmental priorities.

Country and state specific studies provide solid evidences of how government roles have aided the adoption of sustainable construction. In a study by Jabareen, (2008), positive and negative financial incentives were noted to be key enablers when owners were to make decisions concerning adoption of environmental in their homes. The Malaysian government's introduction of Green Technology Financing Scheme (GTFS), which is a loan incentive, targets and attracts innovators and users of sustainable construction technology. By this measure, adoption of sustainable practices increased and with certification also increasing immensely from 1 to 137 from 2009 to 2013 (Uche, Maizon, Afeez, Sanni, & Nita, 2013; Olubunmi, Xia, & Skitmore, 2016). Olanipekun, Olubunmi, Xia, Bo, & Skitmore, (2016) also found that incentives like bonuses and grants increased adoption of sustainable roof technology installations in Chicago and Indianapolis (US) by building owners and architects. Thus, financial and non-financial initiatives can be used to

induce adoption of sustainable procurement and construction practices (Strandberg & Consulting, 2012).

2.7.2 Strategic Stakeholders Engagement in the Procurement Process

The industry has a lot of players who have specialized activities. It is therefore necessary to involve all stakeholders to situate their individual responsibilities through discussions. This leads to effective collaboration of all stakeholders with mutual commitment and proper perception. This is considered a key enabler in the facilitation of sustainable procurement adoption among stakeholders (Walker & Phillips, 2009; Testa, Annunziata, Iraldo, & Frey, 2014). But this mechanism works better in matured markets where financial and time-effectiveness concerns have been addressed through favorable tax reliefs, economic and environmental information provision and simplified administrative procedures (Lovins, 2015).

2.8.3 Induced Organizational Commitment on Sustainable Procurement

Commitment is a basic requirement and a necessary enabler for the adoption of sustainable procurement (Strandberg, 2012). In every organization, numerous factors are considered in the process leading to making decision regarding adoption of sustainable procurement. Notable among them is the organizations environmental leaning among top, middle and low level staff (Strandberg, (2012). Usually, top level staff can pull middle and lower level staff along to adopt sustainable procurement practices, especially when good understanding is share and effected through trainings with specific policy direction (Waris et al., 2018). Such enhanced awareness will likely translate into adoption of sustainable procurement practices. Organizations will be coerced subtly by other competing organizations through enhanced awareness creation.

2.8.4 Market Factors on Sustainable Procurement

When good public education is conducted, citizens will become informed about the need of sustainability. Consequently, this will affect their preferences in housing demands by altering demand for conventional houses and thus drive developers towards constructing sustainable houses. Ultimately this will pressurize developers to source for sustainable materials to stay in business (Lam, Chan, Poon, Chau, & Chun, 2010). Walker & Jones, (2008)consents to the fact that adoption of sustainable procurement practices leads to comparative advantage through product differentiation and innovation.

2.8.5 The Availability of Suppliers and Availability of Qualified Professionals in Sustainable Procurement

Availability of suppliers with right quantity, quality and specifications of sustainable materials needed by the industry can facilitate adoption. If this does not exist, all attempts may prove futile. Integrating sustainable goals into the purchasing or procurement process can be complicated, when there is uncertainty of professional ability. Seeking the consent of a sustainable expertise in the procurement process makes complicated issues more understandable and can help in decision-making.

2.9 SUSTAINABLE PROCUREMENT PRACTICES IN SOME COUNTRIES

The interest of the society has also risen due to an increased concern on public health, greenhouse effect, and energy conservation. The rise in interest has contributed to patronizing green products and services, and the development of a more sustainable environment.

2.9.1 The Chinese Experience of Sustainable Procurement Practices

Governmental Green Procurement (GGP) was introduced by policy makers in practicing procurement in China. Billions of Chinese yuan renminbi worth of certified environmental friendly goods have been introduced into the Chinese market since the GGP was introduced in 2006, of which many of them are purchased by the public sector (Council, 2012). The Chinese government has a great impact on the economy. In 2012, the public expenditure in China clocked 1552 billion EUR. It accounted for 24.20% of GDP in the same year (Wang & Zhang, 2010).

Government procurement in China keeps rising with a high annual increase rate of 25% from 2005 until 2012, even though government procurement covers a very small portion of GDP, statistically speaking. Government procurement in China still clocks below 3% regardless of the increase in rate as at 2012. The ratio between government procurement and GDP falls way below the average of OCED countries which is 12%. Further studies revealed that, government procurement only accounted for 11.1% of total government public expenditure in 2012 (Republic of Cyprus, 2017). Procurement by government is documented as one of the most important policy instrument in maintaining the quality of the environment, promoting sustainable development, encouraging the use of advanced technologies and supporting the development of small and medium enterprises in government procurement legislation. Sustainable procurement is measured as one important policy in achieving ‘energy saving and emission reduction’, the country’s goal (Denjean, 2015). The energy conservation law states clearly that public institute should consider energy conservation products during procurement even though the procurement law specifies the policy function of government procurement in protecting the environmental (Wang & Zhang, 2010).

2.9.2 South Korea's Experience of Sustainable Procurement Practices

Green public procurement was first introduced in tandem with the Korea Eco-label under the Act on development and support of environmental technology of 1994 (OECD, 2015). Green public procurement was enforced when the Act on the encouragement on purchase of green products in 2005 was introduced by the Ministry of Environment. The adoption of the Act of 2005 has played a great role in quantity and quality development of eco-labelled products by leveraging the public demand. Total public expenditure in green purchases has greatly increased from KRW 254.9 billion in 2004 to KRW 787 billion in 2005, with an additional increase to KRW 1727 billion in 2012 (Noronha, 2017).

Green public procurement (GPP) system and the Korea Eco-label is operated by the Korea environment industry and technology institute (KEITI), an affiliate of the ministry of environment. The KEITI is responsible for the implementation of green procurement plans from the state agencies and monitoring of the result. Different policies are also being used to act as a complement to the green public procurement. They are as follows (OECD, 2014) :

- Producing annual guideline to inform procurers of the green procurement and monitoring procedure
- Conducting training for procurers regularly and on demand
- Publicizing the case studies and hold workshops to feature best practices
- Giving national awards and incentives to state agencies with good performance.

GPP in Korea has profited from the already established green standards of Korea Eco-label and Green Recycled Mark. Administrative costs to set the green procurement standards have been narrowed by each institute, thereby encouraging the rapid growth of the green public

market by operating by the standards documented by the Korea Eco-label and Green Recycled Mark (OECD, 2014).

2.9.3 Ghana's Procurement Body

The procurement process in Ghana is guided by the Public Procurement Act, Act 663 (2003). The Act has laid down procedures which guides the value, time for supply, procurement period, and other important issues which are vital for a successful procurement process (Asante, 2016). It is vital to assess procurement practices in order to discover challenges or difficulties in order to develop measures for future procurement (Asante, 2016).

The PPA establishes the various five basic pillars of public procurement in the country. They include (Anvuur, Kumaraswamy, & Male, 2006):

- Comprehensive, transparent, legal and institutional framework
- Clear and standardized procedure and tender documents
- Independent control system
- Proficient procurement staff
- Anti-corruption measures

The public procurement system is discovered as an area that needs urgent attention with regards to widespread perception of the shortcomings and corrupt practices by the government and the developing partners (Ameyaw, Mensah, & Osei-tutu, 2012). In Ghana, public procurement takes 50-70% of the nation's budget, where GDP is 14% and total imports are 24% (Country Procurement Assessment Report, 2003). Procurement practice in Ghana has neglected sustainability considerations. The PPA Act 663, as it stands now, addresses few of sustainability

issues. The laws governing Ghana procurement does not assure the sustainability transactions even though it makes mention of step by step procedure in procurement (Mensah & Ameyaw, 2012a).

2.10 REAL ESTATE DEVELOPMENT

Real estate is defined as the land below and above the earth's surface area, which includes both natural and artificial things attached to the land temporarily. Any artificial development made on a land is classified as part of real estate (Ariyawansa, 2016). The real estate industry in Ghana continues to develop as new residential facilities are springing up everywhere in the country. It contributes to national socio – economic development by providing building which are used in the production of goods in the economy (Mensah & Ameyaw, 2012b). Government investment is a major driver of growth, with a substantial pipeline of projects in the real estate industry, particularly for the development of infrastructure and also pave a way for business opportunities, for real estate companies as well as their labour force.

Real estate development does not only concentrate on the activities within the production cycle, but also take into consideration the quality of the environment as well as limited resources. The process is complex, time consuming, capital intensive and multi-disciplinary (Petersburg & Kohlhepp, 2012). Real estate involves commercial and residential buildings which contributes to future development by creating jobs and accommodation to the fast growing population (Schoenmaker & Vlist, 2015). Commercial real estate involves developments or lands intended to generate profit, either from rental income or capital gain. These include office complexes, industrial plants, agricultural lands and other profit generating structures (Schoenmaker & Vlist, 2015). Developments made on land for housing purpose on the other hand is also termed as residential real estate (Johnson & Benefield, 2015).

2.10.1 Real Estate Regulation in Ghana

In places like Dubai, where real estate accounts for 20% of GDP (compared to an average of 7% in most other countries), governments need to reconsider regulation of the real estate sector. This is necessary in order to ensure that the sector continues to be healthy, transparent, professional and anti-fragile, while keeping the whole economy in balance (Mahmoud Burai, 2015). In addition, the Great Recession of 2007 has taught us a costly lesson of what it means for a real estate sector to be out of control. There was a financial loss of more than \$14 trillion in the United States alone, and more than 20 million jobs were lost worldwide (Hasbini, 2017).

The real estate sector of Ghana has expanded since 1990, regardless of its occasional setbacks and barriers in times of economic instability (Doing business and investing in Ghana, 2018). In 2012, an agreement was created between the government and the Ghana Real Estate Developers Association (GREDA) to confirm the commitment to encourage the growth of private real estate, to aim at meeting the housing needs of the country (Doing business and investing in Ghana, 2018).

The activities of real estate in Ghana are proposed to be regulated by the Real Estate Authority Bill, 2014. The purpose of the bill regulates commercial transactions in the sector, which includes sales purchase, rentals, and leasing of real estate and related fixed assets as well as real estate agents and practitioners. The proposed bill helps to address the problems encountered in sales of land (Ankrah, 2016). But as it stands now, the bill has not been passed yet into law.

Government has a leading role to play in establishing a policy and regulatory environment for structure development in the country. The policy helps to address sustainability issues in the real estate development process (Boamah, 2015).

2.10.2 Phases of Real Estate Development

Real estate development goes through a process from the initial stage of acquiring a site to the selling off of project. Ideally, a developer acquires a land, develops the site and commence with construction, provides finish-out and makes the space ready for use, manages the property after completion, and may finally sell out the structure with time (Patrick, 2011).

In acquisition of land, various legal document is obtained where government's approval is secured prior to the purchase of the land. After the necessary documentation is done, the site is prepared and construction is commenced. The development or construction stage covers the greater part of the project cycle (Daley & Daley, 2011). Developed projects are given out to occupants and maintained by the developer whiles they are still in use (Patrick, 2011). The developer may decide to sell off the structure in the long run. Figure 2.2 depicts the various activities that goes on in the various stages of the real estate development cycle referred by the Project Management Institute, 2000 (Tucker et al., 2012)

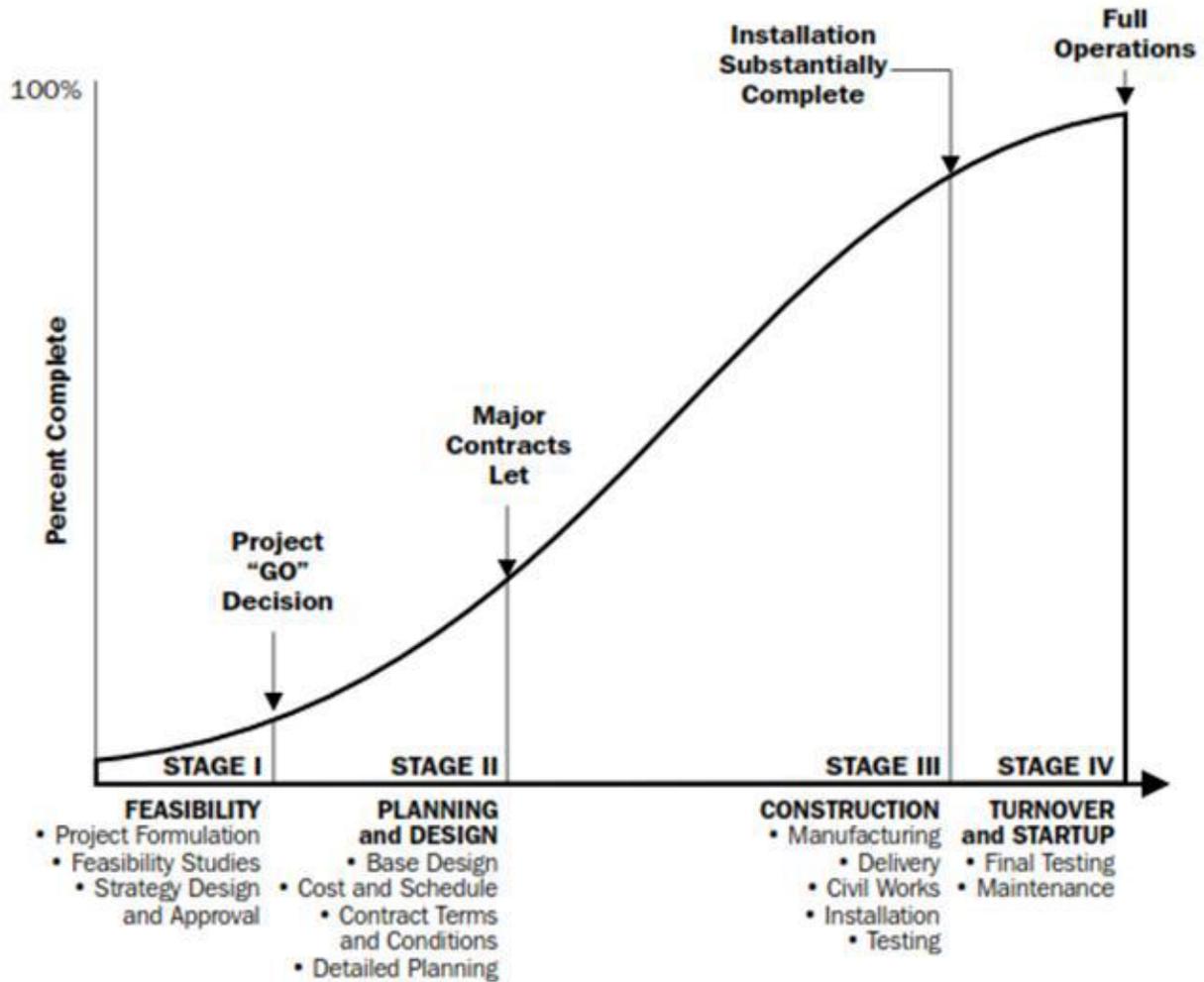


Figure 2. 1: Life cycle stage of development

Source: Tucker et al., (2012)

2.10.3 Procurement in the Real Estate Sector

The private business sector is noted to be a great contributor to the development of the economy, however its one sector which faces difficulties with regulatory constraints and raising capital for their operation (Digest, 2013). Irrespective of the contribution the private sector offers to the economy, real estate development is also seen as a source of diversion to investors who look

forward to expanding their scope of work and getting higher returns in the long run (Attributes, Tuomela-pyykkönen, Aaltonen, & Haapasalo, 2015).

