

PROSPECTS AND CHALLENGES OF GREENING THE KUMASI METROPOLIS

By

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The logo of Kwame Nkrumah University of Science and Technology (KNUST) is a large, faint watermark in the background. It features a yellow eagle with spread wings perched on a shield. The shield is divided into four quadrants with different colors and symbols. Above the eagle is a torch. The entire emblem is encircled by a banner with text in Akan and English.

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DECLARATION

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ABSTRACT

Kumasi Metropolis is currently experiencing a loss of biodiversity which results in poor green space services and facilities. Most public and private open spaces, forests, wetlands and greenbelts have been encroached by land developers. The main objective of the study was to investigate the prospects and challenges of Urban Green Space Development in the Kumasi Metropolis. This was achieved by analysing the underlying strengths, weakness, opportunities and threats for management of urban green spaces in the Kumasi Metropolis.

The study adopted the case study method, in order to understand the situation of green spaces management in the Kumasi Metropolis. Five out of ten communities exhibiting significant green spaces facilities and services in the Kumasi Metropolis were selected for the study. These are; Ahinsan Estate, Santasi, Kaase, Adiembra and Ayigya. All the relevant variables needed for the study were identified and explained through a literature review after which the methodology to solicit the necessary data and information to address the research questions was done

Administration of questionnaires to households in these communities enabled the researcher to understand the household's perception and opinion of green space management. Furthermore, interviews were conducted in some selected institutions that deal with environmental management. These include the Town and Country Planning Department and Environment Protection Agency and Traditional authorities among others.

The study revealed some differences in managing green spaces among residents from these communities as well as institutions. In general, management of green spaces and facilities in Kumasi is not up to expectations. Individuals, households, institutions, businesses (commercial entities), politicians and Kumasi Metropolitan Assembly (KMA) do not tend to place high priority on green spaces in the development of the Metropolis. As such, people have poor attitude towards green spaces. Coupled with this are inefficiencies in service provision by Kumasi Metropolitan Assembly. The Departments within the Kumasi Metropolitan Assembly that are responsible for managing the green space services and facilities are also under-resourced. This weak institutional incapacity in managing green spaces results in weak coordination among

stakeholders, boundaries of stool/skin land and inadequate security of land tenure among others. These issues individually and cumulatively lead to environmental problems, disputes, conflicts and endless litigation which in turn affect the effectiveness in the overall management of green spaces in the city.

Some recommendations pointed to the need for intensive public education to promote a positive attitude for green space management in Kumasi. In addition, enforcement of the environmental by-laws, physical planning codes and standards are also recommended to institutions responsible for the management of green spaces in the Kumasi Metropolis.



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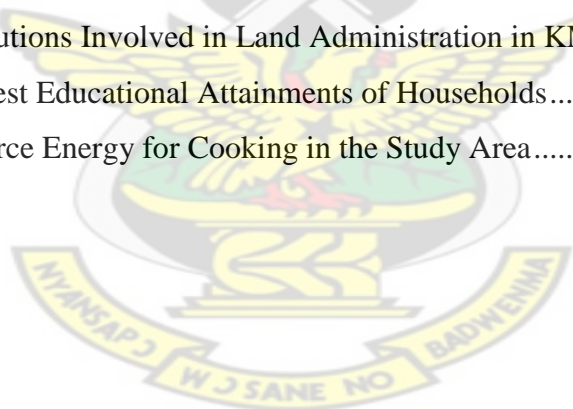
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LIST OF ACRONYMS

| | |
|-------|--|
| CBD | Central Business District |
| CDI | Clean Development Initiatives |
| EPA | Environment Protection Agency |
| GH¢ | Ghana Cedis |
| GIS | Geographical Information System |
| GMT | Greenwich Meridian Time |
| GSS | Ghana Statistical Services |
| ITCZ | Inter-Tropical Convergence Zone |
| KMA | Kumasi Metropolitan Assembly |
| KNUST | Kwame Nkrumah University of Science and Technology |
| LRD | Land Registration Division |
| LVD | Land Valuation Division |
| NDPC | National Development Planning Commission |
| NGOs | Non-Governmental Organisations |
| PVLD | Public and Vested Land Division |
| SMD | Survey and Mapping Division |
| SPSS | Statistical Package for Social Sciences |
| SWOT | Strengths, Weakness, Opportunities and Weaknesses |
| TCPD | Town and Country Planning Department |
| UGS | Urban Green Spaces |
| USA | United States of America |
| UN | United Nations |

CHAPTER ONE

BACKGROUND TO THE STUDY

1.1 Introduction

Ghanaian cities have undergone profound reforms over recent decades, as politicians, decision makers and planners have sought to ensure that the built environments remain livable and can adapt to new lifestyles and demographic trends (Poku-Boansi, and Inkoom, 2011; Mensah, 2014). It is now abundantly clear that rapid urbanization is greatly transforming the spatial pattern of urban land use. Consequently, the resulting losses of urban green space at the local to the global level are continuously altering urban ecosystems. Green spaces are recognized as one of the most popular resources of the urban ecosystems today. The increasing urbanization and human population growth during recent decades have resulted in significant loss of habitats in the urban landscape (McKinney, 2002).

Because of urbanization and gentrification, the physical development which has been taking place in most cities of the World is associated with greater loss of green space and wetlands belt (Mng'ong'o, 2004). The loss or degradation of green space destroys the habitats of creatures, reduces biodiversity and disrupts the structure and process of the urban ecosystem (Zhou, et al, 2011). This situation results in the decimation of green spaces (Akamani, 2006). Therefore, there is the need for an urban green space development framework to protect urban green spaces by identifying the prospects and the challenges in order to contribute meaningfully to urban ecosystems.

Green belts contribute towards healthy ecosystems which underpin many natural processes supporting a range of services including pollination, soil fertility, flood defence, air filtration and carbon capture and storage (Bayram and Ercan 2006).

Urban green spaces could perform many functions in the urban context that benefits people's quality of life. There is a growing consensus about the importance and value of urban green spaces in cities. Therefore planning towards constructing sustainable or eco-cities of the 21st century is highly appreciated (Bayram and Ercan 2006). However, without careful production of knowledge and the linkage of that knowledge

to action on developing and maintaining the urban green spaces, cities of the World will be overwhelmed with many challenges (Vijaya and Iniyamb 2012). This in turn will result in the deterioration of the quality of life in urban areas in many aspects including social, economic, health and the environment.

Physical activity in green spaces like walking or cycling is attributed to many factors such as easy access in terms of routes and entry points, distance, connectivity to residential and commercial areas, size of green spaces in terms of population use, attractiveness, including biodiversity, habitat and absence of graffiti and litter and a range of amenities. Both policy and science now emphasize the critical necessity of green areas within urban social and ecological systems (Rushmore et al., 2007).

Moreover, green spaces are beneficial due to their ability to facilitate hydrological processes in areas where development has interfered with urban hydrology (i.e., the movement, distribution, and quality of water) (Vijaya and Iniyamb 2012). These permeable spaces provide important ecosystem services such as filtering water pollutants, reducing storm water runoff and flooding, and enhancing groundwater recharge (US EPA, 2001; cited in Wendel and Heather, 2011).

Also, as the amount of permeable surfaces decrease, a shift occurs in water distribution from partial subsurface flow to almost all surface runoff (US EPA, 2001; cited in Wendel and Heather, 2011). This process always brings about severe flooding in cities and if drainage infrastructure is not well developed, it might result in unanticipated calamities. Therefore, it's better to maintain the nature and ecology of urban forests and vegetation in the city in order to prevent both human and property losses.

The development of green spaces plays a great role in achieving various socio-economic development targets in any country. Urban green spaces generates tangible ecosystem services including outdoor recreational opportunities, amenities, air pollutant removal, balancing atmospheric oxygen and carbon dioxide contents, micro climatic regulation, soil moisture and groundwater recharge, flood control, wildlife habitat and physical and mental health promotion. There is a need to allocate enough resources to support the day to day monitoring of urban green spaces against

encroachers and to provide guidelines which ensure sustainable land uses which prevent any kind of physical and economic development in the green belt. Also, there must be a continuing effort to ensure the accessibility, availability and usability of green space facilities open to all residents (Li Liu et al., 2004; Atiqul, 2011).

Intensification of activities without proper planning and coordination leads to wear and tear of green spaces and structures resulting in poor quality of urban life (Mng'ong'o, 2004). Hence, management of urban green spaces which include among others; planning, coordinating and controlling of socio-economic activities that take place in the city is critical to every urban ecosystem.

Most cities in developing countries, especially those in Sub Saharan Africa, have a small percentage of green spaces as a result of rapid urbanization, natural population growth and also because of lack of proper spatial planning and control mechanisms, lack of coherent approach to management, poor designing and most of them offer very little services to green space users. Unfortunately, efforts aimed at solving these problems have not yielded the intended results, thus, making it a major problem in towns and cities of the developing world (Mensah, 2010). In managing and maintaining green spaces, most countries in Africa have a number of planning regulations instituted to guide the development of structures in both urban and rural areas. For example, in Ghana, the Local Government Law of 1993 (Act 462) has provisions in Sections 51 and 52 that, unauthorised structures on any public properties (lands) such as schools, market and sanitation sites, open spaces, nature reserves, parks and roads, could be stopped and even demolished without notice, and the developer(s) surcharged with the cost of demolition (Mensah, 2010).

The nature and extent of prospects and challenges in the management of green spaces vary from one country to another in the various regions of the World. Therefore, it cannot be tackled using similar strategies because of differences in conditions and characteristics which they operate. For this reason, it is necessary to develop an appropriate intervention mechanism to understand the prospects and challenges of green spaces in the Kumasi Metropolis.

1.2 Problem Statement

The world environment is continuously changing. Population, urbanization and economic growth, accelerate development everywhere. The increasing population and extensive development have changed the environment over the last decades (Rashid, 2010). Ghana is a developing country where serious urban environmental degradation has taken place in recent years. Urban air pollution, carbon emission through energy consumption, surface water pollution, and loss of open space among others, are challenges facing many cities of developing countries. Green surroundings gradually disappear as villages turn to cities. Fresh and healthy air are displaced by pollution (Rashid et al., 2010).

Green spaces increase the social inclusion among the community especially lower income urban residents who always rely on these spaces for majority of leisure time and recreational activities (US EPA, 2001; cited in Wendel and Heather, 2011). This has not always been true in most cities of the developing World. It has been observed that, people's demand for green space has not been met and those who invested in green spaces are not getting the full benefits expected because of low efficiency.

The absence or weakness of organizational structures for the management of urban green spaces resulted in many deficiencies in both the demand and supply of green spaces. Lack of government guidelines, rules, regulations and lack of conducive environment for individuals or companies to invest in green space facilities development and management has been the major causes of the deterioration of urban green spaces in many cities (Tuzin, et al. 2002).

There is poor planning for green space development in most developing cities. This has been attributed to lack of stakeholders' participation including the individuals, households, companies, NGOs, health and environmental experts. This makes it difficult for them to understand their roles, needs, rights and responsibilities; which are highly needed in all stages of design, construction and management of green spaces and facilities as well as services throughout their lifetime (Newman and Kenworthy, 1999).

According to the population and housing census in 2010, over 50.9 % of the population of Ghana reside in urban areas (GSS, 2012). Ghana is right now at the point of rapid urbanization causing people to migrate from all over the country towards the major cities of Accra and Kumasi. Kumasi is thus at the threshold of rapid urbanization as the City's growth rate of 5.47 % (GSS, 2012) is higher than both the national and regional figures. This could lead to rapid depletion of its resources. The most evident problems that face Kumasi are deforestation, desertification and heavy pollution, which negatively affect the quality of life of the city's dwellers (KMA, 2013).

Since 2013, the City is implementing the so called 'Greening of Kumasi programme of action, which among others is targeted at ensuring that 20 % of the built area in the City is landscaped by 2020, to sensitize people on the benefits of greenery for at least 30 % of its residents by 2016 and to plant 20,000 trees by 2016 (KMA, 2013). Unfortunately, these attempts have not yielded any impressive and fruitful results as green space belts and wetlands are undergoing destruction which brings negative impacts to the residents.

Today, almost all parks, for one reason or the another, have been converted into commercial centres by the city authorities and the traditional rulers, who are the custodians of the land. The authorities seem to be unmindful of the harm they are creating for the youth by denying them the opportunity to unearth their potential through sports and exercises (KMA, 2013). On the whole, the institutional problems behind the environmental degradation have stemmed from political neglect as well as problems in the overall administration and spatial management mechanisms in the city.

Specifically, the problems include the absence of a comprehensive management plan, inadequate institutional capacity, lapses in land administration, lack of community participation, and poor collaboration among cognate agencies (Akamani, 2006). Kumasi city, with the high rate of population growth, has failed to control the

development of unplanned and illegally acquired land for various purposes including housing for residential, commercial/business and industrial needs (KMA, 2013).

Most studies conducted in Kumasi on the effects of urbanization concentrated on examining how the existing strategies on the management, planning and implementation of green spaces in Kumasi are promising or compromising on prospects of achieving a sustainable greener city. The previous studies therefore, drew attention to the stakeholders to take appropriate measures to maintain the garden city of West Africa and make the green space management become a part of a comprehensive programme of sustainable development for other coming decades. These studies have ignored for instance, the issues related to the prospects, challenges and incentives amongst others for the development of green spaces in the city and the rate at which green space belts have been depleted in favour of different land uses.

The enormity of the green space management is an indication of the extent of resources required to adequately contain the tasks involved. The KMA as the leading institution in management of green spaces has amply demonstrated its institutional and resource inability to handle the green space problem in the Kumasi Metropolis. Government grants and subvention have been inadequate for the provision of public social services by KMA. It is always unable to match the demand and aspiration for public services to the growing city population.

To enable the KMA and the other stakeholders to play their role in the management of green spaces in the Kumasi Metropolis, an investigation of the capacity and problem is therefore necessary. Pursuant to the above, this present study seeks to investigate both the challenges and prospects of greening in the Kumasi metropolis.

1.3 Objectives of the Study

The main objective of the study is to investigate the prospects and challenges of Urban Green Space development in the Kumasi Metropolis. Green Space Planning and implementation has been regarded as a comprehensive process with an interaction between concepts, planning processes, implementation and management.

The specific objectives of the study were as follows:

- 1) To analyse existing legal and policy framework that seek to address the issue of green spaces in the Kumasi Metropolis
- 2) To identify the main actors and the roles they played in greening the Kumasi Metropolis
- 3) To evaluate the institutional linkages and coordination in the management of green spaces in the Kumasi Metropolis
- 4) To find out factors inhibiting the KMA from realizing its full potential of greening the Kumasi Metropolis.
- 5) To propose an institutional framework for the management of green spaces that could play a meaningful role towards having a lasting panacea to the green spaces problem in the Kumasi Metropolis.

1.4 Research Questions

Based on the above problem statement and research objectives, the specific questions to be examined in the study are as follows;

- 1) Does the existing policy and legal framework promote the initiatives of greening the Kumasi Metropolis?
- 2) Who are the main actors and what are the roles they play in greening the Kumasi Metropolis?
- 3) How are the existing institutional linkages and coordination system preventing the initiatives of greening the Kumasi Metropolis?
- 4) What are the main factors contributing to the success or failure of greening Kumasi Metropolis?
- 5) What could be the best institutional framework for the effective management of green space in the Kumasi Metropolis?

1.5 Justification of the Study

The importance of urban green space in social functions, biodiversity conservation and other environmental processes for sustainable development has been widely recognised in Western societies. During the 19th century industrialization in Europe and the USA, many cities used urban parks as a remedy for deteriorating urban

conditions (such as poor sanitary conditions and limited contact with nature (Konijnendijk and Randrup, 2004)

Urban green areas were increasingly seen as important recreational environments for city dwellers. As new knowledge developed, the importance of urban green space with its many functions became increasingly recognized.

Nowadays, urban green space is considered important for improving urban quality of life, for biological conservation, for improving local climate conditions, for prevention of unplanned urban growth and even for economic growth of cities.

The study would however contribute significantly to the development of urban green spaces in the Kumasi Metropolis in particular and the nation at large. The findings would also enable the management to come out with pragmatic policies to manage the Urban Green Space in the Kumasi Metropolis. The study would further contribute immensely in building up academic knowledge in a wide range of issues.

1.6 Scope of the Study

The Kumasi Metropolis is the focus of the study. The area has been chosen because for the past decades it has been endowed with a great number of green space belts and wetlands across the city, but with the high rate of urbanization and other factors the green areas has been decreasing without any study to illustrate the phenomenon and the negative impacts to people.

It involved the selection and survey of some current private and public green space services and facilities in the city. These included the city gardens, forest and parks (planted and unplanted within and outside the built areas), playgrounds, pavement areas and gardens.

1.7 Limitations of the Study

Limitations are potential weaknesses or problems with the study identified by the researcher. The limitations often relate to inadequate measures of variables, loss or lack of participants, small sample sizes, errors in measurement, and other factors typically related to data collection and analysis.

The study sought to investigate the prospects and challenges of Urban Green Space in the Kumasi Metropolis. The data was collected using the interview guide from users of green spaces including households, Environment Protection Agency, Town and Country Planning Department of the Kumasi Metropolitan Assembly, Land Commission and Parks and Garden Department.

Given the low level of education among some of the respondents and language barriers the use of self-administered questionnaires could not be employed outright. Thus, the study required additional man-hours to complete the questionnaires and thus compelled the researcher to employ the services of research assistants. However, the use of research assistants and the subsequent interpretations allowed for some misinterpretation and recording of inaccurate information in course of the study. There was also lack of full cooperation from government agencies and departments as they refused to release some reports which were important for the study. Others also felt bothered and complained of having too many students and frequently requesting similar information and interviews which to some extent has been distorting their work schedule. They therefore, resorted to giving only information they knew on-hand and in some cases were reluctant to put in extra effort to search for accurate data on record.

Furthermore, the study was constrained with resource difficulties especially financial resource was not enough to enable full facilitation of the research activities. Thus, it was difficult to carry out an extensive and intensive study throughout the Kumasi metropolis; hence, limiting the survey to only five communities out of ten selected communities which have green space facilities. Nevertheless, the findings from this study are sufficiently accurate and reliable to make informed generalisation about the prospects and challenges of greening the Kumasi Metropolis.

1.8 Organization of the Report

This study report is structured into Six Chapters.

Chapter One is basically an introductory chapter to the research. Sub topics discussed under this chapter include the background of the study, the problem statement,

research questions, the objectives of the study, the significance of the study, limitations of the research, and the structure of the report.

Chapter Two includes reviews of relevant literatures to the study. This chapter also discusses the conceptual framework relevant to the study. It also indicates a review of related literature or research on the prospects and challenges of Urban Green Space in the Kumasi Metropolis.

Chapter Three provides an insight on the study area and methodological framework which deals with matters relating to the research design, selection of study area, sample size determination, data collection, processing and methods of analysis. Chapter Four tackles the general profile of the Kumasi Metropolis that includes the administrative boundaries as well as physical, socio and economic features. Chapter Five focuses on the data presentation, analysis and interpretation. Finally, Chapter Six highlights the summary of the major findings, conclusions and recommendations for policy actions, further research and conclusion.



