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**COLLEGE OF ARCHITECTURE AND PLANNING**

**DEPARTMENT OF BUILDING TECHNOLOGY,**

**SUSTAINABLE PROCUREMENT PRACTICES IN THE ROAD SECTOR OF  
GHANA**

**BY**

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## **DECLARATION**

This is to certify that this work or any part thereof has not been previously submitted in any form to the University or to any other body whether for the purpose of assessment, publication or for any other purpose. I confirm that except for any express acknowledgements, reference cited in the work, the original work is the result of my own efforts.

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## **DEDICATION**

This research work is dedicated to the Almighty God, my lovely wife Mrs. Eunice Agorku, my children: Tabitha Agorku, Elizabeth Agorku, Geoffrey Agorku and David Agorku, and the entire Agorku, Wutor and Dade families of Tanyigbe in the Volta Region of Ghana whose encouragement, love, spiritual and moral support has brought me this far in my educational pursuit.



## **ABSTRACT**

In most developing countries such as Ghana, there are no clear cut policies for sustainable procurement in the road sector. Consequently, implementation measures of sustainable procurement in this sector are very difficult. The aim of the current research was to investigate into sustainable procurement (SP) practices in the road sector of Ghana. Using questionnaire survey, 32 construction professionals working in the road sector were purposively selected from the Ministry of Roads and Highways in the Kumasi Metropolis. They included Quantity surveyors, Civil Engineers and Materials Engineers. The questionnaire among other things drew information about the existing SP practices in the road sector. The data collected was analyzed using Statistical Package for Social Scientist (SPSS) software package version 16. The results revealed that inadequate funding; deficient staff strength, logistics limitations and political interference are some of the key challenges to sustainable procurement practices in the road sector of Ghana. Consequently redesigning of the public procurement policy objectives and procedures to incorporate SP practices by the Government was recommended.



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## **CHAPTER ONE**

### **1.1 INTRODUCTION**

We live in a time of unprecedented global challenges, when vision and action to protect our planet are needed as never before, public bodies are being encouraged to procure sustainably, to reduce social, economic and environmental foot print and in order to stimulate sustainability in the private sector. The world's leading scientists warn that the climate is changing faster than predicted due to the continued increase in global greenhouse gas emissions. Procuring organizations are more seriously involved in designing and implementing sustainable procurement policies focusing on how environmental issues and issues relating to other aspects of the sustainable development pillars (society and economy) can be integrated into the procurement process activities. Building a more sustainable, low-carbon economy is a matter of scientific urgency. However, a clear understanding of the concept of sustainability and how it is related to the procurement process is still lacking especially in the road sector for most developing countries like Ghana. Sustainable procurement (SP) is procurement that is consistent with the principle of sustainable development, such as ensuring a strong, healthy and just society, living within environmental limits and promoting good governance (McCrudden, 2004).



## **1.2 STATEMENT OF THE PROBLEM**

A complete approach to sustainable procurement considers situations whereby public and private organizations meet their need for goods, services, works and utilities in a friendly manner environmentally, socially and economically OECD (2007). According to Ross (2013) most low income countries lagged behind because there are no policies in place that would systematically link sustainable procurement with broader sustainable development goals and action plans leading to implementation measures. Despite the evident enormous benefits connected with sustainable procurement, there exist numerous sustainability considerations that are complex in nature and best practices are still evolving particularly in low and middle income countries such as Ghana, where procurement legislations are usually relatively new with weak capacities and enforcement. The Public Procurement Act 2003, (Act 663) for example, lacks ingredient for sustainable procurement and Ghana's road construction industry too does not have policy document which suggest how stakeholders (Road Contractors) should address environmental sustainable procurement during construction of roads. The cumulative effect is that local conditions and markets are devoid of sustainable procurement elements. Businesses and the road construction industry in the country remain ignorant of the best sustainable procurement practices, since education in this field is limited. According to Chief Executive of the Public Procurement Authority (PPA), in March, 2013 Edition of the Ghana Business News (GBN) waste management and economic use of resources are some of the major challenges one faces as a nation and sustainable procurement can help to address the challenges to a large extent. According to Nketiah-Asante (2009) government institutions generally including the road sector in particular go through a lot of



bureaucratic processes in acquiring goods, services, works and utilities which leads to low productivity, inefficiency and loss of scarce resources which is detrimental to the economy. Ghana's procurement Act 2003, (Act 663) as it stands now addresses only a few of the sustainable procurement issues PPA Report, (2010). Whilst there has been some studies carried out to get better understanding and to address the challenges associated with sustainable procurement practices in the Ghanaian construction industry expertise remains relatively limited within the road sector of Ghana. It is therefore clear that there is the need to research into sustainable procurement practices in the road sector of Ghana.

### **1.3 AIM**

The aim of the research is to examine the effects of sustainable procurement practices in the road sector of Ghana.

### **1.4 OBJECTIVES**

To achieve the above aim the following objectives have been set:

- To identify existing environmental sustainable procurement practice in the road sector of Ghana.
- To identify factors that causes variability in environmental sustainable procurement practices in the road sector of Ghana.
- To identify factors preventing the achievement of sustainable procurement practices for road contracts.



- To adopt measures to mitigate the factors preventing the achievement of sustainable procurement practices for road contracts.

## **1.5 RESEARCH QUESTIONS**

The research is geared towards finding answers to the following questions:

- What challenges confront sustainable procurement practices in the road sector of Ghana?
- What control measures to be adopted to mitigate the challenges?

## **1.6 SIGNIFICANCE OF THE RESEARCH**

In order to further improve sustainable procurement, the Public Procurement Act 2003, (Act 663) was promulgated to ensure cost effectiveness, efficiency and more importantly reduce corruption in procurement. Ghana, as a nation stands to benefit immensely in the long term if sustainable procurement is fully implemented. Sustainability is one of the major ways of seeking to achieve good governance goals of development that prioritize the poor, advances women, sustains the natural environment and create the needed opportunities for employment and wealth creation. Sustainable Procurement practices are amongst the many strategies that could be used for effective advancement of sustainable production and consumption(Adjei 2006).

Effective sustainable procurement practices supports a country's quest to deliver high quality services which meets both current and future needs of its populace based on value



for money. The study will provide policy makers and other stakeholders who are interested with the implementation of Public Procurement Act 2003, (Act663) with adequate information on the effectiveness of the act in environmentally sustainable procurement. Sustainable Procurement Practices will therefore help meet environmental challenges and to achieve binding international targets. Furthermore, it is anticipated that the result of this study will encourage professionals in Roads and Highways to deliver better value for money to meet their environmental Sustainable Procurement needs.

## **1.7 METHODOLOGY**

The survey will commence with a thorough review of existing literature on environmental sustainable procurement practice in the road sector. Secondary data will be obtained through journals, previous thesis, the internet, and books on sustainable procurement. This enabled vital information to be gathered to solicit primary information through open-ended questionnaire from respondents of the study areas. The data so collected will be analysed using Statistical Package for Social Sciences (SPSS) software and Relative Importance Index (RII). This assisted in evaluating the responses received from the respondents to the questionnaire.

## **1.8 SCOPE OF RESEARCH**

The research was conducted in the three (3) Ministry of Roads and Highways (MRH) Agencies in the Kumasi Metropolis of the Ashanti Region; Ghana Highway Authority (GHA), Department of Feeder Roads (DFR) and Department of Urban Roads (DUR). The main reason is that the region has twenty-seven (27) administrative districts which



represent the highest in the country and one of the most densely populated in the country. This suggests that a huge amount of budgetary allocation is made to road infrastructure development in the region. Contextually, the study will be looking at the environmental sustainable procurement practice in the road sector of Ghana.

## **1.9 ORGANIZATION OF THE STUDY**

This study was organized in five (5) chapters. Chapter one comprise the introduction with detail background to the study, the problem statement, the study's objectives, research questions, scope as well as the significance of the study. Chapter two discussed the existing literature on Sustainable Procurement Practices. The chapter also examined recognized authorities and previous researches carried out on the subject.

Chapter three detailed the methodology adopted for the study, while the fourth chapter contains presentation and discussing of the findings of the study. The last chapter provided a summary of the findings as well as the conclusions and recommendations.



## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 INTRODUCTION**

This chapter focuses on the literature review of earlier research work on sustainable procurement (SP). The literature review will help to answer some of the questions raised in the objectives and also provides supportive information that is necessary for the study. The review lends much credence to books, articles and research works that cover the definition of procurement and the three main dimensions of procurement- Social, Environmental and Economic, procurement practices, factors causing variability in sustainable procurement (SP), challenges militating against SP, and measures to address the challenges. The idea of this chapter is to unearth the variables in the subject to enable analysis and discussion of the situation in the study area.

In recent years, academics and procurement practitioners have become increasingly interested in how organizations and their suppliers impact on the environment, society and the economy as a whole (Walker and Wendy, 2006). The strategic role of purchasing and supply as a lever for sustainable development is much more manifested now than before. Contemporary commercial practices shows that business organizations and business partners are focusing their procurement strategies on reducing the environmental ‘footprints’ of their procurement and supply chain activities. The need to improve organizational efficiency, reduce waste, overcome supply chain risk, and achieve



competitive position has made companies to start considering environmental issues from a competitive viewpoint (Humphreys, 2003).

Sustainable procurement is an issue that is being given prominence by both governments and industries and businesses are also being compelled to improve their sustainable performance. These issues are not new however, sustainable procurement are being used to group together a variety of both new and more established issues.

### **2.1.1 Concept of sustainable procurement**

Reflecting broader concerns to achieve sustainable development, sustainable procurement has recently acquired a high degree of salience in policy circles internationally (Brammer and Walker, 2011). Sustainable Procurement builds on the traditional procurement practices which seeks to extend through the adoption of sustainable principles. Procurement is defined as the acquisition of goods, works and/services from the supplier (this may be an individual or an organization). This could be anything from office supplies, to construction materials, to the services of the contractors and sub-contractors. Procurement is everything associated with an incoming invoice (Telgen et al., 2007b). Public procurement is therefore everything that results in an incoming invoice for public authority. For public procurement “everything” is categorized into goods, services and works. Procurement is one way in which companies interact with one another and it could be considered that the actions of a company are only as sustainable as those of its suppliers.