Green building material are mostly consumed by real estate developers, therefore it is important developers adopt green procurement practices in order to enhance the development of sustainable products (Kalubanga, 2015). Activities in the real estate industry affects the environment, from the emission of hazardous substance into the environment, increased energy consumption, down to destruction of the ecological environment (Koranchie, 2015). Some of these activities include sales of land; construction; facility management; service provision such as wiring, painting, cleaning; and other activities associated with structures.

Assessment of procured services, goods or works are mostly done by most organizations. This is done to ascertain the impact the product has on the environment in the entire life cycle of the product or service (Koranchie, 2015). The labour force in charge of procurement are called Contracting and procurement managers. They work to find the most cost-effective deals on goods and services for the company. They analyse sales figures and inventory levels for current stock to determine whose services to patronise or what products to purchase. Contracting and procurement managers then seek both domestic and international suppliers to find the best deals. They pay attention to any developments that may affect the supply or demand of certain goods, and maintain solid technical knowledge of the product or services that they may need to purchase. Contracting and procurement managers also work with suppliers to negotiate contracts and oversee their execution (Procurement and contract management strategy, 2015).

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 INTRODUCTION

The study is aimed at exploring how sustainable procurement practices are adopted in the real estate industry within Ghana. This chapter therefore establishes the research methodological approach which was used to answer the questions in chapter one, in line with the themes which have been discovered in the literature review in chapter two. It begins with broad description of the research approach and design of the study. It also entails how the specific methods and techniques which were used in selecting respondents, gathering and managing data and how data collected were analyzed. Finally, it touches on ethical considerations.

Research methodology according to (Kothari, 2004) is the systematic method or step by step approach to defining a problem, formulating a hypothesis, collecting facts, and analyzing the facts collected. The analyzed facts help the researcher in reaching a conclusion in a form of solution (s) or recommendation towards the stated problem.

3.2 PHILOSOPHICAL APPROACH

The term research philosophy is defined as the system of beliefs and assumptions in developing knowledge in a study or research. These assumptions defines how research questions are understood, the methods adopted by the study, and how interpretations can be done on the research findings (Saunders, 2016). For a researcher to discover the nature of a study and have an idea on the fundamental philosophy of the study, major research paradigms must be known by researchers. In other words, researchers must understand or be familiar with the chosen methodology and

methods, and also know why the methodology and the methods were chosen to solve the research problem (Shah & Al-bargi, 2013).

Kuhn introduced the term “paradigms” in his seminar work *The Structure of Scientific Resolution*. Paradigms is defined by Kuhn as a substantive concepts, variables and problems that comes with conforming methodological approaches and tools (Shah & Al-bargi, 2013). Guba and Lincoln (1994) also defined research paradigms as the basic system or worldview that guides a researcher in a study (Yavuz, 2012). Paradigms is also defined by Chalmers (1982) as the general theoretical assumptions and laws, and techniques adopted by a community in a research. It is defined by it explicit stated laws and theoretical assumptions, standardized application of laws to solving issues, instrumentations and instrumental techniques, general principles that guide a research procedure, and the general methodological prescriptions about how to undertake a research work (Yavuz, 2012). Philosophical position of a research is underpinned by different considerations. Under philosophical position of a study, there are different views which best fits or represent a research design or approach. Ontological and Epistemological philosophical considerations are the two main philosophical considerations which are used in social research are discussed below in this study (Bryman, 2012).

3.2.1 Ontological Position in Research

Ontology is defined as the study of the nature of existence and structure of reality as such. It explains what is probable to know about the world (Al-saadi, 2014). Ontology deals with what we assume of the world in terms of the kind and nature (Yavuz, 2012). There are two perspectives ontological position is made of; the critical realism and the relativist (Fitzgerald & Howcroft, 1998). Critical realism views the world as independent of the human mind which cannot be accessed entirely but partly (Levers, 2013). The word ‘realism’ generated from the expression’s

transcendental realism and *critical naturalism*. A philosophy of reality must commence with a theory 'of being' (ontology) as different from a theory 'of knowledge' (epistemology). When 'what is' or 'what exist' is identified, critical realism then sets in to emphasize on issues regarding information conception about existing issues (Bergin et al., 2008). The realism position is quite independent of the researcher's mind (Bryman, 2012).

Relativist ontology according to Levers, 2013 explains that nothing exists outside human thought. It is believed that reality is a finite subjective experience (Levers, 2013). Relativist position confirms the primacy and experience of the individual. The observer, the perceiver is not in any way the center of the universe or that the universe is anthropocentric (Vernon & Furlong, 1992). This position helps in defining the universe, which affects how individuals think and the view conditioned by human experience (Vernon & Furlong, 1992).

3.2.2 Epistemology Position in Research

The assumptions made about the kind or nature of knowledge or the possibility attached to finding how the world describes the term epistemology (Al-saadi, 2014). In other words, epistemology talks about making sense out of how the world is seen (Al-saadi, 2014). With regards to this position, the researcher's position is centered on the methodology concerning its purpose and goals since research is carried out to look for ideas or knowledge (Jackson, 2013). The knowledge developed in this instance is reliant on the research methodology which is directly linked to the new knowledge (Jackson, 2013). Epistemology also provides philosophical grounds for the kind of knowledge needed for a study. This also seeks to come out with the adequacy and legitimacy of knowledge (A. Ahmed, 2008). Epistemology generally claims the knowledge which is valid in research when organizing knowledge, presenting the knowledge, and accepting the final results of knowledge (Tennis, 2008).

According to Denzini and Lincoln (2005), epistemology finds interest in the link between the researcher and the knowledge, and seeks to find how the knowledge about the world will be known. There are two opposing epistemological stances namely Positivist and Interpretivist Position. Positivist position confirms the relevance of emulating natural sciences. It advocates the use of natural sciences methods to social reality study and beyond (Bryman, 2012). Positivism emphasizes on the relevance of objectivity and proof in finding the truth, where the researcher does not affect the world in any way (Al-saadi, 2014). Value-free inquiry can be conducted as facts and values under positivism is distinct. That is, the researcher is not influenced by his or her research findings (Al-saadi, 2014).

Interpretivism on the other hand is an epistemological stance that takes into account the writer's views on the application of scientific model to study the world, and how it is affected by traditions (Bryman, 2012). This position differs from the positivist position which makes it difficult to apply scientific model to social study. More emphasis is placed on the practicality of context. It is therefore not possible to take an unbiased position when adopting the interpretivist position in a study (Bryman, 2012). Epistemologically, the study adopted the positivist position as established facts are used to verify scientific knowledge (Bryman, 2012).

3.3 RESEARCH APPROACH

Research approach can be described as the plans and the procedures for research that span the steps from broad assumptions to detailed methods of data collection, analysis, and interpretation (Mertens, 2012). Walliman, (2011) stated that the type of approach chosen is dependent on the drive of the study, the type and the obtainability of the required information. Naoum, (2007) also explained research approach as the manner in which the research objectives are attended to.

According to Bell & Bryman, (2007), and Saunders, (2016), research approach can be grouped into three different approaches, thus deductive, abductive and inductive.

Deductive approach begins with establishing a theory and identifying specific instances to which the identified theories apply (Hyde, 2016). The deductive approach focuses on the testing of theories (Flowers, 2009). According to Wilson, (2009), this type of research approach focuses on the development of hypothesis which are firmly based on theories, tested after the use of the research strategy. Deductive approach is mostly adopted for studies in the natural sciences (Collis & Hussey, 2003)

Trochim, Marcus, Mâsse, Moser, & Weld, (2008) defines the movement from the specific to general as inductive approach. Meissner, Creswell, Klassen, Plano, & Smith, (2007) also define inductive approach as bottom-up approach where the partaker's views are used to build broader themes and generate a theory. Inductive research approach deals with the development of theories Wilson, (2009) as well as gathering information (Saunders, 2016).

With the abductive research approach, it deals with the weaknesses of the deductive and inductive approaches. Kovács & Spens, (2006) highlighted that the abductive approach begins with deriving theories from literature review, presenting the theory in the form of hypothesis, testing the hypothesis in an empirical setting and then drawing conclusions in line with specific instances. Instead of moving from theory to data (as in deduction) or data to theory (as in induction), an abductive approach moves back and forth, in effect combining deduction and induction (Suddaby, 2006). This study therefore adopts the abductive research approach.

3.4 RESEARCH METHODS

Conventionally, quantitative and qualitative approaches have dominated in several studies (Creswell, 2014). In recent times researchers are gradually shifting towards a blend of both approaches which is commonly termed as a mixed method or pragmatic approach. One notable reason for this shift towards the emerging trend is to ensure limitations of both approaches are overcome to make studies more robust and rich (Creswell, 2014). Another advantageous characteristic of conducting mixed methods research is the possibility of triangulation (the use of several methods, data sources) to examine the same phenomenon. It further gives relatively higher accuracy by approaching themes from different viewpoints (Olsen, 2004).

This study therefore adopted the mixed method approach because sustainable procurement practices in the real estate industry revolves around diverse enablers and inhibitors. It therefore requires a comprehensive approach to understanding the issue by using quantitative data and techniques to unearth the extent while qualitative data is employed to ascertain the depth of the reasons which entice estate developers to either adopt or shun sustainable procurement practices.

3.5 METHODS AND TECHNIQUES

According to Jankowicz, (2013), research method refers to systematic and orderly approach employed to collected data in a manner that information can be generated from the data but a technique is the specific means followed in order to gather and analyze the data. Data comes in the form of facts, observations made, images, recordings, measurement or experiences on which a theory, test or hypothesis is based (Code & Conduct, 2017). If observation or facts are recorded in a narrative way, it is termed as a qualitative data, whereas observations or collections done on a scale are also termed as quantitative data (Kumar, 2011).

To achieve the objectives of this study, a survey was used to elicit primary data which was then evaluated and analyzed into a more understandable and useful information. The also study made secondary data. The secondary data was derived from journals, thesis, and books of the field of study.

3.6 STUDY POPULATION

Population of a research is the area from which answers to a research question is obtained. It is a study area where information is derived to solve a research problem (Kumar, 2011). This study targeted the real estate firms registered under Ghana Real Estate Developers Association (GREDA). The total number of registered companies in Ghana are 154 (Real Estate Journal, 2017). This study quantitatively elicited information from the procurement departments of the real estate firms. The population for qualitative data made use of institutions responsible for procurement and real estate in the country.

3.7 SAMPLE SIZE AND SAMPLING TECHNIQUE

The sample size of a study is deduced from research population. Selection of participant in a sample should be done without bias. It should be done on equal base (Saunders, et al. 2009). There are several approaches to determining the right sample size for a study. They include the use of similar study's sample size, published tables, using formulas, and using the population census (Israel, 1992). Saunders et al., (2009) noted that data can be solicited from an entire population if the size is manageable. When the population is large, the researcher resorts to the other sample methods (Gray, 2008). This method provides for no sampling error since all the individuals in the population are used. The population census technique was used for this study.

Hence, 154 companies were used to acquire the quantitative data needed for the survey. One official from the Public Procurement Authority and GREDA each were interviewed to obtain the qualitative data needed to complete the survey.

3.8 STUDY INSTRUMENTS

Designing or constructing a questionnaire makes use of wording and ordering of questions, selecting and wording of response kinds, and also giving highlights of the purpose of the study (Martin, 2006). The lay out of every questionnaire should not be clustered with unnecessary headings and numbers. It should be done attractively and neatly with relevant questions that seeks to answer the research questions (Burgess, 2001). If all questions are expected to be answered, simple and interesting questions needs to be asked first in other to raise the interest of the respondents (Burgess, 2001).

