

**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**COLLEGE OF ARCHITECTURE AND BUILT ENVIRONMENT**

**DEPARTMENT OF BUILDING TECHNOLOGY**



**THE EFFECT OF PROCUREMENT OF GOODS ON THE ENVIRONMENT:  
A CASE STUDY OF THE IMPLEMENTATION OF THE URBAN  
DEVELOPMENT GRANT (UDG) PROJECTS IN THE KUMASI  
METROPOLITAN ASSEMBLY (KMA)**

**BY**

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A Dissertation Submitted to the Department of Building Technology, Kwame Nkrumah University of Science and Technology, Kumasi, in partial fulfillment of the requirement for the award of MSc. Degree in Procurement Management

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## DECLARATION

I declare that I have wholly undertaken the study and the report herein under supervision and the project report entitled “**THE EFFECT OF PROCUREMENT OF GOODS ON THE ENVIRONMENT: A CASE STUDY OF THE IMPLEMENTATION OF THE URBAN DEVELOPMENT GRANT (UDG) PROJECTS IN THE KUAMSI METROPOLITAN ASSEMBLY (KMA)**” is the results of my own research except the literature which sources have clearly stated.

Isaac Kumi .....

PG 1769414

Signature

Date

I declare that I have supervised the student in undertaking the study report herein and confirm that the students have my permission to present it for assessment.

Prof. Joshua Ayarkwah .....

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(Head of Department)

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Date

## ABSTRACT

Procurement is considered to be indispensable in KMA, it requires the choice of goods suitable to the environment all because, the environment needs to be protected for man's continued existence hence the need to be guarded of procurement systems. It is conclusive to put forward however that, having people to consider the environment during procurement is a step in the right direction to secure the right goods. In the light of this, the study sought to determine the effect of procurement of goods on the environment using the implementation of the Urban Development Grant (UDG) projects in KMA. The specific objectives are to determine how the Kumasi Metropolitan Assembly consider environmental sustainability during procurement of goods; examine the various environmental sustainability challenges as a result of procurement of goods and find out the plans to ensure effective and proper disposal of procured goods after its lifespan. The study used a mixed methods research design, thus both the qualitative research methods. The population for this study area consists of the various employees at KMA who were directly or indirectly connected with the procurement of any goods or services. In all, twenty (20) respondents were chosen and the sample was selected using the purposive sampling technique. Questionnaire was used mainly to collect relevant data. Since goods procured affect the environment, it is appropriate for procurement officers at the KMA to be concerned about the goods they procure and particularly be thorough about goods that are environmentally friendly. However, to ensure effective and proper disposal of procured goods after their lifespan the Assembly should undertake recycling as the most adopted approach according to the findings of the study.

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## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background of the Study

Undoubtedly, the earth is the habitation for man for which reason the environment needs to be conserved. Though the air, water, nutrients in the soil, minerals among others do not directly influence the economic life of man but it can be catastrophic when endangered. Man and his environment are intertwined and dependent on each other. This makes it clear that the survival of man is inevitably dependent on the sustainability of the environment. This is premised on the fact that the environment from the perspective of Ofori (2002) is the source on which human lives are hinged. It is from the environment that air and water are provided. It will therefore not be farfetched to put forward that, managing the human activities that have the propensity to culminate into environmental destruction is appropriate.

It is clear that, any tendency to abuse the environment through human activities like wrongful disposal of either solid or liquid wastes, irresponsible building acts, excavation among other activities could result in damage to the environment which could mean that the lives that depend on the environment for their survival will be under threat (Akadiri, 2011). This is reasonable in the manner that the destruction of sporadic species or features of the environment not only constitute a loss to man, but also extinction to posterity. To this extent, Bougheyj (2000) posit that, the economy often regards the adoption of environmental protection measures as a costly measure because the environment serves as a base for human lives and provides the economy with the necessary resources for its growth (Ding, 2005).

According to Schwartz et al., (2006), the environment is significantly changing due to the effects of human activities. In this sense, The Millennium Ecosystem Assessment (TMEA) creates awareness that human activity is straining the basic operations of the Earth in such a manner that the ecosystems' ability to protect human lives can no longer be underrated. Whilst the environment serves as the base of resources, it also functions as a repository for generated wastes (Ding, 2005). Considering these developments, it can be deduced that the world is now interested in how to protect the environment for future (Akadiri, 2011) because the Earth's natural resource base is not infinite (Rockström et al., 2013). The foregoing supposes that the nonsustainability of the environment is not detachable from human activities because a vast majority of the needs of humans are met through the practice of procurement from the perspective of Akadiri (2011).

Procurement refers to acquiring goods, works and services at the right cost, time, quantity and quality and the right place for the utilization by individuals, organizations, and government agencies through contracts (Adotevi, 2004). The act of procurement encompasses the purchasing of all manner of products for all manner of operations, which undeniably influences human activities on the environment for which reason procurement decisions need to be considered. Procurement of goods like machines, chemicals, raw materials, health materials, air conditioners, fridges, among others is believed to empower economic activities which in turn produce waste products and eventually are discharged into the natural environment. Therefore it will not be farfetched to consider purchasing as a driving force as practiced in public and private sectors as the base for the non-sustainability of the environment.

This makes the possible negative social and economic impacts on the environment a cause for concern. It is for this reason that one can construe that the environment is abused because the environment derive value by providing the needed materials for economic activities and absorbing the waste product that is always taken for granted.

### **1.2 Statement of the Problem**

Over the years, the activities of human beings have impacted the ecosystem quickly and comprehensively. As a result, the degradation of the environment enhanced the exacerbation of abject poverty among some people. The primary basis of the findings of the Millennium Ecosystem Assessment, (2005), is that the activities of humans have impacted the environment significantly in a manner that calls for seriousness in dealing with the planet's ecosystem for future generations (Millennium Ecosystem Assessment, 2005).

From the foregoing, Ghana is indefensibly part of the environmental woes of the world because it is known for the importation of various kinds of goods ranging from used to unused goods just that the procurement provides between 50 and 70% of the budget which is 24% of imports and a total of 14% of GDP (World Bank, 2003). Meanwhile, most countries with huge industrial base spend about 10% of their Gross Domestic Product on public procurement (Trionfolti, 2003). This explains the quantum of goods imported into the country yearly, which have the possibility of affecting the environment in the long run. This is because from the standpoint of Rees (1999), there is evidence from observation that suggests that the rate of consumption have exceeded the capacity to produce and thus have violated the assimilative capability of the ecosystem. On this note it is obvious that human economic activity is the inexcusable cause of the environmental crisis.

It is on these bordering issues that the need to explore the effects of procurement of goods on the environment has become necessary.

### **1.3 Aim of the study**

The aim of the study is to assess the extent to which the procurement of goods under Urban Development Grant (UDG) in the Kumasi Metropolitan Assembly (KMA) affects the environment.

#### **1.3.1 Objective of the study**

The objective of the study includes the following:

1. To determine how the Kumasi Metropolitan Assembly consider environmental sustainability during procurement of goods
2. To identify the various environmental sustainability challenges as a result of procurement of goods
3. To identify strategies to ensure effective and proper disposal of procured goods after its lifespan.

### **1.4 Research Questions**

1. How do procurement officers in Kumasi Metropolitan Assembly consider environmental sustainability during procurement of goods
2. What are the various environmental challenges created as a result of procurement of goods
3. What are the challenges to the effective disposal of procured goods after its lifespan?



### **1.5 Scope of the Study**

The study seeks to investigate the effect of procurement of goods on the environment. However, due to the size of the region in relation to the limitation of time and financial constraints, the scope of the study is narrowed to the implementation of Urban Development Grant (UDG) projects in the Kumasi Metropolitan Assembly (KMA).

### **1.6 Justification of the Study**

As a result of the vast consumption of resources, through acts of procurement, environmental destruction is apparent everywhere, advancing a crisis that is now of global magnitude. Global warming, depletion of the ozone layer, loss of biodiversity, depletion of natural resources, widespread deforestation are also rampant. The increased in CO<sub>2</sub> emissions for example is evident during the different phases of a building life cycle such as the production of materials, setting the site, exploitation, construction of the building, and demolition (González and Navarro, 2006). All these are affecting the environment for which if care is not taken the natural ecology will be endangered. This is because according to Glasby (2002) the rate at which species are disappearing is about 1,000 to 10,000 times the normal rate and more than 25 percent of all species could disappear within the next two decades. On this premise, the study seeks to explore further the effect of procurement of goods on the environment.

### **1.7 Significance of the Study**

The study would be of interest to institutions both public and private in identifying the significance of maintaining the environment and the likely problems when not protected well.



The study would however help Metropolitan Assembly to be circumspect of the types of goods to procure and their likely challenges they have on the environment.

The outcome and recommendations of the research would enable government and policy makers to formulate and implement appropriate action plans to protect the environment.

Finally the study findings would contribute to the existing body of knowledge and also to the existing body of literature on the subject matter and serve as a basis for further research.

### **1.8 Organization of the Study**

The study consists of five chapters, structured as follows:

Chapter One provides the background of the study; research problem, objectives and research questions are formulated. This chapter also provides the scope, significance and the organization of the study.

Chapter Two gives the literature review of the study. Chapter Three also focuses on the methodology of study while Chapter Four analyses the data and gives interpretation.

Chapter five summarizes the study conducted, with conclusions of findings and recommendations for the study.

## **CHAPTER TWO**

### **REVIEW OF RELATED LITERATURE**

## **2.1 Introduction**

The study sought to assess the extent to which the procurement of goods by KMA under Urban Development Grant (UDG) affects the environment. Therefore the review of the literature is done under the headings discussed below.

## **2.2 Urban Development Grant (UDG)**

The Urban Development Grant (UDG) is an annual performance-based grant to be extended to the 46 MMAs over a five (5) year period 2012-2016. The grant allocations will follow similar principles as the District Development Facility (DDF), under which annual allocations of grant funds are allotted to MMDAs on the basis of an annual assessment exercise. For the UDG, the five key areas of performance on which MMAs will be assessed are related to public financial management and comprise: budgeting, accounting/auditing, revenue management, asset management and social accountability (LGCSP, 2012).

The UDG is characterized by the following:

1. The grant given within the stipulated period ( 5 years) is US\$140 million
2. Only the forty-Six MMAs at the time the fund is initiated are eligible (See Annex 1)
3. The fund is given to complement the DDF and other funds
4. To be eligible for the grant, the Minimum conditions of Functional and Organizational Assessment Tool (FOAT) must be met and score at least the national average of DDF.
5. The allocation of the grant will be determined by using a formula, which will account for the MMA's on the performance indicator of the UDG.

6. The distribution of the grant depends on the timely financial reporting and the submission of budgets and procurement plans
7. MMAs will receive that grant as annual fiscal transfers (treasury to treasury transfer).
8. The grant will be given in two parts, in consonance with the regular local and national government budget cycle (i.e. in the beginning and middle of each financial year).