The procurement process is viewed as involving sourcing (planning: needs identification and assessment, supplier selection) contracting, monitoring and evaluation, and expediting based on the model definition (Telgen et al., 2007b). Sustainable procurement is a “process of acquiring goods, works and services from a supplier that provides the optimum combination of whole life costs and benefits to meet the customer’s requirements. It 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 benefit not only to the organization but also to society and the economy, while minimizing damage to the environment.

Sustainable procurement is about the process of purchasing goods and services that take into account the social, economic and environmental impact that such purchasing has on people and communities. Procurement is the acquisition of goods, services and works . This could include anything from office supplies, to construction materials to the services rendered by Contractors and-Sub contractors. Procurement is also anything associated with incoming invoice for a public authority. For public procurement “everything” is categorized into goods and services, and works. The concept of sustainable procurement draws attention to the responsibility of a company for activities outside its own boundaries (Meehan and Bryde, 2011).

Sustainable procurement has received significant attention in both public and private sector. It is seen as a way to meaningfully reduce the environmental burden of an organization’s core operations, as well as an opportunity to promote sustainability principles (Lyons, 2000). When carefully designed and implemented, sustainable procurement initiatives can improve efficiencies, potentially reduce costs and create



competitive business advantages as society moves toward an expectation of sustainability (Fitzgerald et al., 2007).

Sustainable procurement can be defined as the use of natural products and energy in a way that does not harm the environment. Another widely accepted definition of sustainable procurement is that: “sustainable consumption is consumption that meets the needs of the present without compromising the abilities of the future generations to meet their own needs” (WCED, 1987). In the context of the Dutch public procurement programme, sustainability is defined as the right balance between people planet, and profit (Elkington, 1999). Within the Dutch sustainable procurement programme, people represent social aspects such as labour conditions and exclusion of child labour. Planet represents environmental aspects, e.g. energy use, carbon dioxide emission, waste water, and landfill. Profits represent a healthy economic situation, with realistic profit margins for all involved in the supply chain.

### **2.1.2 Definition of public procurement**

According to the Public Procurement Act 2003, (Act 663), public procurement is the acquisition of goods, works and services at the best possible total cost of ownership, in the right quantity and quality, at the right time, in the right place for the direct benefit or use of governments, corporations, or individuals, generally via a contract” (PPA Module, 2007). Odiambo and Kamau, (2003) defined public procurement as the purchase of commodities and contracting of construction works and services if such acquisition is effected with resources from state budgets, local authority budgets, state foundation



funds, domestic loans or foreign loans guaranteed by the state, foreign aid as well as revenue received from the economic activity of state.

According to World Bank (1995a), public procurement means procurement by a procuring entity using public funds. Wittig (1998) opined that the items involved in public procurement range from simple goods or services such as clips or cleaning services to large commercial projects, such as the development of infrastructure, including roads, power stations and airports. Public procurement is different from private procurement, because in public procurement the economic results must be measured against more complex and long term criteria. Furthermore, public procurement must be transacted with other considerations in mind, besides the economy. These considerations include accountability, non-discrimination among potential suppliers and respect for international obligations. For these reasons, public procurement is subjected in all countries to enacted regulations, in order to protect the public interests. It is worth noting that unlike private procurement, public procurement is a business process within a political system and has therefore significant consideration of integrity, accountability, national interest and effectiveness.

Public Procurement may also be defined as the process by which organizations acquire goods, works and services using public funds. It is a comprehensive process that runs from proper procurement planning, budget allocation, bids invitation, bids evaluation, award of contract, contract management, performance measurement, monitoring, auditing and reporting.



The process of procurement is often part of a company's strategic plan because the ability to purchase certain materials will determine if operations will continue. A business will not be able to survive if its prices of procurement is more than the profit it makes on selling the actual product.

### **2.1.3 Definition of Sustainability**

Sustainability is about finding a balance between economic, social and environmental needs. It is about taking a long-term view when making decisions to ensure that in meeting our own needs that we are not compromising the needs of others today and in the future. It involves taking responsibility for the local, regional and global effects of our way of life. Sustainability emerged because we believe our current development model is unsustainable ITPOES (2010).

The Bruntland (1987) also indicated that sustainability is about meeting the needs of the present without compromising the ability of the future generations to meet their own needs.

### **2.1.4 Social procurement**

Road infrastructural development projects bring about great negative environmental impacts such as depletion of natural resources, high energy consumption patterns, generation of waste , noise creation, dust emission to soil and water bodies etc.(EuropeAids Switch-Asia Programme). To avoid or minimize these and other environmental impacts it is important to integrate life cycle assessment methods and the



use of a software base life cycle tools into the procurement criteria during tendering process which analyses the cost of alternative solutions during the whole construction period. During the process bidders will be required to compete on quality, minimum delay to users (time) and environmental impact.

The social dimension of procurement involves responsibility of corporations to conduct business ethically (Jones et al., 2010). Social procurement (SP) can be understood as the use of purchasing power to create social value. In the case of public sector purchasing, social procurement involves the utilization of procurement strategies to support social policy objectives (Barraket and Weissman 2009). The social requirement in a procurement can be delivered by private companies that are able to incorporate delivery of these outcomes into their normal processes, they can also be subcontracted out to or directly delivered by organisations that have expertise in delivering the required social benefit. Social Procurement is gaining interest from institutional buyers because it provides an opportunity to generate greater value through the procurement process.

For government the added value is created through the delivery of social benefits beyond the benefits conferred by the products and services being purchased; they are achieving other government goals, adding value that would not otherwise be created. For corporate institutions the value added is created in a range of areas including; brand development through the integration of Corporate Social Responsibility (CSR) into the procurement process; staff attraction and retention through values driven activity. For the not-for-profit sector the added value is created by keeping money in the social economy for longer, where it can create more social benefit. Social Procurement can be general – to the extent that some buyers require the tenderer to identify the social value that they will create



through execution of the contract. Social procurement can also be targeted around specific social objectives. Social objectives range from local economic development, to sustainability, to community engagement, to fair trade, to targeted beneficiaries including public housing tenants, long term unemployed, people with disabilities, migrants and refugees, youth, and women. (Social Procurement Australasia,2014).

## **2.2 EXISTING ENVIRONMENTAL SUSTAINABLE PROCUREMENT PRACTICES**

### **2.2.1 Environmental or green procurement**

The concept of sustainable procurement was originally introduced at the UN world summit on sustainable development in Johannesburg in 2002. Kisbi (2011) cited that Jordan faces a variety of urbanization challenges shared by other developing countries in the Middle East and is one of the world's most water- stressed countries, with 95% of its land mass being desert and much of the rest susceptible to desertification. As a result a huge burden is placed on road infrastructure development, services and the environment. According to Ali and AlNsairat (2009) Jordan suffers from problems shared by the international community which include; increasing energy concerns and high levels of pollution. The environmental dimension of sustainability is about reducing ecological impacts today in order to preserve the environment for future generations (Jones et al., 2010). Environmental or green procurement is defined as the purchase of products and services which have less impact on the environment and human health compared with



competing products or services that serve the same purpose. This comparison may consider the source of raw materials, production, manufacturing, packaging, distribution, potential for reuse and recycling, operation, maintenance, or disposal of the product (Buy green 2006).

These may include:

- Energy-efficient and greenhouse friendly products;
- Products that are water efficient and reduce water use;
- Less toxic products to reduce health effects;
- Products using less packaging or with a provision for packaging take-back;
- Products that use fewer resources or in other ways create reduced environmental impacts throughout their life cycle;
- Products made from recycled materials, such as recycled road construction materials; and
- Recycled green organics and recycled plastic products.

### **2.2.2 Procurement practice in Ghana**

The enactment of the Procurement Act 2003, (ACT 663) further ensured that modern trends in procurement was adopted to bring about the much needed sanity to local procurement system which had been flawed by bad procurement practices such as corruption and other malfeasances (Osei-Tutu et al., 2010).



In Ghana, public procurement accounts for 50%-70% of the national budgets (after personal emoluments), 14% of GDP and 24% of imports. Implicitly, public procurement therefore has both social and economic impact on the country (World Bank, 2003a).

In most developing countries, the procurement function is transitioning from a clerical non strategic unit to an effective socio-economic unit that is able to influence decisions and add value (Knight et al., 2007). Developing countries in one way or another have reformed their public procurement regulations. These reforms have not been limited to regulations only; but have included public procurement process, methods, procurement organizational structure, and the workforce. These reforms have been as a result of joint efforts with various development partners like the World Bank, International Trade Centre, WTO, and UNCTAD varying from country to country. Furthermore, public procurement is faced with the challenges imposed by a variety of environmental factors (external factors) such as market, legal environment, political

environment, organizational and socio-economic environmental factors. Regardless of the effort by the central government and its related agencies and the acknowledgement that the procurement departments are capable of adding value to their organizations, still a large number of the internal customers act on their own and more frequently bypass the procuring department (Schiele and McCue, 2006). This problem requires establishment of clear procurement procedures and performance standards. Performance when adopted will provide the decision-makers in the procurement department with unbiased and objective information regarding the performance of the procurement function (Knudsen, 1999). Several countries have instituted reforms in their public procurement processes (Hunja, 2003). This is aimed at purging the public procurement sectors, encouraging



competition, transparency, efficiency and ensuring accountability. These reforms have not come without difficulties (Hunja, 2003). The challenge include poor dissemination of the procurement law (Azeem, 2007), lack of proper training for the managers of the procurement process (Forgor, 2007).

The Country Procurement Assessment Report of Ghana in 2003 revealed that most Ministries, Departments and Agencies (MDAs) and District Assemblies (DAs) staff responsible for procurement were not procurement-proficient, even though they have had some training. The report contended that, application of the PPA and the Standard Tender and Contract Documents will not be successful without broad training and “refresher” programs and encouragement of officials in charge of procurement. In view of this, the PPA initiated a training programme in 2007 throughout the country with the aim to building the capacity of personnel responsible for the management of procurement in various institutions. This exercise unfortunately could not be sustained due to financial difficulties thereby leaving most Procurement Managers completely ignorant in the application of the law. Building the capacity of service providers has been identified as one of the success factors of public procurement reforms. Many bidders are limited in various capacity issues including: lack of basic knowledge in the law, inadequate capacity to appreciate the standard tender documents, poor access to tender information and insufficient technical and managerial skills to be competitive in the tendering process (ODPP, 2007). Political interference with the procurement process is also a big challenge to the implementation process and public procurement reforms. A good number of politicians think that they have the right to intervene in the procurement procedures thereby leading to a capricious procurement decisions (World Bank, 2004b). The lack of



career development path and low salaries of procurement personnel also militates against procurement reforms implementation (World Bank, 2003a). Poor records keeping (World Bank, 2003a ODPP, 2007) and delays in payment of contractors and suppliers have also been cited as some of the crucial factors that challenges the procurement reforms implementation (Azeem, 2007).