The merits and demerits of the survey questionnaires includes appropriateness of the method to the studied problem, accuracy of measurement done, generalizing findings, the convenience in administration of questionnaires, and possibly avoiding ethical or political issues in designing questionnaire (Marshall, 2006).

The content of a questionnaire measures it validity, reliability, accuracy, and consistency. After identifying the respondents to the questionnaire, the design of the questions was done in other to come out with the needed knowledge for the study. The questionnaire of this study encompasses open ended and close ended questions. It also includes scaled response type of question.

3.9 PRE-TESTING OF STUDY INSTRUMENTS

There was a pilot survey on the designed questionnaires before the main survey was organized. The pilot survey was done to pretest the survey questionnaires to discover any shortcomings in the survey instrument. Pretesting was done to minimize the challenges that are likely to be encountered by the respondents and the researcher when undertaking the main survey. It is very important and vital in the collection of data (Creswell, 2014). The pilot survey was conducted on 3 companies in the Ashanti Region. A respondent from each of the firms were asked to check the survey instrument for any difficulty in answering, ambiguity and the time spent in answering the questionnaires. Provision was made to add up to the questions in other to improve the preciseness of the questionnaire.

The pilot survey confirmed the suitability of the methods and instruments used in the study. No error and distortion was detected in the questionnaire after the pre-test per feedbacks. The pre-test helped the researcher to acquaint herself with the research environment and also offered the chance to practice research in real situation before the main study began.

3.10 DATA COLLECTION TECHNIQUES

For the purpose of this study, the collection of data was done using both questionnaire and conducting interview. Questionnaire is made up of questions that is needed to be answered in other to accomplish the purpose of a study. Questions in a questionnaire normally entails checklist and rating scales needed to make human behavior or attitude quantifiable and more simplified in a survey (Marshall, 2006). Questionnaires are administered to a sample of a population to be acquainted by characteristics, attitudes or beliefs of respondents (Marshall, 2006).

The honesty and accuracy of respondents are well trusted by the researcher with the use of the questionnaire (Marshall, 2006). The use of questionnaires are more useful when a large group of

respondents are needed in data collection. They are made up of several questions with structured response and open ended questions (Marshall, 2006).

An interview on the other hand is a conversation for gathering information. A research interview involves an interviewer, who coordinates the process of the conversation and asks questions, and an interviewee, who responds to those questions. Interviews can be conducted face-to-face or over the telephone. The internet is also emerging as a tool for interviewing (Samadi et al, 2014). Interviews are an appropriate method when there is a need to collect in-depth information on people's opinions, thoughts, experiences, and feelings. Interviews are useful when the topic of inquiry relates to issues that require complex questioning and considerable probing. Face-to-face interviews are suitable when your target population can communicate through face-to-face conversations better than they can communicate through writing or phone conversations (Alshenqeeti, 2014).

3.11 ADMINISTRATION OF QUESTIONNAIRES AND CONDUCTION OF INTERVIEWS

Questionnaires for this study were electronically administered to the various real estate companies in Ghana, registered under the Ghana Real Estate Developers Agency (GREDA) through the use of the Survey Monkey. The survey instruments were purposively administered to the procurement offices of the various estate agencies. Two field assistants were oriented to help with the field survey. They helped the researcher in visiting the various real estate firms to make sure the questionnaires were answered. The survey exercise begun officially on 18th February 2019 and was proposed to end in 2 weeks. Due to unforeseen delays in answering of the questions, the survey lasted for 4 months in getting a required number for analysis. More follow-ups were made to gather the additional responses during the supplementary period.

Permission was granted from various institutions before the interview took place. The interviews were conducted right after the quantitative data was collected, which lasted for 2 weeks.

3.12 DATA PROCESSING AND ANALYSIS

Measuring the scale of variable gives an idea of the statistical method to use (Agresti, 2007). The characteristics or features of a population is defined by variables which differs in value (Ryan, 2009). Data obtained from the survey needs to be well organized to reduce the error margin, improve data quality and also discover shortcomings that can affect the outcome of the study (Yuen, 2018). This is done before the main statistical analysis in order to accomplish a consistent, accurate and readable work. After a successful organization of the field data, the quantitative data was passed through the SPSS software to help control the effect of missing data automatically (Bryman, 2005). Analysis of the quantitative data commenced after a successful input of data into the SPSS (Statistical Package for Social Sciences) computer software application.

The quantitative data analysis adopted the descriptive statistical tool by using the Relative Importance Index (RII) which helped in ranking variables identified in the literature review. Descriptive statistics is an analytical tool used to summarize and present data which comes in large quantities. It provides the platform to convey the outcome of the study in a more understandable manner to others (Ryan, 2009). The descriptive analysis made use of mean values and standard deviation. In ranking the variables, W =weightings given by respondents, which ranges from 1 to 5, A = the highest weight (5), N = the total number of samples.

Qualitative data, such as transcripts from an interview, are often also routed in the interaction between the participant and the researcher. Reflecting on how you, as a researcher, may have influenced both the data collected and the analysis, is an important part of the analysis (Richard, et al., 2014). Qualitative data analysis involves making sense out of the data collected from the

interview. According to a study (Creswell, 2014), it involves preparing the data for analysis, conducting different analyses, moving deeper and deeper into understanding the data, representing the data, and making interpretation of the larger meaning of the data. The qualitative data analysis was done by transliterating the responses generated from the interview into themes in order to make meanings out of them.

3.13 ETHICAL CONSIDERATIONS

Research done should not be done at the expense of another's privacy right. Ethical issues are therefore needed when involving another party as a respondent in a research work. Permission was sought from the heads of the companies where the data was gathered before administering the questionnaires. The study was done purposely for academic work and that, the responses made by the respondent were used for the intended purpose only. Information provided by the respondents were given the highest level of confidentiality. Overall, the Kwame Nkrumah University of Science and Technology code of conduct for research was adhered to suit research objectives.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1 INTRODUCTION

This chapter presents the analyses of data collected from respondents who are staff in procurement departments of real estate industry. In line with the objective and questions the analysis comprises of four sections. The first section is an introduction of the socio-demographic characteristics. The second, third and fourth sections answers the research questions on current state of sustainable procurement practice in Ghana's real estate industry, challenges faced in the sustainable procurement and critical success factors for enabling sustainable procurement respectively.

An electronic questionnaire was developed with survey monkey, an online statistical tool and links were mailed to all real estate companies registered who are part of GREDA. A five-point Likert Scale was used to elicit responses from staff of these institutions per the objective of the study. Respondents were mainly procurement managers, assistant procurement managers, agents, maintenance officers and investors.

4.2 BACKGROUND DATA OF RESPONDENTS

Out of the One hundred and fifty-four (154) questionnaires which were expected to be completed by respondents within the real estate industry who were registered members of GREDA, responses were received from 126 respondents. Table 4.1 provides a background of the respondents. Clearly, all respondents have had some form of tertiary education as pertains in Ghana. More than half (57.9%) of respondents have some form of advanced tertiary education.

Table 4 1: Demographic Characteristics of Respondents

Respondents Characteristics	Frequencies	(%)
Role in Procurement Department		
Procurement Manager	23	18.3
Assistant Procurement Manager	32	25.4
Agent	29	23.0
Investor	23	18.3
Maintenance Officer	19	15.1
	126	100
Education Level		
Doctorate	29	23.0
Masters	44	34.9
Bachelor's Degree	25	19.8
Diploma	28	22.3
	126	100
Procurement Experience (in Years)		
Less than 5 years	23	18.3
5-10 Years	40	31.7
11-15 Years	38	30.2
Above 15 Years	25	19.8
	126	100
Frequency of Procurement Activities		
Daily	9	7.1
Weekly	28	22.2
Monthly	30	23.8
Quarterly	30	23.8
Annual	17	13.5
Others (When Needed)	12	9.5
	126	100

Source: Field survey, 2019

With reference to Table 4.1, respondents had differing experiences. About 82 per cent of respondents have been involved in such activities for more than five years, with about 30 percent of respondents having experiences ranging from 11 to 15 years. Close to twenty (20) percent of respondents have also been in the procurement business for over 15 years.

In terms of frequency of procurement activities by their organizations, 47.6 percent of respondents are engaged in procurement activities on monthly and quarterly basis. However, about 13.5 percent are engaged in procurement activities annually while 9.5 percent have purchasing plans which extend beyond a year. The data also indicates that some industry players are engaged in procurement activities daily and when necessary. The real estate industry is very dynamic and the reasons for such variations in the frequencies of procurement could be due partly to organizational policies aimed at cost reduction.

The role of respondents in these firms were also sought. About 18.3 percent were procurement managers and 25.4 percent were procurement assistant managers. There were also some agents, maintenance officers and investors who constituted 23.0, 15.1 and 18.3 percent respectively.

4.3 CURRENT STATE OF SUSTAINABLE PROCUREMENT PRACTICE IN GHANA

As established in the literature, natural resources which drive development are exhaustible and their over exploitation have dire consequences on humans and other living creatures. This has primarily necessitated the global strive and focus on sustainability in all sectors of development (Sachs & Schmidt-traub, 2015). Undoubtedly, the construction sector to which real estate industry belongs is recognized as a major contributor to depletion of non-renewable resources due to population increase and resultant housing and development demands (Shen et al., 2017). Sustainable procurement actions in the real estate industry will reduce the exhaustion and negative climate effects greatly (Shen et al., 2016). As this global agenda is pursued, the state of sustainable development practice in Ghana needs to be ascertained.

Accordingly, respondents' perceptions of the state as pertains to the real estate industry in Ghana with ratings on practices within their firms within Ghana were sought. Perceptions of respondents' specific practices are discussed in this section. A cumulative percentage is also used to rate the actual situation as pertains to Ghana's real estate industry based on implementation of sustainable procurement practices per the Public Procurement Act 663 (2003), involvement of suppliers, relationship between firm and its suppliers, existence of proper standards, procedures and process which are clearly defined (in contracts and documents), clear environmental policy direction and incorporation of policy direction in actual practice. Results of respondents' is shown in Table 4.1.

Table 4.2: Respondents Perception on Sustainable Development Practices in their Firms

CURRENT STATE OF SPP	MEAN	RANK
Supplier involvement in your sustainable procurement practices	3.28	1 ST
Implementation of procurement practices is done in accordance with the Public Procurement Act 2003, Act 663	3.21	2 ND
There is cordial relationship between your firm and its suppliers	3.12	3 RD
Proper standards, procedures and processes on sustainable procurement are spelt out in procurement agreements that are for both tender and contract documents.	3.11	4 TH
The firm incorporates environmental sustainability practices in their procurement process	3.06	5 TH
The firm's environmental policy document ensures sustainability	3.02	6 TH

Source: Field survey, 2019

The Public Procurement Act is not very explicit on environmental sustainability issues. However, it provides some room to accommodate such issues. Sections 19, 28, 48, 50, 68 and 69 which

provides directives on composition of a tender evaluation board of experts, margin of preference, contents of invitation for tender and use of standard tender documents, contents of request for proposals for consultancy services and criteria for evaluating proposals provide a guide for including environmental sustainability concerns (Adjarko, Polytechnic, Ayarkwa, & Agyekum, 2015).

Supplier involvement in your sustainable procurement practices was ranked first with a mean of 3.28. The real estate industry has a lot of stakeholders. Identifying and situating individual responsibilities through discussions leads to effective collaboration, mutual commitment and proper perception (Janouř, 2012; Testa et al., 2014). Suppliers are among the key stakeholders in this industry.

The data as indicated in Table 4.1 above shows that considered adherence to the PPA to be very significant with a mean of 3.21 ranked 2nd. This is consistent with findings from China and most developing countries which pointed to laxity in enforcement of law. This makes industry players disregard environmental concerns. Such lack of legal support also makes purchase and use of sustainable materials unattractive (OECD, 2017; Mensah & Ameyaw, 2012)

However, respondents' ratings on cordiality of relationships that existed between their organization and suppliers in the real estate industry differed slightly. It was ranked third with a mean of 3.12. The issue of relations is probably due to the immature nature of the real estate market in Ghana which is consistent with the findings of (Lovins, 2015). According to Lovins, (2015) strong stakeholder relations thrive in matured markets where financial and time-effectiveness concerns have been addressed through economic and environmental information provision and simplified administrative procedures.

For sustainable procurement practices present in Table 4.2 to be adopted, the commitment of the real estate industry players is necessary. Government pressure and internally induced commitment are the two basic drivers of this type of commitment (Shen et al., 2016). Usually, this commitment when existent is seen in organizational standards, processes and procedures and are clearly communicated to suppliers through sourcing processes and documentations. Top level staff can pull middle and lower level staff along with these processes when good understanding is share and effected through trainings with specific policy direction (Kramar, 2014).

The policy direction of a firm is another important element in achieving sustainability throughout the construction cycle including procurement. According to Pratima & Kendall, (2012) when an organization considers environmental sustainability as the “right thing to do” and not issues to comply with, it will have a positive attitude towards sustainability. They argue that such considerations often arise not from general regulations which demands compliance but values of organization or some powerful individuals in the organization. In effect, the policy direction of leadership in the organization is key.

Sustainable procurement practices are noted to be adopted when individuals in organizations know the real impact of items and goods they purchase and information on sustainable procurement standards within their jurisdiction (Anees, Zaidi, Mirza, Hou, & Ashraf, 2018). Respondents perception on their knowledge and awareness of sustainable procurement practices in Ghana are were as shown in Figure 4.1.