The objective of the grant includes but not limited to the empowerment of the MMAs to be self-financing. Source: **Daily Graphic** (<http://www.mofep.gov.gh/?q=news/270412>)

## **2.2 Sustainability of the Environment**

The importance of sustainability has been seen to be crucial to development in recent years. The rate at which economies are industrializing their economies coupled with increase in population has affected the planet. Due to such increases, the environment has been under immense pressure and has contributed to issues such as pollution, deforestation, the extermination of species and change in climate. Same pressure has impacted the world immensely.

Sustainability seeks to provide solutions to the effects of human activities on the environments. These impacts can be associated with the ever-increasing population and the activities of humans (Sach, 2008). Human population the world over has increased from 2.5 billion to 6.7 billion between 1950 and 2009.

The atmosphere is polluted and drinking water and resources have become scarce (Humphrey et al., 2008). The biodiversity of the planet has also decreased because of

increased deforestation, and most land animals have become exterminated (Ibid.). The actions of humans have also brought about irrevocable process as (Walker et al., 2005).

Carbon dioxide release has increased because of industrialization. The emission of the gases has added to global warming. The temperature of the globe is about 15 degrees Celsius accompanied carbon dioxide (Walker et al., 2005).

Global warming affects the planet. This has led to changes in the weather pattern resulting in heavy rains and extreme drought (Humprey et al., 2008).

With increasing industrialization, the environment is affected tremendously. About 20% of the world's population uses 80% of the natural resources. Annually, 13 million hectares of the tropical forest disappears. A vast ground for fishing have been exhausted or depleted. Species are becoming extinct at a rate of 1000 times faster than the natural rate. The lands (about 40%) for farming have suffered damage.

Although some scientists have become unconcerned about the negative effects of climate change, it is obvious that steps must be taken to protect the planet. It will be rendered possible if corporate and economic activities are developed with consideration of three aspects: people, planet and profit, which also known as the triple bottom line. This term has gained global attention has become principles on which sustainability is hinged (Elkington, 1997)

### **2.3 Procurement of Goods and Services**

The acquisition of goods and services at the right costs, quantity, quality, time and place for the use of government, corporations or individuals normally through contract is known as procurement. Procurement is guided by the Procurement Act, 663 and is



included in the economy and forms the bases for competition between bidders. Quality is derived from competition and the Procurement Act guarantees that competition. Competition is therefore perceived as fundamental to the economy by several economists (Greenspan, 2001).

## **2.4 Sustainable Procurement**

Procuring sustainably involves the acquisition of goods, works and services from a supplier that has condition that combines whole life costs and benefits to satisfy the requirement of the client or customer (Walker, 2008). It can also be said to be the means by which companies satisfy their needs for goods, services, works and utilities in a manner that achieves value for money in order that the organization benefits as well as the society and the economy while minimizing the impact on the environment. Procuring sustainably concerns buying goods and services that take the aspects of social, economic and environmental into consideration with the aim of ensuring the impacts of these aspects can be minimized on the people and communities. Examples include price improvement, availability of quality and the environmental and social impacts (Walker and Brammer, 2011). However, early studies concentrated on environmental preservation only, for example Lamming and Hampson (1996) mentioned that: in supply chain management (Svensson, 2007), procurement is key for the future strategy of business.

### **2.4.1 Procurement impact on sustainability**

The rate at which the human environment and the natural resources are deteriorating and its impact on the environment has been of immense concern to the international community (UN General Assembly, 1987). This has led to the formulation of sustainable development by the Brundtland Commission. The Brundtland Commission



defined sustainability as development that meets the needs of the present world without compromising the ability of future generations to meet their own needs. In this sense priority is given to the needs of the world (WCED, 1987).

The state in which human needs are achieved without damaging the future generations“ chance of achieving same can be said to be sustainability.

This definition has now become the way the present generation lives. Efforts are made by the present generation to meet their needs without compromising future generations“ ability to do same. Thus sustainability underpins human survival. Most people meet their needs through purchasing. In that sense, sustainability is influenced by the way goods and services are purchased. Therefore the present procurement pattern and the accompanied competition has not been able to promote the concept of sustainability effectively. It is important to emphasize that not all societies and their attitudes towards purchasing have put pressure on the natural resources and the ecosystems. Accordingly, Manmohan (2005), stated that the manner in which nations are consuming the society“s resources might impact the very survival of its people. Therefore Sachs (2000), stated two challenges that impacts sustainability. For countries with huge industries, he stated that the challenge is that of pulling down resources without a reduction in human well-being and social justice. The challenge for Southern Countries consists in raising levels of resource consumption at a much smaller gradient than industrial countries did historically; increasing human being concurrently with equity.

Subsequently, decisions about procurement have impacted sustainability and can no longer be seen as drain on the economy. Sustainable procurement can be the drive towards the creation of market competition since it combines environmental and social demand in the bidding process.

#### **2.4.2 Public Procurement as a tool for enhancing societal sustainability**

Purchasing goods and services with public funds, defines the range human activities. This ranges from constructing roads and buildings and the provision of power supply. During the 1992 United Nations Conference on Environment and Development, the present nations emphasize need for governments to show leadership through their spending with respect to purchasing.

“Governments themselves also play a role in consumption, particularly in countries where the public sector plays a large role in the economy and can have a considerable influence on both corporate decisions and public perceptions. They should therefore review the purchasing policies of their agencies and departments so that they may improve, where possible, the environmental content of government procurement policies, without prejudice to international trade principles.” (UNCED, 1992)”

The Organization for Economic Co-operation and Development (OECD), emphasized that since sound environmental public procurement can yield results and benefit economies, governments must take the lead to encourage businesses to follow that lead (OECD, 2002).

For instance, the Ministry of Ecology and Sustainable Development in France opined that considering the environmental and social demands for procuring in the public sector through contracts stimulates the practice of sustainability in procurement (MEDAD, 2007). Therefore authorities in government have insisted on the need to develop and enforce sustainable public sector procurement.

## 2.5 Significance of Sustainable Procurement

Government has endured the pressure of its people to practice sustainable procurement. This is not limited to the public sector as the private sector also thrives to practice sustainable procurement (Walker and Brammer, 2011). The World Summit on Sustainable Development organized in 2002 stressed that authorities must endeavor to promote the implementation of public procurement policies that seeks to develop and implement environmentally sound goods and services. Procurement entities have therefore responded to this call by formulating policies that have principles of sustainable procurement (McLennan, 2004; Bryde and Meehan, 2011).

An example of this includes the UK Strategy for Sustainable Consumption and Production.

In order to achieve the implementation of this strategy, a Committee was established on Consumer Products and the Environment (DEFRA, 2007). According to Kalubanga (2012), 80% of the buyers introduced sustainable programs in 2008 and 90% regarded them as necessary for the survival of their business within the EU.

Entities practicing sustainable procurement have achieved their targets for the goods, services and works required not only on a short-term basis but also in the long term with the associated financial benefits (Pennanen et al, 2005). Kalubanga (2012) has intimated that entities that practice sustainable procurement must endeavor to include external cost considerations in their decision together with the conventional procurement criteria of price and quality.

### 2.5.1 Innovative procurement

Procurement can be described as innovative when organizations create procurement entities whose responsibility is to include modules of creativity and knowhow. The responsibility for continuous improvement and cooperation to assist it should set as criterion for public procurement. The organization's value chain is likely to increase and adds value to its competitiveness (Yliherva, 2006).

The current contents of the criteria for procurement and selection does not encourage knowledge development, procedures or of the product itself. Cooperation elements are not included in the contract with suppliers. This will result in a greater number of provider relationships and order of the short short-term demand. The calls for proposals are precise and leave small innovative solutions offer room. The separation of the risks and remunerations are not equal (Yliherva, 2006).

The procurement function can be developed through the constant emphasis on the strategy for procurement. Focus should be placed the total cost rather than the cheapest price. Coordination with suppliers will enhance the development of the project. Concentrating on few suppliers ensures the control of the costs of transaction, which is also a driver of future transactions. The flow of information ensures transparency (Yliherva, 2006).

There is an influence of innovation on the procurement process including the contents defined in the procured goods and services. Such a stage is important for the innovation aspects due to the fact that the factors to release the ability to use the goods and products are defined.



The procure items mostly described in sufficient detail. However the purpose for the purchased item and how it is related to the entire service is often left out from the details provided (Halme and Kotilainen, 2008).

In several instances, the authority that makes contracts provides details on the alternative solutions and that offers that do not meet creativity standards are not accepted. When allowance is created for creativity, productivity can improve with the emergence of ideas and solutions. This is achieved by stating the impact of the product purchased. The purpose of development can include areas such as the enhancement in technology, improving the coordination between logistics and procurement functions (Halme and Kotilainen, 2008). Providing the acceptance criteria is important for the improvement of the organization's procurement.

## **2.6 Public Procurement Act about Disposal of goods in Ghana**

**Act 663** Public Procurement Act, 2003 considers the procurement structures and the way goods should be disposed of after usage.

### **2.6.1 Procurement Structures**

#### **Scope of application**

**14.** (1) The Act is applicable to

- (a) the purchasing of goods, works and services that are mainly financed with public funds save instance where the Minister resolve that it will be in the national interest if other means are used;
- (b) functions that concerns the purchasing of goods, works and services that includes the definition of the specifications and invitation of sources, preparations, appointment and the award of contract;



(c) The use of public stores and equipment; and

(d) Purchasing with finance or credits obtained or approved by the state and foreign grants with the exception of instances where the agreement for the loan, guarantee contract or foreign agreement provides the process for the usage of the funds.

### **2.6.2 Authority of disposal**

**83.** (1) A Board of Survey shall be formed by the head of a procurement entity that comprises departments that have unserviceable, out-of-date or surplus stores, plant and equipment and shall report on the said items with the aid of a technical report on them, propose a method of disposal preceded by completing a Board of Survey form by the officer in charge.

(2) The proposal of the Board of Survey shall be subject to the approval of the head of the procurement entity and same shall be disposed.

(3) where the items are in a state such that they cannot be serviced for reasons other than wear and tear, by way of accident or expiry, the established process for disposal of such items as provided by the Board shall be followed and disposed.

Since sustainability has become a hallmark for development of all nations, the time is now to pay attention to public procurement procedures and systems concerning the current economic advantages to Sustainable Public Procurement (SPP) systems that has the potential to lead to the long-term benefits to the entire population including government.

This concept of SPP is that of resolving the environmental, social and economic effects of procurement procedures ranging from design to production for usage and its disposal. Climatic conditions are worsening, poverty is rife, and the forest is being degraded.

## **2.7 Environmental Care**

### **2.7.1 Plastics in the environment**

Waste is generated by things that are consumed and with the aspect of plastics; large amount leads to the generation of waste. The issues with plastics are enormous.

Most of the plastics generated goes to the landfill sites. In Europe plastic waste is about 50% (Plastic Europe, 2009). The spaces for the construction of landfill are scarce in most countries leading to long distance transportation and the associated emissions. The increase in the need for landfills has a toll on the lands. These emissions can also contaminate water bodies and the ground.