### **2.2.3 Procurement practices in the UK**

The economic contribution made by the UK construction industry is significant: its output is worth over £100bn a year. This accounts for eight per cent of gross added value and provides employment for over three million workers. This also has big effects on the environment. For example, buildings are responsible for almost half the country's carbon emissions, half our water consumption, about one third of landfill waste and one quarter of all raw materials used in the economy (HM Government, 2008).

The European Union (EU) procurement rules (2004) divides the procurement process into three stages, namely; selection, specification and award. Selection refers to the stage where suppliers are either rejected or selected based on evidence of their overall suitability, economic and financial standing and technical capacity. The specification stage refers to how requirements must be specified including technical, performance and functional specifications. Award stage also refers to the use of various specified criteria for determining which offer is the “most economically advantageous” to the procurer or purchaser (i.e. best value for money). Research by Hughes et al., (2006) on procurement in the United Kingdom (UK) construction industry helps to understand how procurement has been traditionally focused on price and hence economic considerations. The concept



of SP requires a balance between economic, environmental and social factors in procurement to enhance the relationship between procurement and sustainability. This has seen significant push in recent years. However, the heavy reliance on traditional techniques like competitive tendering in the procurement process in construction seems to go against the grain of SP theory in some respects. One traditional feature of the construction sector is that price formation and contractor selection takes place as a simultaneous process (Murdoch and Hughes, 2008). This implies that a contractor who is hungry for work needs to address the price aspect of their bid to a significant extent in order to be attractive.

Tender evaluation criteria and points are still heavily skewed in favour of a contractor's financial offer (Laryea, 2013). There is little doubt that many clients of the construction industry use competitive tendering as a mechanism for obtaining bargain bids from contractors (Smith and Bohn, 1999). There is a significant emphasis on economic interests and a genuine desire to achieve SP should seek to balance the triple bottom line factors. There is evidence to prove that many contractors would intentionally pitch a bid lower than cost in order to win work in times when they are desperate (Rooke et al., 2004). Such commercial behaviours have a tendency to wipe out firms and this may then go on to affect the local economy including job losses. A situation like that will affect the well-being of families and hence goes against the grain of SP.

Furthermore, there is a lot of wasted effort when several companies are bidding for the same work and inevitably some will be wasting resource that could be used elsewhere. This has also been highlighted in the UK Government Construction Strategy (2011). A multiplication of the wasted resource throughout the construction industry would reveal



the enormous amount of resource and money being wasted. A research project on why clients only feel comfortable in entering into a competitive procurement strategy and awarding on price would be of benefit. The reasons may be many and complex but this procurement process has been shown not to be the most successful often ending in dispute, wasting even more resource. A better understanding of the drivers from the perspective of clients may enable an alternative procurement strategy that reduces bidding cost and contributes to reducing the current wasted effort to be developed. If construction companies were able to reduce their bidding costs their overhead would reduce and the cost of construction could reduce.

#### **2.2.4 Procurement practices in Australia**

Road authorities have the opportunity to use green public procurement as a tool to promote positive environmental changes during the procurement process through green preferences and environmental selection criteria for bid evaluation. However, green procurement is also the aspirational target concerning environmental objectives that might help contractors to achieve additional advantages in winning a contract (Uttam et al., 2012). Systems that encourage contractors to “go the extra mile” should therefore be employed.

Public road authorities hold key roles in driving initiatives for reducing greenhouse gas emission (GHGe) throughout the road construction project life cycle (APCC, 2007).

The GHGe reduction goals can be achieved by means of a coherent and efficient chain of procurement processes and methods to transform sustainability and climate change



policies into proactive initiatives and incentives. Green procurement policies and practices are being adopted to varying degrees in a number of governments across the world (Brammer and Walker, 2011).

Lehtiranta et al., (2012) mapped Australia's current GHGe reduction initiatives in the public road construction procurement sector based on the nation's five largest road authorities. These agencies are responsible for 96 per cent of the total AUD13 billion of annual national public road construction and maintenance expenditure. Major gaps in Australia's green procurement practices were found (Lehtiranta et al., 2012). The Australian Sustainable Built Environment National Research Centre (SBEnc) research team has continued to build on the work of (Lehtiranta et al., 2012). helping to find a solution to the fact that most road authorities do not have systems in place to ensure the translation of such goals to proactive mechanisms applicable to road construction projects, despite having developed policies, strategies and action plans integrating GHGe reduction components to different degrees. However, it was found that many road authorities who are core partners to the SBEnc are currently developing sustainable procurement guidelines and tendering requirements that will have an impact on GHGe from construction operations.

According to Tan, et al., (2011) to ensure effectiveness of public policies and strategies it is necessary to determine authority, communication of responsibilities, processes and resources needed to implement sustainable management systems. According to Broome (2002) a well-developed incentive mechanisms will aid the process of achieving client GHGe objective than a contractual obligation alone would. To this end, procurement practices and incentives are being developed and tested to motivate contractors to better



perform with regards to their GHGe from construction activities. Several Australian road authorities have responded positively both to recommendations for the inclusion of non-price criteria addressing sustainability in expressions of interest (EOI) for major contracts (Roads Australia, 2010a), as well as to the inclusion of sustainability clauses in major contracts (Roads Australia, 2010b). However, there remains a lack of adherence to best practices and standardised procedures and guidelines for GHGe assessment and reduction in Australia's road construction industry (Lehtiranta, et al., 2012). This results in irregular application of green initiatives throughout the state project portfolio. The question as to what extent the identified green procurement standard processes are being addressed on a project-by-project basis, remains unanswered. A deeper understanding of the differences between standard procedures and project specific practices will help road authorities to close the existing gaps to ensure the effective translation of climate change policies into feasible project delivery actions.

#### **2.2.5 Procurement practices in North America-Nova Scotia**

Nova Scotia is one of the cleanest environments in the world sets out 21 far-reaching goals for the province ranging from reduced air emissions and waste, to new energy standards for building and road construction. The Act also commits the government to developing and implementing a sustainable procurement policy by the end of 2009, recognizing the important role public procurement plays in creating sustainable prosperity. With this legislation, Nova Scotia is poised to become a North American leader in sustainable procurement. In recent years, a number of jurisdictions worldwide have developed and implemented environmentally preferable procurement policies.



Examples of sustainable procurement policy implementation are less common but do exist. In Canada, Manitoba has a well-developed environmentally preferable procurement process while Whistler, Calgary, and Vancouver have all recently embarked on sustainable procurement initiatives. Nova Scotia can learn from all of their experiences. For the government of Nova Scotia, sustainable procurement means taking full responsibility for the long-term impacts of its purchasing and consumption decisions. The initiative to implement a sustainable procurement policy for the Province of Nova Scotia is being lead by Nova Scotia Economic Development (NSED) and Nova Scotia Environment and Labour (NSEL).

#### **2.2.6 The Marrakech Process**

The Marrakech Process is a global multi-stakeholder process to support the implementation of Sustainable Consumption and Production. The process sought to develop a Global Framework for Action on Sustainable Consumption and Production for 10 years. The work on the ten Year Framework Programmes was reviewed by the Commission on Sustainable Development (CSD) in 2010.

A decision on the implementation of a ten Year Framework Programmes was expected in May 2011. The Process was in responds to the call of the Johannesburg Plan of Implementation (World Summit on Sustainable Development 2002) to support the regional and national initiatives to accelerate the shift towards Sustainable Consumption and Production patterns, separate economic growth from environmental de-gradation. UNEP and UN DESA are the leading agencies of this global process, with an active participation of national governments, development agencies, business and industry, civil



society and other stakeholders. The first meeting devoted to developing the 10 YFP took place in Marrakech, Morocco in June 2003, hence the name. ([www.unep.fr/scp/marrakech/about.htm](http://www.unep.fr/scp/marrakech/about.htm))

### **2.2.7 Economic sustainability**

The economic dimension involves providing for positive economic growth. This focuses on the importance of stable economic growth. It means working within the capacity of the natural environment, adopting measures from fair and rewarding employment through to competitiveness and trade (Jones et al., 2010).

### **2.2.8 Sustainable procurement practices**

The World Summit on Sustainable Development acknowledged in 2002 that Sustainable Public Procurement (SPP) can contribute to achieving sustainable development goals and the Johannesburg Plan of Implementation encourages public procurement practices that stimulate development and diffusion of environmentally sound goods and services and promotes the integration of the three pillars of sustainable development which are economic development, social development and environmental protection.



## **2.3 FACTORS WHICH CAUSES VARIABILITY IN ENVIRONMENTAL SUSTAINABLE PROCUREMENT**

### **2.3.1 Degrees of Sustainable Procurement**

The dependent variable in this research is the degree of sustainable procurement. The Dutch policy on sustainable procurement is based on the notion of making a certain degree of sustainability within procurement is compulsory. However, project teams are asked to aim for more sustainability (non-compulsory), thus leaving room for projects to vary in the degree of sustainability. Studies on sustainable procurement in public sector organisations show great variation with regard to their extent and overall nature of involvement with sustainable procurement (Brammer and Walker, 2011; Meehan and Bryde, 2011, page 94). Secondly, although people might verbally demonstrate that they endorse certain policies or schemes, this does not necessarily have to lead to a change in their behaviour or practice (Meehan and Bryde, 2011, page 95; Vining and Ebreo, 1990). This indicates that sustainable procurement is not a straight forward issue. Sustainability is a complex and often-contested concept (Brammer and Walker, 2011). Defining and bringing into fruition the different degrees of sustainable procurement is therefore difficult. Meehan and Bryde (2011) opined that sustainable procurement ensures that there is minimal impact on society and the environment as well throughout the whole life cycle of the product. Based on earlier empirical data and an interview with an expert, four degrees of sustainable procurement have been identified:

( 1) non application of the enforcement of ecological criteria;



- (2) enforcement of ecological criteria,;
- (3) employment of ecological motivating criteria and ;
- (4) adding much value to products (e.g., generating electricity).