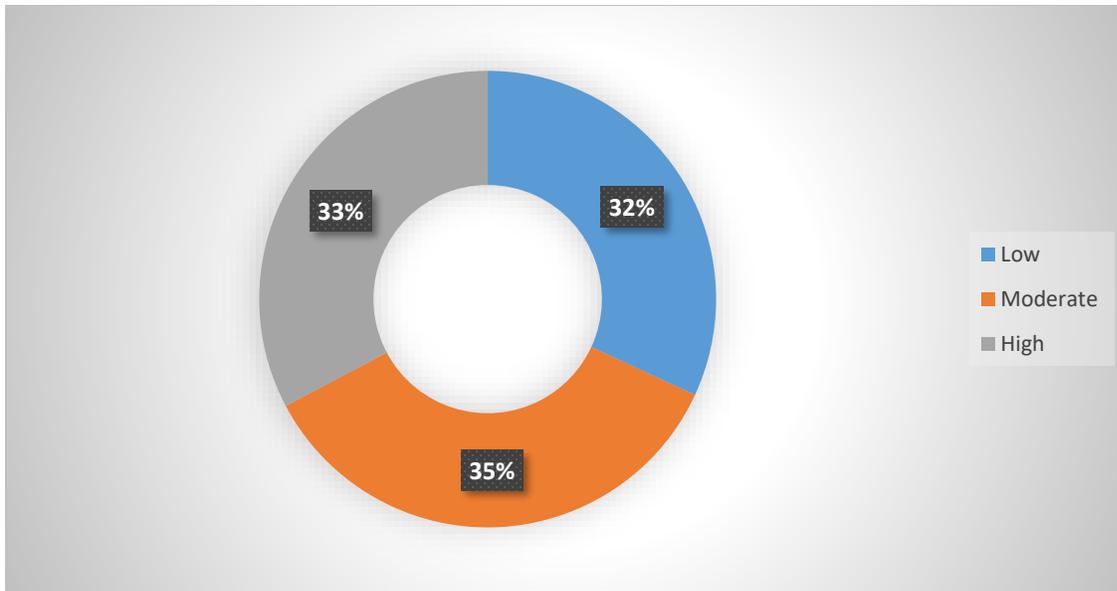


Figure 4.1: Respondents Ratings of their Knowledge on Sustainability

Source: Field survey, 2019

About 32 percent of respondents rated their knowledge to be low, while 33 percent rated their knowledge to be high and 35 percent rated their knowledge to be moderate. This suggests that real estate industry players' knowledge and awareness on sustainable procurement is not sufficient as the majority of respondents' ratings indicated they have moderate or low knowledge on sustainable procurement.

Chi-square test was conducted to find out if respondents' knowledge and awareness were associated with their educational level, years of experience or professional role in the real estate sector at a significance level of 0.05, which is the default test significance level in SPSS.

Table 4.3 indicates that 40.0 percent of procurement professionals perceived their knowledge on sustainability to be low while 35.2 percent of non-procurement professionals rated their knowledge to be low. In terms moderate knowledge, there was 25.5 percent of procurement professionals as against 38.0 percent of non-procurement professionals. However, 34.5 percent of procurement

professionals considered their knowledge to be high while non-professionals who rated their knowledge to be high were 26.8 percent. At a Chi-square value of 2.319 and p-value of 0.314 which is greater than a significance level of 0.05, there is no statistically significant association between procurement professionals and non-procurement professionals in the real estate industry in Ghana. This implies professionals in the real estate industry regardless of their role have some knowledge about sustainability but it is generally insufficient.

Table 4.3: Chi-Square Test of Association between Role and Awareness of Sustainable Procurement Practice

ROLE	Level of Awareness			Total	Chi-Square Value	P-Value
	Low	Moderate	High			
Procurement Professionals	22	14	19	55	2.319	0.314
	40.0%	25.5%	34.5%	100.0%		
	46.8%	34.1%	50.0%	43.7%		
Non-Procurement Professionals	25	27	19	71		
	35.2%	38.0%	26.8%	100.0%		
	53.2%	65.9%	50.0%	56.3%		
Total	47	41	38	126		
	37.3%	32.5%	30.2%	100.0%		
	100.0%	100.0%	100.0%	100.0%		

Source: Field survey, 2019

As presented in Table 4.4, the test of association between education status and level of knowledge and awareness in a similar manner did not differ significantly. Among respondents who had master's degree and above, 38.4 percent had low knowledge, 31.5 percent considered themselves be moderately knowledgeable about sustainability while 30.1 percent had high knowledge. For respondents who had Degree or Diploma, 35.8 percent had low knowledge, 34.0 were moderately

knowledgeable while 30.2 percent had high knowledge about sustainability. At a Chi square value of 0.109 and p-value of 0.946 which is lower than the significant level of 0.05, the test indicates that there is not statistically significant association between educational status and knowledge about sustainability.

Table 4.4: Chi-Square Test of Association between Education Level and Awareness of Sustainable Procurement Practice

Education Level	Awareness			Total	Chi-Square Value	P-value
	Low	Moderate	High			
Above Master's Degree	28	23	22	73	0.109	.947
	38.4%	31.5%	30.1%	100.0%		
	59.6%	56.1%	57.9%	57.9%		
First Degree/Diploma	19	18	16	53		
	35.8%	34.0%	30.2%	100.0%		
	40.4%	43.9%	42.1%	42.1%		
Total	47	41	38	126		
	37.3%	32.5%	30.2%	100.0%		
	100.0%	100.0%	100.0%	100.0%		

Source: Field survey, 2019

As shown in Table 4.5, the test of association between years of experience and knowledge about sustainability also indicated that there was no statistically significant difference. Among respondents who had experiences in the real estate sector spanning over ten (10) years, 41.3 percent had low knowledge, 27.0 percent had moderate knowledge while 31.7 percent had high knowledge. On the other hand, respondents who have experiences of about ten years and below 33.3 percent had low knowledge, 38.1 percent were moderately knowledgeable and 28.6 had high knowledge about sustainability.

This also means that within the real estate sector, the extent of experience acquired does not relate with knowledge about sustainability. At a Chi-square value of 1.832 and p-value of 0.05, there is no statistically compelling evidence.

Table 4.5: Chi-Square Test of Association between Years of Experience and Awareness of Sustainable Procurement Practice

Years of Experience	Awareness			Total	Chi-Square Value	P-Value
	Low	Moderate	High			
10 years and Below	21	24	18	63	1.832	0.400
	33.3%	38.1%	28.6%	100.0%		
	44.7%	58.5%	47.4%	50.0%		
Above 10 Years	26	17	20	63		
	41.3%	27.0%	31.7%	100.0%		
	55.3%	41.5%	52.6%	50.0%		
Total	47	41	38	126		
	37.3%	32.5%	30.2%	100.0%		
	100.0%	100.0%	100.0%	100.0%		

Source: Field survey, 2019

In all these findings, implication is that within the real estate industry in Ghana, there is insufficiency of knowledge and awareness on sustainability in general irrespective of education, role in the sector and years of experience. This finding supports that assertion of Djokoto, Srofenyoh, & Gidiglo, (2014) who found that though industry players are desirous of adopting some sustainability practices, they do not have the appropriate knowledge and how to actually put the knowledge into practice.

A cumulative percentage frequency performance grading system was further used to ascertain the overall state of sustainability practice in Ghana per the ratings of respondents (Rubaish, 2010). The Grading system is as depicted in Table 4.6 with interpretation. High quality grading ranges

from 80% to 100% which indicates perfection in the practice of sustainable procurement. 60% to 79% indicates moderate practice of sustainable procurement. Poor quality as per the table indicates poor practice of sustainable procurement which falls below 59%.

Table 4 6: Cumulative Percentage Grading Criteria

S/N	Grading	Cumulative Percentage
1	High Quality	• 80-100
2	Acceptable Practice	• 60-79
3	Poor Quality	• Below 59

Source: Field survey, 2019

The results of the cumulative frequency percentage per respondents' ratings of the various practices on the 5-point Likert scale is as shown in table.

Table 4.7: State of General Sustainability Practice among Real Estate Developers

S/N	Grading	Cumulative Percentage
1	High Quality	2.4
2	Acceptable Practice	62.7
3	Poor Quality	34.9
	Total	100

Source: Field survey, 2019

This indicates that among the real estate players registered under GREDA, majority (62.7 %) of firms are engaged in some form of sustainable procurement practice. This is evident by the overarching moderate ratings among respondents in all of the sustainable practice indicators measured. However, about one-third (34.9%) of the industry players also need to improve on their practices.

4.4 SUSTAINABILITY PRACTICE ALONG THE PHASES OF THE PROCUREMENT CYCLE

The awareness of the need to shift from traditional procurement process to sustainable procurement is good. Yet, the recognition at major phases of the procurement process must be intentionally conducted to ensure there is no trigger of imbalance in the environment (Wibowo, 2018). The Australian Department of Public Works and Housing (2018) aptly posit that sustainability considerations should be fused into each stage of the procurement process because there are opportunities and strategies which can be leveraged to ensure better environmental and social impacts in dealing with suppliers and managing supply arrangements. Majerník, Daneshjo, Chovancová, & Sančiová, (2018) further suggests that if there are tools which aid practical designing and verification of sustainability from developing criteria for evaluation through to the closing of the contract, it will yield great sustainability benefits.

Hence, the depth of sustainable practice as pertains to the procurement cycle was ascertained by respondents' ratings to further understand how real estate industry players of GREDA ensure sustainability at various phases of the procurement cycle.

4.4 1 Sustainability Compliances at Preparatory Phase of Procurement Cycle

The preparatory phase of the procurement cycle is primarily concerned with identification of procurement needs and how to satisfy these needs. Ensuring sustainability at his stage means that procurement should consider economic, environmental and social concerns.

Table below shows that 42.8 percent of respondents consider that their organizations ensure sustainability during the planning phase of their procurement planning while 27.8 percent and 29.8 percent rated such consideration to be low and moderate respectively.

Table 4.8: Ratings of Sustainability at the Planning Phase

Ratings	Frequency	Percent
Low	35	27.8
Moderate	37	29.4
High	54	42.8
Total	126	100.0

Source: Field survey, 2019

This indicates that though some demand analysis considerations are well practiced by some real estates, there is still some gap. As this stage enables organizations to assess their needs to know if there are possible sustainable ways of meeting their need, more than half of organizations considered their practice at this stage to be moderate or low. In effect, necessary attempts towards mainstreaming sustainable consumption such as adopting strategies to manage demand and purchase of items which can be reused, repaired and recycled are overlooked in the planning phase (“Sustainable Procurement Guide,” 2018). Probable causes of such partial and low consideration for demand analysis are due to non-existence of procurement manuals and other guidelines, poor enforcement of procurement legislation and lack of knowledge sustainability actions necessary to conduct such analysis (Eltayeb & Zailani, 2009).

4.4.2 Sustainable Compliances at Technical Specification Phase of Procurement Cycle

The technical specification phase of the procurement process entails measurable requirement by which tenders will be evaluated. In usually includes, criteria for supplier qualification, description of minimum requirement with regards to supply, award criteria and contract provisions. As shown in the data presented in Table 4.8, 30.2 percent of respondents rated this practice of ensuring sustainability to be low while 33.3 percent consider such practices to be moderately practiced.

Conversely, the remaining 36.5 rated this practice to be high. The indication is that though the case is not blatantly overlooked, about two-thirds of organizations do not attach high importance to this practice as about 63.5 percent of respondents rated this practice to be moderate or low.

Table 4.9: Ratings of Sustainability at the Technical Specification Phase

Ratings	Frequency	Percent
Low	38	30.2
Moderate	42	33.3
High	46	36.5
Total	126	100.0

Source: Field survey, 2019

According to the Guidance, (2019), when organizations have a high consideration for practicing sustainability, clear conformance and performance-based specifications will be used to evaluate attributes of products and their proposed functions to ensure balance in the environment. The data therefore indicates that these critical sustainability concerns are handled apathetically by real estate industry players in Ghana.

A key informant mentioned that “estate developers do not think about sustainability; they are profit oriented. The few who seem to have some knowledge do not know the practical ways of ensuring it is implemented. For instance, if you consider the nature of the people, they hire in the course of their activities of some of them are minors. It is a clear breach of the social pillar of sustainability but they do not notice.

4.4.3 Sustainable Compliances at Supplier Selection of Procurement Cycle

The supplier selection phase focuses on suppliers’ ability to deliver the contract. It has several opportunities for influencing suppliers through information sharing with sustainability concerns through advance notice (Guidance, 2019). Another major opportunity in this stage is space for

educating suppliers on sustainability on general procurement laws and regulations as part of the criteria (UN, 2008). The opportunity for ensuring sustainability in this stage is centered on description of a criteria which revolves around economic, social and environmental issues in addition to the other criteria which will be used to evaluate proposals. As shown in Table 4.11, 44 (34.9 per cent) of respondents rated considerations of sustainable procurement low, 38 (30.2 percent) perceived it to be high while 44 (34.9 percent) considered it to be high.

Table 4 10: Ratings of Sustainability at the Supplier Selection Phase

Ratings	Frequency	Percent
Low	44	34.9
Moderate	38	30.2
High	44	34.9
Total	126	100.0

Source: Field survey, 2019

This implies that there is some moderate and high practice of ensuring sustainability at the supplier selection stage of the procurement cycle in the Ghanaian real estate industry but one in three of firms do ensure incorporation of sustainability in selecting their suppliers. As high practice leads to proper allocation of order sizes among suppliers to manage demand and avoid over production a gap in knowledge on taking advantage of this stage within the cycle is obvious among 65.1 percent of organizations who have low and moderate attitude (Institute, 2018).