Substitutes to landfilling include mechanical recycling, energy recovery, or chemical recovery. Plastics are heterogeneous and therefore its products obstruct recycling rendering recycling difficult (Hopewell, 2009). For plastics to be recycled, they have to be transported over long distances. Burning plastics leads to the release of dangerous substances into the atmosphere mainly contributing to global warming because most of them are fossil based. Chemical recovery is under development and means that chemicals, e.g. raw materials such as monomers and gases, are recovered or converted from the plastic material. This can, for instance, be done by controlled thermal degradation such as hemolysis, which is a non-catalytic cracking process (Al-Salem, 2009).

Some solutions to plastic waste and recycling problems have resulted in new uses for plastic waste, and sometimes even more chemically complex products are created, and

further dispersion in the environment may follow. For instance in, India, plastic asphalt is used as the substitute road material. It is made from churned waste from plastic (which is made up mainly of plastic bags, PET bottles and a film of thin plastic) which is mixed with bitumen. (Khullar, 2009; Gulati, 2010). The roads are expected to last for 4-6 years, and their management towards its life is not stated.

Most of the plastic waste is found on the surface of the open ocean, including the deep ocean and its bed and in organisms (Barnes et al., 2009; Thompson et al., 2004). They are not generated only from dumping at seas but also from land sources such as littering (Barnes et al., 2009)

This plastic waste is sometimes carried by currents, for example by the great oceanic gyres (Yamashita, 2007). It can also accumulate in the center of the gyres (Moore 2001; 2008) and Lavender Law et al. (2010). The plastic products and debris are fragmented into smaller pieces, even to sizes below 5 mm, called micro plastics (Barnes et al., 2009).

The issue of plastic waste has been reported several years ago (reviewed by Barnes et al., 2009). However, the extent of this plastic pollution, especially by micro plastics, is much more prevalent than previously thought, both in terms of greater quantities and smaller particles.

The impacts of the ingestion plastic waste and suffocation or blocking of digestive tract leading to death have been reported as said by Gregory, (2009).

The consequences of exposure to micro plastic in organisms and deposit feeders filter feeding organisms and deposit feeders are not known immediately. Various studies of exposure to micro plastics in amphipods, lugworms, barnacles, sea cucumbers, and

mussels have shown that the organisms ingest the micro plastics (Thompson et al., 2004).

### **2.7.2 Impact of Construction activities on the Environment**

The construction industry is known for its intense resource consumption. It therefore follows that the activities of the industry can have massive impact on the environments and its inhabitants. Actions are therefore required to make activities of the industry sustainable (Holmes and Hudson, 2000; Morel et al., 2001). Even though the period used for construction of projects are short, the impact of its activities within that short period on the environment can be massive. Thus analyzing the impact of construction activities on the environment is very important and must be done with clear focus (Ofori et al., 2000). The activities of the industry generate waste. Its sources include transportation, production and damages during the use of the material (Osmani et al., 2008). The waste contribution due to construction in America and Malaysia is about 29% and over 28% respectively (Teo and Loosemore, 2001). According McDonald (1996), the amount of waste put into landfills is about 14 million tons in Australia and construction contributes about 44 % of this waste. About 40-50% of waste is generated by the construction industry in the European Union (Sterner, 2002). Additionally, demolition of structures is one of the areas that contribute massively to waste generation in Europe (Burgan and Sansom, 2006).

The Burgan and Sansom reported it in 2006 that demolition waste is about 180 million tones annually and only 28% is available for recycling. The materials used for construction has an effect on the environment due to the quantity of non-renewable resources (Ofori, 2002; Godfaurd et al., 2005). Since the materials used in construction are of high-embodied energy, there is the consumption of energy. Most materials from



demolition and construction can be reused to reduce the amount of waste generated (Sterner, 2002). However, the economic nature of construction industry has made every stage of construction minimized. Again, time and quality are deemed critical and virgin materials are taken to be superior to second hand products. The handling of construction waste for recycling consumes time and a lack of sensitization of professionals in the industry can lead to substantial barriers to recycling (Langston and Ding, 2001).

The construction industry on the other hand exploits renewable and nonrenewable natural resources (Abidin, 2010). Accordingly, construction is seen as a sector that consumes 3 billion tons of raw materials annually, or an equivalence of 40% worldwide (World-watch Institute, 2003). In the USA 30% of materials is used by construction, 40% energy, and 25% water (Levin, 1997).

### **2.7.3 Impact of Population growth**

The increase in the population of a particular of a particular group has an impact on the environment since the population exerts pressure on the ecosystem of the Earth for food, water and resources (Munda et al., 1998, Chew, 2001; and Glasby 2002).

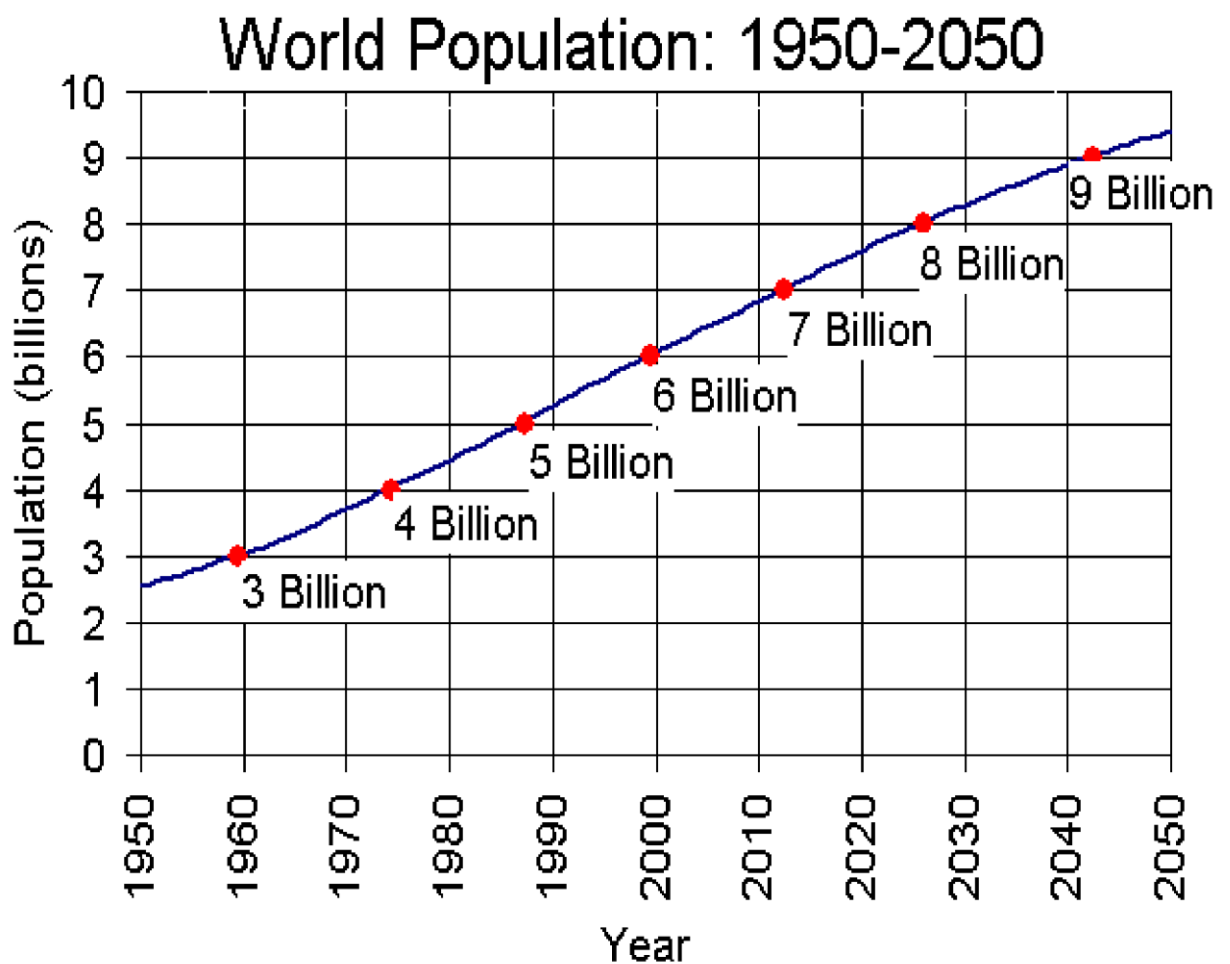
The pressure on renewable and non-renewable resources is enormous. The population growth also reduces the amount of capital and productivity per worker.

A 1998 report of the United Nations stated that the population would increase to 8 billion in 2025 and 9 billion in 2050 globally (Young, 1999; Reuveny, 2002). The year-on-year increment is close to 80 million globally, almost about a 90% of this population are in the poorest countries. This is because life expectancy has increased due to the advancement of technology in the medical sector.



The rate of increase in population can be described as exponential, thereby placing much pressure on food production (Young 1999; Crew, 2001). Hopfenberg and Pimental (2001) however stated that food availability is improving but not at the pace of the population growth. The deficit in food supply became clear after the world food summit in 1996 in which there were plans to mitigate the number of malnourished which was predicted as 920 million to half this level by 2015 (Young, 1999).

**Figure 2.1. Global population, actual and projected, 1950-2050**



**Source:** WRI and Population Reference Bureau 2006 revision

The demand of land increases with the growth of the population, subsequently leading to deforestation, water consumption and the depletion of the lands including soil

erosion. The highest for this challenge is experienced in developing countries and usually caused by over farming and increased crop production. To increase their yield, farmers resort to the use of chemical fertilizers (Gilland, 2002). The land is therefore robbed of its nutrient by crops that grow on chemical fertilizers leading to the use of more fertilizers in subsequent years.

The growth in the population coupled with economic activities has led to migration from the rural areas to the urban centers. According to the World Health Organization, population in the urban areas has increased from 32 % to 45 % in 1955 and 1995 respectively globally (Moore et al., 2003). It was estimated that global urbanization will increase from 47% to 65% by 2015 (Ibid.). The rate at which urbanization is increasing poses concern to the environment. The resulting effect is that of health hazards, mainly because of overcrowding and poor living conditions (Chew, 2001).

### **2.7.3 Environmental deprivation**

The completion in the market have not led to the creation of a world in which natural resources are utilized in a manner that present and generations to come could benefit from. Competition in the economy is actually a driver for the production of good products and services.

In fact, the Millennium Ecosystem Assessment (MA), (2005), has achieved a substantial net gain in human conditions of living and economic development. The MA program was initiated in 2002 by the Secretary General of the United Nations have collaborated about 1300 scientists. According to the program, humans more quickly relative to any other period have changed the ecosystems in time in the history of humans (Global Ecosystem Assessment, 2005). The degradation of the ecosystem has increased the risk of nonlinear changes, and the worsening of poverty of the populace.