The procurement process is considered as a special process for decision-making, where the project teams come out with innovations regarding the procurement that influences whether the full potential of sustainable procurement is used (Günther and Scheibe, 2006). Top management support, commitment and expertise (Brammer and Walker, 2011) are three major factors often mentioned in sustainable procurement literature as potential drivers of sustainable procurement practices within public sector organizations. These factors are expected to influence the decisions made by the actors involved, and they determine whether the full potential of sustainable procurement is used. These three factors are further discussed;

### **2.3.2 Top Management support in sustainable procurement**

The traditional change management literature has often pointed to the pivotal role top management support plays in the implementation of organizational change, Fernandez et al., (2006). Within the procurement and sustainable procurement literature, a similar role is given to top management support (Højmosé and Adrien-Kirby, 2012). For example, a study by Brammer and Walker (2011) found leadership and top management support to be critical in the implementation of sustainable procurement. If managers are supportive and incorporate sustainable procurement in their strategies or goal setting, project teams will indeed procure sustainably (Brammer and Walker, 2011).



Ageron et al., (2011)also concluded similarly with regard to sustainable supply chain management; that top management support is necessary and is usually a key driver for successful sustainable supply chain management. The importance of top management support could be partly explained by the fact that top managers facilitate, ensure and deploy organisational resources to meet the goals of organisations and individual departments,Hoejmose and Adrien-Kirby(2012, ). In the public sector, top management support not only requires support from the political top but also from top-level civil servants (Fernandez and Rainey, 2006).

### **2.3.3 Lack of Commitment to sustainable procurement**

Commitment may be defined as a force that draws a project team together to a course of action deemed very necessary for the application of sustainable procurement within their procurement project set up (Herscovitch and Meyer, 2002). Commitment is considered as a very crucial ingredientwhich determined the range of sustainable procurement in sustainable procurement literature (Erdmenger, 2003; Michelsen and de Boer, 2009). Without the right mind-set, purchasers will make traditional choices. Commitment is therefore a large determinant to what an organisation can achieved, Hoejmose and Adrien-Kirb, (2012). Although sustainable procurement literature identifies the relevance of commitment of the procurers and project teams to change, little attention is given to the characteristics of commitment. Literature from the field of organizational change offers more insights into commitment to changes. Commitment to change does not have to be present from the onset of the procurement process; it can occur after education or coerced involvement at the individual or system level (McLaughlin, 1990). If public



procurers are required to change their routines or behaviour, they could become committed in the process (McLaughlin, 1990).

There are three different classifications of commitment: affective, continuance, and normative (Herscovitch and Meyer, 2002).

Affective commitment is a desire to provide support for change based on a belief in its inherent benefits (Herscovitch and Meyer, 2002). An example would be a belief that sustainable procurement is beneficial for the environment. Continuance commitment is the recognition that there are costs associated with failure to provide support for the change (Herscovitch and Meyer, 2002). For example the recognition that not procuring sustainably could lead to hefty fines (due to breaking environmental laws) or bad press. Normative commitment is a sense of obligation to provide support for change, for example, because in many other projects in the organisation project teams are procuring sustainably. Herscovitch and Meyer (2002) demonstrated that affective and normative commitment to a change resulted in higher levels of support than continuance commitment.

#### **2.3.4 Lack of Expertise in sustainable procurement**

Sustainable procurement is a complex, often-contested concept, and it requires that public procurers have specific skills and knowledge. A lack of expertise negatively affects the effort put into sustainable procurement. According to Snell (2006), 80% of (both public and private) purchasers even lack a clear understanding of the term sustainable. Lacking an understanding of what sustainable procurement is and can do makes it difficult to see



its potential, such as the potential to realize economic benefits (Bowen et al., 2001). Although the organisation might request information about environmental issues in a call for tenders, this does not mean they will turn down a cheap offer in favour of a more environmentally friendly offer (Michelsen and de Boer, 2009). It also does not mean that the project team has enough expertise to draw a sensible conclusion from the received information. If the project teams lack expertise, they will have to interpret the information based on their own old routines, which are no longer appropriate to the situation, causing them to make safe and traditional choices (Meehan and Bryde, 2011).

Close collaboration between project teams and environmental experts, training, national standards and templates for sustainable procurement are considered potential solutions for a lack of expertise (Michelsen and de Boer, 2009). According Brammer and Walker (2011) training increased employee engagement with sustainable procurement, however, they did not find that knowledge or awareness issues had an effect on their engagement.

## **2.4 FACTORS PREVENTING THE ACHIEVEMENT OF ENVIRONMENTALSUSTAINABLE PROCUREMENT IN GHANA.**

The challenges to the institutionalization of national laws are pervasive in developing countries, Ghana not being an exception. The National Public Procurement Authority of Sierra Leone in its 2005 report outlined several challenges militating against the operations of the Authority. Some of them include: inadequate funding, deficient staff strength and organisational and logistical limitations. The report recommended among other things, that the law could achieve its objective if there is a concerted effort by all stakeholders, backed by a very firm political will and adequate budgetary support, to



streamline and improve public procurement procedures in Sierra Leone (NPPA Annual Report, 2005). The annual report of Ghana's Public Procurement Authority (PPA), since its establishment, has always cited inadequate funding as the leading barrier to smooth operations of the Authority (PPA Annual Report, 2007 and 2008). The sheer magnitude of procurement outlays has a great impact on the economy and needs to be well managed. Indeed, in all countries in the world, estimates of the financial activities of government procurement managers are believed to be in the range of 10% range– 30 % of GDP (Callender and Mathews, 2000). Efficiently handling this size of procurement outlays has been a policy and management concern as well as a challenge for public procurement practitioners.

Public procurement has been utilized as an important tool for achieving economic, social and other objectives (Arrowsmith, 2003; Thai, 2001). In its report to the Congress, the Commission on Government Procurement states: “The magnitude of the Government's outlays for procurement and grants creates opportunities for implementing selected national policies” (Federal Acquisition Institute, 1999). Due to numerous reasons (including greater scrutiny of taxpayers and competing vendors), public procurement has been perceived as an area of waste and corruption (Nakamura,2004).

In addition, public procurement is faced with the challenges imposed by a variety of environmental factors (external factors) such as market, legal environment, political environment, organizational and socio-economic environmental factors. Regardless of the effort by the central government and its related agencies and the acknowledgement that the procurement departments are capable of adding value to their organizations, still a large number of the internal customers act on their own and more



frequently bypass the procuring department (Schiele and McCue, 2006). This problem requires establishment of clear procurement procedures and performance standards. Performance when adopted will provide the decision-makers in the procurement department with unbiased and objective information regarding the performance of the procurement function (Knudsen, 1999).

Political interference with the procurement process is also a big challenge to the implementation process and public procurement reforms. A good number of politicians think that they have the right to intervene in the procurement procedures thereby leading to a capricious procurement decisions (World Bank, 2004b). The lack of career development path and low salaries of procurement personnel also militates against procurement reforms implementation (World Bank, 2003a). Poor records keeping (World Bank, 2003a and ODPP, 2007) and delays in payment of contractors and suppliers have also been cited amongst as some of the crucial factors that challenges the procurement reforms implementation (Azeem, 2007). Other challenges include poor dissemination of the procurement law (Azeem, 2007), lack of proper training for the managers of the procurement process (Forgor, 2007).

Public procurement has, for long, been overshadowed with inefficiency, corruption and disregard of fundamental "value for money" considerations. This has adversely impacted the rate and quality of progress in realizing the objectives of national development, especially in developing and transition countries (Tan et al., 2009). Employees may neither engage in, nor give the appearance of engaging in, dishonest or unethical actions. Both are injurious to the public's perception of honest government. As a government employee, you might have access to procurement and other nonpublic information that



could affect a contract bid or the award process (Wymer and Regan, 2005). Improper disclosure of such protected information could violate numerous laws, as well as ethics rules. It also could subject you to administrative actions, as well as civil or criminal penalties. Management in contracting authorities should ensure that there is an appropriate focus on good practice in purchasing and, where there is a significant procurement function that procedures are in place to ensure compliance with all relevant guidelines. Officials involved in procurement must not make improper use of their position (Tan et al., 2009). Officials may have access to very confidential and/or market sensitive information. It is unethical to use inside information provided to the agency as part of a tender process, either for the material benefit of the official or for another person. Criminal sanctions apply to such behaviour.

## **2.5 MEASURES TO MITIGATE FACTORS PREVENTING THE ACHIEVEMENT OF ENVIRONMENTAL SUSTAINABLE PROCUREMENT CHALLENGES**

For sustainable procurement strategies to be successful they will likely need to be able to overcome many of the challenges. Literature has identified a number of strategies that can assist organizations develop sustainable procurement strategies. Some of these strategies are described below:

### **2.5.1 Integration of sustainable procurement into existing practices**

Integration is vital to sustainable procurement strategies. Both time and resources are often limited, so any additional sustainable procurement or initiatives need to be easily



incorporated into the existing responsibilities of purchasers and supply chain managers (Fitzgerald et al., 2007). Sustainable procurement practices may require particular knowledge, but this can be provided using regularly scheduled training sessions that many organizations host. The ultimate goal is to incorporate sustainability into every aspect of what managers do anyway. Once sustainability considerations become part of the job, it is not seen as an additional burden.

Broom (2002) suggests that performance indicators that can be used as incentives must be realistic and relevant to the project, reflect the state of the technical definition and be easily administered. Alternatively, the use of GHGe calculators could facilitate the comparative analysis of road- building materials and techniques proposed by the contractors on their tenders with respect to the climate change targets of the issuing road authorities (Zammataro, 2010).

Walker and Hampson, (2013), opined that because Alliance contracts are based on best value primacy this model has the potential for promoting innovation and achievement of more positive outcomes in relation to GHGe and other sustainability issues.

Mexico's key actors in the health and energy sectors, namely the Mexican Institute of Social Security (IMSS), the Mexican Petroleum Company (PEMEX) and the Commission for Electricity (CFE), requested the OECD to help them deliver better services with decreasing resources in 2011. The health and energy sectors in Mexico represent 40% of all public sector procurement, approximately USD 15 billion. Procurement offers the potential for savings and improved performance is key to the viability and credibility of the institutions. To achieve economies of scale within



individual organisations as well as across sectors, the following recommendations were made;

- 1) Initiate a dialogue among Mexican entities to consider joint procurement for common goods and services.
- 2) Streamline processes and increase co-ordination in highly decentralised structures in the health and energy sectors and further centralise standardised requirements.
- 3) Reduce the use of direct awards and increase the use of open and competitive tendering.
- 4) Increase integration among the electronic systems of individual entities and the Federal Government's e-procurement system as well as provide systematic training on the use of these systems to both civil servants and potential suppliers.