4.4.4 Sustainable Compliance at Tender Evaluation Phase of Procurement Process

The evaluation stage entails scrutiny of the offers which have been received and reckoned valid. It is the point in the cycle where actual specification of requirements is checked. It offers an opportunity for organizations to check if these tenders submitted meet their needs. If the demand analysis was appropriately conducted economic, environmental and social indicators would

influence the tenders and serve as a basis for selecting the best offer (UNDP, 2006). It is also necessary to conduct evaluation on the organizations submitting the offer to distinguish between those who can deliver and those who are able to deliver just good offers in writing.

As shown in Table 4.12, 27.0 percent (34) of respondents rated their organization as practicing low sustainability in terms of evaluation while 34.1 percent (43) posited that such a practice is considered moderately. Yet, 38.9 percent (44) of respondents their organizations to be performing high.

Table 4.11: Ratings of Sustainability at the Tender Evaluation Phase

Ratings	Frequency	Percent
Low	34	27.0
Moderate	43	34.1
High	44	38.9
Total	126	100.0

The indication is that at this stage of procurement the Ghanaian real estate industry has not completely ignored sustainability practices but the level of practice needs to be enhanced as it deprives the industry of a clear opportunity of moving suppliers along the path of sustainability by setting some minimum sustainability weight criteria which suppliers are required to achieve just like any other criteria in order to win a bid (Kwok, 2014).

4.4.5 Sustainable Compliance at Contract Implementation Phase of Procurement Cycle

The contract implementation phase entails supervision to make sure both parties to the contract meet their obligations completely. For the purpose of ensuring sustainability at this level, efficiency and effectiveness in delivering economic, social and environmental issues in the

contract becomes the primary goal (UNDP, 2006). A contract management plan is necessary for smooth facilitation of this phase to ensure the focus of sustainability is not lost and initial drive for achieving set goals are not reduced (Guidance, 2019). In essence, monitoring and evaluation becomes crucial.

Table 4.13 depicts respondent ratings at this phase of the procurement cycle. Out of 126, (43) 34.1 percent of respondents rated this to be low while 34.9 percent rated it to be moderately practiced. Thirty-one (31.0) percent of respondents considered their practice of sustainability at this stage to be high. The implication of this is that the greater portion of real estate industry players minimally ensure sustainability. This is inconsistent with the claim of Mensah & Ameyaw, (2012) who argue that sustainable procurement practices are disregarded. However, there is still some gap as one in three (34.1 percent) of real estate players considered this to be low.

Table 4.12: Ratings of Sustainability at the Contract Implementation Phase

Ratings	Frequency	Percent
Low	43	34.1
Moderate	44	34.9
High	39	31.0
Total	126	100.0

Source: Field survey, 2019

Again, a cumulative percentage was used to ascertain the overall ratings of the real estate players along the phases of the procurement cycle. Table 4.14 indicates that 5.6 percent of organizations under GREDA have sustainable procurement practices of which are of a high quality but practice

of the majority (56.3 percent) is acceptable. It is also worthy to note that 38.1 percent of organizations need to improve on their practices along the procurement phases.

Table 4.13: Grading of Sustainability along the Procurement Cycle

Grading	Frequency	Percent
High Quality	7	5.6
Acceptable	71	56.3
Needs Improvement	48	38.1
Total	126	100.0

Source: Field survey, 2019

Comparatively, the state of the sustainable procurement practices as shown in Table 4.5 and sustainability along the procurement cycle in Table 4.11, there was no significant differences in practice as shown in Figure 4.3 below.

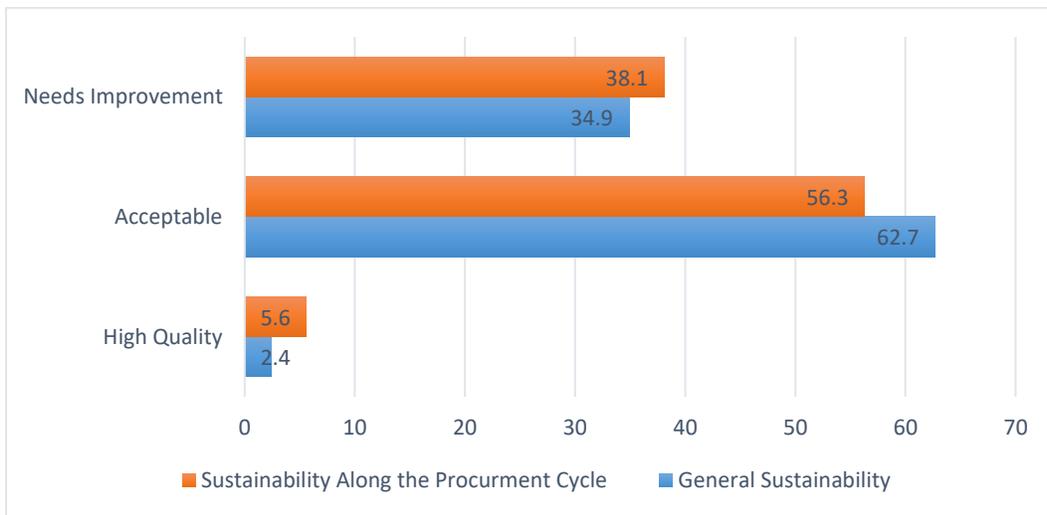


Figure 4.2: Comparison of General Sustainability and Sustainable Procurement Practice along the Procurement Cycle among Real Estate Developers in Ghana

The percentage of real estate industry players who needs to improve practice along the procurement cycle increased from 34.9 percent to 38.1 percent while those who had acceptable practice reduced from 62.7 percent to 56.7 percent. However, the percentage of industry players who had high quality sustainable practice increased form 2.4 percent to 5.6 percent when considered along the phases of sustainability.

4.5 CHALLENGES OF SUSTAINABLE PROCUREMENT PRACTICE

The recognition that sustainable procurement within the real estate industry will reduce the impact on environmental, social and economic live of individuals, communities, organizations and nations is well underscored in literature (UNEP, 2012; Wibowo, 2018). Despite this great acknowledgement, there are several challenges which militate against sustainable procurement practices which have been commonly labelled in general terms as barrier or drawbacks (Shen et al., 2017). Nevertheless, challenges as identified by different studies differ from country to country. This part of the analyses entails a contextual assessment of how these challenges affect the real estate industry in Ghana.

Challenges as identified in the literature were listed for participants to rate how this challenge are relevant to the real estate industry in Ghana and the extent to which they affect the sustainable procurement actions in their various organizations. Respondents were also given the freedom to include any other challenge which considered different from these broad themes but use the same scale to provide a rating. The challenges included in the survey questionnaire were;

- Difficulties in information and technology applications,
- Low social drive
- Low technical and management capacity

- Low multi-stakeholder approach
- High initial cost of green materials.

4.5.1 Difficulties in Information and Technology applications Challenge to Sustainable Procurement

The practice of sourcing and purchasing items in the real estate industry has evolved due to the sustainable development agenda. This has sparked a remarkable shift in product production due to change in demand for sustainable materials which have different technologies (Alia & Mohamad, 2017). Coping with this trend demands enhancement in knowledge for installation of sustainable products.

The data as shown in the Figure 4.4 indicates respondents' perception of how information technology advancement difficulties hinder their adoption of sustainable procurement practices and product. The ratings of respondents show that while 48 (38.1%) considered ICT difficulties to moderately impact on their adoption of sustainable procurement, 42 (33.3%) considered it to be a key challenge. On the contrary, 36 (28.6) do not see ICT as a difficult challenge in relation to adoption of sustainable procurement practice. The indication then is that ICT impacts the desire of organizations within the real estate industry players' adoption with about 71.4 percent of respondent considering it to influence their choices moderately or highly.

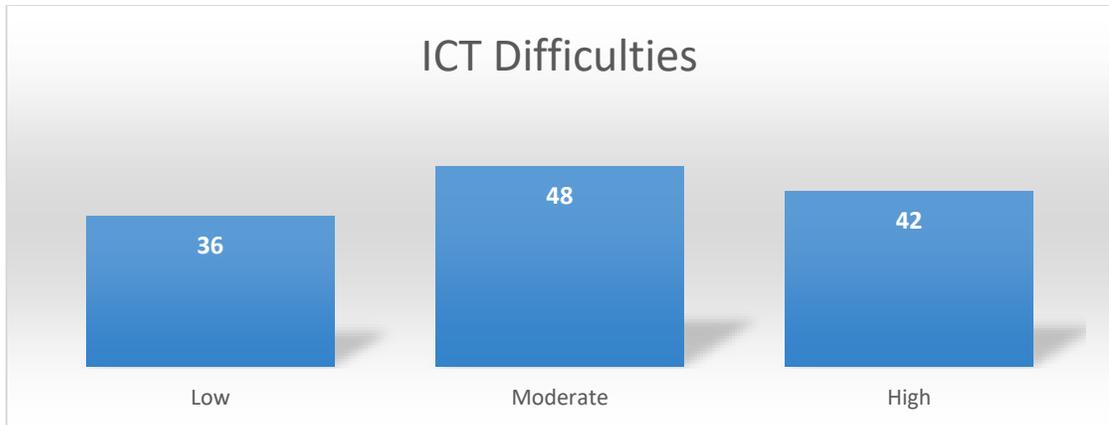


Figure 4.3: Ratings of ICT Challenges Experienced

Source: Field survey, 2019

This situation is consistent with the claim of UN, (2017) who found that in the United States sustainable products required higher technical ability to use than traditional products and thus impact on firms' decisions to adopt sustainable procurement practices.

4.5.2 Social Drive Challenge to Sustainable Procurement

The nature of real estate market activities is influenced by organizations drive for social considerations and also partly by consumers who are enlightened on sustainability. This section of the challenge sought to establish whether organizations social inclinations influenced their adoption or otherwise of sustainable procurement practices.

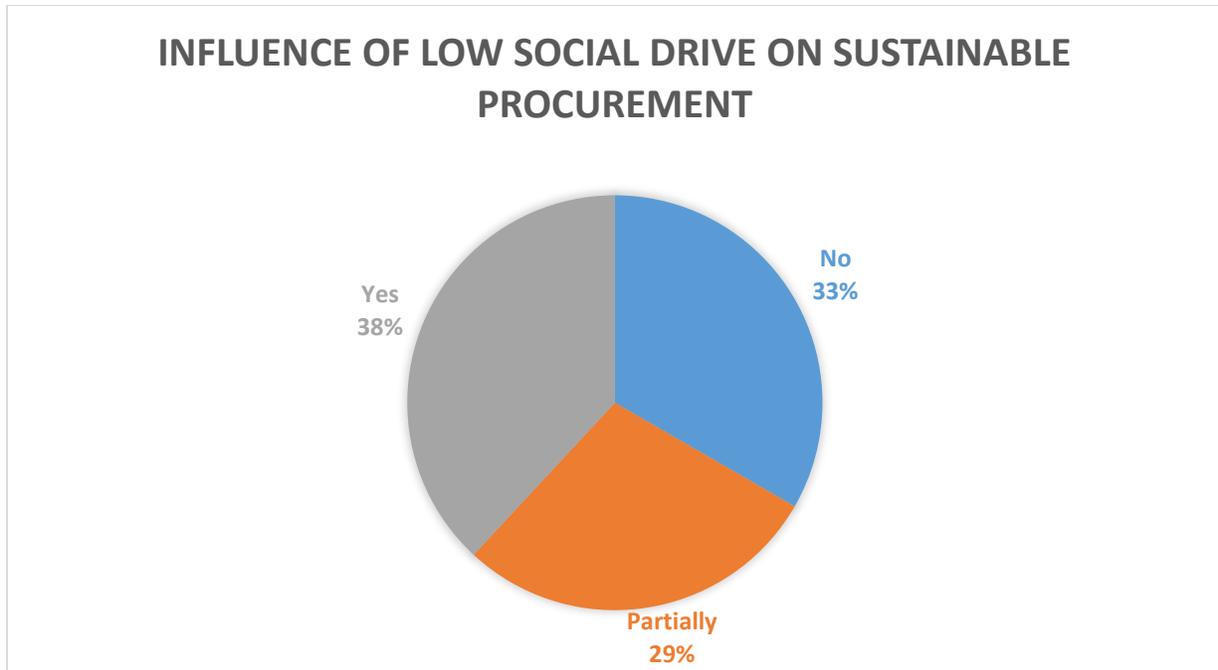


Figure 4.4: Influence of Low Social Drive on Sustainable Procurement

Source: Field survey, 2019

As shown in Figure 4.5, 33 percent of respondents opined that it is low and 38 percent considered it to be a high while 29% also considered it to partially influence the decision of adopting. This means a lack of social drive impacts decisions of organizations partially and highly in the Ghanaian real estate industry. This finding is also consistent studies conducted in China (Mathiyazhagan, Govindan, Noorulhaq, & Geng, 2013). It however differs from the view of Häkkinen & Belloni, (2016) who argue that this inertia among players in the construction sector is chiefly a matter of change in process rather than the items because of the fear of incurring some hidden costs in the process of acquiring these items.

4.5.3 Low Technical and Management Capacity Challenge to Sustainable Procurement

It is obvious that the paradigm shift has made it necessary for organizations to learn about sustainable procurement benefits and use of necessary tools. Availability of information and

training within organizations must be recognized by top level managers who are considered strategic drivers or barriers to the adoption of sustainability practices in general and sustainable procurement in particular (Alia, Bohari, Skitmore, Xia, & Zhang, 2016). According to Kipkorir, (2015) existing practices must be reviewed before sustainable procurement plans can be implemented and this must include life cycle assessments. Such regular reviews will then be incorporated into organizational policies, plans and programs. When such review processes are led by top level management traditional procurement systems are likely to change.