CHAPTER TWO

PROSPECTS AND CHALLENGES OF GREENING GROWING CITIES: THEORIES, POLICY AND STRATEGIES

2.1 Introduction

The concept of urban greening has become the current answer to the world of its environmental and economic crises in the 21st century (Lipietz 1997). Since its inception, there has been a stream of investigations and literature on the ambiguity of its definition and application. There are two main opposing schools of thought - the pessimists, usually ecologists and other scientists, who are convinced that the earth cannot forever support the world's demand for renewable and non-renewable resources. On the other side are the optimists, the economists, who are equally convinced that the earth, with market incentives, appropriate public policies, material substitution, recycling, and new technology can satisfy the needs and improve the quality of human welfare, of this and following generations indefinitely. Both views and supporting arguments are explored in the context of sustainable resource use and sustainable development.

This chapter comprises of two main sections. Section one comprises of conceptualization of urban green spaces, typology of green spaces, benefits of green spaces, environmental challenges of green spaces among others. The second section entirely deals with the theoretical framework of the study.

2.2 Definition of the Key Concepts

The concept of green spaces started to be popular at the end of 19th century as a result of industrialization in Europe. The role of green spaces in the urban environment gained significance changing the urban fabric both spatially and theoretically. During that time the definition of green spaces made by professions such as urban design, town planning and landscape architecture changed by bringing out the new ideas, views and concepts with regard to green spaces (Csepely-Knorr, 2011).

2.2.1 Urban Green Space

Urban green spaces provides the connection between urban and nature. In this context, green areas are reflection in the urban spaces of natural or near natural areas within the cities. The green fields are a continuation of mostly landscapes around the city. Urban green areas provide lots of ecological benefits to the needs of urban people for instance, the increase of spare time of urban residents and pressure of work, study and other socio- economic activities enhances their demand for green spaces. Generally, green spaces gives an indication that, it is necessary for workers to spend their time in work and also to have a spare time for leisure activities because it helps people engage in self-creation activities and relaxation of body and soul. This time pays attention to two kinds of activities: people deal with nature on one hand and the other interaction between people themselves. For instance, people's desire for fresh air, natural views and natural attractions, which reflects people's natural perception; the latter reflects their social behaviour (Wuqiang et al., 2012).

Introduction of suburban green space into the city acts as the base of ecological balance. In practice, problems of urban woods and agriculture should be paid sufficient attention (Wuqiang et al., 2012). Green space systems require improvement of the spatial pattern of urban green space. Urban green space systems include protection of existing green spaces, creation of new spatial forms, and restoration and maintenance of connectivity among diverse green spaces. To maintain or restore connectivity, planners must identify the best habitat and potential corridors by considering distances and the barriers between habitats (impedance) posed by the landscape and land use (Kuchelmeister, G. 1991). An urban green space provides many functions in urban context that benefits people's quality of life.

2.2.2 Green Plants

In the urban environment, the green plants in cities are viewed as the basic components of green spaces and structures. They are regarded as the lungs of the city dwellers. These plants consist of trees, shrubs, gardens and flowers among others. They play a crucial role in the urban nature as it host a variety of wildlife, provide opportunities for recreation, ameliorate pollution, help to stabilize the soil and shield from sun glare (Mng'ong'o, 2004).

2.2.3 Green Structures

It consists of all forms of inner and outer connected network of green plants (natural and artificial) and historical standings in the urban areas which form a continuous network of ecology and landscape to create an aesthetic urban environment which guarantee the conservation of biodiversity (Mng'ong'o, 2004). The green structure in the urban areas provides an opportunity for the urban dwellers to travel from the city centre to the country side and makes them enjoy the well interconnected series of natural and artificial landscape. This has positive impact to the dwellers' health (Julie, 2007)

2.2.4 Parks/Public Open Space

Nowadays, in the cities, there are limited green areas. Parks or public open spaces are very important in the life of urban people. People who live in the cities want to go outside (especially green areas) whenever they have spare time. They go to parks or public open spaces. Parks are designed in different type, size and functions. In the parks, people can do lots of activities (Bayram and Ercan 2012).

Typically, classification are based upon the size of the park, its deemed function, geographical location and the types of facilities present within the park and sometimes the degree of naturalness of the park. It can be variously described as nature parks, pocket parks, district parks, community parks, neighborhood parks, sporting fields and urban forests. Urban parks involve activities which take place within the park (e.g. cricket oval, skateboard park, bowling green), the agency responsible for managing the park (e.g. national park, state park, city park), the history of the park (e. g. heritage rose garden), the condition of the park, the land use history of the area (e.g. street-corner neighborhood park), the types of people who use the park, landscaping and embellishments (e.g. dog park, bike park or Chinese garden) and the philosophy behind the park's development (e.g. recreation reserve or civic square) (Bayram and Ercan 2006; Werquin et al., 2005).

New uses and new layers of interest should be brought into public open spaces. Some open spaces could supply firewood and wild food (nuts, berries, herbs); others could infiltrate rainwater back into the ground, instead of allowing the water to accentuate flood peaks; Sunday markets can fit well into parks. Every public open space can

have a specific use, in addition to its general functions. It could be a centre for kite flying, for tennis, for lovers of herbaceous plants, for reenacting military battles and for every special recreational type which has a magazine or a local newsstand (Turner, 1998).

2.3 Benefits of Urban Green Space

According to Bayram and Ercan (2006) the benefits of urban green space vary from intangible psychological and aesthetic benefits to amelioration of urban climate and mitigation of air pollution. Historically, the health, aesthetic and recreational benefits of urban green spaces have been considered as main attributes to a good urban setting in industrialized cities (Tyrväinen et al., 2005). Even though the amenity-recreational benefits of urban green space are still very important today, the ecological role of green spaces and their environmental services are increasingly stressed. This is also true for the economic roles of green areas. The shifts of focus are due to developing knowledge and understanding of human-nature interactions and the benefits of urban green spaces in particular. Two examples of this are increasing interests in ecological aspects of urban green space since 1960s, and the impact of the concept of sustainability starting from the late 1980s.

Today, urban green space is increasingly recognized for its many roles (Lipietz 1997). The concept of sustainable development and its three dimensions (sociocultural, environmental and economic) has broadened the range of urban green space perspectives. Urban green spaces become important to people and communities by symbolizing cultural meanings. They are habitats for wildlife and offer a 'textbook' for urban people to learn about nature. Green spaces contribute to a positive, nature-oriented image of a city. They also enhance tourism and promote economic development (Tyrväinen et al., 2005).

2.3.1 Socio-Cultural Aspects

From a socio-cultural perspective, the city structure should not only support the individual and social needs of human beings and the overall quality of city life, but also help to promote a city's healthy society. Urban green space provides social

services essential to the quality of human life, which is a key component of sustainable development (Chiesura, 2004). This view emphasizes the roles of urban green areas in providing 'urban nature' for human psychological needs by accommodating outdoor activities for the public's social needs (such as meeting people, recreation, eco-education, and sports), improving physical living conditions for better public health, and carrying the cultural value of a city. Some of these issues are introduced below.

- *Recreation, play and amenity use*

Parks and nature in the city provides a peaceful and relaxing setting for stressed urban inhabitants. They are 'second living rooms' for people living in confined quarters. Green spaces are places for non-organized sports and for spontaneous activities that complement organized ones. They are activity spaces for an increasingly sedentary and overweight city population. Green space is also environments for children to discover the world (Ståhle, 2007). Recreational activities in urban green space vary among cultures and social groups, as do the preferred types of urban green space used for these activities. Studies have discovered some general factors influencing the 'recreational performance' of urban green space. These span the size and experienced characteristics of a certain green space including: form/shape, distance to the park, location in the city, the possibility and preference of commuting for leisure, incomes of families (as influences on recreational habits), the size, accessibility and maintenance of a green space (Ståhle, 2007; Werquin, 2005).

- *Health benefits*

Since the origin of public parks, urban green spaces have been regarded as important factors both for 'public hygiene' and for maintaining an overall, socially-preferred moral (Ståhle, 2007; Julie, 2007). Relatively recent scientific studies have identified and assessed measurable effects of nature's influence on both physical and mental health. The experience of 'nature' promotes not only a sense of relaxation and regenerative enjoyment, but also a higher spiritual state of integrating oneself with nature (Chiesura, 2004). It is these restorative experiences, the enjoyment of amenity and spiritual sublimation provided and evoked by urban nature that contribute to the quality of human life, and therefore to sustainable development of a city.

- *Aesthetics*

Urban green space includes various elements, such as vegetation, water, stones and sculptures and architecture. They offer various colors, textures, forms and structure that all contribute to rich visual effects in urban settings. Aesthetic benefits of urban green space relate to people's experience of both the appearance of each element and the composition of them as a whole. Much of aesthetic experience is subjective in nature and has impacts on people's mental and emotional state (Tyrväinen, et al., 2005). A variety of research approaches has dealt with aesthetic values, including psychophysical, cognitive (psychological), experiential (phenomenological) and expert approaches (Turner, 1998; Talen, 2003, Tyrväinen, et al., 2005).

2.3.2 Culture, History, Identity (Symbolic Meanings) and Livability of a Place

Cultural and historical artifacts, as well as local traditions, give a city or a neighborhood its identity. These are irreplaceable features of a city. It forms a valuable attraction to tourists and residents. People's preference for their environment is partially influenced by their cultural background. Cultural and historical elements and activities give people a sense of place. They maintain the feeling of belonging to a well-identified cultural entity amongst local residents. They also contribute to quality of life and the livability of a place (Talen, 2003). Cultural and historical heritage includes both the natural landscape of mountains, rivers, historic gardens, botanical gardens, local parks and of associated buildings or other man-made features. Protecting this heritage is essential for preserving a sense of place. Most people interpret landscape within their own cultural frame. They use what they perceive immediately to integrate with what they know and remember (Tuzin et al., 2002). Therefore, effective management of green spaces ensures the local history and culture in urban which in turn helps to enhance local identity and a sense of place.

2.3.3 Ecological Aspects

From the perspective of ecology, the urban ecosystem is "a basic set of conditions for both humans and other species" (Tjallingii, 2005). This view emphasizes the role of urban green areas, especially as habitats for wildlife and as spaces for enhancing natural processes, such as facilitating water infiltration, flood water retention,

providing shade, acting as windbreaks, reducing the urban heat island effect; improving air quality and enabling organic recycling. Factors that determine the ecological performance of urban green spaces are the overall provision of green spaces, their size, diversity, distribution, history, and the design and management of each green space (Werquin et al., 2005).

- *Biodiversity*

The biodiversity issue is part of the sustainability agenda 21 which has among its goals the preservation of natural resources for future generations. Biodiversity is typically related to a particular region or country. For example, the 1992 Convention of Biodiversity accepted at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro aims to preserve genetic diversity, the diversity of species, and the diversity of biotopes. Biodiversity is emphasized in cities. Ecological research has revealed that, during recent decades cities could be surprisingly rich in species (Newman and Kenworthy, 1999). Although there is fragmentation, continual spatial decrease and neglect in urban planning, urban nature can still support various mosaics of indigenous and valuable habitats and species. This implies that, the cities which consist of spontaneous nature should be considered as important for urban sustainable development. However, the knowledge of urban nature at the local level is often limited, which poses a challenge for concrete actions (Newman and Kenworthy, 1999)

- *Water Management*

Water structures are essential for cities in many senses. They are key elements in the peri-urban landscape (Tjallingii, 2005). They carry the identity and the history of a city. Water structures are often ‘carriers’ of urban green spaces, providing a structural frame. However, urbanization and construction may impair water structures, hinder the natural way of water circulation and even result in the sinking of ground water tables. Protecting water resource and water structures for today and for the future is a key element of the sustainability concept. Studies have shown that water and green areas often have a common history in a city (Werquin et al., 2005).

From this perspective, water and green areas are natural allies and share a common future. Urban green areas are essential for water arrangement issues, such as flood control, rainwater retention and natural purification. Water elements turn to enhance biodiversity, tree growth, scenic beauty and recreation. Strategies and techniques of using urban green space for water management have been developed and implemented (Tjallingii, 2005). Permeable soils with low groundwater tables, for example, use green spaces for rainwater infiltration, leading to groundwater recharge. On hard rocks or impermeable clay soils rainwater is stored in ponds and watercourses with fluctuating water tables. In upstream mountains and hills, reforestation can be an effective erosion prevention strategy. Keeping floodplains open and green spaces is a good strategy for flood control (Werquin et al., 2005).

- *Climate and air Quality*

Climate and air quality are important factors in the urban environment. They directly connect, for example, with quality of urban life and survival of wildlife. Studies have shown that urban green spaces contribute to mitigating bad climate and air conditions connected with hard urban structures. Green spaces provide shade, windbreaks, enhanced ventilation, reduced temperatures and improved air quality. Green corridors, for example, play a positive role for ventilation and air quality of a city (Tjallingii, 2005). Woodlands or tree belts help to reduce air pollution from roads by slowing down air circulation and accumulating dusts. Urban green space cover reduces surface temperatures, and therefore, helps mitigate the heat island effect typical of urban areas. A study in Munich shows that, an increase of vegetated surface cover by 10% reduced surface temperatures by an average of 1°C. Urban climatologists stress the importance of having a great range of different microclimatic conditions within walking distance (≤ 150 m) in avoiding climate extremes (Tjallingii, 2005). Tjallingii, (2005) also discuss appropriate sizes of green zones in order to improve local climate conditions. A dense network of green space is important for meeting these requirements.

2.3.4 Structural Aspects

Urban green spaces and natural landscape are architectural structures for urban living. It consists of general layout of urban buildings and infrastructures. The structural

functions of urban green space are often used in urban planning and design. It defines the urban structure and urban form, regulating urban development, buffering between city zones, organizing traffic and the architectural use for planning and design.

- *Buffering Between City Zones*

At a smaller scale, parks and urban green spaces are often used in urban planning practice to separate urban zones. An example can be seen in the planning concept of 'Albertslund South', a new town planned in the southwest of Copenhagen in the late 1960s. A large community park was planned between a highway intersection and residential areas. Buffering noise from highways and providing quality environment for the new town were among the major planning concepts for this area. Green spaces are especially valued in a compact city form. They provide a natural balance to build form and can be developed as a green network to ensure contact with the natural world (Talen, 2003).

- *Traffic Organization*

Vegetation and urban green spaces have roles in organizing traffic. Planning and design of urban green space have been related to the traffic network for a considerable period of time. Examples can be seen in the boulevards in European cities developed from the mid-19th century, parkways in American cities after Olmsted's designs, and recently developed greenways in many cities of the world. Public space has a fundamental function, which is to allow people to move around on foot, by bicycle, by car, motorbike or public transport. The design and management of public space need to reconcile the needs of these often conflicting modes of transport. Vegetation and green space contributes to high quality streetscapes and public space. Well-designed streets and public spaces encourage walking and cycling, and promote a safer environment by reducing vehicle speeds and use (Talen, 2003).

- *Architectural Uses for Planning and Design*

Urban green spaces and natural landscapes have architectural values for planning and design. "Vegetation is used in defining open space and integrating the buildings to the surrounding environment. Plants form walls, canopies or floors of varying heights and densities; these are architectural characteristics. Landscape variations have been

created through different colors, textures, forms and densities of plants. Urban trees can direct vision break up large spaces, and define space. They can be used to frame scenes and to provide foreground and backgrounds for landscape features” (Tyrväinen et al., 2005, p.89). Urban green spaces and natural landscapes “give local character and identity, provide distinctive landscape and give legibility and structure to the urban fabric” (Talen, 2003).

2.3.5 Economic Aspects

The economic value of nature can be defined as “the total amount of welfare that nature generates for society” which has social-economic, environmental, merit and financial dimensions (Rodenburg et al., 2001, p.106). Broadly speaking, all other benefits of urban green space have an economic component. The direct economic benefits of urban green space include values of market-priced products, such as those generated through wood production, urban agriculture and urban horticulture industry etc. However, the most relevant values of urban green spaces are their indirect economic values, and they have no market-price (Tyrväinen et al., 2005).

According to current understanding, these indirect economic values include value gained by reduced costs for environmental control, energy consumption and public health, enhancement of local and regional economy by promoting tourism and attracting investment and human resources, increased property values, improvement of business benefits through drawing customers and increasing workers’ productivity. Many of these benefits are ensured because of the recreational opportunity, aesthetic feeling of confidence in a locality that high quality urban green space may offer to people (Ståhle, 2007; Tyrväinen et al., 2005).

In order to provide information on the value of nature for urban development decisions, studies have tried to transfer these non-priced values into a priced form (Vaughan, 2007). The methods for doing this include the contingent valuation method (‘willingness to pay’), the hedonic pricing method (‘housing market price’), the travel cost method, tree pricing and environmental benefit valuation (Tyrväinen et al, 2005). In an example from Guangzhou city, China, willingness to pay for recreational use of urban green space found to be about 1.6 EURO per person per month (Olson, 1995).

Studies identified some general factors that influence the economic value of urban green space. For example, the factors that influence a park's impact on property values include security and layout park age, park size and maintenance. Good location and active management raised the average willingness to pay. Proper maintenance is important to sustaining the value of urban parks. Moreover, cultural differences also influence attitudes to urban green space and hence its value (Tyrväinen et al., 2005).

2.4 Urban Green Structure Planning as a Central Concept

Having done with the conceptualization of urban greening and the benefits of urban green space, these perspectives can now be used to present urban green structure planning as this study's central concept. Urban green structure planning is about planning for optimizing green space benefits. This sub-section introduces some current broad scale trends, new perspectives and new approaches to urban green space planning and management.

2.4.1 Urban Green Space Becoming a Planning Issue

In almost all cities of the World, the competition between land uses is very common, and it is very intensive in the process of urban development and regeneration. There are often trade-off relationships between existing or potential urban green space and other land uses such as housing, and infrastructure (Vaughan, 2007). In addition, even within the land use of urban green space, prioritizing between different functions is often needed. For example, developing an intensively used amusement park with large paved areas can conflict with the goal of preserving plant biodiversity. In order to make these trade-off decisions it is suggested that, both planners and decision-makers need to evaluate and consider carefully what the advantages and disadvantages of alternative options are.

Traditionally, development of urban green space has often been considered only on a local project level, at the level of an individual park. It has been witnessed that, under land use pressure, as is often the case in urban areas, green space considerations are always weak in comparison with more commercially oriented development. The concept of sustainable development suggests that development of urban green space, as well as other land uses, should be considered from socio-cultural, ecological and

economic perspectives. With increasing awareness of the full range of urban green space and nature values, the status of urban green space on the political agenda seems to have been raised. However, in order to achieve some particular function (ecological functions), urban green space needs to be viewed in an interconnected way and at a city or regional scale (Tyrväinen et al., 2005). It is especially within this context that urban green space has been brought into the planning discourse.

2.4.2 Perspectives of Green Space Planning

Inspired by the contemporary urban planning discourse, urban green space planners have gradually adopted the view of urban green space planning as a relational process, as a complex series of shorter 'idea-action chains' (Van Tatenhove, 1999). Moreover, this process cannot be separated from its social historical context, in which both concepts and physical conditions are produced and acted upon. Planning for urban green space is no longer only a technical issue, but also about politics, communication and action which involves a wider range of stakeholders. It is suggested that planners, government authorities and stakeholders should all have input in green space planning and management practice through an effective communicative process. Public participation is particularly encouraged in planning and development processes of neighborhood green space. Therefore, the role of the green space planner is shifting from a technical expert to that of a mediator between different views, aspirations, opinions and interests of different stakeholders.

In extensive search for new knowledge and understanding of green space in urban settings over the past 20 years, concepts and methods from other fields have been applied in the study of urban green space designing and management. For example, landscape and urban ecology perspective is increasingly used for studying the nature of urban settings (Werquin et al., 2005); another obvious trend is the application of an environmental psychological approach to study user perceptions of urban green space for particular purposes (Kaplan, 1989). The involvement of different fields and professions in studies of urban green space has led to more interdisciplinary work (Konijnendijk et al., 2005; Werquin et al., 2005). These studies provides valuable indications of the benefits of urban green space (as described in previous sections) as well as approaches that may optimize these benefits that need to be incorporated in

the planning for green ways (Hellmund and Smith, 2006) and for green structure (Werquin et al., 2005).