According to Wee, (2002) ethics are the moral principles or values that guide officials in all aspects of their work. Ethical behaviour encompasses the concepts of honesty, integrity, probity, diligence, fairness, trust, respect and consistency. Ethical behavior includes avoiding conflicts of interest, and not making improper use of an individual's position. Ethical behavior is important in public procurement as it involves the expenditure of public money, and is subject to public scrutiny. Public officials should always behave ethically and fairly, including in their business undertakings. Ethical behavior supports openness and accountability in a procurement process and gives suppliers confidence to participate in the Government marketplace. Ethical behavior can also reduce the cost of managing risks associated with fraud, theft, corruption, and other improper behavior; and enhance confidence in public administration Wee(2002).



An important and effective way to maintain ethics awareness in agencies is to provide training for employees (Amos and Weathington, 2008). Ethics training and seminars can be provided, along with training in more specific areas, such as procurement procedures, record keeping, records management, and accountability and administrative law. Regular reviews or audits of procurement processes can be done to ensure probity is being considered and achieved (Amos and Weathington, 2008).

### **2.5.2 Green Procurement Incentive Tools**

Broome (2002) states that “intelligent use of incentives relates to designing a multi-incentive plan so that the contractor, in pursuing its business objectives, is indirectly placing the same emphasis or weighting on each of the client’s project objectives as the client does.” There are numerous incentive mechanisms that can be built into the procurement process in order to translate policies and strategies into proactive initiatives that ensure achievement of the overall goals and objectives. Some of the possible incentive mechanisms are explained in the following sub-sections.

### **2.5.3 Pre-qualification**

Lam et al.,(2000) define contractor pre-qualification as a process to evaluate the ability of candidate contractors to complete a contract satisfactorily before they are admitted into the bidding process. Austroads developed the National Pre-Qualification System for Civil (Road and Bridge) Construction Contracts, applied nationwide. However, while this system requires a certified EMS, it does not include sustainability or GHGe management (Casey and Kelley, 2010).



#### **2.5.4 Multi-Factor Tender Evaluation**

Multi-factor or multi-criteria tender evaluation is a way to achieve best value for money instead of simply the lowest price. This approach to tender evaluation has been growing in the contractor selection process over the last decade and can be carried out on a project by project basis or through a standard set of criteria (Wong et al., 2000). Numerous advanced models (such as Multiple Kernel Learning (Lam and Yu, 2011), Stochastic Decision Models (Russell et al., 1990), etc.) and non-financial criteria have been created to compare different bids. They could be applied based on the road-building techniques and materials proposed by the contractors during tender such as GHGe calculations Zammataro (2010). Environmental Cost Assessment (Curkovica and Sroufe, 2007).

#### **2.5.5 Tax Incentives**

Tax incentives can be introduced in contracts especially during the tendering process to motivate stakeholders to perform more sustainably in the construction industry (Feige et al., 2011). An example of such taxes is the carbon tax, an excise tax imposed according to the carbon content of fossil fuels (Zhanga and Baranzinic, 2004). Such a tax could be an incentive to reduce fuel consumption during road works and therefore improve contractor GHGe performance.

#### **2.5.6 Incentive Contracts**

Contract clauses can be used for sustainability purposes to address issues that pertain to the execution of the contract. Performance-based incentives can be used through the



establishment of minimum levels of performance at project completion or at milestones Broome (2002). Conditional and banked awards, as well as value enhancement incentives can also be integrated into the contract to promote higher performance (Broome, 2002). GHGe calculators such as Carbon Gauge designed by VicRoads (Murphy, 2011a) and CHANGER designed by the International Road Federation (2010) could be used to such an end.

### **2.5.7 Delivery Models**

There are many delivery models available to the road construction industry, and the project will excel only if the right delivery model is chosen for the appropriate context (Song et al., 2009). The delivery method selection is therefore one of the most critical steps in ensuring project success (CEIID, 2010). In the construction industry, traditional design–bid–build approaches have historically created adversaries among project team members, whose individual profitability frequently is only attainable at the expense of another party to the contract (Hauck et al., 2004). Currently, there is a trend in Australia towards Alliance and Public Private Partnership (PPP) contracts for delivering some of Australia's most complex and significant public sector infrastructure projects (CEIID, 2010). However, PPP is not as common as Alliance in the Australian road construction industry. Because Alliance contracts are based on best value primacy (Walker and Hampson, 2003), this model has the potential for promoting innovation and achievement of positive outcomes in relation to GHGe and other sustainability issues (Gollagher and Young, 2009).



## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 INTRODUCTION**

This chapter outlines the methodology which was used to carry out the study. The methodology covers the research design, the population and sample design, data collection and data analysis methods.

#### **3.2 RESEARCH DESIGN**

Creswell (2006) defines a research design as procedures for collecting, analysing, interpreting and reporting data in research studies. This study used the quantitative survey research approach as its research design. The choice was premised on the fact that the study sought respondents' views and opinions on the aim and objectives of the study.

Survey research is a data collection method which requires asking respondents for information using either verbal or written questions. Survey research provides quick, inexpensive, efficient and accurate way of assessing information about the population. Survey research requires that questions being asked, whether oral or written are well thought out and structured by the researcher. The structured method of survey involves the developing and circulation of questionnaire with list of questions in acceptable sequence which has pre-categorized answers. These questionnaires may be self-administered, where the respondents are expected to complete them by themselves. Self-administered questionnaires do not require interviews and therefore has a lower cost and



also eliminates interviewer bias thereby allowing respondents adequate time to consult and give considered answers and because respondents may not be required to reveal their identity, they are likely to give more honest reliable answers. It also permits wider geographical coverage and the use of large samples will yield large volumes of highly reliable data which is normally easy to analyze ( Asika, 1991).

### **3.3 POPULATION**

The population refers to an entire group of individuals, events or objects which have a common characteristic. The population for this study is forty (40) and includes all the Key procurement staff of the three (3) Agencies of the Ministry of Roads and Highways of the Kumasi Metropolis of the Ashanti Region; Ghana Highway Authority (GHA), Department of Feeder Roads (DFR) and Department of Urban Roads (DUR).

### **3.4 SAMPLE SIZE DETERMINATION**

The sample size required for a study is influenced by several factors, including the purpose of the study, the population size, the level of precision, the level of confident or risk and the degree of variability in the attributes being measured (Miaoulis and Michenser, 1976 Cited in Israel, 2012). According to Israel (2012), sample size for a study can be determine using; (a) figures in Published tables (b) Sample size of similar studies (c) A census for small populations and (d) Formulas. In this study, census for small populations was used (Stoker in Strydom and De Vos (1998: 192). The sample size from by GHA, DUR and DFR Administration is forty (40).



In general, it is stated that the larger the population, the smaller the percentage of that population sample needs to include. Strydom and De Vos (1998:191) further stated that if the population itself is relatively small, the sample should comprise a reasonably large percentage of the population.

### **3.5 SAMPLING TECHNIQUE**

According to Stangor (2007) sampling is the “selection of people to participate in a research project, usually with the goal of being able to use these people to make inferences about a larger group of individuals”. Any sampling process therefore presupposes the existence of a population from which the sample was drawn. There are several ways to ensure that the sample drawn is as representative of the population as possible so that any conclusion drawn may be as close as possible to the characteristics of the population. These principles were applied in drawing a sample for this research work. There are two methods normally used for sampling. These are probability and non-probability sampling (Stangor, 2007; Opoku, 2007). The choice of either probability or non-probability sampling was determined by the nature and composition of the working population from which the sample was drawn and the nature of the research being carried out. Probability sampling is a sampling technique which ensures that every member, element or unit of the population has an equal chance of being included in the sample (Stangor, 2007).

In this study, 40 Civil Engineering, Material Engineering and Quantity Surveying members of staff of the three road agencies of the Ministry of Roads and Highways in the Kumasi Metropolis were engaged in the study. These comprised 12 each from the



Departments of feeder and Urban Roads and the remaining 16 from the Ghana Highway Authority.

### **3.6 DATA COLLECTION**

The instrument used in data collection was questionnaire. The data for the research was collected through the administration of questionnaire to respondents. All the sets of questionnaire contained opened and closed-ended questions. The closed -ended questions enabled the researcher to specifically direct the respondents towards the desired responses whilst the open ended questions gave respondents the opportunity to express themselves, without any restrictions. On the other hand the open -ended approach was chosen to give the respondents opportunity to comment on some of the issues in the questionnaire. The questionnaires were designed to collect general information from the three (3) entities; GHA,DUR and DFR of the MRH in Kumasi in the Ashanti Region. The questions were categorized to enable information to be collected in a more effective approach.

The first part of the questionnaire sought information about the demographic characteristics of respondents. These included the position within their various entities, highest level of education attained, experience and the type of project they embark on etc. The subsequent part sought all the relevant questions needed to achieve the aim and objectives of the research; these are information about sustainable procurement practices, factors which causes environmental variability, sustainable procurement challenges and measures to be adopted to mitigate the observed challenges.



Generally the level of agreement of the respondents were measured on a four (4) point ordinal scale where; 1 = Disagree 2 = Strongly Disagree 3 = Agree 4 = Strongly Agree

### **3.7DATA ANALYSIS**

The responses of the questionnaire were analyzed to enable discussions to be made on the subjects. Statistical Package for Social Scientist (SPSS) version 16 was first used to collate all the responses. Thereafter, the questions on the general particulars of the respondents and their respective Agencies were analyzed into percentages. The results were further presented in graphs, charts and tables. The other types of questions were also analyzed to obtain the level of agreement or otherwise from the respondents. The questions were ranked on a scale of 1– 4 indicating different levels of agreement. Thus, 1 = Disagree 2 = Strongly Disagree 3 = Agree 4 = Strongly Agree



## **CHAPTER FOUR**

### **RESULTS AND DISCUSSION**

#### **4.1 INTRODUCTION**

This chapter presents the results and discussions on the questionnaire survey carried out. The chapter is organized into five sections: The first section draws information about the general particulars of the respondents and their Agencies. The remaining four sections addressed the objectives of the study.