The data as presented in Figure 4.6 shows that 37.3 percent of respondents considered this factor as affecting their attempts at ensuring sustainability in their procurement while 25.4 percent reckoned it to be low. About 37.3 percent also rated this challenge as influencing their sustainable practice considerations. The data indicates that in the real estate industry in Ghana, low technical and management capacity also impacts their sustainable procurement practices with 94 (74.6%) consider it to actually influence their decisions moderately or highly. This finding also confirms the claim that top management staff are key internal drivers who could facilitate adoption of sustainable development practices among middle and low level staff through clear policy direction and employment of competent green procurement staff (Ore, 2015). Å & Moorhouse, (2008) account that this technical capacity challenge is the most important of all.

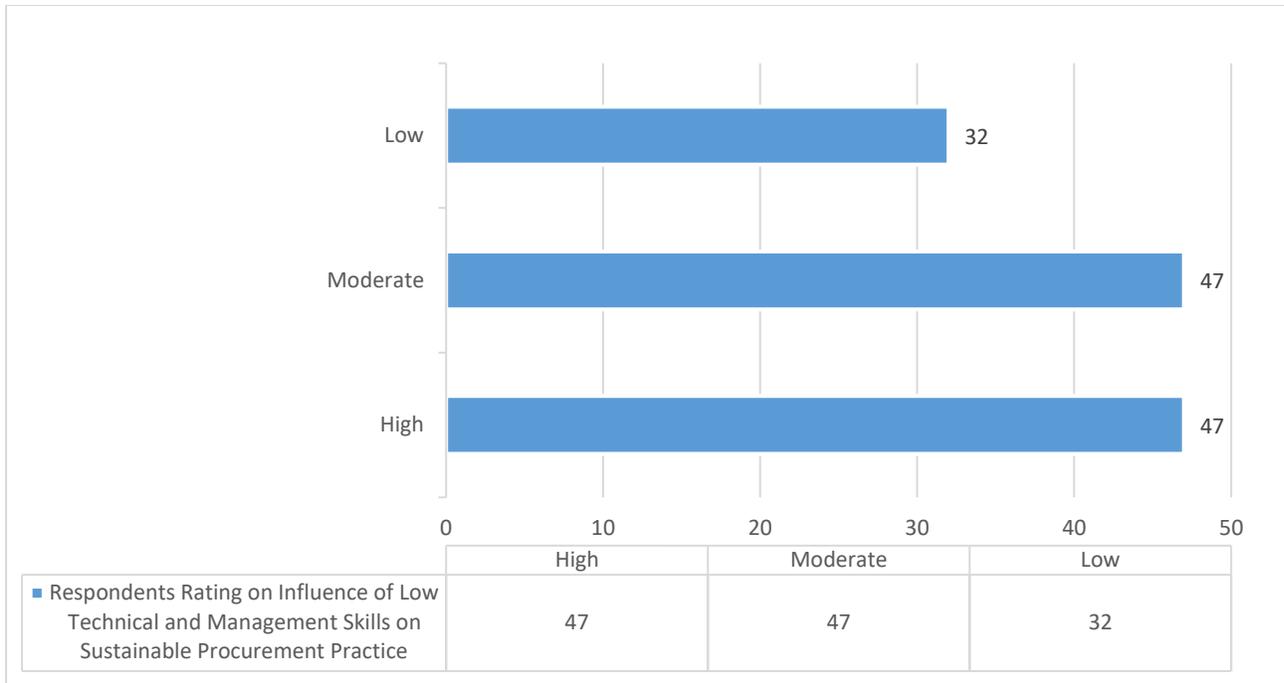


Figure 4.5: Respondents Rating on Influence of Low Technical and Management Skills on Sustainable Procurement Practice

Source: Field survey, 2019

4.5.4 Multi-Stakeholder Involvement Challenge to Sustainable Procurement

Innovation adoption success depends highly on internal and external stakeholders of the organizations which is built on effective cooperation and working relations (Appiagyei, Ayarkwa, & Agyekum, 2016). The adoption of sustainable procurement practices and products in the real estate industry is not different. The sector’s activities include several stakeholders at different levels. Unwillingness, lack of knowledge and inaccessible information hinders cooperation and eventually adoption of sustainable procurement practices.

As shown in Figure 4.7, 39 percent of respondents considered this challenge to be high and 29 percent rated it to be low. However, 32 percent of rated it as challenge which affect their

sustainable procurement initiatives moderately. This implies that low stakeholders' approaches do influences real estate industry players considerations for adopting sustainable purchasing practices but in different gradations. This finding is supportive in Mensah & Ameyaw, (2012) who posit that developers lack the capacity to undertake comprehensive stakeholder analyses because not all industry players are registered. This further indicates a laxity in the enforcement of regulations within the sector.

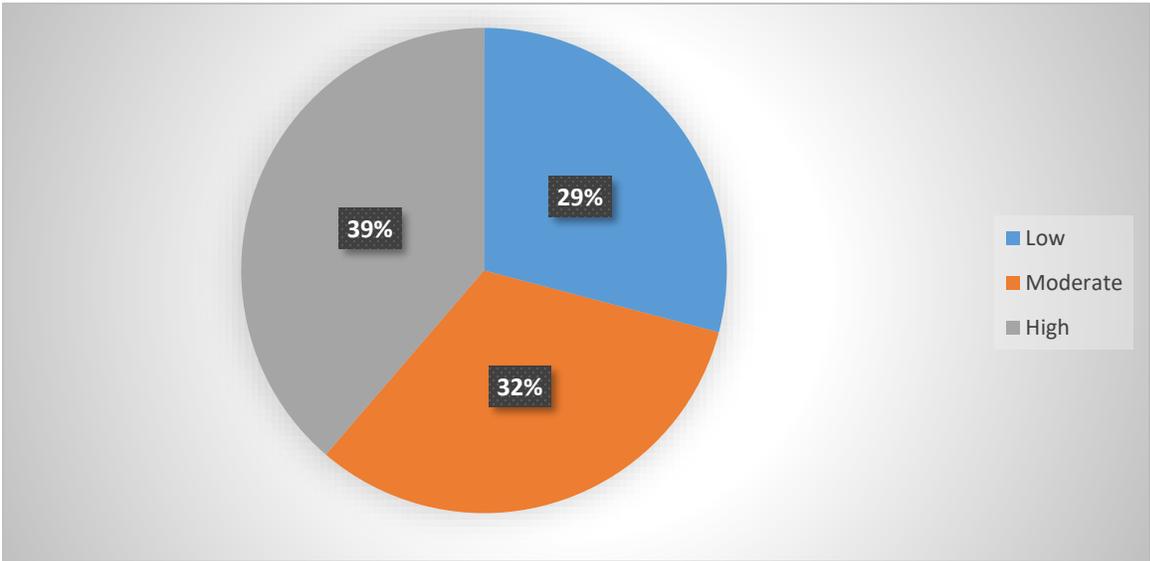


Figure 4.6: Respondents Rating on Stakeholders Involvement

Source: Field survey, 2019

4.5.5 Higher Initial costs of Green Products Challenge to Sustainable Procurement

Business strive to reduce cost and risks and maximize their profits. Within construction industry and real estate sector in particular costs of sustainable products, sourcing costs and risk of hidden

costs have been found to be the considerations which affect sustainable procurement adoption (Ping, Chan, Darko, Olanipekun, & Ameyaw, 2017).

The data as presented in figure 4.8, indicates that 30 percent of respondent did not consider cost as a major factor which challenged their actions towards implementation of sustainable procurement action while 37 percent and 33 percent acknowledge that it influenced their actions moderately and highly respectively. This means the issue of cost is factor which challenges most real estate industry players. Among all the challenges this appears to be the most commonly as several studies in China, United States and Ghana found it to be critical. This finding is consistent with findings in both developing and developed nations (Shen et al., 2017; Ping et al., (2017).

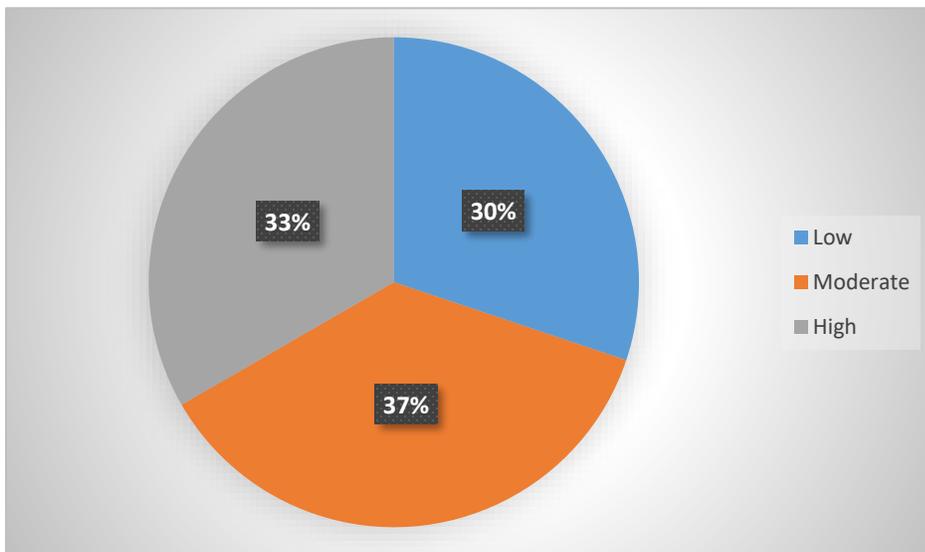


Figure 4.7: Respondents Rating on Influence of Initial Cost of Green Products

Source: Field survey, 2019

To understand if any of these challenges had the greatest impact on adoption of sustainable procurement in the real estate sector, a Friedman's test was conducted to understand if there was a significant difference among real estate industry players in their rank order of these challenges

faced in their attempt to ensure sustainability. The Friedman test is a non-parametric test for difference between groups to know their level of agreement on three or more items. In SPSS a standard significance of 0.05 which is commonly acceptable in social science studies is the default and this was maintained for this study. The key assumptions which were checked before the testing as per the statistical requirement include;

- The data is of the sample and is measured on three or more different occasions
- Group must be from random sample
- Group must be measured on an ordinal scale (e.g 7 or 5-point Likert scale)
- A Post-Hoc test is may be necessary to establish the specific group which had the significant difference (Garth, 2008). The results are as presented in the tables 4.14 and 4.15.

Table 4 14: Descriptive Statistics of Friedman Test

Challenge	N	Mean	Std. Deviation	Minimum	Maximum
Difficulties in ICT Application	126	3.13	1.053	1	5
Lack of Social Drive	126	3.11	1.045	1	5
Low Technical and Management	126	3.18	1.038	1	5
Low Multi Stakeholder Approach	126	3.13	1.091	1	5
Higher Initial Cost of Green Products	126	3.08	1.078	1	5

Source: Field survey, 2019

Table 4.15: Mean Rank of Friedman Test

Challenge	Mean Rank	Ranks	P-value
Difficulties in ICT Application	2.98	4th	0.884
Lack of Social Drive	3.00	3rd	
Low Technical and Management	3.08	1st	
Low Multi Stakeholder Approach	3.04	2nd	
Higher Initial Cost of Green Products	2.90	5th	

Source: Field survey, 2019

The mean values ranged from 2.90 to 3.08. This is statistically insignificant with the p value of 0.884 greater than 0.05. So the rankings of real estate actors differed. This means that though these challenges were noted to influence their choice of adoption, in term of ranks among the respondents they differed. Thus, these challenges affect them differently though *low technical and management skills, low stakeholders' approach* and *lack of social drive* appeared to be slightly higher than others. The mean rank of low technical and management skills in very instructive as it supports the findings in Nigeria which indicated that industry players lack the tools for evaluating their performances and are susceptible to some wrong evaluations which consequently impacts on their choices.

4.6 MEANS OF MITIGATING SUSTAINABILITY CHALLENGES

Mitigation entails plans, process and actions which have been designed to remedy or reduce negative environmental effects which are likely to occur. The real estate industry (construction sector) is reckoned to be a major contributor to negative environmental effects through its activities. Adebayo & Avenue, (1994) contends that effects from the construction industry is not really emphasized in Ghana. The study therefore sought to understand some mitigation practices of real estate actors within Ghana under five key themes. Figure 4.9 is a presentation of the results aggregated into three sections per the scale as Low, Moderate and High.

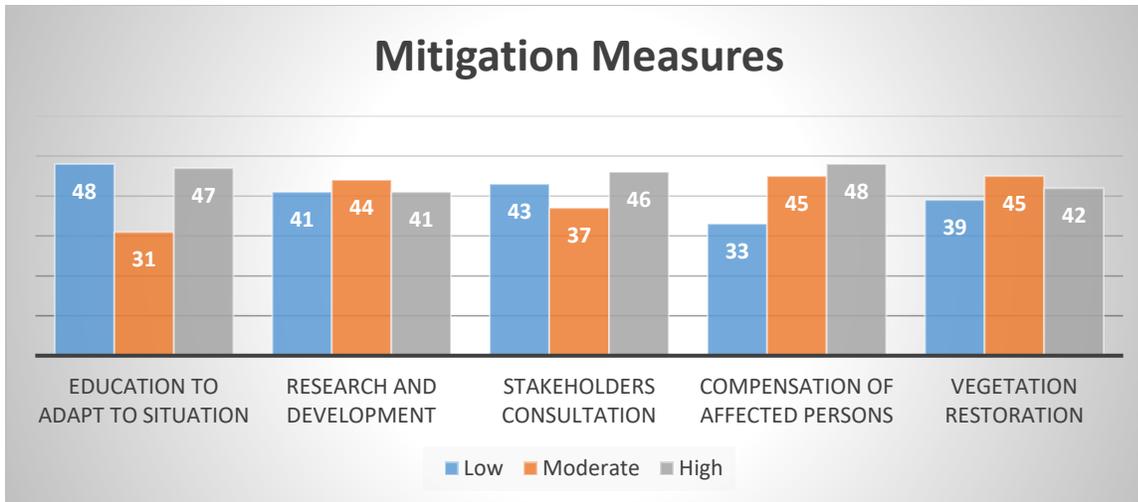


Figure 4. 8: Mitigation Measures to Sustainability Challenges

A cumulative frequency was used to assess mitigation practices while Kendall’s coefficient of concordance was used to assess the trend of agreement among respondents. The cumulative percentage rating was used to assess mitigation practices among real estate industry players based on respondents’ ratings on some common mitigation practices which were found in the literature.