#### **2.7.4 Global Environmental Change**

Human activity has brought about major changes in the environment at a very quick pace. The ramifications brought about industrial revolution, has overshadowed the global environment (Schwartz et al., 2006).

The environment is a resource for the provision of renewable and non-renewable resources (Ding, 2005). The renewable resource consists of plants and animals otherwise called flora and fauna with have the ability to reproduce when there are losses from economic extraction (Ding, 2005). The Non-renewable ones are the minerals, which includes fossil fuel, which does not regenerate thereby making them unsustainable. Such minerals require geological surveys to predict. Even though the environment is a base for resources it also serve as an abode for waste (Ding, 2005). Through economic activities, wastes are produced and are discharged into the environment. Scientists have stated that energy is only transformed from one state to the other but are not created from human activities (Common, 1995). The ability of the environment to absorb the waste products is assimilative, since it has the capacity to receive waste matter, and then processes it into nutrients, which serves as a source of food for inhabitants of the ecosystem. This capability is however dependent on the biodegradability of the soil (Pearce, 1998)

#### **2.8 Disposal of Goods and Equipment**

Disposal from the standpoint of PPDA (2003) denotes the transfer of public assets including intellectual property rights and good will including the right to purchase and dispose by means of selling, renting, leasing, auctioning or a hybrid of the above methods as approved and regulated by the Public Enterprise Reform and Divestiture. Also, according to Obaidullah (2006), disposal of asset constitutes is the withdrawal of

asset from use upon the completion of its useful life. Based on the foregoing it can be construed that as long as goods have their lifespan or expiry, their disposal is inevitable. This suggests that adequate laws and processes must be followed to get rid of such goods and equipment as appropriate as possible.

However, there are laid down requirements that procurement must meet in the procurement of goods, works and services by the government machinery (Thai, 2001). Additionally, in order to achieve the basic principles, there is the need to exercise great governance ability including probity and accountability (Wittig, 2003; Callender & Schapper, 2003).

The law for Procurement in the public sector states that disposal should be done based on the policy that stipulates the disposal. Other includes, when the item is no longer useful because of changed processes, when it occupies space, when the time for selling reaches, when there is disregard to health and safety procedures, when it becomes or contains chemicals deemed harmful to life and when it becomes irreparable. Therefore disposal on reasons of an asset may be as a result of either the asset becoming redundant, obsolete or inefficient, replaced by an upgrade, becoming unserviceable or beyond economic repair, damaged, stolen or missing, or surplus to requirements before disposal is done.

Goods and equipment could also be considered between repairing them or disposing them when they are out of order, defective used goods. Chiya and Balakrishnan (2007) opine that in disposing items follow; the laid down policy and approval authority for disposal of inventory Items (e.g. defective or obsolete items).



Antrekowitsch (2006) says in disposing items first, it is important to ensure that the action is approved prior to releasing the item for disposal.

According to Shinkuma (2007), disposals of goods become necessary when they become worn out, poor to perform or out of order from their intended reasons for which they were designed for. However, Shinkuma (2007) furthers that, the malfunctioning of goods and equipment suggests the wrong nature of the assets. In the light of this Chiya and Balakrishnan (2007) posit that goods and equipment are disposed off when they become outdated and defective. Antrekowitsch (2006) disposes of goods and equipment of a Government Agency if updating the inventory of the institutions. It goes to affirm the assumed fact that having no space adequate enough to accommodate goods and equipment makes facilitates is disposal with time.

### **2.8.1 Means and Steps of Material Disposal**

The manner of waste disposal varies depending on their nature whether liquid or solid. The different kinds or means of disposal among others are giving to other agency within the government, bestowment to an NGO or selling to gain the scrap value.

It is important that documents on the disposed items are kept in the designated database. In Nigeria, the following sanctions are applied to these practices:

1. Competitive Bidding is the means by which public projects or properties are procured.
2. The disposal methods are through selling, rental, leasing and high purchase, licensing and tenancy and the auctioning of the product.
3. Prior to disposal, it is mandatory that the disposal is planned and subjected to the approval of an independent professional

4. The procurement entity and the board are responsible for the disposal.

The processes followed in disposing items are enumerated below;

1. Identify the disposables.
2. Put in to classes of surplus and obsolete items.
3. The disposal should be subject to an approval by the Standing Disposal Committee
4. The items must be inspected
5. State the method of disposal
6. Fix the price of reserves
7. Approval of the Competent Authority
8. Consider and evaluate the offers
9. Enter the accounting details
10. Elimination of the stores that were disposed by the Purchaser

Defra (2007) stated that disposing off obsolete items is important in all settings irrespective of the resources that the entity has. Good waste management is helpful to maintain the health standards of the facility which will prevent spreading diseases, reduce the possibility to be injured, and prevents reselling and reusing. On other hand the life of the people are put on risks if waste is not properly managed.

## **2.9 Environmental challenges to development**

Industrialization has come with paradigms where unlimited development, large production, and high consumption have become the order of the day. Therefore nations with huge industry bases have come up with elaborate policies geared towards the promotion of economic growth. Companies have consequently diverted their attention

from quality to quantity in order that production will be increased and its accompanied profit gains (Kyoungmoon, 2008).

The destruction of the environment have become apparent in every quarter leading to a crisis faced the world over. An example that makes environmental destruction evident includes, global warming, thinning of the ozone layer, loss of biodiversity, depletion of natural resources and deforestation. A major cause of the crisis in the environment is human activities. This ranges from causing pollution and the reliance on the environment.

It has been suggested by Rees (1999) that the rate at which resources are consumed is more than the rate of production across the continent. By extension he intimated that the waste levels have violated the assimilation capacity of many ecosystems at every scale.

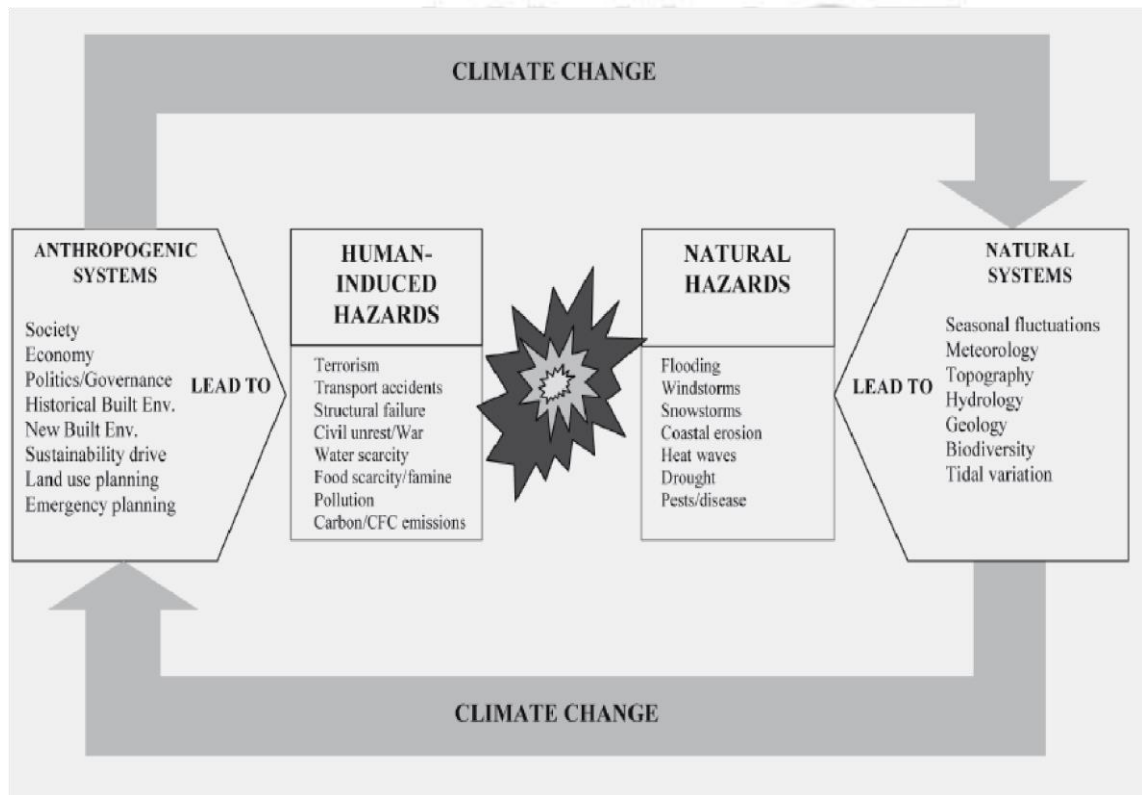
### **2.9.1 Climate Change**

This phenomenon has become identical with global warming and is precipitated by emergence of greenhouse gases, which keeps the energy on the surface of the earth. It is expected that frequent climate changes will occur in the next century (Kininmonth, 2003). The existence of global warming has led to several atmospheric extremes that has caused major increases in the possibility and rate at which heat waves are experienced and the accompanied impact on health (Loaiciga, 2009; Glasby, 2002).

The phenomenon of green house is not entirely new. It was predicted earlier in 1896 by a Swedish chemist that the change in atmospheric carbon dioxide concentration was responsible for worldwide temperature fluctuations (Kininmonth, 2003).

Carbon dioxide has concentrated because fossil fuels are burned leading to global warming. It was confirmed in 1988 by the Intergovernmental Panel on Climate Change

(IPCC) that global warming was caused by activities by humans following the proclamation for it in 1985 by researchers (Kininmonth, 2003). Subsequently, in 1990 and also in 1995, it was confirmed that human activities contributed to greenhouse gases and climate change (Kininmonth, 2003; Meadows and Hoffman, 2003).