In summary, the past two decades have brought some major changes in green space planning and practice. The perspective of green space planning has been shifting from technical design to a relational process, while the objective of green space development has been shifting from a single function focus to multi-functionality. The scale of concern has been shifting from single green spaces to integrative urban green structure. In Europe, the so-called green structure planning approach has gradually emerged in this context.

2.5 Planning for the Urban Environment

This section gives an overview of the different planning theories developed during the past 50 years which is followed by an introduction of some current urban planning perspectives. The overview of planning theories is mainly based on Taylor (1998). Subsequently, based on approaches in policy study, a framework for analyzing planning has been developed. Finally some central discourses on planning for the urban environment are introduced.

2.5.1 Green City Theory

Sustainable development is a wide concept and has been defined in many ways depending on, among other things, local circumstances. It means different things to different places, with different values and cultures. According to Lipietz (1997) the definition of ‘sustainable development’ adopted by the organs of the UN is

“a development model which allows the satisfaction of all the needs of a generation without compromising the possibility for successive generations to satisfy their needs.”

The definition of ‘sustainable development’ stems from the ‘eco-development’ model of the 1970s. The original idea of eco-development began with the observation that the development model of the seventies entailed too much consumption of raw materials and production focusing on satisfying the needs of all human beings. It is ambiguous, because the rich and the poor do not demand the satisfaction of the same needs at the same time. Also, the definition goes on to envisage an order of satisfaction, ‘beginning with the needs of the poorest.’ This is the criterion of minimal

justice upheld by John Rawls (in Viking 1995) in his Theory of Justice. The basic problem, from this point of view, is not that there are inequalities: some inequalities are acceptable, as long as they permit an improvement in the situation of those who are worst off.

After the Earth Summit on Environment and Development of 1992, various definitions mushroomed, created by a range of organizations in different geographical regions of the globe. They came to mean different things, but common to all to be the aim of 'improved public health and quality of life' in both rural and urban areas. More emphasis has been directed to cities since they are the main magnets of human migration and the largest consumers and distributors of goods and services (Lipietz (1997). The definitions of 'sustainable urban development' vary, but most of them envisage the aspects of improved urban economy, ecology, equity (socio-cultural), and health environment. These are some of the objectives of 'sustainable urban development' for the achievement of improved quality of human life such as envisaged in this study.

2.5.2 Ecological City

In the late 20th Century, planning has evolved a number of variants of environmentally friendly urban development such as the organic city, green city or eco-cities and more recently, the sustainable city (Haughton and Hunter 1994; Newman and Kenworthy, 1999). Cities have certain qualities that are often summarized by the word organic, which combines not only the human settlement and green texture, but also the processes that shape the settlements and its green structure. Such processes are not spontaneous and not imposed (Newman and Kenworthy 1999). Newman and Kenworthy offer the qualities of what they define as an ecological city in two points:

- ✓ The buildings are part of a pattern and are non-uniform; they appear to grow out of the landscape and are difficult to distinguish from it. Nature is not lost in this city and is part of the city. Water and trees can be central to the streets and public spaces. These can be turned to recycled resources and used frugally.

- ✓ Streets are filled with people walking; short walks access all major local destination. The key issue here is the kind of density and mixed land use that has grown from the need to have sufficient people living nearby and sufficient work, shops, schools etc. Within walking distances, each combination of land use is organic to the city's peculiar history and culture, but all have a quality of a 'pedestrian' place.

This image of an organic city is the historic one, however its characteristics are found in many modern cities. Newman and Kenworthy (1999) argue that, if we can learn from the principles that lie behind the design of such organic cities, then it is possible to see how our new technology and urban process can relate to this organic city tradition. This is the approach taken by the New Urbanism and many others in the urban ecological movement (Haughton and Hunter, 1994)

2.5.3 Forms and Sustainability of Green City

The green structure of a city depends strongly on the forms of that city. Newman and Kenworthy (1999) argue that, urban form itself is both a cause and effect of urban activities. Each city evolves along a certain wave of development with a combination of technology, communication, social- cultural and economic innovations. There is also another *structural* transition in human activity and employment itself going from primary resource based sectors, secondary manufacturing to tertiary services, to quaternary knowledge based on cultural sectors. Primary and secondary activity in urban areas form the basis of the green space facilities and services in the cities.

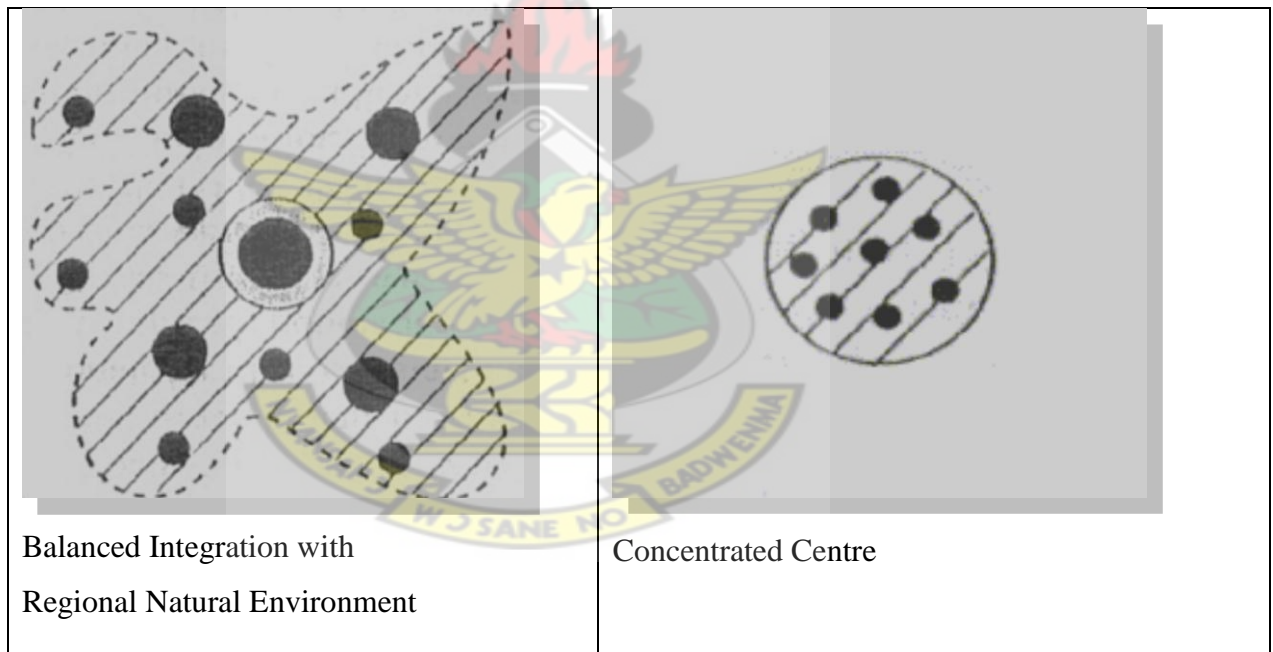
The industrial city of western countries is now in transition to a more post-industrial city (Ward, 2004). The city region functions more as a node of hyper grid networks of motorways and airports for movement of people and goods. Hence, many patterns of urban activity are turned inside out. The growth nodes of production and consumption migrate to the urban fringe or Edge City. These edge-cities include airports, retail, recreation/leisure and business-parks. They are linked to hyper grids. The high quality of services in these edge cities attracts inhabitants from the city centre outwards. It is therefore argued that, the old physical forms and spatial structures are now being forced to serve completely new functions and technologies with obvious mismatches.

For example, high streets becomes traffic junctions, green areas become highways and residential and terrace houses become IT centers (Dillinger, 1994).

2.5.4 Forms of an Ideal City

Haughton and Hunter (1994) have posited a typology of urban forms as shown in the figures below. Balanced integration with regional natural environment concentrated centre, concentrated-decentralization and de-concentrated development. The need for ‘balanced integration with natural environment’ arose from the lessons that, the urban development of the 19th Century annihilated nature rather than accommodated it. Pressures from increased population required new thinking of how cities and inhabitants could remain in contact with nature. (See Typology of Urban Forms in Figure 2.1)

Figure 2.1: Balanced Integration with Regional Natural Environment and Concentrated Centre



Source: Haughton and Hunter (1994:288)

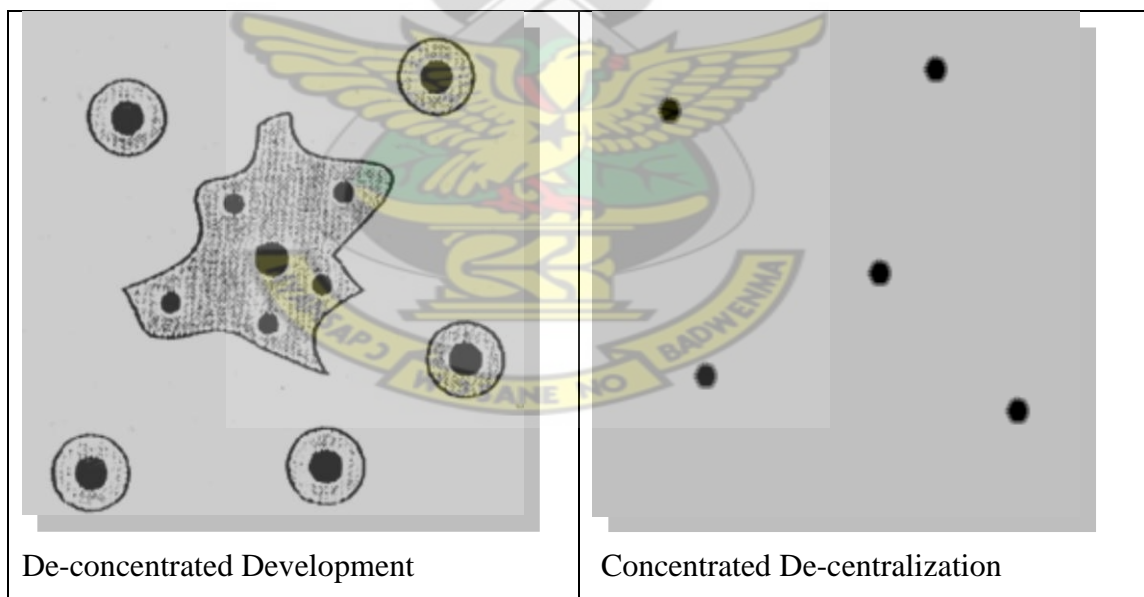
The star-like form is replicated in the thinking of Alexander *et al.* (1982) about the finger-like city form building on the social cohesion. Hadjri (1999) came up with a proposal of linking ecological areas with the built environment by incorporating the variables such as aquifer recharge areas, green belts, and recreational sites.

The ‘Concentrated Centre’ aiming at employment of technology that tamed nature. Advances in water and electric energy supply, new building materials and techniques,

gave way to the possibility of achieving high-rise buildings with high-density living. This approach would allow considerable provision of open and green spaces as part of spatial development. The main objective of this urban form is to create the high-rise development by creating the compact and high-density communities. In so doing it enables us to preserve the green belt for ecological, social, economic and recreational purposes. It aims at increasing the amount of land for green spaces, among others. It is believed that, concentrated urban development can tame nature resulting in the opposite of what the green city should look like (Berstein, 1994).

Also, both the De-concentrated-Development and Concentrated De-centralization (Figure 2.2 development approach are taken to include the allowance of mixed-density development and ready access to nature or green spaces. The boundaries of this city were based on ecological and social capacities. Hadjri (1999) and other scholars felt that such an approach had a ‘sense of urbanity’, diversity and vibrancy of cultural and socio-economic life.

Figure 2.2: De-concentrated-Development and Concentrated De-Centralization



Source: Haughton and Hunter (1994:288)

2.6 Debate on Sustainable Green Cities

The idea of a sustainable city was initially centered on how the city could function ecologically (Orrskog, 2002). It was thought that, living environments such as neighborhoods would be surrounded by, or close to, nature. The idea of the garden

city favored and adopted by many countries started with cities in Great Britain, USA and Europe.

In order to accommodate the necessary services and infrastructure, a spread-like form in cities deemed to be adequate and allow cities to grow in that manner. During the 1980s, this notion of an eco-city started changing. Some of the planners and architects shifted their thinking that such spread-like city cannot be sustainable in terms of livability, workability and recreation. Compact cities designing favored more than the spread city. In recent decades, the discussion on the sustainable city in the developed world has been shifted to the compact city (Orrskog 2002). It is thought that urban sustainability can be accomplished if physical and population densities are maintained or increased, urban economics, social and cultural activities are intensified, and urban size, form, and structure are manipulated. This can be achieved through maintaining concentration, mixed uses of land and proximity of urban functions. It is also thought that the compact city could better take care of the circulation of materials such as bio energy between society and nature. Mixed land uses along with shorter travel distance than in a spread like city is most preferable in most developed cities.

2.7 Green Space Sustainability in the Kumasi Metropolis.

According to Mensah (2010), a number of broad factors are found to be the principal factors affecting the rapid destruction of green spaces in Kumasi aside urbanization. Laxity in the enforcement of development controls is the predominant factor that depletes green spaces in Kumasi. Development controls as the tool or mechanisms used in town planning to guide the growth of cities and improve the quality of life of the residents has not brought significant results. Planning schemes/layouts or master plans that were used as a guide to control physical development of Kumasi by the city authorities contained many provisions on green spaces that were not in existence on the ground. This is because of the fact that, most of physical development which has been done in Kumasi do not comply with development regulations that requires land development permission, adhering to building standards, codes and zoning regulations (Mensah 2010)

Careful cross examination of the layout of the study neighborhoods and the actual physical developments that have taken place in the neighborhoods in question show

some differences. Areas demarcated on the layout as parks, nature reserves, wetlands, and forest reserves were either not in existence or were substantially encroached upon for different land uses. This problem appeared in almost all the demarcated green space facilities. For example (Hammond, 2011) revealed that, at the Patasi neighborhood, a large proportion of land at Patasi and Danyame delineated on the layout as a green space and public park was nowhere to be found.

It was also found that, Public Park and nature reserve which were visible on the layout of Danyame Neighborhood were not implemented in the area. The park was just on paper. It is not in existence whilst the nature reserve was seriously encroached upon. This observation collaborates with Saporiti's finding on developing countries where many public parks were found to only exist on paper but not implemented on the ground.

The study revealed that, Kumasi city authorities admitted the poor enforcement of development controls by their outfits as the cause of this problem because of many political and administrative reasons (Mensah, 2010). One reason that was found to contribute to the problem was insufficient resources base of the city authorities. The various bodies that constitute the planning body of Kumasi which were engaged in the study voiced out extensively the poor nature of resources of their outfits especially poor finances and lack of logistics. For example, the Town and Country Planning Department, Development Control Unit (Works Department), and the Development Planning Unit lamented on the poor capacities of their outfits to control the physical development of Kumasi due to lack of resources (Korboe, 2001). Issues of political interference, nepotism and favoritism were other reasons for the poor enforcement of development controls. Such issues have disrupted the Kumasi city authorities from strictly enforcing development controls because projects that have to be halted for intruding into green spaces or destructing these spaces were still allowed to progress. This is because the owners of those projects have political or social ties with top government officials or the leadership of the city authorities.

Another factor which is very pervasive in Kumasi is the problem of ownership of green space lands. Who has absolute control over green spaces?. This is the big and

debatable problem. For example some of such lands are public school lands, right of ways, sanitary sites, open spaces (grey and green spaces) and railway reservation. Some chiefs in Kumasi recognize public lands such as nature reserves and wetlands as the property of their neighborhoods of which they are heads but not the property of the government of Ghana (controlled by Lands Commission and other government agencies). This conflict of ownership over green space lands is a peculiar problem in Kumasi and it is having devastating effects on the development of green spaces. It has claimed the destruction of several green spaces in Kumasi (Korboe, 2001).

Hammond, (2011) pointed out, the uncooperative attitudes of the general public towards the preservation of green spaces. In many parts of the world the good efforts shown by the general public to preserve green spaces cannot be over emphasized. In Kumasi, the level of commitment of the public in preserving green spaces is poor. All the allied bodies and stakeholders on green spaces management in Kumasi expressed great worries about the uncooperative behaviour of the residents on the preservation of green spaces.

Other plausible cause is the poor perception of the general public on green spaces since many of them perceive green spaces as resources that they are not responsible for their upkeep.

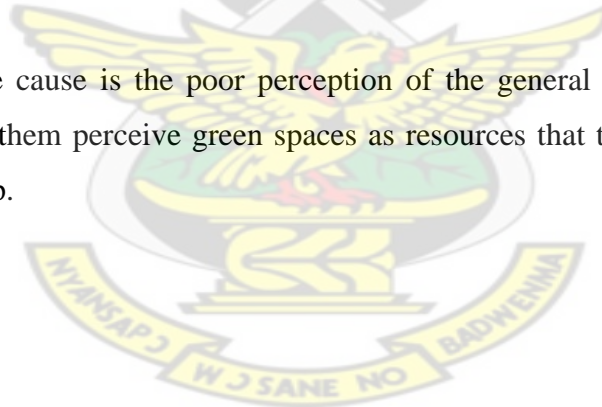


Plate 2.1: Parts of Fante Newtown Park Used for Commercial Activities



Source: Kumasi Metropolitan Assembly (2010).

Other challenges include the low priority to green spaces by the KMA, and poor maintenance culture. All these factors have established that rapid destructions of green spaces in Kumasi is underpinned by a variety of human induced factors which include laxity in the enforcement of development controls, problem of ownership of green space lands, low priority of green spaces, poor coordination among stakeholders, uncooperative attitudes of the general public and poor maintenance of green spaces.

2.8 National Urban Policy Framework

Ghana's National Urban Policy Framework (NUPF) was developed in 2012 in consultation with a variety of stakeholders and covers the broad spectrum of environmental issues among others to improve environmental quality of urban life

The policy was developed by the Ministry of Local Government and Rural Development (MLGRD). It is a fairly concise document that sets out basic principles and objectives, identifies roles and responsibilities and also covers environmental management and protection, legislation and funding among others.

The Policy is aimed at developing and maintaining a clean, safe and pleasant physical environment in all human settlements, to promote the social, economic and physical well-being of all sections of the population. It comprises a number of complementary activities, including the construction and maintenance of sanitary infrastructure, the provision of services, public education, community and individual action, regulation and legislation (Ministry of Local Government and Rural Development, 2012). It also aims to achieve the following;

- Develop and manage infrastructure systems with the appropriate technology needed to provide basic hygienic conditions in towns and cities.
- Prepare and implement sanitation action plans for all leading urban centres, including related statutory regulations and by-laws for ensuring effective collection, disposal and treatment of solid, liquid and toxic waste.
- Generate environmental awareness by increasing mass media public education programmes on sanitation in schools and public places.
- Provide adequate equipment and operational funds to support environment and waste management activities.
- Protect open spaces, green belts, forest reserves, water bodies, wetlands, water catchment areas and other ecologically sensitive areas from physical development and urban encroachment.
- Develop and implement a systematic programme of flood control measures in urban communities.
- Pursue rigorous public education and law enforcement against reprehensive public attitudes and conduct that induce environmental degradation.

- Establish adequate measures against natural hazards in urban areas.
- Protect the environmental quality of mining towns and their hinterlands.