The variables which were used to assess mitigation practices by real estate firms using a five-point Likert scale include; education to adapt to situation, research and development to find better ways, stakeholder consultation, compensation to affected persons and vegetation restoration. The rating results are as recorded in Table 4.16.

Table 4.16: Grading of Mitigation Practices in the Real Estate Industry

Grading	Frequency	Percent
High Quality	21	16.7
Acceptable	56	44.4
Needs Improvement	49	38.9
Total	126	100.0

Source: Field survey, 2019

Per the cumulative percentage ranking, 16.7 (21) per cent of real estate industry players have high quality mitigation practices while that of 44.4 (56) percent is acceptable. On the other hand, mitigation practices of 38.9 were not up to standard and required improvement. This implies that within the real estate industry in Ghana, one out of every five organizations have high quality mitigation practices and about two in five firms in the sector need to improve on their performance.

The Kendall's coefficient of concordance (W) is usually known as a normalization of the Friedman statistics. It is basically used to assess the agreement pattern of three or more raters to establish a trend of their ranking agreement. It ranges from 0 to 1, with 1 indicating perfect agreement and 0 indicating perfect disagreement (Abdi, 1955). Kendall's coefficient of concordance was used in this study to ascertain the level of agreement among respondents on mitigation measures practiced by their organizations to ensure sustainability (Garth, 2008). Results of the tests are as shown in Table 4.17.

Table 4.17: Descriptive of Kendall's W Test

Mitigation Measures	Mean	Standard Deviation
Education to adapt to situation	2.95	1.165
Research and development to find better ways	3.07	1.118
Stakeholder consultation	3.02	1.035
Compensation to affected persons	3.19	1.143
Vegetation restoration	3.02	1.095

Source: Field survey, 2019

The results imply that respondents considered *compensation affected persons* is the most common mitigation measure with the highest mean score of 3.19. The next to this is *research and*

development to find better ways with a respective mean of 3.07. *Stakeholder consultation* and *vegetation restoration* had equal mean scores 3.02. In literature, equals mean scores from this test are differentiated by the standard deviation such that the mean with the lowest standard deviation is ranked higher (Shen, Peng, Zhang, & Wu, 2011). Accordingly, *stakeholder consultation* with a standard deviation of 1.035 which is lower than a standard deviation of 1.095 is the third major mitigation consideration while *vegetation restoration* is fourth. *Education to adapt to situation* is the least ranked among participants. All standard deviations were greater than one, indicating that there were variations in the ratings of the respondents. Results for the mean ranking of the mitigation challenges is shown in Table 4.18

Table 4.18: Results for Mean Ranking of Mitigation of Challenges

Mitigation	Mean Rank	Ranking
Compensation of Affected persons	3.15	1 st
Research and Development to find better ways	3.02	2 nd
Stakeholder consultation	2.98	3 rd
Vegetation Restoration	2.98	4 th
Education to adapt to situation	2.87	5 th

Source: Field survey, 2019

The mean ranking provided by the Kendall’s W differed from that of the descriptive. Respondents’ rated *compensation of affected persons* as the most common mitigation practice within the industry, followed by *research and development to find better ways*. It is worthy to note that from

the Kendal ranking, the remaining three variables assumed means which are below 3.0 and thus insignificant. Table 4.19 indicates the Kendal test value of 0.005 which implies that real estate industry players disagreed perfectly. It can therefore be inferred that real estate actors have different priorities in terms of mitigating environmental challenges. The reason could partly be due to the lack of cohesion among industry players in the construction sector in Ghana as observed by (K. Ahmed, Hatira, & Valva, 2014).

Table 4.19: Results for Kendall's Coefficient of Concordance

N	126
Kendall's Wa	.005
Chi-Square	2.708
Df	4
Asymp. Sig.	.608
a. Kendall's Coefficient of Concordance	

Source: Field survey, 2019

4.7 ENVIRONMENTAL PRIMARY CONCERNS

The population of the world is noted to have doubled. As shelter is a basic need of humans, there is great demand for houses (Yu et al., 2018). In Ghana, there is an accumulated housing deficit of 250,000 units in addition to the yearly need of 70,000 (K. Ahmed et al., 2014). Obviously, this offers great potential to the emerging real estate market. If meeting these developments are not sustainably pursued from the procurement to operation and maintenance level, an imbalance in the environment is likely to lead to several dire consequences (Djokoto et al., 2014). It is therefore important to ascertain the specific environmental primary concerns of firms in the real estate

industry as this also drive their procurements. Respondents’ perceptions were sought on the basic concerns which included, disposal of waste, saving electricity, saving water, safety at workplace, wildlife conservation, reduction in carbon footprint and reduction in atmospheric dust using a five-point Likert scale.

A Friedman test was thereafter conducted to ascertain significance of means of respondents’ perception of real estate players on the primary concerns. The results of the test are as presented in Table 4.19.

Table 4 20: Friedman Test Results

Environmental Primary Concern	N	Mean	Rank	Chi-Square Value	P-value	df
Disposal of Waste or By Products	126	3.66	7 th	14.866	0.021	6
Saving Electricity or Power	126	4.21	2 nd			
Saving Water	126	4.19	3 rd			
Safety at Work Place	126	4.41	1 st			
Wildlife Conservation	126	3.92	5 th			
Reduction in Carbon Prints	126	3.69	6 th			
Reduction in Atmospheric Dust	126	3.92	4 th			

Source: Field survey, 2019

The results indicated a p-value of 0.021 which is less than 0.05 and thus shows that the difference in the mean rankings were statistically significant. It therefore shows that within the real estate industry in Ghana, *safety at the work place, saving electricity, saving water, reduction in atmospheric dust and wildlife conservation* are the five most considered environmental concerns.

Firstly, the recognition of safety among real estate actors in Ghana is consistent with the study by Okolie, (2013) in Nigeria which revealed that the necessity of internalizing safety culture when top management are committed to safety concerns. They however established that the key to this success is the training of staff at all levels on sustainability and institutionalization of a blueprint with strict enforcement.

Saving power or electricity is the next environmental concern which is pursued in the real estate industry in Ghana. Inarguably, energy consumption is one of the commonest concerns with much evidence (Weißbach et al., 2013). According to the UNEP, (2012), sustainable products can reduce energy consumption by about 30 to 80 percent.

Saving water, reduction in atmospheric dust and wildlife conservation were next in the rankings respectively. These concerns as pertain to Ghana's real estate industry are similar to the assertion of the findings of UNEP, (2012) who aptly account that when sustainable procurement practices are pursued stakeholders will exercise control over purchase and handling of hazardous chemicals and contractors will be informed of raw material arrangements and among other things;

- Source for logs which are legally harvested, recycled steel and glass, while shifting to renewable alternatives such as rubber and bamboo to reduce greenhouse gas emissions
- Manage incessant releases into water bodies, consequently reducing pollution of watercourses by chemicals.
- Construct energy efficient buildings with natural cooling options to reduce energy consumption as well as water usage, runoff to sewers and other solid wastes.
- install commercial solar panel system which uses renewable energy to power buildings

(UNEP, 2012).

4.8 CRITICAL SUCCESS FACTORS OF SUSTAINABLE PROCUREMENT

Among the studies which have been conducted in the real estate industry and sustainability, there are critical factors which have been noted to aid adoption of sustainable procurement practices as an incentive or pressure. Broadly, they can be classified as financial and non-financial (Olubunmi et al., 2016). To understand what critical factors are necessary for the Ghanaian real estate industry to adopt sustainable procurement practices, a set of factors identified in literature was used to solicit respondents' views as pertains to their practices in the industry. The factors included

- Tracking, monitoring and Reporting progress
- Conducting a training session and creating awareness of new approaches to sustainable procurement
- Commitment of management to incorporate sustainable factors in the procurement process
- Supplier communication and engagement in sustainable procurement process
- Availability of overarching sustainability policy in procurement programs
- Seeking the consent of Sustainability experts in the procurement process
- Knowledge of benefits of sustainable procurement
- Setting goals and targets to discover the outfit's priorities and objectives
- Having designated staff responsible for implementing sustainable procurement

A Friedman tests used to rank the variables and ascertain the level of agreement among respondents on these critical factors as pertain to the real estate industry. The results of the test are as summarized in Table 4.20.

Table 4 3: Friedman Test Results

4.21: Descriptive Statistics of Success Factors of Sustainable Procurement

SUCCESS FACTOR	N	Mean	Std. Deviation
Tracking, monitoring_and_reporting_progress	126	3.17	1.125
Q1_Conducting_a_training_session_and_creating_awareness	126	3.03	1.109
Q2_Commitment_to_Sustainable_factors_in_procurement	126	3.14	1.157
Q3_Supplier_communication_and_engagement_in_sustainable_procurement	126	3.13	1.175
Q4_Availability_of_Sustainability_policy_in_procurement_programs	126	3.06	1.141
Q5_Seeking_the_advice_of_Sustainability_expert_in_the_procurement	126	3.17	1.108
Q6_Knowledge_of_the_benefits_of_Sustainable_Procurement	126	3.02	1.106
Q7_Setting_goals_and_targets_to_discover_the_outfits_priorities	126	3.18	1.120
Q8_Having_staff_responsible_for_implementing_procurement	126	3.10	1.034

Source: Field survey, 2019

The mean rank of the test shows that tracking, monitoring progress and supplier communication, commitment to sustainable factors in procurement, seeking advice of sustainability experts in procurement were the leading factors considered critical in the Ghanaian real estate sector. There is consensus from several studies that when this is done effectively, it facilitates adoption of sustainable procurement practices (Waris et al., 2018; Bag et al., 2013; Diabat & Govindan, 2011). However, Table 4.21 shows a p-value of 0.973 which is greater than the significant value of 0.05, indicating that real estate actors did not agree. The indication then is that these factors were rated differently. Several factors could account for these variations. The real estate market in Ghana is fairly new and players lack the know-how of sustainability in practice (K. Ahmed et al., 2014). Another possibility could be the lack and unfamiliarity of real estate industry player with tools and techniques for undertaking some of these actions. Also, the laxity in the sector can also be a factor as regulation and directives are not well monitored.

Table 4.22: Friedman Test Results

SUCCESS_FACTOR	Mean Rank	Chi-Square test	P-Value
		2.223	0.973
Tracking, monitoring_and_reporting_progress	5.08		
Q1_Conducting_a_training_session_and_creating_awareness	4.81		
Q2_Commitment_to_Sustainable_factors_in_procurement	5.07		
Q3_Supplier_communication_and_engagement_in_sustainable_procurement	5.13		
Q4_Availability_of_Sustainability_policy_in_procurement_programs	4.92		
Q5_Seeking_the_advice_of_Sustainability_expert_in_the_procurement	5.09		
Q6_Knowledge_of_the_benefits_of_Sustainable_Procurement	4.85		
Q7_Setting_goals_and_targets_to_discover_the_outfits_priorities	5.08		
Q8_Having_staff_responsible_for_implementing_procurement	4.97		

Source: Field survey, 2019

4.9 ANALYSIS OF QUALITATIVE DATA

In line with the objectives of the study, two key informants from the Public Procurement Authority and Ghana Real Estate Developer Association were interviewed. Each of them had some advanced level of tertiary education with over 5 years' experience in the procurement department. Responses are as summarized thematically in this section.

4.9.1 Institutional Mandate on the Procurement Process in the Real Estate Industry

Per the explanation of the key informants interviewed, both institutions have some dealings with real estate developers. The dealings were however divergent and suggested a gap which tend to allow developers to persist in the use traditional procurement practices within the sector. GREDA is an association which seeks the welfare of its members and seem to ensure some level of sanity in the real estate industry. Real estate developers are not required by law to join this association. The PPA does not lack the legal authority to enforce compliance as the case of GREDA but their mandate covers procurement within the public sector and not private sector to which the real estate developers belong. Several repercussions can be inferred from this control gap in relation to the two bodies. One respondent asserted that:

“Actually, we ensure compliance within the public sector in line with the PPA Act which is mandatory for all public sector institutions. We do not have control over private procurement. We only enforce compliance when we happen to engage them other than that they are on their own”

Another also asserted that *“we serve as a link between them and government and help them to have access to market for the houses. This is after their registration at the*

Registrar Generals Department. It is the duty of the district assemblies where they operate to monitor their activities but we do visit them sometimes.

- As the PPA act is not explicit on the environmental and social considerations, possible regulatory pressure towards adoption of sustainable procurement practices in general and along the procurement cycle is lost.
- A critical factor such as tracking, monitoring and reporting of progress made by developers from traditional to sustainable procurement practices cannot be evaluated as they are not mandated to share these practices
- Practice of sustainability is low within the real estate sector is mainly driven by organizational commitment and moral suasion.