#### **4.2 GENERAL PARTICULARS OF THE RESPONDENTS AND THEIR AGENCIES**

The first section of the questionnaire sought to draw information about the respondents and their Agencies. The purpose of this section was to assess the credibility of the respondents who have been selected for the study. The variables studied were the years of working experience of the respondents, position held in their respective Agencies etc. as shown on Table 4.1. It was also observed that most of the respondents have Bachelor Degrees as their highest level of education and besides having long years of working experience. As shown on the Table, 93.2% have worked for not less than 5 years in their chosen fields of profession.

These credentials justify the credibility of the respondents and hence the information provided can be relied on as a through representation of the state of sustainable procurement in the road sector of Ghana.



**TABLE 4.1: GENERAL INFORMATION OF THE RESPONDENTS AND THEIR AGENCIES**

	<b>Item Description</b>	<b>Frequency</b>	<b>Percent</b>
<b>1</b>	<b>Agency of Ministry of Roads and Highways the firms belong to</b>		
A	GHA	14	43.8
B	DUR	9	28.1
C	DFR	9	28.1
	Total	32	100.0
<b>2</b>	<b>Position of respondents in their Agencies</b>		
A	Quantity Surveyor	15	46.9
B	Civil Engineer	11	34.4
C	Material Engineer	6	18.8
	Total	32	100.0
<b>3</b>	<b>Highest Level of Education</b>		
A	Higher National Diploma (HND)	2	6.2
B	Bachelor Degrees (Including Honours)	24	75.0
C	Postgraduate/MA/MPhil/PhD	5	15.6
D	Others (specify)	1	3.1
B	Total	32	100.0
<b>4</b>	<b>Years of working Experience</b>		
A	Less than 5 years	2	6.2
B	5-10 years	7	21.9
C	10-15 years	8	25.0
D	Above 15 years	15	46.9
	Total	32	100.0
<b>5</b>	<b>Type of Road Activity you execute</b>		
A	Routine Maintenance	20	62.5
B	Periodic Maintenance	12	37.5
	Total	32	100.0



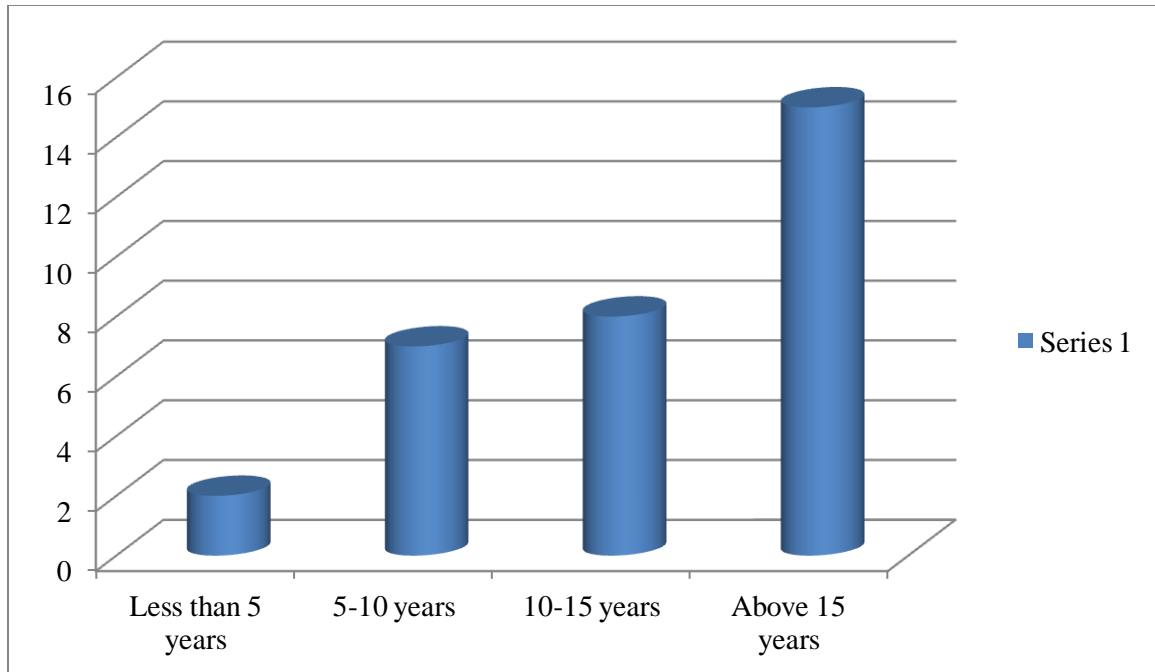


Fig 4.1: Years of working experience of respondents

### **Environmental Sustainable Procurement (ESP) Practices**

The second section of the questionnaire sought to explore the various practices put in place in the road sector to ensure environmental sustainable Procurement Practices. Six practices which have been reported in literature as being ESP practices were selected for the current study. The respondents were consequently asked to indicate the extent to which those practices were in use in their respective agencies. The results of their responses were analyzed using Relative Importance Index (RII) as shown on Table 4.2 below.

From Table 4.2, it was found that the ESP practices which are relevant and in use in the Ghanaian road sector is regular training for the managers of the procurement process, having (11) respondents representing 50%, which was ranked first. On ES procurement



practices on our roads, 22 respondents representing 68.75% agreed that it is being practiced on our projects. Regular monitoring, control and review methods for Green House Gas emissions (GHGe) was ranked second with a response rate 46.7%, etc. as shown on the Table. Some of the respondents however, on Environmental criteria in our design and procurement processes through to contractor selection; Standardized procedures and guidelines for Greenhouse gas emissions (GHGe) assessment and reduction in our contracts; and Incentives for GHGe reduction in all contracts. indicated that the procurement personnel and the management members usually attend workshops and seminars on sustainable procurement and other related issues. These seminars were organized usually once in a year. Management also ensures the monitoring, control and review of the methods for Green House Gas emissions. Notwithstanding the above, it was also found from the Table that, most of the road agencies do not include standardized procedures and guidelines for Greenhouse gas emissions (GHGe) assessment and reduction in their contracts. Consequently, there is no Incentives for GHGe reduction in all contracts. The results above concur with the findings of Forgor(2007).



**TABLE 4.2: ENVIRONMENTAL SUSTAINABLE PROCUREMENT PRACTICES**

S/no		RATING								
		1	2	3	4	Total	$\Sigma W$	Mean	RII	Rank
1	Regular training for the managers of the procurement process.	3	2	16	11	32	99	3.094	0.773	1st
2	Regular monitoring, control, and review methods for GHGe.	6	3	15	8	32	89	2.781	0.695	2nd
3	Environmental Sustainable (green) procurement measures are practiced on our projects.	5	1	22	4	32	89	2.781	0.695	2nd
4	Environmental criteria in our design and procurement processes through to contractor selection.	8	7	10	7	32	80	2.500	0.625	4th
5	Standardized procedures and guidelines for Greenhouse gas emissions (GHGe) assessment and reduction in our contracts.	7	15	9	1	32	68	2.125	0.531	5th
6	Incentives for GHGe reduction in all contracts.	6	18	8	0	32	66	2.063	0.516	6th



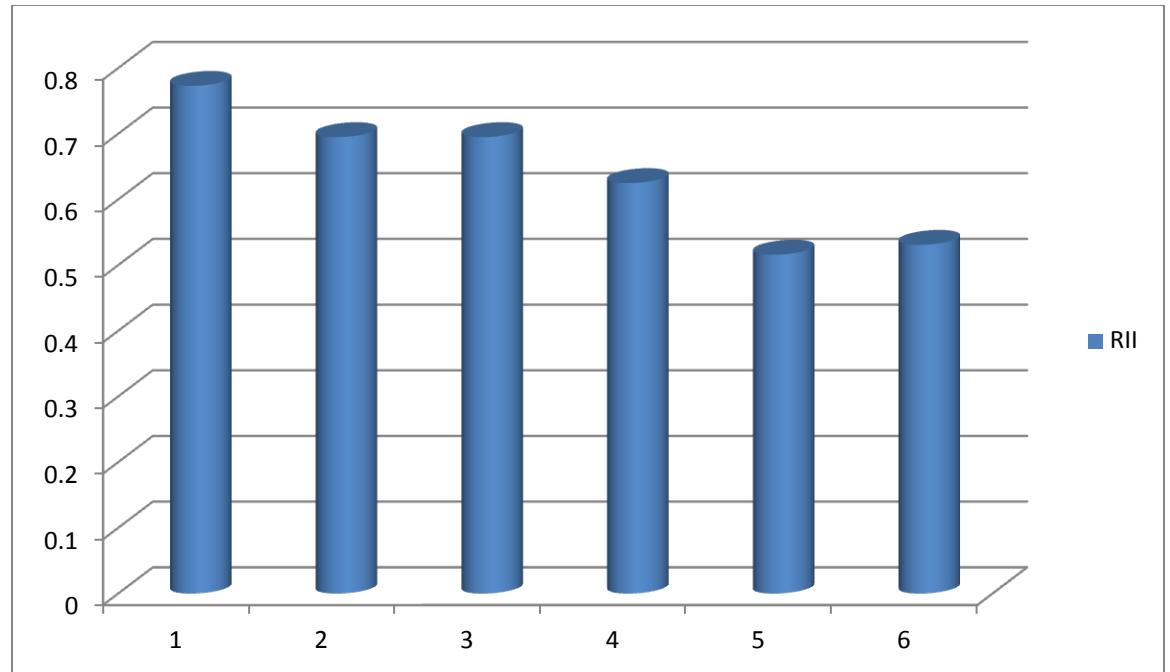


Fig 4.2: Environmental Sustainable Procurement Practices

#### **4.4: FACTORS WHICH CAUSES ENVIRONMENTAL SUSTAINABLE PROCUREMENT VARIABILITY IN THE ROAD SECTOR**

This section of the questionnaire sought to explore the view of respondents about the factors which causes environmental sustainable procurement in the road sector. From Table 4.3 below it was identified that all the respondents to all the questions posed agreed that the degree of variability exist in the road construction sector of Ghana.

From Table 4.3 each of the variables had RII value of above the average ( i.e 0.5). Comparatively, it was observed that Top management expertise in Environmental sustainable procurement (SP) practices ranked first, followed by desire to provide support for change based on a belief in its inherent benefits (2<sup>nd</sup>). These findings are an



indication that although all the causes needs attention the first two is paramount as reported, Fernandez et al., (2006).