The policy came into effect after series of consultations with stakeholders and evaluation of past environmental protection strategies. It identified some problems and constraints in environmental sanitation which form part of the implementation strategies. The challenges include among others the following;

- ✓ Overconcentration of growth and development in a few cities
- ✓ A weak urban economy
- ✓ Land-use disorder and uncontrolled urban sprawl
- ✓ Increasing environmental deterioration
- ✓ Inadequate urban infrastructure and services
- ✓ Increasing Urban Insecurity
- ✓ Urban Poverty, Slums and Squatter Settlements
- ✓ Weak Urban Governance and Institutional Coordination

In order to have a smooth implementation of the policy, there was a need for clarity of the roles and responsibilities of the different spheres of government, the private sector and civil society organisations. The roles were defined in the Policy Action Plan published separately as part of the National Urban Policy. The tasks addressed each stakeholder as follows:

- NUP should signal a consistent message of conviction to key departments, state agencies, MMDAs, and the private sector about the policy.
- Key decision-makers (District, Municipal and Metropolitan Assemblies) and investors must know how and where the government expects to focus poverty reduction and economic development efforts, including the different locational advantages of each city, their priority industries, environmental challenges and infrastructure needs. The powers of public bodies over the development and management of urban areas was streamlined in order to organise their functions more efficiently and to strengthen city leadership.
- Other government policies and investment programmes need to be coordinated so that the spatial dimension and focus could be on major priority areas such

as poverty reduction, environment protection programmes. Government should continue to support initiatives to develop urban management capacity whereby the management of urban areas could be carried out at the local level by the MMDAs, since they are in touch with local needs and conditions. This is in line with the country's decentralisation policy framework.

- Capacity-building to continue to be a key function of the state, as a result of the deficient skills and experience among many District Assemblies.

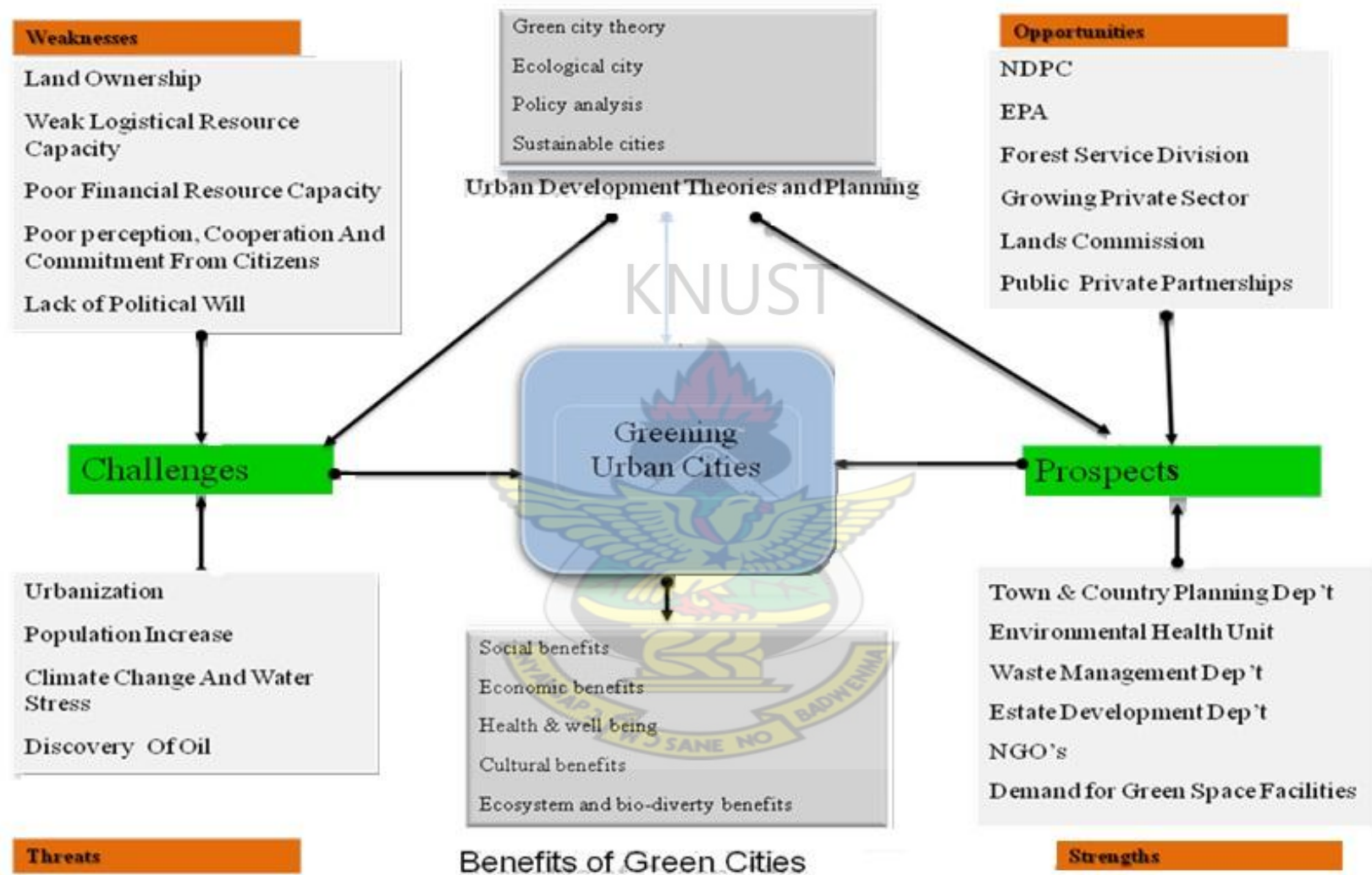
2.9 Conceptual Framework

This study is grounded on a body of knowledge synthesized from concepts and theories that place a new light on urban development theories, benefits and challenges of green spaces in the Kumasi metropolis. The study makes particular reference to Poku-Boansi and Inkoom, (2011), who put forward the understanding that it is now abundantly clear that rapid urbanization, climate change and water stress, population increase, weak logistical resource capacity, poor perception of people on green spaces, and lack of political will among others is greatly transforming the spatial pattern of urban land use. Consequently, the resulting loss of urban green spaces is continuously altering urban ecosystems.

The study also settles on the well sounding arguments that each city evolves along a certain wave of development, a stage of which is a combination of technology, communication and economic innovation. Haughton and Hunter (1994) have posited a typology of urban forms balancing integration with regional natural environment, concentrated centres, concentrated-decentralisations and de-concentrated development. The need for balanced integration with natural environment has again arisen from the lessons that the urban development for some time now has annihilated nature rather than accommodated it. Learning from the principles that lie behind the design of organic cities, it becomes possible to see how technology and urban process can relate to greening urban spaces in contemporary development (Haughton and Hunter, 1994; Newman and Kenworthy; 1999; McKinney, 2002 and Mensah, 2010).

This conceptual background is synergized in the analysis which serves as the main analytical framework within this study. Figure 2.5 below is a picturesque representation of the conceptual framework for the study.

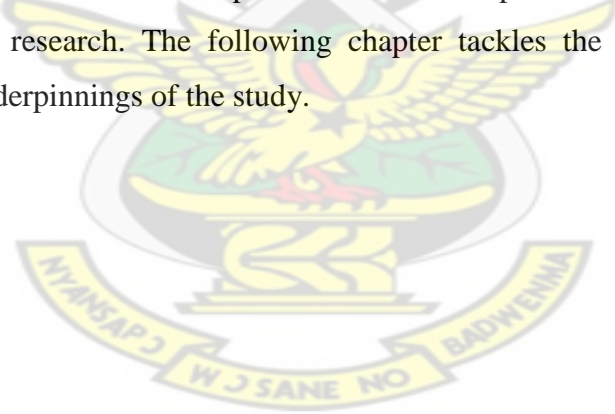
Figure 2.3 Conceptual Framework of the Study.



2.10 Summary of the Chapter

In the above elaborations it is understood that sustainable urban green space development encompasses, efficient land use; better access; efficient resource use; less pollution and waste; the restoration of natural systems; good housing and living environments; a healthy social ecology; a sustainable economy and community participation and involvement.

The prospects of urban green space development cannot be overemphasized. More importantly, a sustainably managed city does not only become livable for the current populations but also for future generations. It is unlikely that the twenty first century green city will succeed unless they are able to respond to social needs with speed, efficiency, effectiveness and quality. However, in order achieve all the above, city planners and all stakeholders have to come to terms with physical, environmental, economic and social challenges. These challenges and prospects which form the crust for this study are modeled in a conceptual framework to provide the knowledge base that guide the entire research. The following chapter tackles the contextual backing and philosophical underpinnings of the study.



CHAPTER THREE

METHODOLOGICAL FRAMEWORK AND STUDY AREA

3.1 Introduction

This chapter focuses on the research techniques adopted for this study with the aim of achieving the research objectives. It elaborates the research design and provides details regarding the population, sample and sampling techniques and the research instruments used in collecting data for the study. It also discusses the data collection methods and data analysis plan.

3.2 Research Design

Brink (2002) defines a research design as “a blueprint for conducting a study with maximum control over factors that may interfere with the validity of the findings’. The study adopted case study design to assess the prospects and challenges of greening the Kumasi Metropolis.

According to Yin (2009), the case study approach is an ‘empirical inquiry which investigates a contemporary phenomenon within its real-life context’. It allows the researcher to understand the situation in general with regard to the study objectives. The approach was preferred because it deals with technically distinctive situation, relies on multiple sources of evidence, and benefits from prior development of theoretical prepositions to guide data collection and analysis. In addition, it is a single case study strategy, which allowed the researcher to look at the existing situation and anticipate the future prospects in managing green spaces. Moreover, it accommodates both qualitative and quantitative data that allowed the researcher to get a rich mix of data for analysis and interpretation.

It also involves the collection of field and documented data, analysing information and reporting results. It is used to narrow down a very broad field of research into one easily researchable topic.

3.3 Category of Variables, Data Type and Units of Inquiry

Unit of analysis is the most elementary part of the phenomenon or entity to be studied or analyzed in a research and it affects the research design. It is the actual empirical objects or elements, which must be observed and measured qualitatively and or quantitatively in the particular study (Komekpor, 2002). In this research, the main unit of analysis is the green spaces in the Kumasi Metropolis. Other units of analysis include households who live within study areas for which green spaces facilities or structures are available and officials of allied bodies of green spaces in Kumasi Metropolis. The data to be collected involves the history and characteristics of green spaces and the challenges that threaten green spaces.

Data which were collected includes the land use distribution, percentage of land with open space and green space structures in the Kumasi Metropolis. Further, data on the environment policy, legal and framework which includes rules, regulations, projects and framework on land and environment management together with the factors that inhibit the smooth implementation and monitoring of the greening process was collected from the Environmental Protection Agency (EPA), Land Commission, Town and Country Planning Department, and Parks and Garden Department. Also, data on the role played by actors to the selected institutions dealing with environment and green spaces issues and institutions was collected from the Social and Welfare Department of KMA. The data collected included; type of organization, level of participation, roles played, area of interest, scope of operation, source of funding and bottlenecks.

Other important data collected includes; socio-economic and demographic information of the households living in the study area and their proximity to green spaces, choice and preferences (See Table 3.1).

Table 3.1: Summary of Data Required and Sources and Data Collection Tools

| Variables | Data Type | Data Source | Data collection Tools |
|--|---|---|---|
| Specific Research Objective 1: <i>To analyse existing legal and policy framework that seek to address the issue of green spaces in the Kumasi Metropolis</i> | | | |
| Enabling environment for effective policy and legal framework for green space management | <ul style="list-style-type: none"> • Environment Laws and By-Laws • Environment Policies and regulations • Building codes, and planning standards and • Available greening projects and programme. | <ul style="list-style-type: none"> ➤ EPA ➤ TCPD ➤ KMA | <ul style="list-style-type: none"> ➤ Interview ➤ Questionnaire |
| Specific Research Objective 2: <i>To identify the main actors and the roles they played in greening the Kumasi Metropolis</i> | | | |
| Institutional set up | <ul style="list-style-type: none"> • Type of organization • Level of participation • Roles played • Area of interest • scope of operation • source of funding • Bottlenecks | <ul style="list-style-type: none"> ➤ Social welfare department of KMA ➤ NGOs dealing with urban environment | <ul style="list-style-type: none"> ➤ Interviews ➤ Questionnaire |
| Specific Objective 3: <i>To evaluate the institutional linkages and coordination in the management of green spaces in the Kumasi Metropolis</i> | | | |
| Physical and institutional set up of green spaces management | <ul style="list-style-type: none"> • Coordination system of green spaces management • Maintenance and servicing green spaces facilities • Connectivity • accessibility • transport network, • security • access to electricity | <ul style="list-style-type: none"> ➤ TCPD ➤ Department of Parks and Gardens | <ul style="list-style-type: none"> ➤ Observation ➤ Interview ➤ Observation |

| | | | |
|--|---|---|---|
| | <ul style="list-style-type: none"> • and seating | | |
| Specific Objective 4: <i>To find out factors inhibiting the KMA from realizing its full potential of greening the Kumasi Metropolis.</i> | | | |
| Political factor | <ul style="list-style-type: none"> • Political will to implement greening initiatives • Land use conflict at the local level | ➤ Household heads | ➤ Questionnaire |
| Institutional factors | <ul style="list-style-type: none"> • Adequate qualified staff in land management sector • Financial and budget constraints • Delays in getting building and physical development documents • Enforcement of the physical development regulations • Sanctions of green spaces encroachers • Corruption involved in general land management | <ul style="list-style-type: none"> ➤ KMA ➤ TCPD | <ul style="list-style-type: none"> ➤ Observation ➤ Interview ➤ Questionnaire |

Source: Author's Construct, 2014

3.4 Criterion for Selection of Study Areas

The key factor in selecting and making decisions about an appropriate unit of analysis is to decide what one wants to say at the end of the evaluation (Flyvbjerg, 2006). An appraisal of the existing situation was quickly conducted in some parts of the Metropolis. This was supplemented with experiences of living in Kumasi and acquaintance with the background knowledge in the city. During this reconnaissance stage issues such as the intensity of development, spatial patterns, presence or absence of green spaces and presence of community

initiatives in land development and management including greening the environment were observed. Proximity and easy access to the study areas were also considered as the factor in selecting the study area because of its direct relationship with the cost and time of conducting the study. The data and information obtained was analysed and the outcome of the analyses enabled an improvement of the checklist by incorporating or dropping earlier preconceptions of the areas. Then, consultations was made with the head of Town and Country Planning Department, officials from the Department of Parks and Gardens and KMA, where it was revealed that, the Metropolis has over 10 communities which have been demarcated and has significant characteristics of urban green spaces in the Kumasi Metropolis (Figure 3.1).

Five out of ten communities were purposively selected for the study. The main reason for selection is that, over the past ten decades, these areas has experience a substantial changes in both quality and quantity of green space because of many factors such as urbanization and rapid population growth of the metropolis. In addition, these communities have high rate of physical structure development and other activities that lead to rapid depletion of green spaces. The communities selected are Ahinsan Estate (B), Ayigya (D), Adiembra (G), Santasi (J) and Kaase (H) (See figure 3.1 and 3.2)

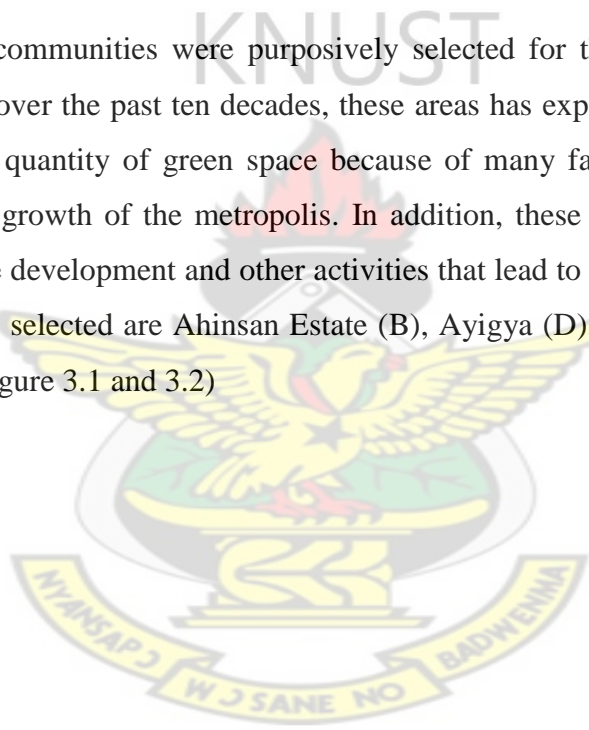


Figure 3.1: Demarcated Green Spaces Areas of Kumasi Metropolis

(Source: Town and Country Planning Department, 2014)



Figure 3.2 Study Areas in the National, Regional and Metropolitan Context



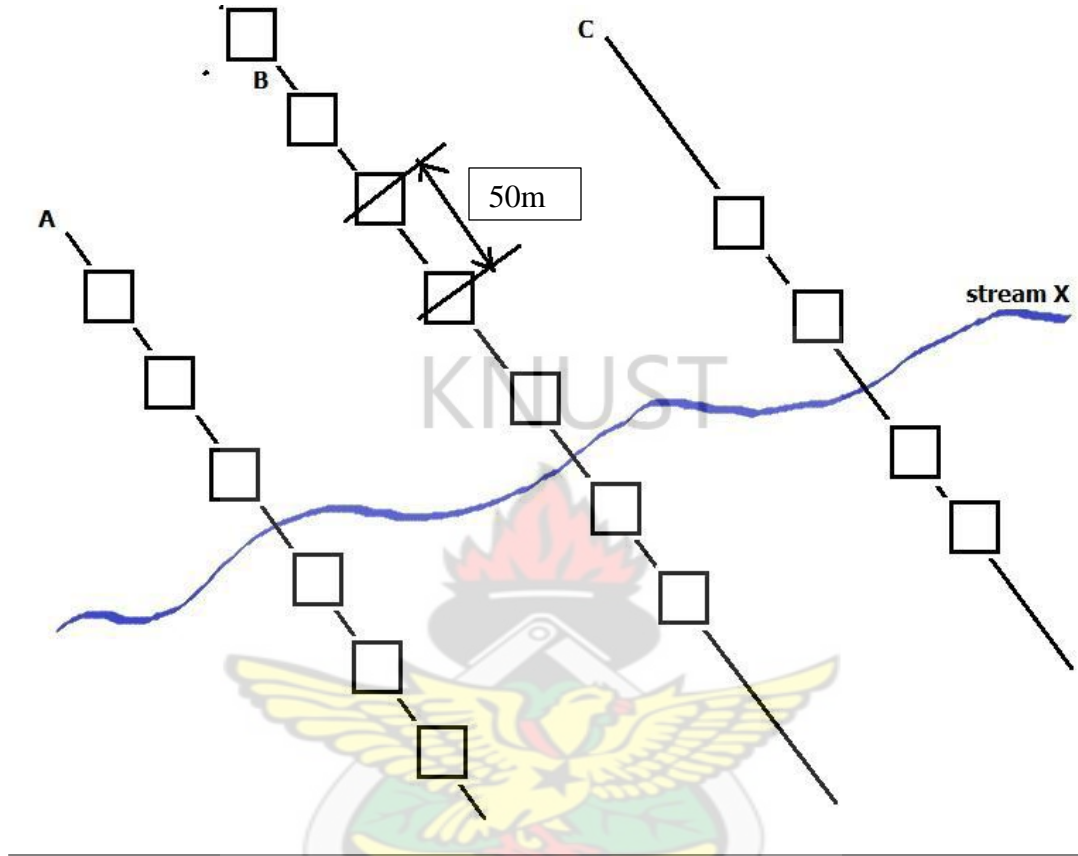
Also, from the reconnaissance survey, the green spaces in Kumasi were identified and delineated. Following a detailed study of maps of Kumasi and use of aerial photographs and physical inspection of these green spaces, a detailed description of land cover and land use types were recorded. Based on the information from this survey, some of the major green space sites of ecological, landscape, economic and social interests were chosen for the study using the quadrant sampling technique. It was assumed that, it would be impractical, if not impossible, to count each individual interaction in a large area. Ecologists randomly choose small portions of the whole area and classify and study the interactions in each small portion. They can then estimate the size of each population in the larger community. This process is called the *quadrat sampling technique* (Barrat-Segretain & Amoros, 1996)

For example, if a 10 m x 10 m (100 m²) site is being surveyed, three quadrats of a smaller size, perhaps 1 m x 1 m (1 m²), might be selected at random. If the population densities of a particular species at the three quadrats are 10, 12, and 14 individuals per m², an average is taken [(10 + 12 + 14)/3 = 12 individuals per m²]. That number is multiplied by the ratio of the larger area to the area of each quadrat (100 m²/1 m²) to calculate the estimated population size within the site (12 x 100 = 1200 individuals). This process is repeated for all species in the community (Barrat-Segretain & Amoros, 1996)

Green spaces of ecological interests included areas with economic and social activities directly affecting or bordering the green space (e.g. light industries, car washing bays, agriculture, housing etc.) were selected as sites of economic interests. This background constitutes the major criteria for selecting the various green spaces or study sites.