**Figure 2.2. The relationships between climate changes and natural human induced Hazards.**

**Source:** adapted from (Bosheret al., 2007)

### 2.9.2 Biodiversity

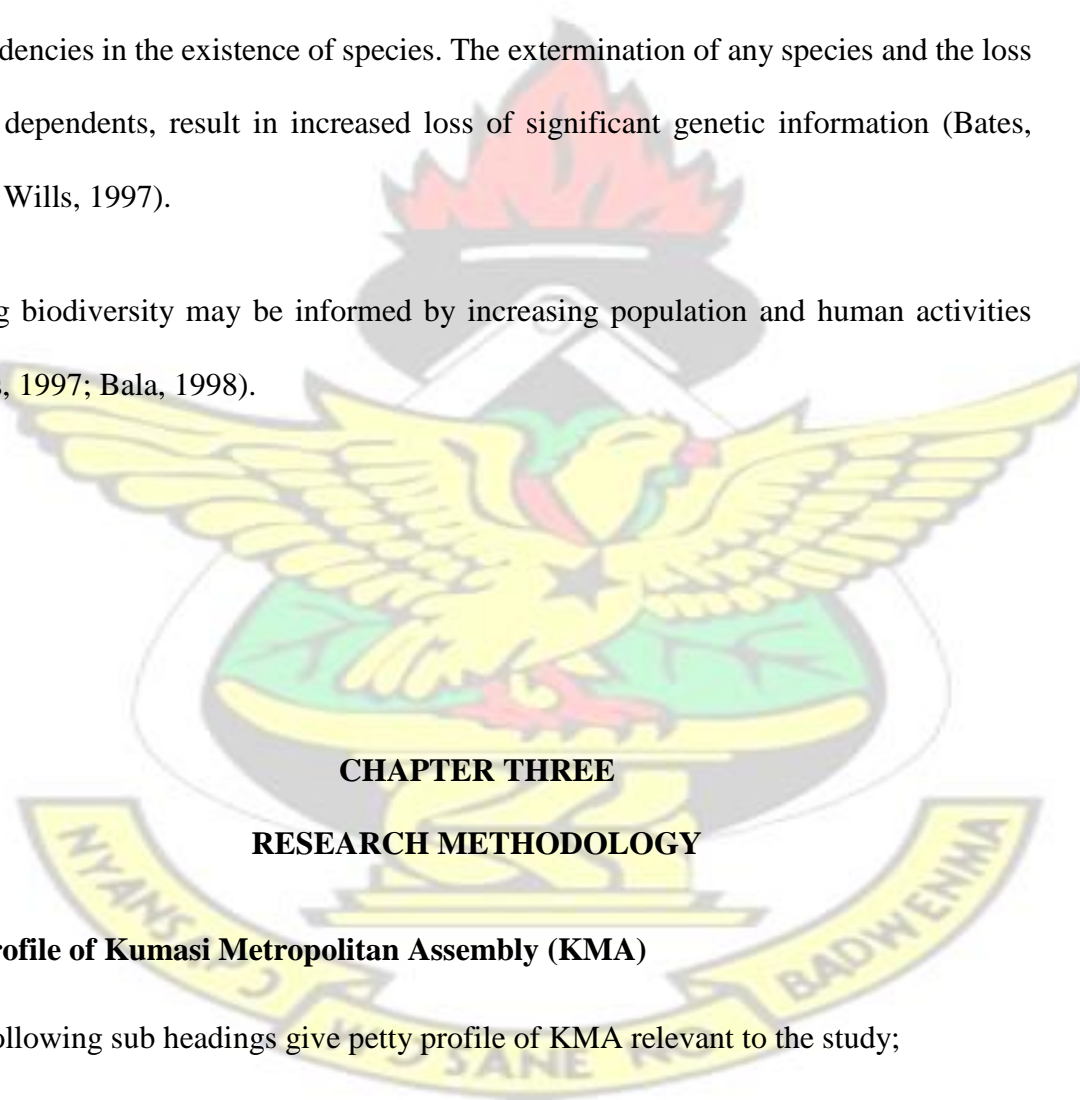
It is defined as the variability of human activities on Earth. There is a correlation between global resource and all aspects of the society. It should be treated with haste as the population of humans is impacting the environment negatively at a fast pace destroying natural habitats.

The significance of this phenomenon is enormous. The first include the sustenance of food production. Since the world is growing in population, there is increased demand



for food (Gilland, 2002). Secondly, species forms a core source of medicine that can help to heal several human diseases and enhancing medical research and development (Bates, 1990; Wills, 1997; de Mendonca et al., 2003). The other importance of biodiversity is that the rainforests plays a crucial part towards terrestrial recycling of various gases such as, carbon, nitrogen and oxygen through the mediation of greenhouse effect by absorbing carbon dioxide and releasing oxygen (Common, 1995; Pearce, 1998). The fourth point is that the earth is an interwoven ecosystem. There are dependencies in the existence of species. The extermination of any species and the loss of its dependents, result in increased loss of significant genetic information (Bates, 1990; Wills, 1997).

Losing biodiversity may be informed by increasing population and human activities (Wills, 1997; Bala, 1998).



## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Profile of Kumasi Metropolitan Assembly (KMA)**

The following sub headings give petty profile of KMA relevant to the study;

##### **3.1.1 Population**

Kumasi has a population of 1,730,249 according to the population and housing census for 2010. In 2014 this figure became high with Kumasi having a population of about 2,

119,101, which is an indication a growth rate of 5.4% compared to the average for the entire country of 2.7%, and covers an area of approximately 254sq km. The city of Kumasi is indeed a large industrial and commercial center with formal industries in timber and food processing. There is also a large non-formal sector of small-scale industries in furniture, footwear production and vehicle repair (Magazine). The city is found in the transitional zone, which falls within 270km north of the country's capital city, Accra.

### **3.1.2 Vision**

The city has a vision of developing into a safe and proactive city through the improvement of city management by proper governance, the development of the immediate towns, tourism promotion, sanitized environment, good environmental and social services and the provision of needed infrastructure.

### **3.1.3 Mission**

The Kumasi Metropolitan Assembly has been established to improve the condition of life of the people it governs by formulating and implementing policies in a manner that is sustainable to improve the development of its people, reduce poverty and provide good governance by a well-motivated and highly skilled labor.

### **3.1.4 The KMA is responsible for:**

- 1. Environmental and Waste Management**
- 2. Income Collection**
- 3. Fixing of Fees and Rates**
- 4. The preparation of development budgets**

5. The provision of basic socio-economic infrastructure etc. schools, health centers, markets, lorry parks etc.
6. Ensure that peace and security prevails and
7. To develop sports and culture.

### **3.2 Research Design**

The study adopted the mixed method approach to research, which is the combination of qualitative and quantitative methods of research. The combination of such methods enhances the understanding of the problem (Mertler, 2009). The aim of exploring the effect of procurement of goods on the environment, resulting to a qualitative study is appropriate for the design. Research works that are descriptive give a clear view of the particular facts the issue on hand and aims to answer the research questions by collecting empirical data. Cooper and Schindler, (2003) postulated the best way for identifying the what, where and how of a phenomenon is to adopt descriptive study. It provides the grounds for identifying the real perception of the respondent, the behavior and attitudes to determine the manner in which the issue is related to the entire population. The proper use of descriptive survey, provides reliable and valid information (Ngechu, 2006)

The quantitative study will provide the statistical or convinced significance to the collected data where appropriate. Also by adopting this approach the researcher collected valuable information adopting the use of questionnaire

### **3.3 Target Population**

Fraenkel and Wallen (2000), defined population as the group of individuals with comparable features. According to Kothari (2008), population is any group of individuals with utmost importance to the researcher. Upon this, Mugenda and

Mugenda (2003) suggest that, population constitutes a totality of individual, cases or objects having some common noticeable attributes. The foregoing makes it clear that any study population should have elements or items with observable features for study. Therefore, the population for this study area constituted the various employees at KMA that are involved in the procurement of goods and services.

The study population included Procurement Officers, Records Officers, Finance and Accounts and Human Resources.

### **3.4 Sample Size and Techniques**

Sampling involves the selection of a representative portion of the population (Amedahe, 2004).

The study selected four (4) respondents each from the four units selected constituting twenty (20) respondents for the study. All the departments and units had at least one (1) respondent chosen for the study. The chosen sample is believed to be representative of the entire population. The sample was selected using the purposive sampling technique to serve as the sample size for the purpose of administering research instruments.

### **3.5 Data Collection Instruments**

Data for the study was picked using the questionnaire. It was used to collect data from the respondents. It included a rating scale mainly soliciting the opinion of the various responses by rating on a scale of 1-4. Strongly Agree, SA = 4, Agree, A = 3 Strongly Disagree, SD = 2 and Disagree, D = 1.

### **3.6 Pilot Testing of the Questionnaire**

The process of testing questionnaire is done by conducting the test on a few respondents (Malhotra, 2006). This is because in the process of preparing research instrument to



collect data, more than a few mistakes that cannot be easily identified are made. Additionally conducting a pilot study provides a springboard for conducting a successful data collection. This is because the pretest will give the researcher ideas and the signals where the questionnaire likely to fail or not accomplish its target (Van Teijlingen and Hundley, 2001). Pretesting has its role in providing the grounds to conduct the study without having to deal with variations in the answers given by the respondents due to misunderstanding of the questions (Brymana and Bell, 2007) In view of the above, 10 respondents were used for the pilot study. Through the pilot study, the reliability of the questionnaire was confirmed. A change emanating from the pilot study was effected to reflect what respondents were likely to expect.

### **3.7 Analysis of Data**

Following the completion of data collection, the data was presented. It was aimed at avoiding errors (Amin, 2005). The data was then analyzed in a quest to answer the research questions. This phase involved activities such as editing, coding, computer data entry and the verification of the accuracy of the data to be entered into the computer so that quantitative analysis can be done

After that, the descriptive or qualitative analysis was done as the second phase of data analysis aiming at describing characteristics of the sample (Amin, 2005). The respondent's demographic characteristics was analyzed and presented in tables.

The data was analyzed mainly employing descriptive tools such as frequencies and percentages.

The result was then interpreted based on the figures that emanated from the analysis. The rate at which the data was analyzed based on the methods adopted justifies the approaches used.

### **3.8 Ethical Consideration**

Ethic considerations deal with the development of moral standards that can be applied to situations in which there can be actual or potential harm to an individual or a group. This means that, the consideration of ethics in research is of growing importance. Therefore to ensure the success of the study the following were observed as ethical values;

#### **3.8.1 Informed consent**

It was important that the respondents' consents to the study was sought for. For this reason, a consent note from the school was placed on the questionnaire informing respondents at KMA of what was expected of them and their need to participate.

To maximize the cooperation of the participants, they were briefed of the study to make them aware of the purpose of the project, and the application of the findings.

#### **3.8.2 Voluntary participation**

Care was observed not to influence the decision of the respondents by asking any leading questions or through any act of pretense sabotage their ideas.

It was important that the study ensured respect for the respondents and be a compulsion free exercise. For this reason the researcher ensured that the answers of the study came from the respondents own opinions and thus free from the influence of others.

It was therefore made known that it was the right of every respondent to refuse a study.

The respondents were therefore no coerced to participate

### **3.8.3 Confidentiality**

Also the respondents were assured of the confidentiality of data and information collected from them and for that matter was going to be used as private as confidential documents and used for its intended purposes.