**TABLE 4.3: FACTORS WHICH CAUSES ENVIRONMENTAL SUSTAINABLE PROCUREMENT VARIABILITY IN THE ROAD SECTOR**

S/no		RATING				Total	$\sum W$	Mean	RII	Rank
		1	2	3	4					
1	Top management expertise in Environmental sustainable procurement (SP) practices	1	1	22	8	32	101	3.156	0.789	1st
2	Desire to provide support for change based on a belief in its inherent benefits	2	3	19	8	32	97	3.031	0.758	2nd
3	Planning to embrace policy objectives of the procurement institution.	1	1	29	1	32	94	2.938	0.734	3rd
4	Lack of sense of obligation to provide support for change	4	7	10	11	32	92	2.875	0.719	4th

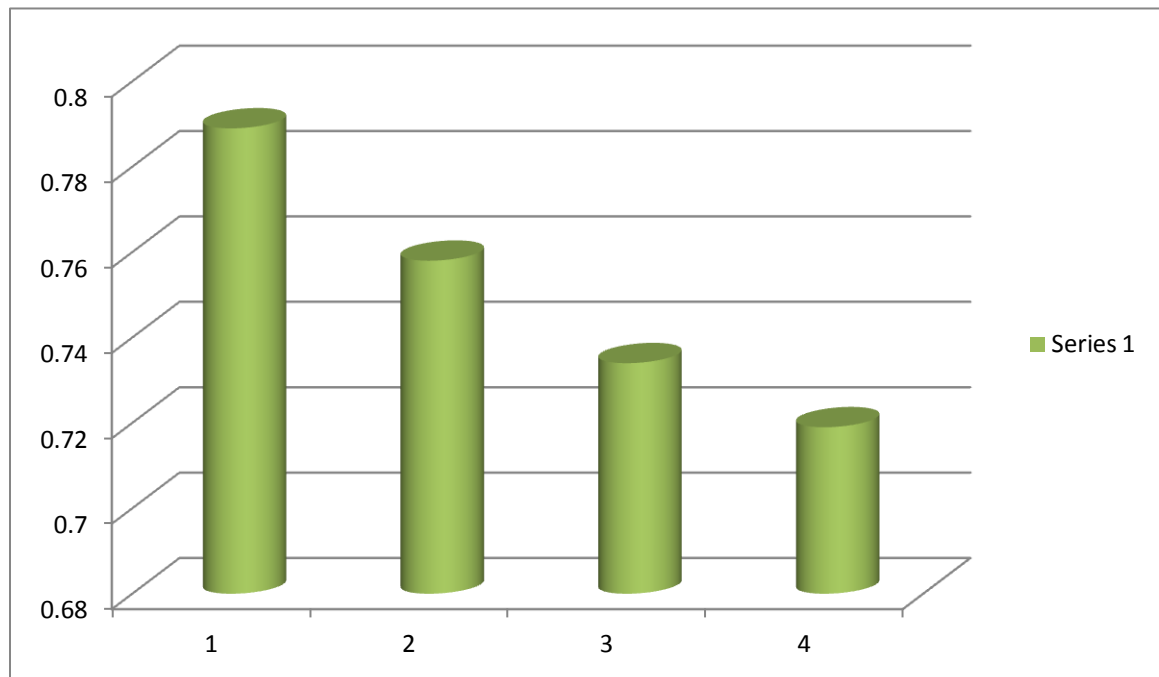


Fig 4.3: Factors which causes Environmental variability in the road sector



#### **4.5: FACTORS PREVENTING THE ACHIEVEMENT OF ENVIRONMENTAL SUSTAINABLE PROCUREMENT PRACTICES IN THE ROAD SECTOR**

Road infrastructure developments worldwide are not without challenges and Ghana's road sector is not exception. Road infrastructure generally is capital intensive and adequate funding and other resources are needed for the smooth implementation of such projects.

Table 4.4 below presents a vivid picture of the responses from the research participants on the challenges facing environmental sustainable procurement practices in the road sector of Ghana.

The research participants from the three agencies of the MRH perfectly agree with all the factors identified as challenges preventing the achievement of environmental sustainable procurement practices in the road sector, (World Bank, 2004b). As can be seen from the Table each of the variables had RII value of above the average ( i.e 0.5), which is an indication that the challenges being encountered in other countries (NPPA Annual Report, 2005) with regards to the road sector, Ghana being not exception.

From the Table it was found that the first-two challenges could be prioritized, and these are; Inadequate funding for projects and deficient staff strength and logistics limitations.



**TABLE 4.4: FACTORS PREVENTING THE ACHIEVEMENT OF ENVIRONMENTAL SUSTAINABLEPROCUREMENT PRACTICES IN THE ROAD SECTOR**

S/no		RATING				Total	ΣW	Mean	RII	Rank
		1	2	3	4					
1	Inadequate funding for projects	1	0	13	18	32	112	3.500	0.875	1st
2	Deficient staff strength and logistical limitations	2	1	16	13	32	104	3.250	0.813	2nd
3	Political interference thereby leading to capricious procurement decisions	1	1	20	10	32	103	3.219	0.805	3rd
4	Lack of career development path and low salaries of procurement personnel	1	1	20	10	32	103	3.219	0.805	3rd
5	Lack of political will and inadequate budget support	2	2	17	11	32	101	3.156	0.789	5th
6	Inefficiency, corruption and disregard for fundamental “value for money” considerations.	1	3	22	6	32	97	3.031	0.758	6th
7	Employees engaging in dishonest or unethical actions	3	3	20	6	32	93	2.906	0.727	7th
8	Inefficient handling and managing of procurement outlays/planning	2	5	20	5	32	92	2.875	0.719	8th
9	Lack of clear procurement procedures and performance standards.	2	8	16	6	32	90	2.813	0.703	9th



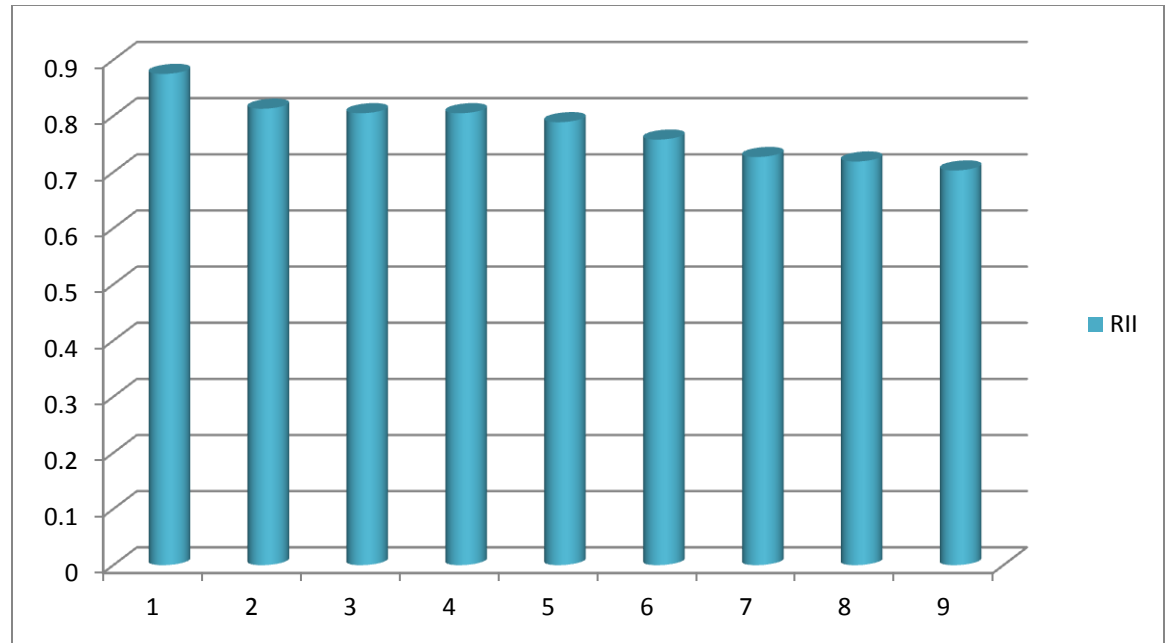


Fig 4.4: Challenges militating against Environmental Sustainable practices in the road sector

#### 4.6: MEASURES TO CONTROL SUSTAINABLE PROCUREMENT PRACTICES VARIABILITY AND CHALLENGES

Challenges are difficult tasks that test someone's ability or skill in an endeavour. Ones these challenges presents themselves there should be a formidable way to surmount them. As a follow-up to solicit the views of respondents on measures to mitigate environmental sustainable procurement challenges in the road sector of Ghana, Table: 4.5 below represent the views of the various respondents to the questionnaire. The responses are all above the average RII of 0.5. Although the respondents agreed on all the suggestions on the questionnaire, they were of the view that the first two on the table i.e. career development plan should be developed and strictly implemented and political interference should also be avoided so that environmental sustainable procurement



practices can achieved should be prioritized as a measure to control the environmental sustainable procurement.