For each green space area, e.g. along a stream X, three permanent transects A, B and C were marked apart based on the ecological, landscape and surrounding economic and social activities (Figure 3.3).

Figure 3.3: A Schematic Diagram of a Sample Study Site along a Stream X Showing the Transects to the Study Areas.



Source: (Adopted from Barrat-Segretain & Amoros, 1996).

3.5 Determination of the Sample Size

According to 2000 population and housing census by Ghana statistical services, the populations of the selected communities are given in Table 3.2. Given the average household size of 5.1 of the Kumasi Metropolis (KMA Development Plan, 2010), the household populations for 2014 in the study areas was derived. The 2000 population of the study communities were projected to the current year (2014) using the geometrical model of population projection: $P_t = P_o(1+r)^t$

where,

P_t = Future population (2014)

Po= Population of the base year (2000 Population, from GSS, 2005)

r = Population Growth Rate of KMA (5.4 %, from KMA Development Plan, 2010)

t = Time frame (14 years)

Table 3.2: Population Projection and Household Population of the Study Areas

| AREA LETTER | STUDY AREAS | POPULATION (2000) | PROJECTED POPULATION (2014) | PROJECTED NUMBER OF HOUSEHOLDS POPULATION (2014) |
|--------------|----------------|-------------------|-----------------------------|--|
| B | Ahinsan Estate | 43,211 | 53,328 | 10,456 |
| K | Santasi | 19,262 | 23,771 | 4,660 |
| H | Kaase | 52,975 | 65,378 | 12,819 |
| J | Adiembra | 7,966 | 9,831 | 1,927 |
| D | Ayigya | 51,011 | 62,954 | 12,343 |
| Total | | 174,425 | 206,414 | 42,025 |

Source: Author's Projections, 2014

The sample size mathematical calculation method was used to determine the size of sampled households from the projected 2014 households. In order to increase the accuracy of the research results, giving room for a minimal degree of error, the research operated at a 95 % level of confidence with a margin of error of 5%. Using the mathematical sampling method: where n= sample size, N= sampling population and α = margin of error, as indicated by (Cobbinah and Amoak, 2011), the sample size was derived from the population (the sum of all households in the five selected study areas) by the formula

$$n = \frac{N}{1 + N (\alpha)^2}$$

Where:

n=sample size of the study population;

N =Number of households

α = the margin of error, and

1 = constant.

From table 3.2, the sample size (n) for the study is given by

$$n = \frac{42,205}{1 + 42,205(0.05)^2}$$

$$n = \frac{42,205}{106.5125} = 396$$

To obtain a representative number of respondents from each study area, the sample was proportionally distributed as shown in Table 3.3

The selection of households from houses for the study was also based on the availability and willingness of the person contacted to respond to the questionnaire. However, using the purposive sampling method, more men were selected for the study than women. This was done because of the culture and nature of the study population, it always happen that, men are responsible for the major decision regarding management and physical development of both public and family owned land and as such provided more and accurate information on a green space management than women.

However, the researcher could not administer all entire sampled households in the 5 selected communities. This was done because of the fact that, the trend of the response showed a similar pattern. Therefore, after collecting data from 350 (88.4%) respondents it was inferred that the remaining 46 respondents (11.6%) would significantly not have any major effects on the already collected data. For this reason, 350 respondents were used for the study instead of

the calculated 396 sampled size. The actual number of respondents administered in each study area has been shown in the table 3.3

Table 3.3: Sample Size for the Study Communities

| STUDY AREA | SAMPLE SIZE PER POPULATION IN THE STUDY AREAS | CALCULATED SAMPLE | ACTUAL SAMPLE USED |
|----------------|---|-------------------|--------------------|
| Ahinsan Estate | $(10,456/42,456)*396= 98$ | 98 | 87 |
| Santasi | $(4,660/42,205)*396= 44$ | 44 | 43 |
| Kaase | $(12,819/42,205)*396=120$ | 120 | 99 |
| Adiembra | $(1,927/42,205)*396=18$ | 18 | 14 |
| Ayigya | $(12,343/42,205)*396=116$ | 116 | 107 |
| TOTAL | - | 395 (100%) | 299 (76%) |

Source: Author's Projections, 2014

3.6 Data Collection Procedure

Data collection means gathering information to address the critical questions that have been identified earlier in the study. Many methods are available to gather information, and a wide variety of information sources were identified. The most important issue related to data collection is selecting the most appropriate information or evidence to answer questions raised in the study (Brink, 2002).

Both primary and secondary data were collected from the respondents (households and users of green spaces, private green space owners, public institutions, Environmental Protection Agency, Department of Parks and Garden, Town and Country Planning Department and Land Commission. Also data was collected from the parks, playgrounds, forest and all forms of home gardens such as guerrilla, façade, allotment and community gardens.

The main instrument for the primary data collection used for this study comprised structured questionnaires which contained both open-ended and close-ended questions. This was used

mainly for the household data collection and helped in overcoming the challenges such as language and other communication barriers.

A combination of both interviews and questionnaires was used to collect data from the various institutions which participate in the management of green spaces in Kumasi. For instance, unstructured interview was used to collect information about the type, size and distribution of the green space in Kumasi.

Additionally, observation was used to collect information in the study area especially in those places that could be accessed and could be seen more easily. Also, with the use of other electronic instruments such as digital camera and smart phones, relevant pictures were taken from the study areas.

The collected data was recorded, coded and edited. This was done after being inspected and cleaned and then was entered into the relevant software in the computer for further analysis and interpretation.

3.7 Research Instruments

In view of the nature of the topic, it was realized that questionnaires would be the most appropriate instrument to use. Questionnaires are an inexpensive way to gather data from a potentially large number of respondents. The researcher gave a serious thought to the wording of individual questions. This was done to ensure that respondents answered objectively to the questions in the questionnaire.

The questions were in open ended and closed or forced choice-formats. In the open ended question, the respondents formulated their own answers. In the closed formats, respondents were forced to choose between several given options. The open ended formats allowed the exploration of a wide range of possible themes arising from an issue. It was used where a comprehensive range of alternative choices could be compiled. The closed or forced choice-format was easy and quick to fill and also minimized discrimination against the less literate (in

self-administered questionnaire) or the less articulate (in interview questionnaire). It was easy to code, record, and analyse results quantitatively and easy to report results.

3.8 Administration of Questionnaire

Questionnaires had a personalized letter explaining briefly the purpose of the survey, the importance of the respondents' participation and a statement guaranteeing confidentiality. This cover letter also expressed thanks to the respondents at the end.

3.8.1 Interview Schedules

Interviews involved an interviewer asking one or more interviewees a set of questions which may be highly structured or unstructured. Interviews are usually synchronous and are often face-to-face, but they do not have to be. The interviews were conducted with the respondents to get their views on the effects of customer care on customer retention in the banking industry.

3.8.2 Structured Interviews

The structured interview, (as its formal) may be considered as an oral presentation of a written questionnaire. The interviewer read out the questions and the interviewees give their responses, while other interactions are kept to a minimum. The structured interviews have a fixed number of questions and even the possible responses are restricted. The questions in structured interviews are likely to be closed questions although this is not always the case. The structured interview is more efficient in terms of the time taken to collect the data and the degree of reliability and validity is greater than in the unstructured interview formats.

3.9 Data analysis

Data analysis played a major part in the completion of this study. Data was reviewed after the collection of filled questionnaires and compilation of data from the interview was also performed. A critical analysis was done after which the data was interpreted and graphically represented. Both quantitative and qualitative analysis of data was done. Quantitative methods involves proceeding for the positivist assumption that, if something exists, it exists in some degree and can therefore be numerically measured. Qualitative methods were more open-ended and required the researcher to elaborate with words convincingly, concerning the motive. The approaches for qualitative analysis of data involved data reduction, coding, tabulation and calculation of summarizing statistics. Microsoft Excel and Statistical Package for Social

Sciences (SPSS) were used. The scores for all questions were summed up and the average scores taken.

3.10 Training Research Assistants and Pre-Testing

Training of research assistants took place on 19/02/2014 followed by a pre-test exercise at Ahinsan Estate (one of the study areas) the following day. Problems that were identified in the data collection instruments were rectified before the administration of the questionnaires and collection of data during the actual field work.

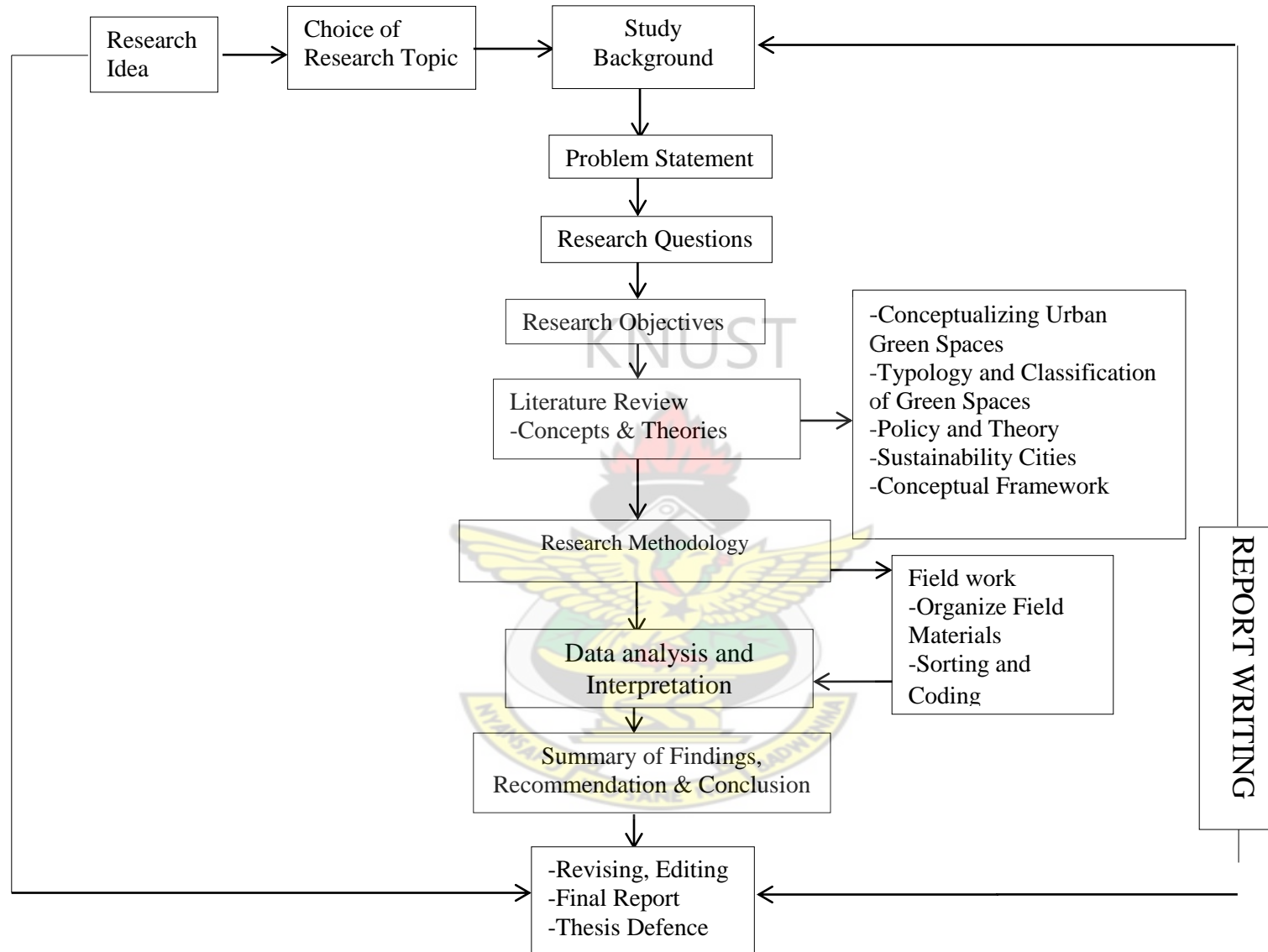
3.11 Data Handling

The details of the study procedures regarding the selection criteria, the interpretation of items in the instruments were thoroughly discussed with research assistants. This is to ensure that, there is standardization and uniformity in understanding and translating of the questions in the tools so as to strengthen its reliability and validity.

3.12 The Research Process

After coming out with the research topic (See figure 3.3), the research began with a review of relevant literature on the concept relating to the management of green spaces in different perspectives such as policy, planning and theories. The second step of the research process identified all the data requirements and adopted the appropriate data collection instruments taking into consideration the units of analysis. The data collection tools were then designed. The selections of the study areas and the sample size for the study were also determined. The field data was then processed (sorted, cleaned and coded by use of the excel software) and entered into the computer using the SPSS software for analysis. The field data was interpreted which led to some major findings based on the research questions and objectives (Figure 3.3).

Figure 3.3: Research Process



Source: Adopted from Research Methodology Lecture Notes, 2013

CHAPTER FOUR

PROFILE OF KUMASI METROPOLIS

4.1 Location and History

Kumasi is located in the semi-deciduous region of Ghana and therefore had all the advantages offered by natural landscape, especially urban trees, forest and wetlands (KMA, 2013). Kumasi is the second largest city in Ghana and the capital of the Ashanti Region. It lies within latitudes 6°38' and 6°45' north and longitudes 1°41' and 1°32' west on a landscape between 250 and 350 meters above sea level. Kumasi used to be known as the Garden City of West Africa. This was because, during the colonial era, planning interventions in Kumasi were in the form of establishing green belts and recreational parks within the layouts of residential areas. Due to the undulating topography and numerous streams that transect Kumasi, the green belts and recreational parks were invariably situated along the major streams. They were seen as both sanitary measures and as a way of separating residential areas especially the European, from non-European zones. The provision of a green belt of about 300 meters from buildings surrounding residential areas was designed to protect Europeans residing in these areas from mosquito borne diseases. After independence, these green belts were designated as recreational space and named 'Nature Reserves' or 'Parks' on zoning maps (KMA, 2010). Today, this garden city status is long lost and these green belts are largely either non-existent, their borders slowly being infringed upon for urban infrastructure and housing, subsistence agriculture or used as dumping grounds (KMA, 2010). The suburbs e.g. Dakwadwom, Ahensan, Aboabo and Atonsu situated in or close to these 'vacant' land areas are frequently under floods.

4.2 Demographic Features

The Kumasi city as delineated in Figure 3.1 is metropolitan because it has a population of over 250,000 (Ghana Statistical Service, 2005). The Kumasi Metropolis is made up of the following Sub-Metropolitan areas: Asawase, Asokwa, Bantama, Kwadaso, Manhyia, Nhyiaeso, Oforikrom, Old Tafo, Suame and Subin. There is the Kumasi Statutory Planning Committee which integrates the development planning of the Metropolis, monitors and evaluates development planning and management, integrates the development planning

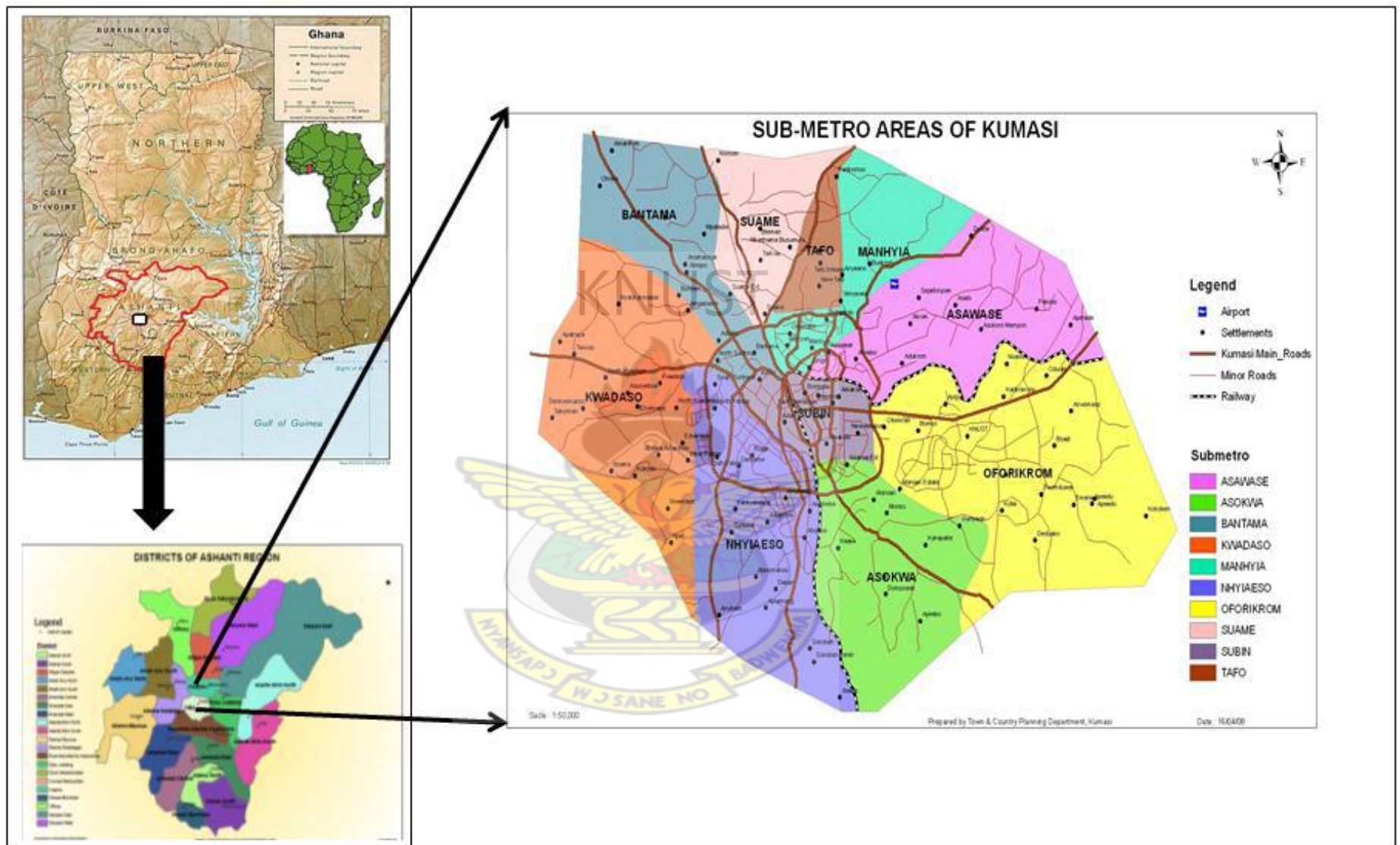
proposals from the sub-metropolitan assemblies and advice the authority thereon KMA, (2010)

The urban population of the Ashanti Region (which is 51.3 %) is only second to the Greater Accra Region (87.7 %). In 2000, Kumasi had 1,170,270 people, reflecting an inter-censal growth rate of 5.4% between 1984 and 2000 (GSS, 2005). The population is projected to be 2,443,737 in 2014 based on the annual growth rate of 5.4% between 2010 and 2014. Due to its fast physical and demographic growth, Kumasi now extends beyond the administrative boundaries of the KMA into the neighbouring districts (KMA, 2010).