### **3.9 Summary**

The chapter consists of the profile of Kumasi metropolitan assembly, research design, target population, 4-sample size and techniques, data collection instruments, pilot testing of the questionnaire, analysis of data and ethical consideration

## **CHAPTER FOUR**

### **DATA ANALYSIS AND DISCUSSION OF RESULTS**

#### **4.1 Introduction**

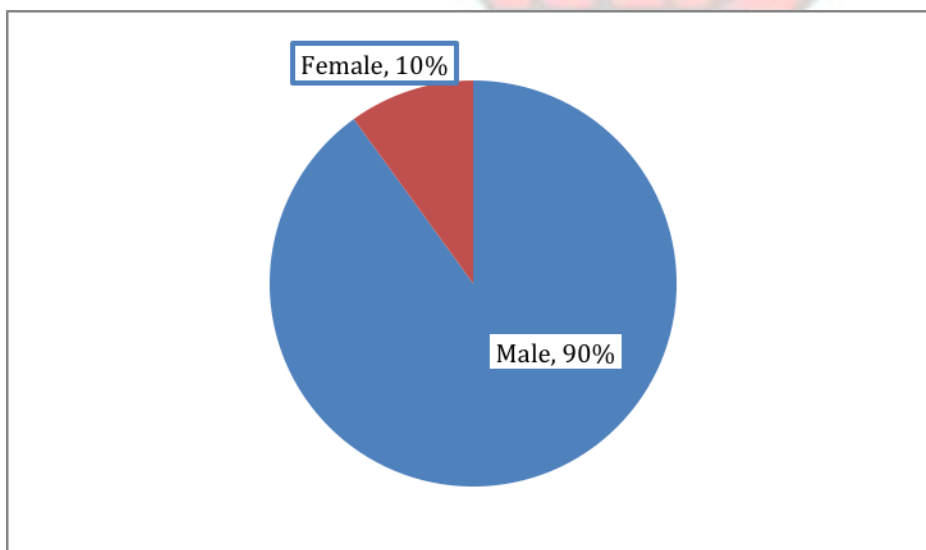
In this chapter the data was analyzed and interpreted. Data analysis focuses on what meanings can be derived from the data collected so they can be understood. The statistical tools used for the analysis were frequency with percentages, descriptive (mean scores and standard deviation), Chi-square Test to determine the significance of the variables and relative importance index to rank the significant variables (direction of agreement with regards to this research). Results were presented in tables and charts.

The analysis was organized in four sections to throw more light on the objectives of the study. The first section presented the socio-demographic information of the respondents with emphasis on gender, age group, level of education and the experience in terms of years of practice in the Assembly. The other three sections addressed the research objectives; the determinant of environmental sustainability, environmental

sustainability challenges as a result of procurement of goods and ensuring effective and proper disposal of procured goods after its lifespan.

#### 4.2 Socio-Demographic Information

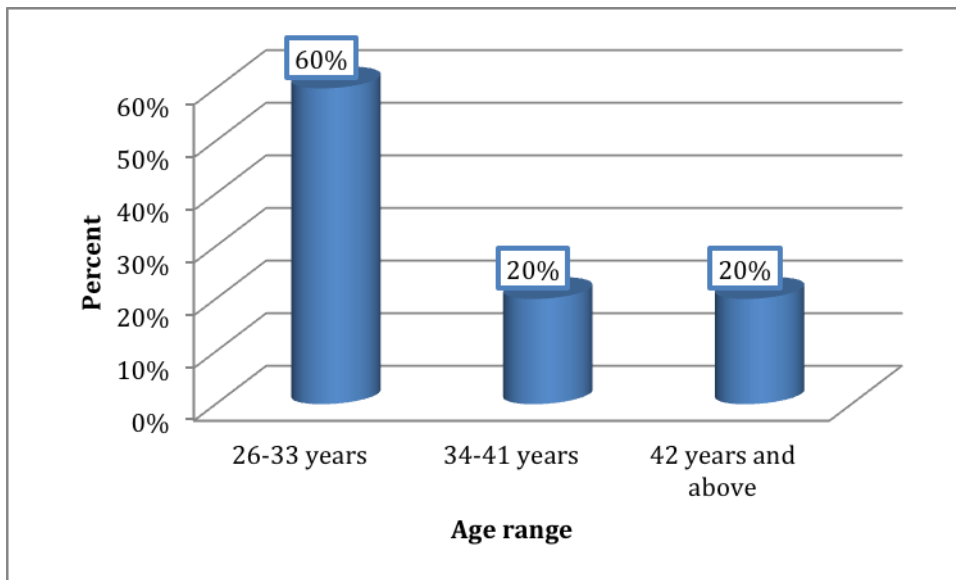
Figure 4.1 presented the results of the socio-demographic information of the respondents in the study. The results showed that gender distribution was skewed to the male. Male gender comprised of 90 percent and female gender comprises 10 percent. The age ranged was observed to be mainly between 26 to 33 years representing 60 percent. The age ranges 34 to 41 years and 42 years and above represent 20 percent each.



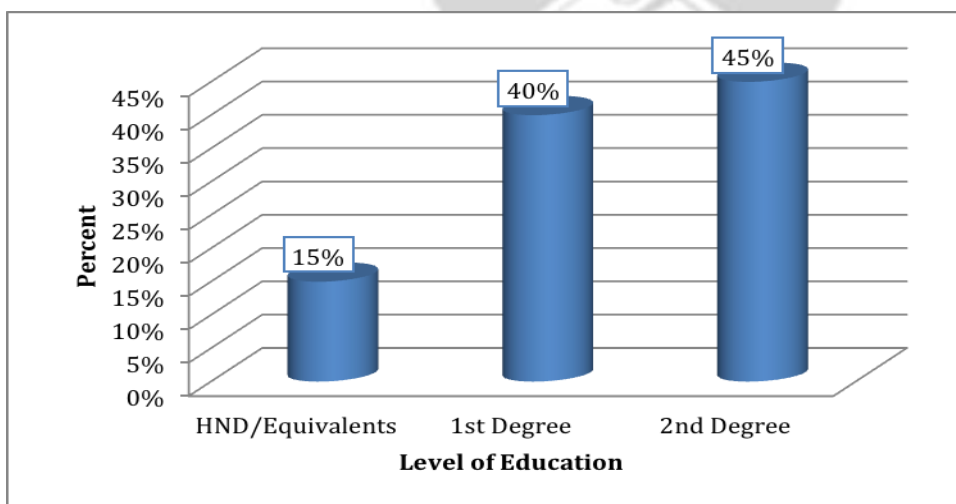
**Figure 4.1: Gender**

Source: Field Study, 2015





**Figure 4.2: Age Range of Respondents Source:**  
Field Study, 2015

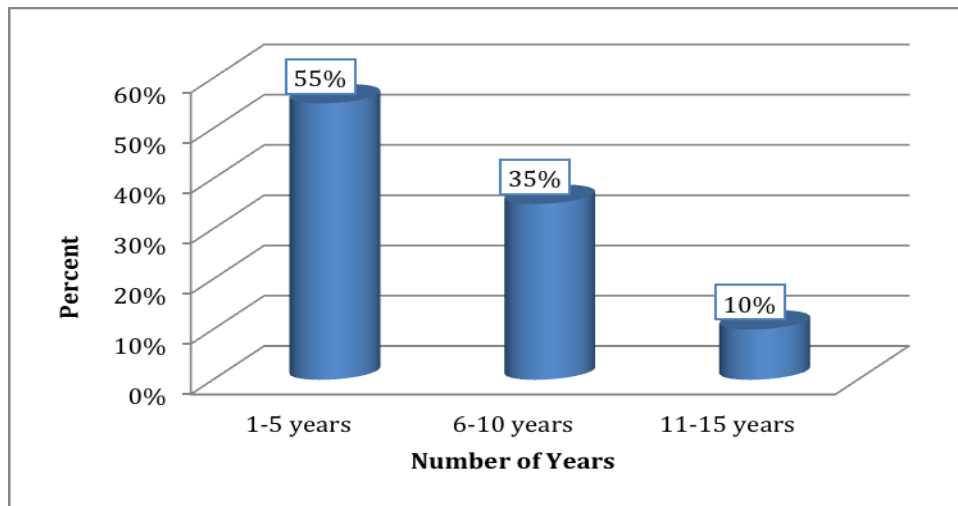


**Figure 4.3: Level of Education**

Source: Field Study, 2015

Figure 4.3 showed the level of education of respondents. It was observed from the results of the respondents educational level that majority of the respondents indicated they have 2<sup>nd</sup> degree, representing 45 percent. Those who indicated they have 1<sup>st</sup> degree as their highest educational level were 40 percent and 15 percent of the respondents

indicated they have HND/equivalents. It was found from the level of education of respondents that their educational levels were high.



**Figure 4.4: How long have you been working in KMA**

Source: Field Study, 2015

The results showed that 55 percent of the respondents have been working in the organization for 1-5 years. It was observed that 35 percent have been working for 6-10 years and 10 percent have been working for 11-15 years. Based on the analysis of the study, it can be read that majority of the respondents have worked for years ranging from 1-5 years. Relatively, respondents within these working age categories constitute the least served in KMA as compared to the others. It can however, be revealed that, though majority have worked within 1-5 years but it can be suggested to mean that their experience are not as compared to the those who have worked above 5 years. It can therefore be deduced that workers with less experience may not fully understand issues of procurement related to environmental sustainability.

### 4.3 Determination of Environmental Sustainability by KMA

This section of the study presented the determinants of the environmental sustainability of the Assembly. Ten variables were used to measure how environmental sustainability were considered during procurement of goods. Respondents at each case were asked to indicate whether they agree (yes), disagree (no) or have no idea about the statement on environmental sustainability. Table 4.1 showed the results of the environmental sustainability.

**Table 4.1: Environmental Sustainability**

Sustainability	Yes	No	No Idea	Total
Do you consider goods procured by KMA <u>environmentally friendly</u>	13 65%	7 35%	0 0%	20 100%
Goods specification should include sustainability <u>considerations</u>	20 100%	0 0%	0 0%	20 100%
Guides for procuring sustainable goods are in the <u>status book of KMA</u>	10 50%	10 50%	0 0%	20 100%
Do you think the procured goods affect the <u>environment</u>	16 80%	2 10%	2 10%	20 100%
Do goods procured by KMA create environmental <u>problems</u>	10 50%	8 40%	2 10%	20 100%
Is the disposal of waste considered during <u>procurement of goods</u>	9 45%	7 35%	4 20%	20 100%
Do you face interference procuring any goods to <u>KMA</u>	9 45%	10 50%	1 5%	20 100%
Do you think adopting sustainable material should be <u>voluntary</u>	2 10%	18 90%	0 0%	20 100%
I am aware that sustainability is getting more <u>recognition in KMA</u>	13 65%	1 5%	6 30%	20 100%
The use of environmentally friendly materials would <u>increase costs</u>	8 40%	11 55%	1 5%	20 100%

**Source: Field Study, 2015**

Respondents were asked whether they consider goods procured by KMA as environmentally friendly. It was observed that 65 percent of the respondents indicated they consider goods procured by KMA environmentally friendly.

While 35 percent considered it not environmentally friendly. This showed majority of the respondents consider goods procured by KMA as environmentally friendly. This implies that majority of the respondents are likely to take decisions that will help support the environment because according to the Millennium Ecosystem Assessment (2005), humans have changed ecosystems more rapidly and extensively than in any comparable period of time in human history over the past 50 years. Hence it can be suggested that having people to consider the environment during procurement is a step in the right direction to secure it.

The respondents were asked whether the guides for procuring sustainable goods are in the status book of KMA. It was realized that 50 percent of the respondents said guides for procuring sustainable goods are in the status book of KMA and 50 percent said guides for procuring sustainable goods are not in the status book of KMA. Based on the foregoing it is obvious that equal percentage regards the use of procurement guides as much as those who do not take cognizance. It can therefore be deduced that, hazardous goods are likely to infiltrate the environment through procurement as long as the percentage of respondents who have no regards for procurement guides increase.