4.9.2 Perception of Knowledge of Sustainability among Developers

The level of real estate developer's knowledge perceptions was also different as one informant indicates that he "*cannot tell*" because "*we do not require members to depend on us for the procurement*". The knowledge level of the association leaders concerning sustainability was observed to be low. However, the other informant was very conversant with sustainability and opined that *even in the public sector, there is no clear environmental and social framework which can be used to evaluate tenders as requirements for awarding a contract*. On the case of estate developers, he opined that they *do not have knowledge about sustainability* and at best the level can be described as "minimal" and theoretical.

Their perception on knowledge among developers also raises some concerns such as

- the lack of motivation and to adopt sustainable procurement practices
- No supplier engagements on sustainability

- lack of knowledge on benefits of sustainability

4.9.3 Sustainability Practice and Challenges in Real Estate in Ghana

Respondents have divergent views on the state of sustainable procurement practice within the real estate sector in Ghana. As one perceived that existence of law will automatically pressurize developers to adopt sustainable practices, the other opined that clear requirements for ensuring sustainability in relation to the environment and social pillars are non-existent. They commented that: *“Since government has a law on that we expect our members to comply”* while another also mentioned that *“sustainability is not practiced”* and cited an example of services rendered which are not sustainable. *“In their construction most of them show that they do not understand sustainability and so they cannot practice what they do not know about. Most of them employ minors because they are profit oriented. They seek to reduce cost without caring about the social and environmental concerns”*.

It was also gathered that the major barriers which militate against sustainable procurement practices were

- lack of knowledge
- lack of enforcement
- cost of adopting sustainable procurement practices
- lack of motivation
- unwillingness to change
- inability of trained staff to put into practice skills acquired through training

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter provides a summary of the research findings as per the data analyzed in the previous chapter and its implication for adoption of sustainable procurement practices by real estate developers in Ghana. Based on the implication of the findings, recommendations to improve adoption of sustainable procurement within the sector are suggested.

The research aimed at ascertaining sustainable procurement practice, challenges faced in the shift from traditional procurement to sustainable procurement practice and critical success factors which facilitate or hinder sustainable procurement adoption within the real estate industry in Ghana. Mixed methods, techniques and tools were employed in the study. Semi-structured questionnaires and interview guides were used to solicit responses from real estate developers registered under GREDA.

5.2 SUMMARY OF FINDINGS

Per the data collected, the following findings were made regarding sustainable procurement in the Real Estate Industry in Ghana.

5.2.1 Sustainable Procurement Practices in the Real Estate Industry

The study found that over half of real estate developers are engaged in some sustainable actions generally and along the various phases of procurement (62.7 and 56.3 percent respectively) while 5.6 percent of developers were noted to be exhibiting high quality sustainable practices. Disturbingly, 38.1 percent of respondents were noted to performing poorly. Also, real estate developers' knowledge was found to be low regardless of education, years of experience and role

in the industry, with about 68 percent of respondent perceiving their knowledge on sustainability to be minimal or low.

On sustainability practices along the procurement cycle, the study also found that

- Necessary attempts towards mainstreaming sustainable consumption such as adopting strategies to manage demand and purchase of items which can be reused, repaired and recycled are overlooked in the planning phase as sustainable practice were noted to be minimal and low among 57.2 percent of respondents.
- Sustainability during technical specification of needs is not out rightly disregarded but unintentional with about two in three (63.5%) of developers considering attention given to practice of sustainability at this stage to be moderate and low.
- About 65.1 percent of developers further perceived their initiatives to ensure incorporation of sustainability criteria for selecting their suppliers to be moderate and low
- Sixty-one percent (61.1%) of developers considered sustainability actions at the tender evaluation stage to be moderate and low
- Ensuring sustainability during the contract implementation stage was moderately and lowly practiced by 69% of developers

In essence, an average of 63.1 percent of respondents (about two out of three) considered sustainable procurement actions within their organization along the procurement to be minimally or lowly practiced.

5.2.2 Challenges faced in Sustainable Development Practice

Difficulties in information and technology applications, low social drive, low technical and management capacity, low multi-stakeholder approach, high initial cost of green materials were noted to impact adoption of sustainable practices as means of all variables were greater than 3.

However, the Friedman test showed that these challenges affected developers in diverse degrees though low technical and management skills, low stakeholders' approach and lack of social drive appeared to be slightly higher than others. Overall, the difference was not statistically compelling for generalization.

5.2.3 Mitigation Measures

Compensation of affected persons and *research and development to find better ways* were noted to be the major mitigation practiced employed by the real estate developers in Ghana. It is worthy to note that from the Kendal Co-efficient ranking, the remaining three variables (*education to adapt to situation, stakeholder consultation, and vegetation restoration*) assumed means which are below 3.0 and thus insignificant. The Kendal test value of 0.005 implied that real estate industry players disagreed perfectly on these mitigation measures and thus had different priorities in terms of mitigating environmental challenges. So, *Compensation for affected persons and Research and development* though notable cannot be generalized for the real estate industry in Ghana.

5.2.4 Environmental Primary Concerns

The study also found that *safety at the work place, saving electricity, saving water, reduction in atmospheric dust and wildlife conservation* are the five most considered environmental concerns

respectively, per the Friedman test conducted. Unlike the mitigation and challenges, these concerns rankings were significant with a p-value of 0.021 which was less than a significant value of 0.05

5.2.5 Critical Success Factors

In terms of ranks, the real estate industry in Ghana considered *tracking and monitoring progress*, *supplier communication*, *commitment to sustainable factors in procurement*, *seeking advice of sustainability experts in procurement* as factors which could aid adoption of sustainable procurement practices within the real estate sector but statistically, the evidence as produced by the test was not compelling for generalization.

5.3 CONCLUSIONS

Following these findings, it can be inferred that within the real estate industry in Ghana, there is/are:

- Lack of specific regulation to ensure sustainable procurement in the real estate industry as existing laws only provide directives for the public sector. This makes industry players disregard environmental concerns because there is lack of legal pressure. Such lack of legal support also makes purchase and use of sustainable materials unattractive.
- Real estate players had some knowledge about sustainability but it is insufficient to ensure quality adoption of sustainable procurement. This lack of capacity is seen among actors in the real estate sector regardless of education, role and years of experience. Consequently, issues of sustainability along the procurement cycle are indifferently practiced.
- Generally, a low drive towards sustainability as both external (government pressure) and internal (knowledge and capacity) necessary for adopting sustainability in procurement is low. Consequently, possible strategies to manage demand and purchase of items which can be reused, repaired and recycled are overlooked.

- Lack of capacity to undertake comprehensive stakeholder analyses leading to low stakeholder collaboration.
- Difficulties in information and technology applications, low social drive, low technical and management capacity, low multi-stakeholder approach and high initial cost of green materials were reckoned as challenges faced but the level of effect varied among developers.

However, there are some attempts towards ensuring safety at the work place, water conservation, saving energy, reduction in atmospheric dust and wildlife conservation. Real estate activities are seemed uncoordinated as there is no striking pattern of critical issues considered by developers. Yet, tracking and monitoring progress, supplier communication, commitment to sustainable factors in procurement, seeking advice of sustainability experts in procurement were relatively considered by most members.

5.4 RECOMMENDATIONS

- There is the need for specific sustainability regulations to be enacted to provide clear guidance for purchasing and supply of sustainable materials within the general private sector in Ghana to which the real estate industry belongs.
- Sustainability capacity building trainings concerning the necessary action to be taken at various stages of the procurement cycle needs to be conducted in the real estate industry through GREDA to enhance knowledge and practice of members.
- It will be very helpful if the policies in the procurement Act in Ghana is redefined to cover the various elements of sustainability and the private sector, as the Act as it stands now, makes no provision or lacks sustainability measures and also provides for the public sector only.

5.5 FUTURE RESEARCH RECOMMENDATION

This study mainly concentrated on the environmental sustainability issues regarding the procurement activities of the real estate industry in Ghana. The other pillars of the sustainability concept, economic and social could be addressed for the same topic or related aspects of the topic with a broader scope.

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APPENDICES
QUESTIONNAIRE

Sustainable procurement is a process whereby organizations meet their needs for goods, services, works and utilities in a way that achieves value for money on a whole life basis in terms of generating benefits not only to the organization, but also to society and the economy, whilst minimizing damage to the environment. These benefits helps to improve the quality of the environment, the quality of our social life and the development of our economy.

In view of this, this research is purely and strictly for academic purpose and your opinions and responses will be treated with utmost confidentiality. Your anonymity is assured. The information provided by your firm will be used for the purpose of this research only. This is to widen the knowledge and the scope of Sustainable Procurement particularly and sustainability at large.

NAME: AMOAH ESI OHENEWAAH

EMAIL /CONTACT: amoahnana.ea@gmail.com /0247729710

SECTION A: DEMOGRAPHIC INFORMATION

PLEASE TICK OR FILL IN WHERE APPLICABLE

1. Please indicate your role in the procurement department.....

2. Highest level of education

Doctorate { } Masters { } Degree { } Diploma { } Other, Specify
.....

3. Number of years of experience in the procurement field

Less than 5 years { } 5-10 years { } 11-15 years { } above 15 years { }

SECTION B: CURRENT STATE OF SUSTAINABLE PROCUREMENT

4. Indicate how often procurement activities is undertaken in your firm?

Daily { } Weekly { } Monthly { } Quarterly { } Annually { } Others specify

5. On a scale of 1 to 5 (where 1= Very Low; 2= Low; 3=Moderate; 4=High; 5=Very High), describe the current state of sustainable procurement in your outfit.

CURRENT STATE IN YOUR OUTFIT	Very Low 1	Low 2	Moderate 3	High 4	Very High 5
Implementation of procurement practices is done in accordance with the Public Procurement Act 2003, Act 663					
Supplier involvement in your sustainable procurement practices					
There is cordial relationship between your firm and its suppliers					
Proper standards, procedures and processes on sustainable procurement are spelt out in procurement agreements that are for both tender and contract documents.					
The firms environmental policy document ensures sustainability					
The firm incorporates environmental sustainability practices in their procurement process					
Other(s), please specify					

6. On a scale of 1 to 5 (where 1= Very Low; 2= Low; 3=Moderate; 4=High; 5=Very High), please state the extent to which environmental sustainability issues are embedded in the procurement process in your outfit.

PROCUREMENT CYCLE	Very Low 1	Low 2	Moderate 3	High 4	Very High 5
Preparation of Procurement Process					
Definition of Requirement					
Selection of Suppliers					
Evaluation of Tender and Contract Award					
Contract Implementation					

SECTION B: CHALLENGES IN IMPLEMENTATION OF SUSTAINABLE PROCUREMENT

7. On a scale of 1 to 5 (where 1= Very Low; 2= Low; 3=Moderate; 4=High; 5=Very High), indicate to what extent the challenges below affect sustainable procurement.

Challenge/ Scale	Very Low 1	Low 2	Moderate 3	High 4	Very High 5
Difficulties in ICT application					
Lack of Social Drive					

Low technical and management capacity					
Low Multi-stakeholder approach					
Higher Initial costs of Green Products					
Other(s), please specify					

8. On a scale of 1 to 5 (where 1= Very Low; 2= Low; 3=Moderate; 4=High; 5=Very High), rate the measures undertaken by your outfit to mitigate sustainable procurement challenges

MITIGATION MEASURES	Very low (1)	Low (2)	Moderate (3)	High (4)	Very high (5)
Education to adapt to situation					
Research and development to find better ways					
Stakeholder consultation					
Compensation to affected persons					
Vegetation Restoration					

Other(s), please specify					

9. On a scale of 1 to 5 (where 1= Very Low; 2= Low; 3=Moderate; 4=High; 5=Very High), rate how the following environmental concerns are considered by your firm in their daily activities?

ENVIRONMENTAL CONCERN	PRIMARY	Very low (1)	Low (2)	Moderate (3)	High (4)	Very high (5)
Disposal of waste or by products						
How to save Power or electricity						
How to save water						
Safety at work place						
How to conserve wildlife						
How to reduce dust and emission of harmful gases into the atmosphere						
How to reduce carbon prints						
Other(s), please specify						

SECTION D: CRITICAL SUCCESS FACTORS FOR ENABLING SUSTAINABLE PROCUREMENT

10. On a scale of 1 to 5, indicate which of the critical success factors of Sustainable Procurement listed below has the highest impact on achieving sustainable procurement.

1= Very Low; 2= Low; 3=Moderate; 4=High, 5=Very High

Critical Success factor/ Scale	Very Low 1	Low 2	Moderate 3	High 4	Very High 5
Tracking, monitoring and Reporting progress					
Conducting a training session and creating awareness of new approaches to sustainable procurement					
Commitment of management to incorporate sustainable factors in the procurement process					
Supplier communication and engagement in sustainable procurement process					
Availability of overarching sustainability policy in procurement programs					
Seeking the consent of Sustainability experts in the procurement process					

Knowledge of benefits of sustainable procurement					
Setting goals and targets to discover the outfit's priorities and objectives					
Having designated staff responsible for implementing sustainable procurement					

11. In your opinion, are there some other factors that can help a firm achieve Sustainable Procurement?

QUALITATIVE QUESTIONS

1. How does the policies or the measures set down by your entity affect the procurement activities of the real estate industry?
2. Do you think sustainable procurement is widespread in Ghana?
3. What is your entity's perception about the knowledge of sustainable procurement among the real estate developers in Ghana?
4. In your own opinion, what are some of the challenges or barriers which militates against sustainable procurement practices in the industry?