The Metropolis has a total surface area of 254 square kilometers. It is the most populous district in the Ashanti region with population density of 5,419 people per square kilometre. The city comprises of 10 sub-metros (Figure 4.1)



Figure 4.1: Location of Kumasi in the National and Regional Contexts.



Source: Kumasi Metropolitan Assembly, 2014

4.3 Profile of Kumasi Metropolis

4.3.1 Climate

The climate of Kumasi is tropical, of the wet sub-equatorial type, and strongly influenced by the tropical continental and tropical maritime air masses. The migration of the Inter-Tropical Convergence Zone (ITCZ) determines the seasons. Rainfall is bi-modal. The major rainfall period is between May and June and the minor rainfall period is between September and October. The dry north-east trade winds (Harmattan) reach Kumasi around mid- November to early December. Relative humidity on a normal day, in Kumasi, ranges from a maximum of 100 % at 0900 GMT to 60 % at 1500 GMT. On very dry days it ranges from 40 to 84 % and 85 to 100 % on very wet days. The average minimum and maximum temperatures in Kumasi are about 21.5 °C and 30.7 °C respectively (KMA, 2010)

4.3.2 Hydrology

The Metropolis is located within the Pra basin which is divided into five sub-basins by a series of ridges running generally in a north-south direction. These sub-basins are Kwadaso, Subin, Aboabo, Sisai and the Wiwi. The Suatem River flows through North Suntreso and joins the Kwadaso River at Dakwadwom to form the Daban River which flows to Kaase (KMA, 2010). The Subin River flows from the Kumasi Zoo also to Kaase. The Wiwi River flows from Nsenie and merges into the Sisai River at Atonsu. The Sisai, Subin and Daban Rivers finally join the main River, a tributary of the Pra near Asafo, south of Kumasi. In the north-western sector of the Metropolis are several small tributaries of the Owabi River. The Metropolis is therefore drained by a relatively dense network of rivers whose natural drainage runs generally from north to south, exhibiting dendritic patterns (KMA, 2010)

However, estate developments, agricultural encroachment and indiscriminate disposal in the rivers have impacted negatively on the drainage systems and have consequently brought some of these water bodies to the brink of extinction and increased the incidence and spread of floods and floodwaters. Some portions of these rivers have also been converted to storm drains e.g. the portion of the Aboabo River from the Airport roundabout to the High School Junction. For those that are still flowing, pollution is a serious problem.

4.3.3 Land use and Vegetation

The Kumasi Metropolis falls within the moist semi-deciduous South-East Ecological Zone.

About 80 % of the total land coverage of the Metropolitan area is planned (KMA, 2006). The major land uses that make up the Metropolis are residential, industrial, commercial, educational, civic and culture, transportation and open spaces. Among these land uses, the predominant ones are residential, commercial, educational and industrial. The residential areas take up to 44 % of the total land area in Kumasi. About 29 % is taken up by the different land uses such as educational, civic and culture, transportation and open spaces (KMA, 2010)

Patches of vegetation reserves within the Metropolis house the Kumasi Zoological Gardens and the KNUST Botanical Gardens. Others are the Otumfuo Children's Park at Dakwadwom, Kumasi Children's Park at Amakom and the Kumasi Golf Course at Nhyiaeso. Aside these, there are other patches of vegetation cover scattered over peri-urban areas of the Metropolis e.g. Atasomanso, Breman and Kagyase and Owabi. Predominant local trees are *Ceiba*, *Triplochlon* and *Celtis*. Due to urban sprawl, most trees have been cut to make way for buildings, roads and other infrastructure. All lands adjacent to the main rivers have been declared by TCPD as green belts. These green belts are meant to serve as natural flood plains of the river but encroachment has significantly reduced their flood storage capacity. Common vegetation in these green space areas are shrubs, grasses and food crops and vegetables like okro, carrot, cabbage etc. associated with urban agriculture (KMA, 2010)

4.3.4 Relief, Geology and Soils

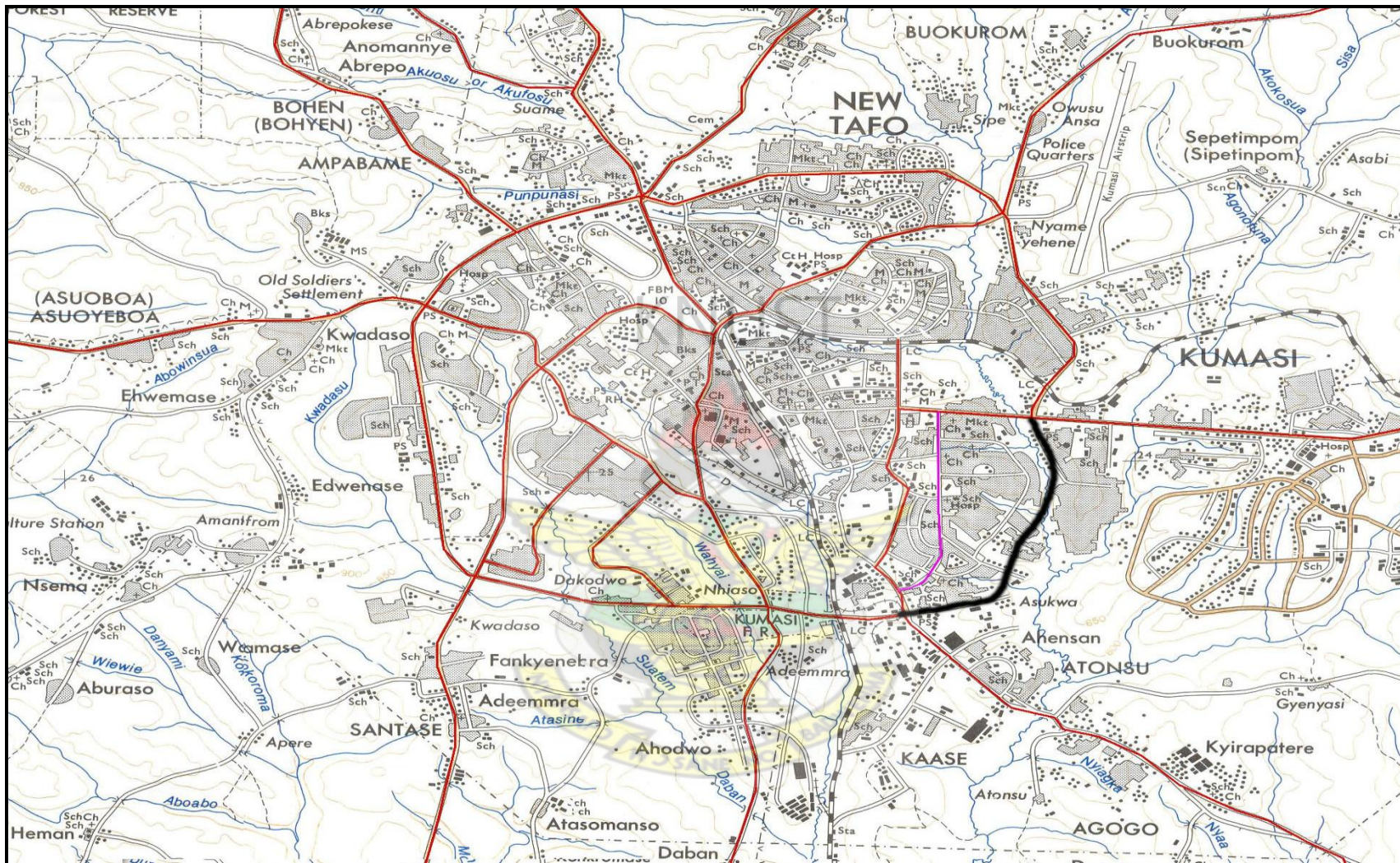
The Metropolis is undulating and lies within the plateau of the south-west physical region which ranges from 250-300 m above sea levels. The area is underlain with rock. There are six soil types in the metropolis but the predominant soil type of the metropolis is forest ochrosol which dominates the entire region. The soil within the basins is silty clay loam which is moderately slow to slowly permeable resulting in fairly high runoff rates. This rich soil type makes it possible for foodstuff to be grown in the Metropolis and its periphery (KMA, 2010)

4.3.5 Settlement Structure

Physically the structure of Kumasi is concentric or circular in shape. This is attributable to the radial growth of physical structures along the arterial roads in the Metropolis. These major arteries converge at Kejetia, the centre of Kumasi. Thus, infrastructure growth and development is traversing all directions in the Metropolis, with the city centre as the origin of growth as shown in Figure 4.2 (KMA, 2010)



Figure 4.2: Settlement Structure of Kumasi Metropolitan Area

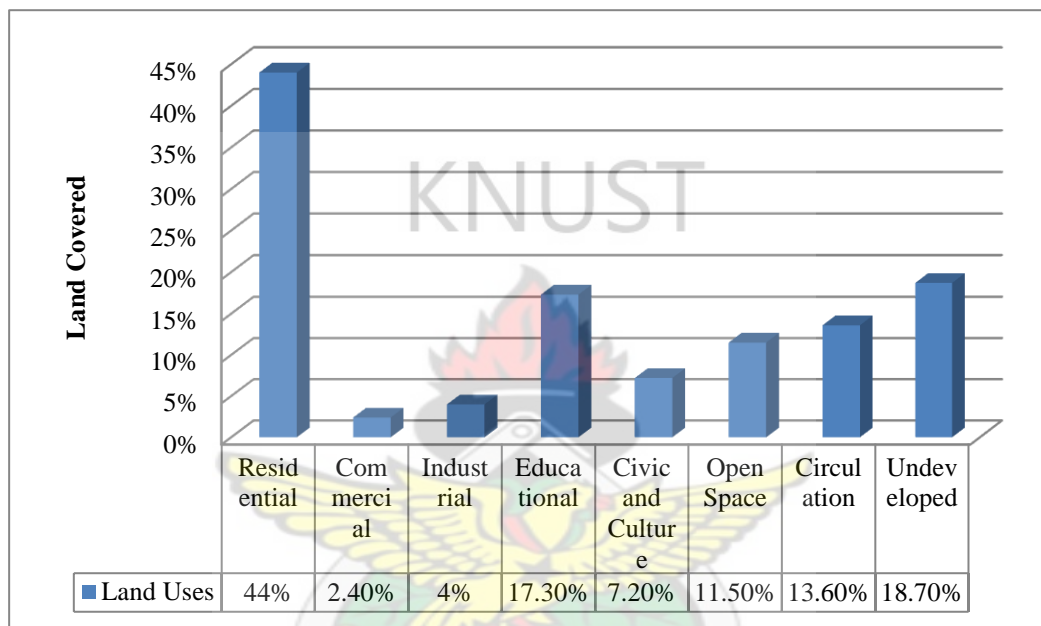


(Source: Town and Country Planning Department, 2014)

4.3.6 Distribution of Land Uses

According to KMA, 2010, the Metropolitan Area of Kumasi covers a total land area of approximately 254sq. Km (25,415 hectares). Significant size (79.0%) of this land area has been planned, approved and developed. These developed areas comprised the following land uses; residential, commercial, industrial, educational, civic and culture, open space circulation and under developed land (Figure 4.3 and 4.4).

Figure 4.3: Distribution of Land Uses in Kumasi Metropolis



(Source: Town and Country Planning Department)

KUMASI METROPOLITAN AREA STRUCTURE PLAN

Legend

- Settlements
- Kumasi Main_Roads
- Water
- Civic & Cultural landuse
- Commercial landuse
- Educational Landuse
- Industrial Landuse
- Open Space
- Residential Landuse

SCALE 1:20,000

Prepared by Chapman Owusu-Sekyere for Town & Country Planning Department - Kumasi

Date : 12/11/07

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4.3.7 Residential Land Use

These land uses covers living areas in the Metropolis and are predominantly occupied by housing facilities. A significant size (43.9%) of the total land developed in Kumasi is occupied by residential facilities. These residential facilities are further stratified into the high-income residential area, middle-income residential areas and low-income residential areas. The rapid growth of Kumasi due to in-migration and the inability to tandem the population growth with housing provision has led to the emergence of slum. Furthermore, the lack of political will to enforce development control in the Metropolis has resulted in haphazard development of physical infrastructure. This uncontrolled development has resulted in encroachment on access roads by residential building in some of the communities especially areas that are now developing (KMA, 2010)

4.3.8 Commercial Land Uses

Approximately 2.4 per cent of the total land area developed in the Metropolis is occupied by commercial activities. These commercial activities are mainly concentrated at the centre of Kumasi. These areas comprise Adum shopping area, the Central Market, Asafo Market, Kejetia and Asafo transportation terminals. Notwithstanding this allocation for commercial activities, new commercial activities are now emerging along the arterial roads in the Metropolis. This is attributed to the limited space in the CBD due to haphazard organisation of activities especially Central Market, leading to uneconomic use of space as well as inability to meet demand for new economic activities (KMA, 2010)

4.3.9 Industrial Land Use

This accommodates facilities for processing and manufacturing of consumable and non-consumable goods. It occupies 4 % of the total land developed in the Metropolis. With regards to consumable goods, notable area in Kumasi that accommodates such industrial facilities is the Ahinsan – Kaase enclave, a home for Guinness Ghana Brewery Limited and the Coca Cola Bottling Plant that are engaged in beverage processing as well as other small-scale industries. Suame and Asafo Magazines; Kaase/Asokwa Industrial Area and the Sokoban Wood Village are well-known non-consumable goods industries that occupy significant size of the industrial land use in the Metropolis. The inability of these industries to effectively manage the waste to be

generated by their production has been a pain in the neck of the residents dwelling in the communities that house these establishments (KMA, 2010)

4.3.10 Educational Land Use

Educational facility in the Metropolis is the second largest land use (17.0%) in the Metropolis after residential facilities. This activity ranges from Pre-School to Primary School, Junior High School, Senior High School, Vocational/Technical, Training Colleges and Tertiary Institutions. The largest educational land use is the Kwame Nkrumah University of Science and Technology (KNUST) located in the eastern section of Kumasi. Other five tertiary educational institutions also occupy significant size of educational land use. Collectively, the fifteen (15) major second-cycle institutions within Kumasi also cover a significant size of the educational land use. One of the difficulties confronting the educational land use in the metropolis is encroachment by private residential property and make-shift structures. These structures sometimes create noise pollution which disrupts teaching and learning (KMA, 2010)

4.3.11 Civic and Cultural Land Use

It is purposely zoned to accommodate public and private offices, health facilities, security establishments and centre for religious and socio-cultural functions. It covers 7.3 % of the total land area developed in Kumasi. Manhyia Palace, Centre for National Culture, Komfo Anokye Teaching Hospital (KATH) and other five major Polyclinics are the prominent architectural edifice that occupies significant size of the civic and culture land use.. Parcels of land occupied by religious centers such as churches, mosques and shrines are also considered as civic and culture land uses. The inability of religious organizations to get access to land in the city center has compelled some of these organizations, especially the churches, to build their structures in waterways. Coupled with this phenomenon is the noise pollution created by these churches during their services especially in the evenings and early morning) (KMA, 2010)

4.3.12 Commercial Land Use

There are several Financial and Insurance companies in the city. The offices of these financial institutions also occupy quite a sizable land. Among them include Bank of

Ghana, Standard Chartered, Ecobank, Barclays Bank, SG-SSB, Rural Banks and Forex bureaus (KMA, 2010)

4.4 Summary of the Chapter

The chapter provided an insight of Kumasi Metropolis in the context of physical, economic and social characteristics that, in one way or the other, affects the management of green spaces. The information gathered in this chapter together with the elaborate methodology applied in data collection will provide a background for the analysis of the data gathered from the field. Therefore, the next chapter will analyse the empirical data collected from the field survey to provide a basis for an assessment of the Prospects and Challenges of Greening the Kumasi Metropolis



CHAPTER FIVE

ANALYSIS OF PROSPECTS AND CHALLENGES OF GREENING KUMASI

5.1 Introduction

This chapter presents the dynamics of green spaces in Kumasi city. It includes a discussion of the socio-economic and demographic characteristics of households; characteristics of the five selected areas including their historical evolution, environmental, housing characteristics and more importantly access to social amenities and services. In addition, the major determinants influencing the locational preference of the inhabitants living in and around green spaces are analyzed. The issues raised here include how and why green spaces were quantitatively and qualitatively changing and whether the changes had some implications on the total structure of the city and the daily lifestyles of the inhabitants. A mapping exercise was employed as the technique of evidence. The mapping exercise included an analysis of documents, observations and interviews with key informants.

5.2 Dynamics of Green Spaces in the Kumasi Metropolitan Assembly

Contextually, the dynamics of green space management involve an assessment of the institutional, legal and administrative framework that form a basis for quantitative and qualitative changes within Kumasi. These are examined first at the city level and then narrowing to the community and individual levels.