Respondents were asked whether they think the procured goods affect the environment, and majority indicated it does affect the environment. However, 10 percent indicated it does not affect the environment and 10 percent said they do not have any idea about its effect on the environment. Aside the fact that minority have no idea of the effects of goods on the environment, majority of the respondents are conscious of the fact that procured goods affect the environment. It can be construed therefore global



environmental change caused by human activity is liable to reduce from the standpoint of Schwartz et al. (2006).

It was observed that 50 percent of the respondents considered goods procured by KMA create environmental problems. It was found that 40 percent indicated goods procured by KMA do not create environmental problems. The study again observed that 10 percent indicated they do not have idea about goods procured by KMA whether it create environmental problems or not. The analysis makes evident that, majority of the respondents in KMA understand the fact that goods procured by KMA create environmental problems. This according to MA (2005) is relevant to direct people to understand that human actions are putting such strain on the environment and the need to protect it. It can therefore be put forward that having most procurement officers understanding procurement impact on the environment will help acquire the right goods for use.

As part of measuring sustainability, respondents were asked whether the disposal of waste was considered during procurement of goods. It was observed that 45 percent of the respondents indicated disposal of waste is considered during procurement of goods. It was indicated by 35 percent that disposal of waste is not considered during procurement of goods and 10 percent indicated they do not have idea. Since disposal of goods according to (Defra, 2007) is essential in all settings, it is appropriate to have most respondents knowing disposal of goods during public procurement simply because according to Thai (2001) such officers could consider the requirements for goods, systems, and services in a timely manner.

Majority of the respondents indicated they do not face interference procuring any goods to KMA representing 50 percent and 45 percent indicated they face interference

procuring any goods to KMA. Majority of the respondents indicated that they think adopting sustainable material should not be voluntary, representing 90 percent. Few percentages, thus 10 percent indicated they think adopting sustainable material should be voluntary.

From the study analyzed it can be inferred that goods procured by KMA are meticulously considered to be environmentally friendly because majority of the respondents suppose that procuring sustainable material should be guided. It is however, for this reason that Barbier (2003) suggested the adoption of right goods that are environmentally friendly to help treat natural resources as important assets and as natural capital.

It was found from the results that 65 percent of the respondents indicated that sustainability is steadily being accepted in KMA and 30 percent have no idea. The assertion that the use of environmentally friendly materials would increase costs was agreed by 40 percent of the respondents. It was observed that 55 percent indicated the use of environmentally friendly materials would not increase costs. Having the majority seeing the fact that sustainability is getting more recognition in KMA suggests a step in the right direction according to Pearce and Turner (1990) to for the conservation and prevention of exhaustion of natural resources by the present generation.

#### **4.4 Environmental Sustainability Challenges as a Result of Procurement of Goods**

Respondents were asked what they would say about the environmental sustainability challenges as a result of procurement of goods. Table 4.3 below present the frequency

distribution of how each challenge was indicated and how significant the distributions were.

**Table 4.2: Environmental Sustainability Challenges**

Challenges	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree	Asymp. Sig.
Lack of environmental concern among the procurement officers	0 0%	4 20%	3 15%	7 35%	6 30%	.572
Lack of education on environmental sustainability	1 5%	7 35%	0 0%	5 25%	7 35%	.187
Perception that sustainable materials are inferior in quality	12 60%	7 35%	0 0%	1 5%	0 0%	.011
Lack of technical & management capacity	1 5%	3 15%	4 20%	5 25%	7 35%	.287
Unwillingness on procurement officer to change the way of specifying goods	0 0%	10 50%	6 30%	1 5%	3 15%	.027

Source: Field Study, 2015

As regards environmental sustainability challenges, it was observed that 20 percent of the respondents disagree with the challenge, lack of environmental concern among the procurement officers and 15 percent were neutral. Therefore it will not be out of place to side with Kyoungsoon et al., (2008) on the basis that procurement officers have incline to shift their focus from quality to quantity as they persistently strive for increased production and the increased profits. However, it was found out that 35 percent agreed and 30 percent strongly agree that there was lack of environmental concern among the procurement officers.

This showed that majority of the respondents agreed that there exist challenges of lack of environmental concern among the procurement officers. However, the nonparametric chi-square p-value indicated there is no significant difference in the distribution.

It was found that about 60 percent of the respondents at least agreed that there was lack of education on environmental sustainability, thus 25 percent agreed and 35 percent strongly agreed. However, 40 percent at most disagreed that there was lack of education on environmental sustainability in the Assembly. Deducing from the analysis it can be proposed that most members in KMA are likely to procure goods that could be injurious to the environment as long as the majority is uneducated about the relevance of environmental sustainability. This is based on the fact that education on public procurement from the viewpoint of Thai, (2001) has been a neglected area of academic education and research. To this extent Langston and Ding (2001) also adds that if professionals are not given enough environmental education, it may create significant barriers to the effectiveness of recycling.

Majority of the respondents indicated they strongly disagree the perception that sustainable materials are inferior in quality, representing 60 percent. In addition, 35 percent disagree the perception that sustainable materials are inferior in quality. It was observed that few percentages of the respondents, 5 percent agreed the perception that sustainable materials are inferior in quality. The results shows that the scaling was significant because  $p\text{-value of } 0.011 < 0.05$ . The direction as discussed already indicated disagreement of the assertion on the perception that sustainable materials are inferior in quality. On this note it can be suggested procuring quality goods would ensure longevity, which inevitably will avoid early spoilage and disposal of goods but ensure prolonged use of the goods

Most of the respondents; 25 percent agreed and 35 percent strongly agreed that there is lack of technical & management capacity. The respondents who at least agreed represent 60 percent cumulatively. There were 15 percent of the respondents who



disagreed and 5 percent strongly disagree that there was lack of technical & management capacity. It was observed that 20 percent of the respondents were neutral of the assertion that the Assembly was facing technical & management capacity problem. The forgoing brings to the fore, the fact that people with technical and management ability are lacking in KMA. It tendency of procuring hazardous goods could be high because there is a significant difference p-values of  $0.287 > 0.05$

Moreover, 50 percent disagree the assertion that procurement officers are unwilling to change the way of specifying goods, 30 percent were neutral to the assertion and 20 percent at least agreed that, the procurement officers are unwilling to change the way of specifying goods. From the analysis it can be realized that, this assertion was observed not to be a challenge of the Assembly. Therefore, it can deemed that goods procured will be suitable the environment.

#### 4.5 Relative Importance Index (RII)

Relative importance index was used to measure how each of the challenge was ranked in relation to the other. Indices were presented in percentage and ranked from 1 to 5. Index of 70 percent and above indicated higher level of agreement and below indicated lower level of agreement (disagrees). Table 4.3 presented the results of the descriptive and relative index.

**Table 4.3: Sustainability Challenges**

Challenges	N	Sum	Mean	Std. Deviation	RII	Ranking
Lack of environmental concern among the procurement officers	20	75	3.75	1.118	75	1
Lack of technical & management capacity	20	74	3.7	1.261	74	2

Lack of education on environmental sustainability	20	70	3.5	1.433	70	3
Unwillingness on procurement officer to change the way of specifying goods	20	57	2.85	1.089	57	4
Perception that sustainable materials are inferior in quality	20	30	1.5	0.761	30	5

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Source: Field Study, 2015

It was observed that the respondents agreed the first three ranked challenges averagely.

The challenges were; Lack of environmental concern among the procurement officers ranked first with index of 75 percent and mean score of  $3.75 \approx 4$ . This suggested averagely, respondents agreed that there was lack of environmental concern among the procurement officers.

The second ranked challenge was lack of technical & management capacity with index of 74 percent and mean score of  $3.7 \approx 4$  showing averagely respondents agreed. And the third ranked challenged which was also averagely respondents agreed was lack of education on environmental sustainability with index of 70 percent and mean score of  $3.5 \approx 4$ .

The last two challenges were observed to have indices of 57 percent and 30 percent. Unwillingness on procurement officer to change the way of specifying goods was ranked 4<sup>th</sup> with index of 57 percent and mean score of 2.85 showing it was averagely disagreed and the perception that sustainable materials are inferior in quality was ranked 5<sup>th</sup> with index of 30 percent and mean score of 1.5 indicating averagely respondents disagreed with that perception..

#### 4.6 Plans to Ensure Effective and Proper Disposal of Procured Goods after its lifespan

This section of the analysis measures the ways to ensure effective and proper disposal of procured goods after its lifespan. Table 4.4 and 4.5 presented the results of ensuring effective and proper disposal of procured goods after its lifespan.

**Table 4.4: Effective and Proper disposal of Procured Goods after its Lifespan**

	<b><u>Strongly disagree</u></b>	<b><u>Disagree</u></b>	<b><u>Neutral</u></b>	<b><u>Agree</u></b>	<b><u>Strongly Agree</u></b>	<b><u>Pvalue</u></b>
Recycling should be the way to dispose of goods	0 0%	0 0%	0 0%	3 15%	17 85%	.002
Dumping on refuse dump can solve disposal problems	9 45%	1 5%	2 10%	4 20%	4 20%	.050
Increasing the landfill area will help dispose of goods	0 0%	10 50%	7 35%	3 15%	0 0%	.157
Goods should be combusted to reduce waste	4 20%	2 10%	0 0%	14 70%	0 0%	.002
Dumping waste at rivers should be encouraged	15 75%	3 15%	0 0%	0 0%	2 10%	.000

**Source: Field Study, 2015**

It was observed that all the respondents indicated they agree that recycling should be the way to dispose of goods; 15 percent agree and 85 percent strongly agree. This means that to ensure effective and proper disposal of procured goods after its lifespan the Assembly should undertake recycling. The p-value of the chi-square was observed to be less than 5 percent;  $0.002 < 0.05$ .

It was observed from the results that 45 percent and 5 percent of the respondents respectively strongly disagree that dumping on refuse dump can solve disposal

problems. Again, it was observed that 20 percent of the respondents agree and the same percentage also strongly agree that dumping on refuse dump can solve disposal problems. It was found out that majority of the respondents disagree that dumping on refuse dump can solve disposal problems and therefore could be concluded that it is not the best way to ensure effective and proper way of disposal of procured goods after their lifespan because according to (Barnes et al., 2009) large and increasing amounts of waste (plastic products, debris, fragments and even micro-particles) are found in the open ocean, on land surface, in sediments, and in organisms posing threat to human life.

Increasing the landfill area will help dispose of goods was disagreed by 50 percent of the respondents and 35 percent were neutral. It results indicated 15 percent agreed that increasing the landfill area will help dispose of goods. The results therefore showed that increasing the landfill area will not help dispose of goods indicated by the majority of the respondents. The responses accentuate however with Sterner (2002) observation that the recyclable material mostly ends up in landfill sites and for that matter. And for this cause Sterner (2002) advises that executing a waste management plan during the planning and design stages can decrease waste.