**TABLE 4.5: MEASURES TO CONTROL SUSTAINABLE PROCUREMENT PRACTICES VARIABILITY AND CHALLENGES**

S/no		RATING				Total	$\sum W$	Mean	RII	Rank
		1	2	3	4					
1	Career development plan should be developed and strictly implemented	0	0	15	17	32	113	3.531	0.883	1st
2	Political interference should be avoided	0	0	17	15	32	111	3.469	0.867	2nd
3	Ethics training and seminar should be provided to sharpen the skills of procurement professionals.	1	0	14	17	32	111	3.469	0.867	2nd
4	Successive Governments should provide adequate funding for planned projects	0	0	18	14	32	110	3.438	0.859	4rd
5	Need to procure sustainably to secure the future	0	0	19	13	32	109	3.406	0.852	5th
6	SP procedures should be clearly spelt in both tender and contract documents	0	0	23	9	32	105	3.281	0.820	6th



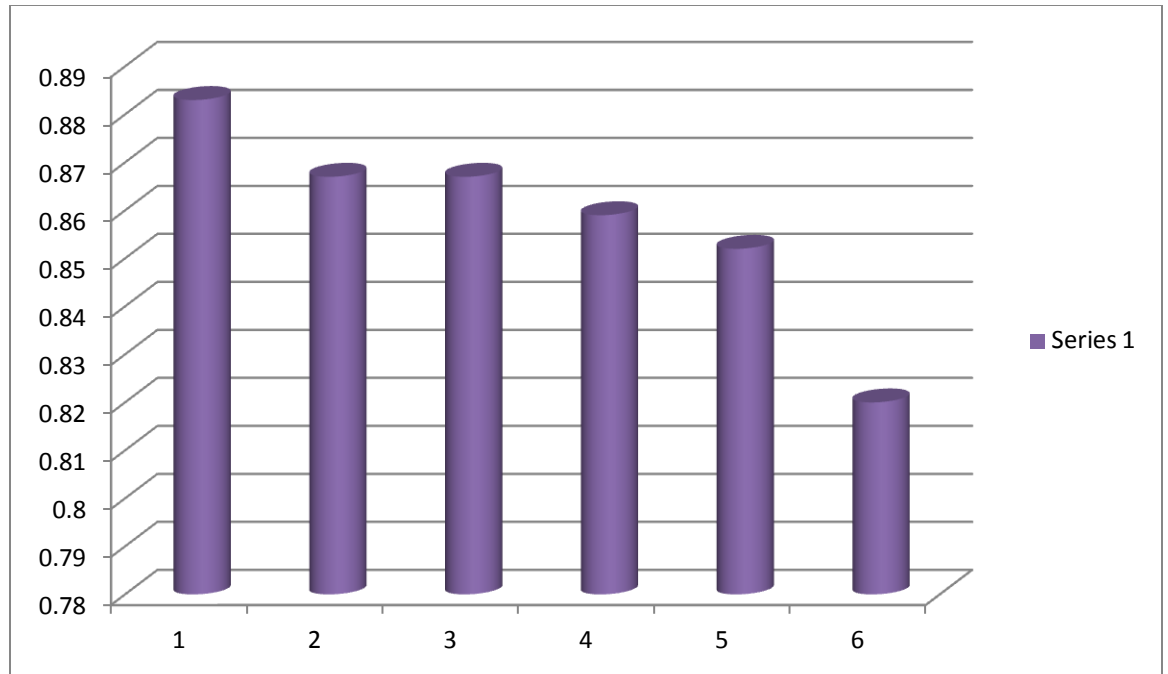


Fig 4.5: Measures to control Sustainable Procurement Practices variability and challenges



## **CHAPTER 5**

### **CONCLUSION AND RECOMMENDATIONS**

#### **5.1 INTRODUCTION**

The aim of the study is to examine the effects of sustainable procurement practices in the road sector of Ghana. In the light of this questionnaire survey was conducted among 40 professionals in the road sector. The respondents were Civil engineers, Materials Engineers and Quantity Surveyors from the three agencies of the Ministry of Roads and Highways in the Kumasi Metropolis of the Ashanti of Ghana. This chapter presents the conclusions and recommendations made to key policy makers on environmental sustainable procurement practices in the road sector of Ghana. The study is focused in sustainable procurement practices in the road sector of Ghana.

#### **5.2 CONCLUSIONS**

Based on the objectives of this research the following conclusions and recommendations were drawn;

**Objective 1: To identify existing environmental sustainable procurement practice in the road sector of Ghana.**

- The study found that some of the ESP practices were being practiced on road projects; They included:



- i. The use of environmental criteria in design and procurement processes through to contractor selection;
  - ii. Standardized procedures and guidelines for Greenhouse gas emissions (GHGe) assessment and reduction in our contracts and
- Incentives for GHGe reduction in all contracts was however, not given any serious attention.

**Objective 2: To identify factors that causes variability in environmental sustainable procurement practices in the road sector of Ghana.**

The factors were;

- Top management expertise and in environmental sustainable practices (decisions by Top management of institutions can help a lot reduced ESP variability).
- Desire to provide support for change based on belief in its inherent benefits (agreeing to provide for a change will enhance environmental sustainable procurement in road sector of Ghana).
- Planning to embrace policy objectives of the procurement institution.



**Objective 3: To identify factors preventing the achievement of sustainable procurement practices for road contracts.**

The conclusion made was that:

- Inadequate funding for projects, deficient staff strength and logistics limitations, political interference were the key challenges.

**Objective 4: To adopt measures to mitigate the factors preventing the achievement of sustainable procurement practices for road contracts.**

The following measures were found:

- Career development plan should be developed and strictly implemented. Training and seminar on SP should be organized regular to sharpen the skills of procurement professionals.
- Successive Governments should budget for and provide adequate funding for road construction project.

### **5.3 RECOMMENDATIONS**

Based on the findings of the study, the following recommendations are made:

- Environmental sustainable procurement guidelines tailored to suit the design and construction of roads should be formulated and implemented.
- Incentives for greenhouse gas emission reduction in all contracts should be adopted



- Political interference should be avoided.
- Training and seminars should be constantly provided to sharpen the skills of all procurement professionals.



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## **APPENDIX ‘A’**

**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**COLLEGE OF ARCHITECTURE AND PLANNING**

**DEPARTMENT OF BUILDING TECHNOLOGY**

**MSc. PROCUREMENT MANAGEMENT**

### **Questionnaire**

**Topic: Sustainable Procurement (SP) Practices in the road sector of Ghana.**

This questionnaire is designed to elicit your view on the Sustainable Procurement Practices in the road sector of Ghana.

**SP** is a process whereby organisations 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 organisation, but also to society and the economy, whilst minimising damage to the environment ( DEFRA, 2006)

The aim of this study is to examine the effects of sustainable procurement practices in the road sector of Ghana. The results from this questionnaire will assist policy-makers, Civil Engineers, Structural Engineers, Quantity Surveyors, Procurement Officials, and other stakeholders in the procurement industry on Environmental Sustainable Procurement Practices and how to use the information in future procurement planning and development.



Your responses to the following questions would be highly appreciated for the success of the research. Any information given would be treated with utmost confidentiality.

## INSTRUCTIONS

- Please tick (✓) or circle (○) the most appropriate answer to each of the questions.
- Where applicable, tick all the answers which apply

## SECTION I: DEMOGRAPHIC CHARACTERISTICS

1. Please indicate your Agency under the Ministry of Roads and Highways (MRH)

- ☐ GHA
- ☐ DUR
- ☐ DFR
- ☐ Others, (Specify).....

2. Your position in organisation

- ☐ Quantity Surveyor
- ☐ Civil Engineer
- ☐ Structural Engineer
- ☐ Material Engineer
- ☐ Others, (Specify) .....



3. Indicate your highest level of education

☐

Higher National Diploma (HND)

☐

Bachelor Degrees (Including Honours)

☐

Postgraduate/MA/M Phil/PhD

Others (Specify).....

4. Please indicate your rank/position in your Agency

.....

5. How long have you worked in the road sector?

☐

Less than 5 years

☐

5 – 10 years

☐

10 – 15 years

☐

Above 15 years

6. What type of road activity do you execute?

☐

Routine Maintenance

☐

Periodic Maintenance

☐

Development Works

☐

Rehabilitation Works

7. Indicate the average number of projects you execute per year.

☐

Less than 5

☐

5 – 10

☐

10 – 15

☐

Above 15



## SECTION II: ENVIRONMENTAL SUSTAINABLE PRACTICES (SP) IN THE ROAD SECTOR

This section seeks to explore your views on environmental sustainable procurement practices.

8. Which of the following practices do you implement in your Agency?

Rank your level of agreement using a scale of 1 to 4, where:

1 = Irrelevant 2 = Relevant 3 = More relevant 4 = Most relevant

<b>Environmental Sustainable Procurement Practices</b>	<b>Irrelevant</b>	<b>Relevant</b>	<b>More Relevant</b>	<b>Most Relevant</b>
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Standardized procedures and guidelines for Green house gas emissions (GHGe) assessment and reduction in our contracts.				
Incentives for GHGe reduction in all contracts.				
Environmental criteria in our design and procurement processes through to contractor selection.				
Regular monitoring, control, and review methods for GHGe.				
Environmental Sustainable (green) procurement measures are practiced on our projects.				
Regular training for the managers of the procurement process.				



9. Rank your level of agreement with the factors that caused Environmental variability in the sustainable procurement in the road sector on the following scale of 1 to 4,

Where: 1 = Disagree 2 = Strongly Disagree 3 = Agree 4 = Strongly Agree

<b>Factors that caused environmental variability in the road sector.</b>	<b>Disagree</b>	<b>Strongly Disagree</b>	<b>Agree</b>	<b>Strongly Agree</b>
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Top management expertise in Environmental sustainable procurement (SP) practices				
Planning to embrace policy objectives of the procurement institution.				
Desire to provide support for change based on a belief in its inherent benefits				
Lack of sense of obligation to provide support for change				

10. Rank your level of agreement with the challenges militating against Environmental Sustainable Procurement Practices in the road sector on the following scale of 1 to 4, where: 1 = Disagree 2 = Strongly Disagree 3 = Agree 4 = Strongly Agree

<b>Factors preventing the achievement of Sustainable Procurement road Contracts</b>	<b>Disagree</b>	<b>Strongly Disagree</b>	<b>Agree</b>	<b>Strongly Agree</b>
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Inadequate funding for projects				
Deficient staff strength and logistical limitations				
Lack of political will and inadequate budget support				
Inefficient handling and managing of procurement outlays/planning				
Lack of clear procurement procedures and performance standards.				
Political interference thereby leading to				



capricious procurement decisions				
Lack of career development path and low salaries of procurement personnel				
Inefficiency, corruption and disregard for fundamental “value for money” considerations.				
Employees engaging in dishonest or unethical actions				

11. Rank your level of agreement on the measures to address SP variability and challenges with the following scale of 1 to 4,

Where: 1 = Disagree 2 = Strongly Disagree 3 = Agree 4 = Strongly Agree

<b>Measures to control Sustainable Procurement Practices variability and challenges</b>	<b>Disagree</b>	<b>Strongly Disagree</b>	<b>Agree</b>	<b>Strongly Agree</b>
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Successive Governments should provide adequate funding for planned projects				
SP procedures should be clearly spelt in both tender and contract documents				
Political interference should be avoided				
Career development plan should be developed and strictly implemented				
Need to procure sustainably to secure the future				
Ethics training and seminar should be provided to sharpen the skills of procurement professionals.				

12. What control measures in your opinion can help to achieve sustainable procurement in your organization?

.....

.....