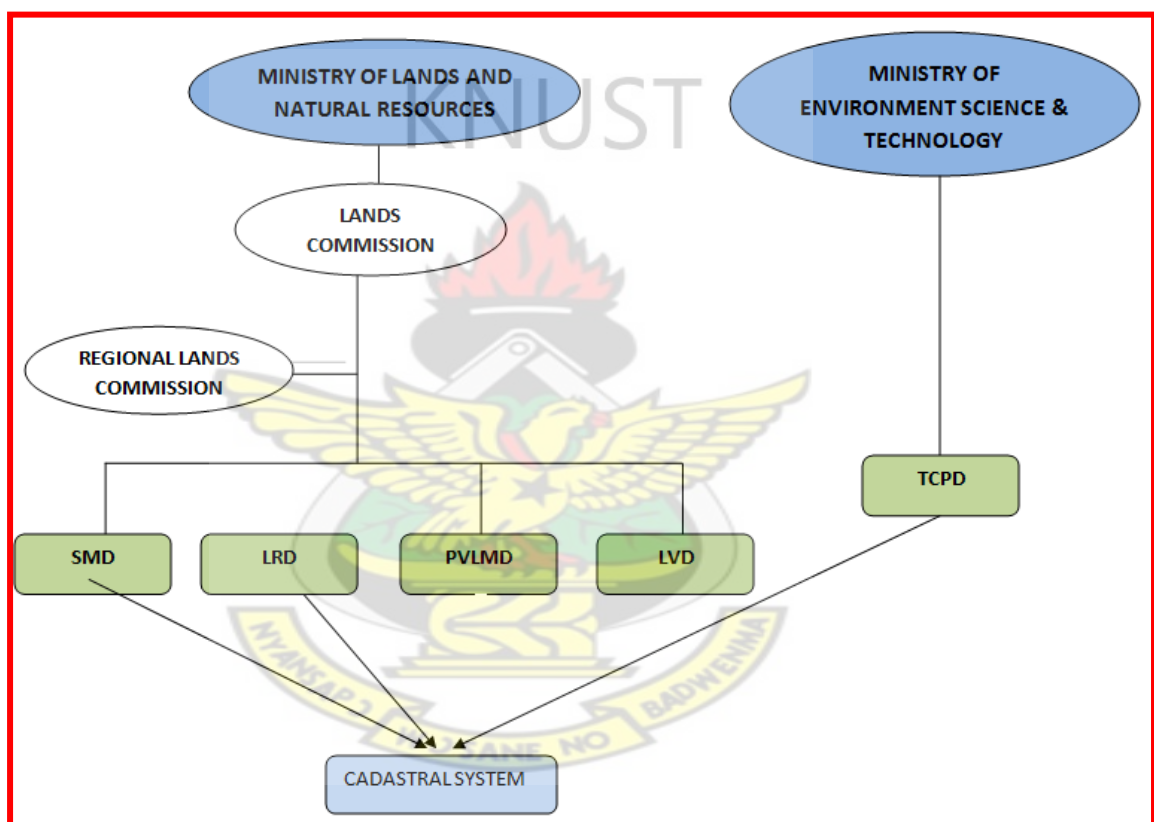
5.2.1 Legal and Administrative Challenges in Green Space Management

The Local Government Act 462, 1993 and Local Government Legislative Instrument LI 1614, 1989 established the Kumasi Metropolitan Assembly (KMA) to manage the city. Furthermore, these legal frameworks have empowered KMA with the responsibilities to promulgate byelaws, giving legal effect to its decisions. The Local Government Act 462 (1993) and legislative instrument LI (1614) has also given authority to KMA to become a Planning Authority to formulate policies, programmes and projects as well as to mobilize resources within its jurisdiction to undertake development projects.

In the context of green space management, the study acknowledged that for KMA be able to effectively carry out its assigned responsibilities, various decision making

organs have been established and empowered to carry out certain specific tasks. These agencies or departments include the Lands Commission namely the Survey and Mapping Division (SMD), the Land Registration Division (LRD), the Land Valuation Division (LVD) and the Public and Vested Land Division (PVLMD), the Department for Parks and Gardens, as well as the Town and Country Planning Department. These agencies have been given the mandate to initiate developmental projects within the administrative framework of KMA. These roles are shown in Figure 5.3 and the roles of each sector are discussed in the preceding sub-sections.

Figure 5.1 Institutions Involved in Land Administration in KMA



Source: KMA, 2014

The other divisions that play a key role in green space management in Kumasi are Non-governmental organizations and the Traditional Authority. The role played by these institutions is almost indispensable yet generating challenges at the same time.

The study observed that most land owners in Kumasi hold land through various forms of customary tenure where access to land and the use of it is still controlled or managed in practice by chiefs and family heads. This has become an especially important source of chiefly power, family wealth, cultural leadership and it is also

highly significant in peri-urban and commercial farming areas. The evidence of these land ownership reflects the increasing interruptions of spatial development within the Kumasi Metropolis as confirmed in this study. Strategic efforts are what it would take on the part of administrative authorities to resolve these conflicting needs between traditional authority and sustainable city proponents. Views and opinions of NGOs on the other hand are channelled through their representatives to the Administration for consideration by the Assembly.

According to the TCPD, the overall legal regime for land administration in Ghana consists of constitutional provisions, policy instruments, statutory enactments, judicial decisions, common law principles and customary laws and practices which have been enacted and developed over the years to regulate land rights generally. Courts have also ruled on customary law issues resulting in a body of legal precedents for some land related customs. Currently there are over one hundred statutes on land ownership, tenure, planning and use, added to the different customary laws as they pertain to specific localities. Under the currently operating Land Administration Project (LAP), the laws relating to land are to be consolidated into two pieces of legislation, namely the Lands Act to provide for Land Tenure, Land Administration and Land Management and Surveying and Mapping, and the Land Use Planning Act. These are available to all stakeholders in land administration in KMA.

5.3.2 According to TCPD and land commission, some of the identified challenges within the current Land Administration are as follows:

- ✓ General indiscipline in the land market - characterized by the current spate of land encroachments, multiple sales of parcels, developments on land using unapproved schemes, informal settlements leading to development of shantytowns, etc. These issues individually and cumulatively lead to environmental problems, disputes, conflicts and endless litigation.
- ✓ Indeterminate boundaries of stool/skin lands - resulting directly from the lack of boundary maps/plans, and the use of old or inaccurate maps, leading to land conflicts and litigation between stools/skins and other land owning groups.
- ✓ Compulsory acquisition by government of large tracts of land which has not been utilized and for which payment of compensation has been delayed. By this policy, land owners have been left almost landless, denied their source of

livelihood and have, in effect, become tenants on their own lands, giving rise to poverty and disputes between the State and the stools, as well as within the private land sector.

- ✓ Inadequate security of land tenure due to conflicts of interests between and within land owning groups and the State, land racketeering, slow disposal of land cases by the courts and a weak land administration system.
- ✓ Difficult accessibility to land for agricultural, industrial, commercial and residential development purposes due to conflicting claims to ownership and varied outmoded land disposal procedures.
- ✓ A weak land administration system characterized by the lack of a comprehensive land policy framework, reliance on inadequate and out-dated legislation, lack of adequate functional and co-ordinated geographic information system (GIS)-based tools as well as of transparent guidelines; poor capacity and capability to initiate and co-ordinate policy actions let alone resolve contradictory policies; and inappropriate policy actions among various land delivery agencies.
- ✓ Lack of consultation with land owners and chiefs in decision-making for land allocation, acquisition, management, utilization and development which has generated intractable disputes between the State and the private land owning groups and within communities.
- ✓ Lack of consultation, co-ordination and co-operation among land development agencies.

The net effect of these constraints is a distorted and dysfunctional green space management that is not development oriented.

5.3 Changes of Green Spaces in the Kumasi Metropolis

Changes of green spaces as observed in this study are linked with variations of population and physical densifications in the city. Thus, population and physical densification can be seen as independent variables that induced or triggered changes in the green spaces. These changes were both quantitative and qualitative. Quantitative change is taken as the total loss of land, which is potential for the change

of green spaces into other land use—in this case development. The loss of plant species resulting in bareness as well comes under this category. Qualitative change is the change of one form of vegetation in the green spaces into other forms see plate 5.1 and 5.2. For instance, a change of shrub land with interlocking crowns to shrub land without interlocking crowns. The number of hectares of land changed into development is employed as a quantitative measure, and how much the green plants or vegetation changed or reduced from one category of vegetation into another is employed as the qualitative measure of such change.

5.4 Dynamics of Green Spaces at Community Levels

This sub section explores the dynamics of green spaces at the community levels. The problem raised is how and why green spaces changed quantitatively and qualitatively and the implication of these changes on the daily lives of the inhabitants. Similar to the results at city level, in order to estimate the green space changes at the community level, a mapping exercise was employed as the technique of data collection. This included an analysis of documents, observations and measurements, along with interviews with key informants. Formal interviews with plot owners at the block level were as well conducted. In each community the question of whether the development plans had some influence on the green space as well as direct attempts at greening the areas are discussed.

Interviews with the long-time residents revealed that reeds and ‘bush-like’ shrubs have given way to farm crops, palm plantations, vegetables gardens and coconuts trees. In recent years, farm lands are being replaced by residential development, commercial activities and civic developments. The thickets of food crops and other vegetation are now reduced to occasional scattered trees. A few lawns are as well observed and, in the remaining areas of the low-lying land, unattended to vegetation.

Plate 5.1: Natural Vegetation Being Replaced by Small Scale Farming at Kaase



Source; Field Survey, 2014.

Plate 5.2: Natural Vegetation Being Replaced by Small Scale Farming at Ahinsan Estate.



Source: Field Survey, 2014.

5.5 Perceptible Densification and Browning at the Community Level

Across the communities studied, the reduction and extinctions of green plants and spaces were notably quick. Encroachment of wetlands and public green spaces were as though it lacked any sort of management (Plate 5.6).

Plate 5.3: Typical Plot Densification in Kaase



Source: Field Survey, 2014

The owner of the plot (figure 5.3) had in 1993 constructed the main house with plot coverage of 6%. In the same year he added another two bedroom house detached house with plot coverage of 3%. The third house constructed in 1996, and Fourth and Fifth houses were built in 1998. In 2014 the plot coverage will be 20%. During the discussion with the owner, it was revealed that, he was constructing another house built from money he collected from the tenants as rent.

Encroachment to the reserved green belts, building extensions and replacement of plant fences in plots with solid walls were some of the reasons for such a fast green space reduction and extinction. Besides encroachment, green plants in the studied settlements and communities were as well disappearing through precarious management regimes e.g. harvesting for either food or fodder, particularly in new settlements and communities of Ahinsan estate, Santaase and Ayigya, and felling of

trees and improper care. Unlike the process in settlements and communities in most old and new, formal and informal plots green plants and spaces were disappearing through housing extensions, substituting plant fences with solid block work walls and pouring concrete over the remaining plot spaces.

Plate 5.4 Residential Areas at Kaase



Source: Field Survey, 2014

The processes of reduction and extinction of public and semi-public green spaces in most settlements and communities are not new. Bernstein's (1994) observed similar findings, that unguided physical densification has often destroyed natural landscapes and other open spaces found in cities of developing countries. In Accra, for example, illegal encroachment in open green areas earmarked for recreation was be increasingly taking place (Bernstein 1994).

How residents extinguish the green plants and spaces in their plots is as well interesting. This raises the question of whether green plants and spaces in the studied areas are critical in people's daily life. Where are they placed in the day-to-day human activities? As observed in chapter four above, Kumasi is rapidly urbanizing amidst poverty and unemployment and the answers to the questions of where inhabitants place green issues in their day-to-day life include other factors that may be equally

important. The need for livelihood enhancement may be more important than the shade of a tree.

Studies conducted by Kuchelmeister (1993), in various countries of sub-Saharan Africa, showed that urban green plants have tangible, environmental and social benefits. In the Sahel, and Central Africa urban residents use baobab leaves and processed parkia seeds as food. As well some medicinal tree species are locally exploited in and around the town.

In some households in Ayigya and Kaase, residents rely largely on biomass fuels harvested from green spaces for cooking and heating, despite the fact that the collection of fuel wood has caused extensive land degradation in many urban settlements. These findings show that residents in the studied settlements and communities seem to use plants, now threatened with extinction, for various purposes. The disturbance and eventual extinctions of such plant species means disturbance and extinctions of the benefits offered by such plants.

The use of green spaces for socio-cultural and ritual ceremonies coincides with Kuchelmeister (1993) and MacPherson and Rowntree (1993), findings that they unite different peoples with different cultures. Socio-culturally, green spaces offer opportunities for people of all ages to interact. They as well enhance cultural life by providing venues for local festivals and safe playgrounds for children. In most communities in the Kumasi Metropolis, there is a potential for social cohesion and collective concerns towards, among other things, managing living environments. In the absence of green spaces as observed across the studied settlements and communities, the above potentials disappear.

Across the settlements and communities most residents were observably using most of the open spaces for production of agricultural products such as vegetables and fruits. In most communities considered in this study, it was observed that most residents used most open spaces in settlements and plots for production of vegetables. Almost 650 ha of the urban area of Kumasi is being used for vegetable production, which will be equivalent to 4% of the whole area. Vegetable and other crops

production offer employment for almost 4000 residents (Cornish, et al, 2001). Caused by growing pressure on the land through increasing population, the general tendency will be a decrease in the area used for open space production. The production of vegetables in most open spaces, as with the studied cases, shows the viability of urban agriculture as one of the survival strategies for the urban poor and gives an indication of the importance and function of open space production in the urban area of Kumasi.

The reasons for engaging in urban agriculture are employment and food security for the urban poor. It is a strategy of survival for the unemployed, the low wage earners, and women without sufficient skills to secure well-paid jobs (MacPherson and Rowntree (1993). The importance of agriculturally used open spaces in Kumasi's urban areas becomes clear by the fact that more than 90% of all leafy vegetables coming to the cities' markets have their origin in the open spaces and home gardens (Cornish, et al, 2001)

Across the settlements and communities studied the addition of plots as a way of densification processes was observed. In Kaase, it was observed that residents subdivide their farm lots and allocate to other developers. The process of subdivision continues until the whole farm is full of informal plots. How residents in both formal and informal areas of Kaase and Ahinsan Estate continue to add buildings in the limited plot spaces until almost all plot green spaces disappear is as well interesting. For a rational and intelligible person the process of building more in a limited plot space to the detriment of the green seems to hint that there may be other motives than a need for a 'feeling of a sense of satisfaction' from scents of flowers. This brings to question individual rationality with respect to environmental consciousness.

Plate 5.5 Residential Facilities Located in Public Green Space in the Kumasi Town Forest Reserve



Source: Field Survey, 2014

The consequences of the reduction and extinction of green spaces in urban Africa as well as elsewhere in the world are the emergence of ecologically split plots of land of ‘habitat islands’ which again prohibit interspecies movement causing non-replenishment of habitats and death of some weak species. In the absence of green areas most buildings will look like unorganized rocks with holes in their sides. In hot and humid areas like Kumasi, already a mostly browned area, life is intolerable. It is as well argued that in Africa south of the Sahara, the labour of women is more important in all parts of food production than the labour of men. Most women often provide the agricultural labour needed in every phase of the food cycle to guarantee the family’s nutrition. At the same time, they cannot neglect other tasks of food preparation, childcare, fetching water and fuel wood, housecleaning and looking after the small animals (Murray, 1991). Besides these tasks, women as well generate income, which is often more than half of the total household income. Thus in many ways women play an important role in the food supply of households: through their productive labour, their decisions on production, consumption and division of food and through their income, which can contribute to buy food. In the disturbed and often extinguished green spaces the above benefits offered to unemployed women to cultivate vegetables for domestic consumption and commercial purpose often disappear.

5.6 Perceptible Qualitative Changes of Vegetation at the Community Level

Gradual changes were observed across the communities studied. In most settlements, changes from bush land to grassland and grassland to bare land were as well observed in the open spaces. Findings as well showed that introduced or imported plant species were conspicuous across the settlements and communities. Imported food and non-food plants species were grown in open spaces of almost all the areas studied. Unlike in new settlements, observations showed that, in the old settlements, the imported plants species almost replaced the indigenous ones. The same was observed in old communities and residential plots.

Kuhns et al., (1996) came up with similar findings that often vegetation changes from dense and palatable thickets of plants to less dense plant species. As will be observed across the valleys and major open spaces in the settlements studied, gradual changes were often caused by human beings in the process of harvesting building materials such as reeds and thatch, and fodder for animals. In some communities green spaces were over utilized and clearance of sites for new construction often caused disturbances leading to extinctions of most plant species. The findings observed in the settlements studied as well accentuate similar findings observed by Kuhns et al., (1996) that human activities often disturb the ecosystem of flora and fauna leading, in most cases, to the presence of disturbed landscapes and subsequent loss of 'habitat island' species in a given locality. The disturbance is often in the form of 'hunting' habitat island species for, for example, food and building material.

5.7 Changing Urban Ecology

The introduction of exotic plants in most settlements and communities studied is common in most cities of developing and developed countries. In the study of cities of West African countries, Accra in Ghana and Kissidougou in Guinea, Whittaker, et al, (2001) observed similar findings that colonizing plant species were fast replacing the indigenous ones. The colonizing species were found scattered in urban green spaces. In the study of the plant kingdom in Krakatau Island, Whittaker, et al (1998) concluded that the existence of colonizing plants species often depended on the indigenous species and vice versa. However the consequences of introducing foreign

plant species in the settlements and communities studied are not clearly documented. In some areas of the settlements studied, for instance Ahinsan Estate and Ayigya, palm trees and coconut trees planted in the garden killed all the underneath growth. Observation showed that trees such as *ficus benjamina* planted near building walls caused foundation failures. As noted by Fitzgerald (2003) native green plants are mainly found in urban pockets or voids sandwiched by development. The remnant plant communities retain certain aspects of pre-settlement features, despite the fact that over time they often lose some of the facets of their original form. Invading non-native or imported species and sometimes changes of environmental conditions such as ground water levels due to surrounding development are examples of forces that cause the changes. Perhaps, in Kumasi, a careful study should be conducted before embarking on the real urban design project. This might entail, among other things, a careful selection of certain categories of plant species for particular areas.

Plate 5.6 Low Stream Flow Turning Gray in Ahinsan Estate and Ayigya



Source: Field Survey, 2014

In a study of Chicago urban areas, McPherson and Luttinger (1997) observed that imported plant species are adaptable to a wide range of local conditions and readily reproduce and grow quicker than the indigenous plants. The imported plant species, in these areas, as well often outnumber native plants. The same is observed in the settlements and communities studied in Kumasi. One of the disadvantages of imported plant species claimed by many scientists is that they pose threats to native or indigenous plant communities. In the study of Chicago city a non-native buckthorn

tree was cultivated as a popular hedge material. The tree established itself in remnant woodlands. The result was that most native plants species disappeared (McPherson and Luttinger, 1997). One of the reasons for the disappearance of native species, as observed by Fitzgerald (2003), is that some imported plant species, e.g. buckthorn tree have high nitrogen content. Nitrogen stimulates the decomposition rate of littered tree materials, which again alter soil fertility favouring high growth of most exotic species over native ones. How such side effects of imported plant species will be handled in Kumasi is not clear.

Some ecologists, however, have argued that many exotic plants do not pose threats to urban native plant communities, but can co-exist with the native varieties (Whittaker 1998). He argued that non-native plants represent a substantial, but rarely harmful, proportion of flora in urban systems. They are part of the urban biodiversity and form a unique urban flora. A good example, according to them is the trees in the urban streetscape, which are tolerant to pollution as well as compacted soils.

The processes of graduated or displacement of land vegetation cover disturbs the ecosystems of the city. Most of the species in a system have an interdependent character. Disturbing one of them may affect the existence of the other. In most cases some of the weaker species suffer a knockout effect and sometimes completely disappear (Whittaker 1998 and Fitzgerald 2003).

The introduced plant species in urban areas have a number of advantages and disadvantages on ecology of the city. They may as well harmonize a symbiotic character and coexists with the indigenous species. Some tacit competition may develop within the ecosystem. The natives are in most cases weak in such competition and disappear. In the studied areas some imported trees such as ‘*ficus benjamina*’, if planted near the buildings, often uproot the buildings and cause cracks in walls and foundations. The inhabitants in the studied areas often get food, medicine, fodder or building materials from green plants found in open spaces. They may as well get some shade and feel an expression of beauty from trees and lawns. The study concludes therefore that the disappearance of green plants and spaces, therefore, may

negatively affect the above qualities of green plants and spaces and the well-being of human.

5.8 Individual Roles and Concerns in Green Space Management

Actions of individuals ‘on and off plots’ of green plants and spaces are explored. The ‘on plot’ green spaces are spaces found in plots and fences. Spaces found along the access roads and public open spaces make up the ‘off plot’ green spaces in the study communities of Ahinsan Estate. Observations showed that ‘on plot’ plants included fruits and a few shady and ornamental trees, and a variety of vegetables, shrubs and lawns. Only few plots had shady or ornamental trees. In some plots vegetables such as, pepper, Kontomire, okro, and some cassava were grown. Shrubs were propagated for flowers and perfumes and fencing materials.