Goods should be combusted to reduce waste was agreed by the majority of the respondents, representing 70 percent. It was observed that 20 percent and 10 percent respectively strongly disagreed and disagreed that goods should be combusted to reduce waste. Combustion of waste therefore could be suggested as a means to reduce waste as indicated by the majority of the respondents.

Dumping waste at sea should be encouraged was disagreed by respondents. It was seen that 75 percent and 15 percent of the respondents respectively strongly disagree and agree that dumping waste at sea should be encouraged. Few percentages of the



respondents strongly agree that dumping waste at sea should be encouraged relative to those the majority who disagree.

**Table 4.5: Ensuring Effective and Proper Disposal**

	N	Mean	Std. Deviation	RII	Ranking
Recycling should be the way to dispose of goods	20	4.85	0.37	97	1
Goods should be combusted to reduce waste	20	3.2	1.28	64	2
Increasing the landfill area will help dispose of goods	20	3.15	1.23	63	3
Dumping on refuse dump can solve disposal problems	20	2.65	1.69	53	4
Dumping waste at rivers should be encouraged	20	1.55	1.23	31	5

Source: Field Study, 2015

It was observed that recycling should be the way to dispose of goods was highly significant as observed in the frequency distribution in table 4.5. It was ranked first with index of 97 percent and mean score of 4.85, which showed that respondents strongly agreed that recycling should be the way to dispose of goods.

The 2<sup>nd</sup> and 3<sup>rd</sup> ranked measures were goods should be combusted to reduce waste and Increasing the landfill area will help dispose of goods respectively. Their indices were 64 percent and 63 percent respectively with their mean scores of 3.2 and 3.15 indicating averagely respondents disagreed with the assertion that goods should be combusted to reduce waste and increasing the landfill area will help dispose of goods. Similarly, Dumping on refuse dump can solve disposal problems was significantly disagreed by the respondent with index of 53 percent and mean score of 2.65. The last variable,

dumping waste at sea should be encouraged was ranked 5<sup>th</sup> with index of 31 percent and mean score of 1.55 showing that respondents strongly disagreed.

#### **4.7 Chapter Summary**

The chapter analyzed the data collected and discussed the results. Analysis was done in relation to the objectives of the study and results presented in sections; the first two sections 4.1 to 4.2 showed the introduction of the chapter and socio-demographic information respectively. The subsequent sections presented the specific objectives; determination of environmental sustainability, environmental sustainability challenges as a result of procurement of goods and plans to ensure effective and proper disposal of procured goods after its lifespan.



### **CHAPTER FIVE**

#### **SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATION**

##### **5.1 Summary**

The study sought to determine the effect of procurement of goods on the environment; A case study of the implementation of the Urban Development Grant (UDG) projects

in KMA. The specific objectives were to determine how the Kumasi Metropolitan Assembly considers environmental sustainability during procurement of goods; to examine the various environmental sustainability challenges as a result of procurement of goods; and find out the plans to ensure effective and proper disposal of procured goods after its lifespan.

The study used a combined research design methods, thus both the qualitative and quantitative research methods just that better understanding will be achieved because different kinds of objectives were studied. The population for this study area constituted the various employees at KMA who were directly or indirectly connected with the procurement of any goods or services.

In all, twenty (20) respondents were chosen and the sample was selected using the purposive sampling technique. The researcher adopted the questionnaire approaches to collect relevant data.

### **5.1.1 Key Findings**

#### **5.1.1.1 In determination of environmental sustainability by KMA it was found out that;**

- Most goods procured by KMA are environmentally friendly.
- Though procurement officers at KMA observe procurement guides purchasing sustainable goods but not always
- Majority of the respondents indicated that adopting sustainable material for the environment should not be interfered with
- The study made clear that, majority consented to the fact that sustainability is getting more recognition in KMA

**5.1.1.2 In assessing environmental sustainability challenges as a result of procurement of goods, it was discovered that;**

- There exist challenges of lack of environmental concern among the procurement officers according to majority response
- Most responses suggested that there was lack of education on environmental sustainability
- Lack of technical & management capacity constitute a challenge in KMA
- Moreover, most responses indicated that procurement officers are unwilling to change the way of specifying procured goods

**5.1.3 As regards Plans to Ensure Effective and Proper Disposal of Procured Goods after its lifespan it was shown that;**

- It was observed that recycling should be the way to dispose of goods
- Other measures like combustion and dumping in landfill sites and rivers though were adopted but denoted less desired approaches.
- The adoption of dumping of waste on refuse dump was accepted as a means to solve disposal problems.

**5.2 Conclusion**

Procurement is deemed to be needful in planning and rooted as well in the market economy hence requires a choice between goods/services according to quantity and quality to suit the environment criteria eventually.

The findings of the study makes evident that, the environment needs to be protected for human habitation and survival hence the need to be circumspect of procurement systems. It is conclusive however to put forward that, having people to consider the



environment during procurement is a step in the right direction to secure the right goods for it.

The findings however, makes it relevant to heed to caution on the grounds that hazardous goods are likely to gain access to the environment through procurement as long as KMA officers downplay regards for procurement guides. It can therefore be put forward that having most procurement officers understanding procurement guides and impact on the environment will help acquire the right goods for use.

As regards environmental sustainability challenges it can be concluded that there exist challenges in KMA culminating into the lack of environmental concerns among the procurement officers, which has the propensity to affect proper disposal of procured goods after its lifespan.

This means that to ensure effective and proper disposal of procured goods after its lifespan the Assembly should undertake recycling the most adopted approach according to the findings of the study.

### **5.3 Recommendation**

Based on the findings of the study, the following are made as recommendation;

#### **5.3.1 Concern for environment**

Procurement officers at KMA should be taught to be concerned about the goods they procure and be meticulously concerning environmentally friendly goods particularly.

### **5.3.2 Education on environmental sustainability**

Timely training should be conducted for procurement officers at KMA on the need to shift their focus from quantity to quality goods that likely to sustain the environment. Because most procured goods could be damaging to the environment as long as officers remain uneducated about trends of goods.

### **5.3.3 Technical & management capacity**

Professionals with knowledge in modern procurement practices as it relates to goods and services purchases should be employed or consulted where appropriate. Having such expertise will help procure right goods to reduce the tendency of having to dispose off waste.

### **5.3.4 Guide to disposal of waste**

Recycling should be the way to dispose of goods. This means that to ensure effective and proper disposal of procured goods after its lifespan the Assembly should undertake recycling.

### **5.3.5 Public Procurement Act**

Public Procurement Act (663), 2003, could be rechecked and enforced to promote safe procurement and sustainability requirements.

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## APPENDIX

**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**COLLEGE OF ARCHITECTURE AND BUILT ENVIRONMENT**

**DEPARTMENT OF BUILDING TECHNOLOGY**

## MSC. PROCUREMENT MANAGEMENT

### QUESTIONNAIRE

This questionnaire will feed into a research being conducted on the topic: “**The effect of procurement of goods on the environment; a case study of the implementation of the Urban Development Grant (UDG) project in the Kumasi Metropolitan Assembly (KMA)**”. The final report would be submitted to the Graduate School of the Kwame Nkrumah University of Science and Technology as a Thesis. Whatever information given here is intended for academic discourse only and is not intended for putting any sensitive information in your organization in the public domain or any other organization for that matter.

DATE: \_\_\_\_, \_\_\_\_, 2015

(Please tick (□) your answers and fill spaces provided where necessary. However you are not under any compulsions to provide answers that beat your thinking)

Contact of researcher

Name: Isaac Kumi. E-mail [kumi.isaac@yahoo.com](mailto:kumi.isaac@yahoo.com). Mobile Number 0244203400 **PART**

**I: Socio-Demographic Information** 1. What is your gender? [ ] Male

[ ] Female

2. Could you kindly identify the age range you fall in?

[ ] 18-25

[ ] 26-33

[ ] 34-41

[ ] 42 and above (specify).....

3. What is your level of education?

[ ] JHS/SHS

[ ] HND/Equivalents

[ ] 1<sup>st</sup> Degree

[ ] 2<sup>nd</sup> Degree

[ ] Others Please specify.....

4. How long have you been working in KMA

- ☐ Less than 1 year  
☐ 1-5 years  
☐ 6-10 years  
☐ 11-15 years  
☐ 16 years and above

**PART II: Determination of environmental sustainability by KMA**

**Yes      No      No Idea**

☐ ☐ ☐ 1. Do you consider goods procured by KMA environmentally friendly?

☐ ☐ ☐ 2. Goods specification should include sustainability considerations?  
☐ ☐ ☐ 3. Guides for procuring sustainable goods are in the status book of KMA

☐ ☐ ☐ 4. Do you think the procured goods affect the environment?

☐ ☐ ☐ 5. Do goods procured by KMA create environmental problems?  
☐ ☐ ☐ 6. Is the disposal of waste considered during procurement of goods?

☐ ☐ ☐ 7. Do you face interference procuring any goods to KMA?

☐ ☐ ☐ 8. Do you think adopting sustainable material should be voluntary

☐ ☐ ☐ 9. I am aware that sustainability is getting more recognition in KMA

☐ ☐ ☐ 10. The use of environmentally friendly materials would increase costs

**PART III: Environmental sustainability challenges as a result of procurement of goods**

On a scale of 1-5, rate the following statements that best represent your perception of sustainability. (1 = strongly disagree & 5= strongly agree)

(Please tick (□) appropriately where applicable)

<b>Statement</b>		<b>Strongly Agree</b> <b>5</b>	<b>Agree</b> <b>4</b>	<b>Neutral</b> <b>3</b>	<b>Disagree</b> <b>2</b>	<b>Strongly Disagree</b> <b>1</b>
What will you say are the Environmental sustainability challenges as a result of procurement of goods						
<b>1</b>	Lack of environmental concern among the procurement officers					
<b>2</b>	Lack of education on environmental sustainability					
<b>3.</b>	Perception that sustainable materials are inferior in quality					
<b>4.</b>	Lack of technical & management capacity					
<b>5</b>	Unwillingness on procurement officer to change the way of specifying goods					
<b>6</b>	Others (specify)					

#### **PART IV: Ensuring effective and proper disposal of procured goods after its lifespan**

On a scale of 1-5, rate the following statements that best represent your perception of sustainability. (1 = strongly disagree & 5= strongly agree)



(Please tick(☐) appropriately where applicable)

Statement To what extent do you think the following are ways of ensuring the effective and proper disposal of procured goods after its lifespan		Strongly Agree 5	Agree 4	Neutral 3	Disagree 2	Strongly Disagree 1
1	Recycling should be the way to dispose of goods					
2	Dumping on refuse dump can solve disposal problems					
3.	Increasing the landfill area will help dispose of goods					
4.	Goods should be combusted to reduce waste					
5	Dumping waste in a river should be encouraged					
6	Others (specify)					

Thank You