The ‘off plot’ plants were few. *Ficus benjamina* and some shady trees like Neems were found in the public open spaces. Access roads were too narrow to accommodate, inter alia, green plants.

The household heads were asked about their understanding on benefits of green spaces and predominant economic take place in the area. Of those who answered in the affirmative in all five-study areas, 42% clearly understood that the presence of urban green spaces has multiple advantages to their daily life, including environmental, economic and social benefits. They are also aware that, urban ecological systems that include among others: city forests wetlands, garden and fallow land must be retained in the city for future prospects. The most commonly recognised benefits of green areas for most of the household interviewed was agriculture (farming along wetlands 32.0%), car washing 24%, Carpentry/sawmill 18% and other activities scored 24%.

It was revealed that, environmental interventions such as tree planting programmes in Kumasi under Greening Kumasi project will make environmental sound behaviour easier. Social, environment and economic return of green spaces is more apparent and that they are more effective than public education efforts in changing attitudes towards management of green spaces.

It was also revealed that, respondent 67% are aware of and welcomed city greening programmes, and agreed that the KMA should disseminate information through as many media and events as possible; it was their view that such outlets would help to persuade public support to the development of urban green spaces in the city.

5.8.1 Supply of 'on and off plot' green plants and spaces

The interviews revealed that the residents had provided most of the 'on plot' green plants. Large amounts of seedlings for the plants were obtained from government botanical gardens scattered citywide. Some of the seedlings were purchased from private nurseries found along the roads throughout the city. Most plot green spaces were planted with shrubs, lawns and vegetables. A few here and there scattered non-food trees were as well observed.

The interviews as well showed that women usually supplied the plants. One lady had this to say:

“..I do plant and nurse the trees myself. Look here I got these banana trees from my friend. Yeah my daughter as well likes flowers, she often plants them. She normally waters the plants, now she is schooling. We plant various flowers which give out nice scent during the evening.”

Most ladies residing in other plots were observably doing planting activities. The interviews revealed that across the communities men sometimes played the role of advising where to get plants and which category to plant around their buildings. At one moment when one lady was asked whether her husband planted trees and lawns she said: “... No, but he sometimes gives advice on which plants and where to plant them. He also buys the seedlings.” This statement was about the family in which the woman belonged. But it is close to what was echoed by a man-respondent during the interviews: “I brought these flowers from Aburi. My wife looks after them. She likes flowers.

The government provided the green spaces for 'off plot' plants along the access roads and in public open spaces. The observations however showed that most green spaces reserved along the access roads were non-existent. Building development encroached them. A few single trees servicing as shade or ornamental purposes were seen.

Individuals planted them. Other plants, particularly, grasses were limited to small portions of these open spaces, otherwise a considerable large part of such spaces were bare.

5.8.2 Use of ‘on and off plot’ plants and green spaces

The ‘on plot’ green plants were used for various purposes. Most plants were used either for food or medicine/health supplementation, shade or aesthetic/ornamental or as ‘building’ materials. A few households, in some occasions, as well used trees found in their plots for energy in the form of wood fuel.

Interviews revealed that vegetables and fruit trees were used for food supplementation. Other non-food trees such as neems, together with vegetables were used for supplementing medicine. Semi processed leaves, barks and roots of trees and shrubs were consumed as medicine. One of the respondents was growing few plants. While going around the plot she had this to say: “...here are some flowers. We mix them with soup and use them as flavour. We also use them as medicine. This is ‘shure’ you know them? We use them as vegetables and flavours.”

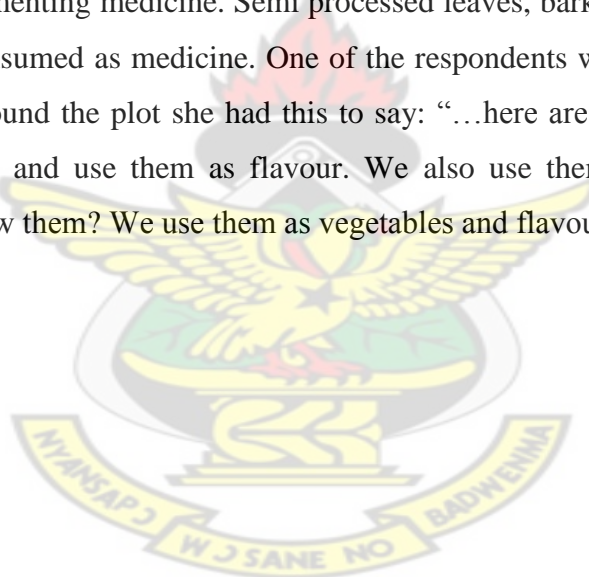


Plate 5.7 Neem tree leaves for Medicinal use in a Household at Dakwadwom, Kumasi



Source: Field Survey, 2014

Interviews revealed that most of the ‘on plot’ green spaces in most plots were used for small-scale cultivations. Vegetables, fruit trees such as coconuts, bananas, mangos and cashew nuts, shrubs such as flowers and other plants were being raised in these spaces. Apart from cultivation, some of the ‘on plot’ open spaces, in most plots, were used for passive recreation when meeting a friend, talking and resting. On few occasions, ritual, family and burial ceremonies were being performed in some plots. Other activities, mostly done by women, included hair plating. The observations showed that development encroached most of the ‘on plot’ green spaces. To avoid sandy dust most plots had their green surfaces concreted.

**Plate 5:8 Community Members Participating in Green Space Management
Meeting Friends in Public Space**



Source: Field Survey, 2014

Unlike the ‘on plot’, only few of the ‘off plot’ plants were used for either food or building materials. Thus it seems as if ‘off plot’ plants belong to the commons. They are for all residents. Interviews revealed that the ‘off plot’ green spaces were used for recreation, transit, socialization and economic purposes. Recreation activities included active (playing and doing physical exercises) and passive ones such as dozing, plating and talking (Plate 7.4).

5.8.3 Care of ‘on and off plot’ plants

The residents, across the study communities seemed to take care of the ‘on plot’ plants. During interviews it was revealed that activities such as planting, manuring, watering, pruning and weeding were done in most plots. The ‘off plot’ plants were observably scarce or few as compared to the sizes of spaces. The caring activity was practically non-existent. Across the study communities water was said to be scarce and sporadic. It was observed that most of the plants along streets and on public open spaces were properly not cared for.

Care of public open spaces was pronounced in communities such as Santaase and Dakwadwom more than Kaase and the others. Caring activities included planting of trees and safeguarding them from internal and external space invasions.

Generally the observation showed that across the communities, in almost all public open spaces basic facilities for active and passive recreation such as sitting benches were lacking. Most of the areas of spaces were bare. Where green was present it was littered by domestic solid wastes. Interviews revealed that most residents were against dumping wastes in the spaces. However, some of the residents threw the wastes during the night.

5.9 SWOT Analysis for Urban Green Spaces Management in Kumasi

In this framework the internal and external environments of the city are assessed in the context of how they will contribute to, or hinder, green space development and management. This is based on information gathered from field survey in the Kumasi Metropolis. Strengths and Weaknesses refer to the internal characteristics of KMA, especially (a) its key institutions, public, private and third sector, (b) economic factors and endowments in the city, and (c) the status of its physical environment. Opportunities and Threats refer to the external environment, which will include economic, technological, political, and social trends, cycles and shocks. The SWOT analysis for the prospects and challenges in management of green spaces in the Kumasi Metropolis is shown in table 5.1

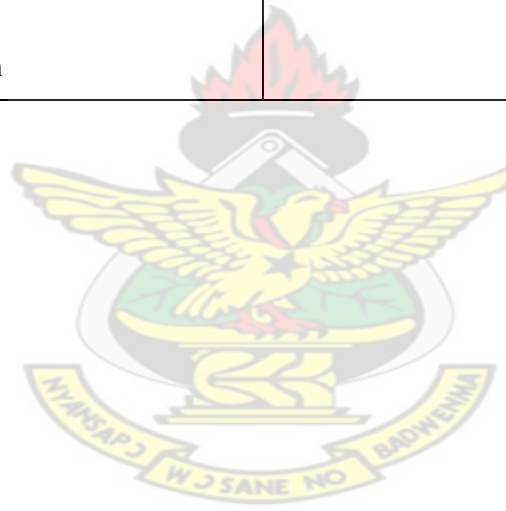
Table 5.1 The SWOT Analysis for the Management of Green Spaces in the Kumasi Metropolis

| Strengths | Weaknesses |
|---|--|
| <p>1. Natural resources:</p> <ul style="list-style-type: none"> - Richness and diversity of the natural resources - Spatial diversity and biodiversity <p>2. Human resources- skilled labour in the tourism sector</p> <p>3. Economic resources:</p> <ul style="list-style-type: none"> - Possibility of development of agriculture, trade and enterprise in the service of tourism - Increase in the number of tourist agencies <p>4. Existence of the basic infrastructure network (roads, water pipes etc.)</p> <p>5. Tourist, sport and recreational potential:</p> <ul style="list-style-type: none"> - Potential for the development of the different categories of the tourism (hunting, fishing, recreational tourism, rural, thematic tourism, etc.) - A great number of hotels, accommodation facilities and host services <p>6. Cultural facilities:</p> <ul style="list-style-type: none"> - Great number of important cultural facilities and monuments <p>7. Tradition and historical heritage</p> <ul style="list-style-type: none"> - Natural and cultural heritage - Tourist attractions (mostly Dubrovnik), historical buildings | <ul style="list-style-type: none"> - Community densification and increasing pressure for spatial development - Ineffective coordination between the private and the public sector. - Inadequate local managerial capacity of green space. - Undeveloped open space and recreational potentials. - Low resource mobilization for the development of green spaces - Low education and sensitization of green spaces. - Poor patronage of green spaces. - Weak collaboration between relevant stakeholders in urban green space management - Poor enforcement of existing green space laws. - Poor enforcement of existing laws on pollution - Untimely release of funds to government agencies. - Lack of motivation among green space protection and management workers in works department. - Inadequate logistics for green space protection and management workers in works department - Poor Awareness and perception of green space services and |

| | |
|--|---|
| <ul style="list-style-type: none"> - Preservation of traditional values, local culture and customs - Cultural, sports and religious manifestations | <p>support</p> <ul style="list-style-type: none"> – Low investment in green space Research and Development – Irregular updating of community or block profile in key green space communities – External cost considerations – high cost of permits <p>2. A weak green entrepreneurial spirit:</p> <ul style="list-style-type: none"> - Inefficient environmental protection NGOs (pollution of the water sources, waste management) - An insufficient number of green categorized enterprises <p>5. Problems of water supply and drainage</p> <p>6. Bush fires caused by high temperatures</p> |
| <p>Opportunities</p> <p>Geo-economic and Geo-strategic advantage-</p> <ul style="list-style-type: none"> - A national business hub - Innovation and emerging knowledge intensive, less space demanding industries - Existence of institutional mechanisms for networking and collaboration - A good geographical and geo political position | <p>Threats</p> <p>1. Artificial disasters:</p> <ul style="list-style-type: none"> - There is rapid urbanization and high population growth and hefty market potentials in Kumasi Metropolis. Increasing Demand for socio and economic infrastructures - Sluggish real estate as well leading to increasing informal settlements - Weak property title system and Monitoring of development |

| | |
|---|---|
| <ul style="list-style-type: none"> - Active private sector exists, particularly the Ghana Real Estate developers association, accounting for 80% of total housing delivery. - An expanding and stable economy - A commitment to sustainable development - Existence of periodic political push factors to initiate visible spatial development - Existence of mechanisms for cooperation with other stakeholders in green space management <p>5. Favourable Mediterranean climatic condition</p> | <p>activities.</p> <ul style="list-style-type: none"> - The Government has poor management of its lands and others. - A difficulty of land ownership and its transfer exist, and brings to focus the problems of assets' perfection for security. |
|---|---|

Source: Field Data, 2014



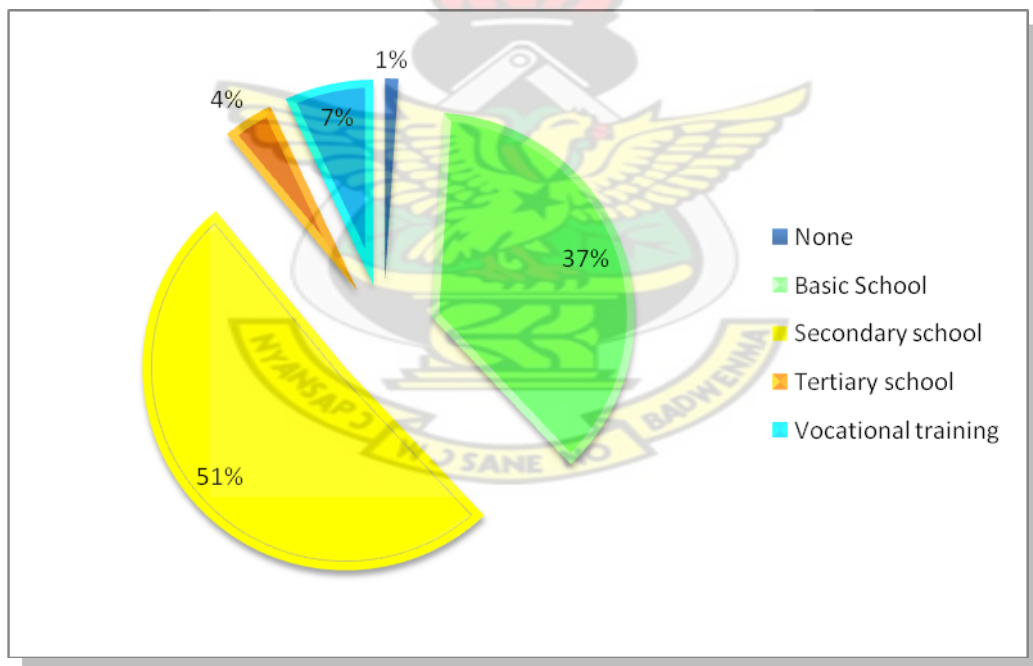
5.10 Characteristics of the Household Environment of Survey Participants

A household, in this study is taken to be all individuals, related or unrelated, who share the same dwelling and the same source of income. The demographic and socio economic data of the participants is critical because it enables us to know about the participants who took part in the study as they provide some basic and personal information about themselves. This is necessary in explaining some variables usually associated with inhabitants of Green spaces.

5.10.1 Educational Level of Respondents

With regard to education, the highest education attainment by household heads as presented in figure 5.2 indicates that the majority (51%) of household heads had attained secondary school education while basic, tertiary and vocational education were 37%, 4% and 7% respectively.

Figure 5.2 Highest Educational Attainments of Households



Source: Field Survey, 2014.

5.10.2 Income Level of Household

The study described the income status in the sub-catchment by matching the monthly income ranges with observed household size (Table 5.2). As indicated by Cornish, et al, 2001 it always happen that, some households with low income conduct their

livelihood activities such as urban agriculture, pastures and fuel wood collection in the protected green zone. The income of the participants was estimated from their daily expenditure and grouped into four income groups as shown in Table 5.2. However, 14(4%) respondents refused to give details of their income and expenditure.

Table 5.2: Average Monthly Income of Households (GH¢)

| Income Range (GH¢) | Name of Community | | | | | | | | | | Total | |
|--------------------------|-------------------|-----|-------|-----|---------|-----|--------|-----|----------|-----|-------|-----|
| | Ahinsan Estate | | Kaase | | Santasi | | Ayigya | | Adiembra | | | |
| | No | % | No | % | No. | % | No. | % | No. | % | No. | % |
| Less than 200 | 34 | 41 | 37 | 39 | 9 | 23 | 17 | 16 | 3 | 25 | 100 | 30 |
| 200-299 | 23 | 28 | 22 | 23 | 7 | 18 | 22 | 21 | 4 | 33 | 78 | 23 |
| 300-399 | 14 | 17 | 19 | 20 | 11 | 28 | 31 | 30 | 3 | 25 | 68 | 23 |
| 400 - 1,000 | 16 | 14 | 20 | 18 | 15 | 31 | 35 | 33 | 8 | 17 | 80 | 38 |
| Total | 87 | 100 | 98 | 100 | 42 | 100 | 105 | 100 | 14 | 100 | 336 | 100 |

Source: Field Survey, 2014

The highest income-earning household in the study area amounted to (GH¢) 1,000. These are households employed in the public sector or commercial activities including retail and wholesale activities. The mean monthly income of the households interviewed was range between 300 GH¢ to 1,000 GH¢. These households also demonstrated a low propensity to save for housing development or commercial activities that would take up green spaces in the metropolis. However, these households largely depended on Urban Green Spaces in the form of urban agriculture and fuel wood resource extraction.

5.10.3 Sources of Energy Used in Study Area

Across the study area, it was noticed that the source of energy used was mainly depend on availability, affordability accessibility. Within the Kumasi metropolis, sometimes households use variety of sources of energy and light such as, fuel wood, charcoal, paraffin, PV solar home systems, grid electricity, touch lights and other biomass residue. Plates 5.1 and is an example of energy forms used in the study area.

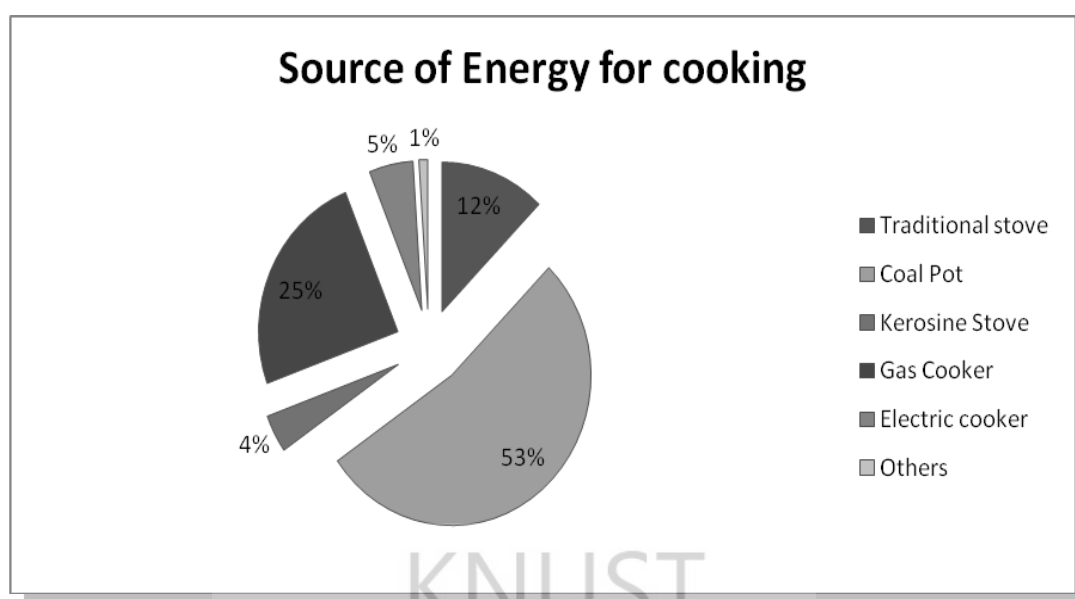
Plate 5.9: Fuelwood Collected from Eucalytus Trees at Kaase



Source: Source: Field Survey, 2014

Energy access is also differentiated based on income levels. It was noted in the study that, respondents with lower income ranging from 200 GH¢ to 300 GH¢ (53%) tend to rely on firewood extracted from green spaces as the main source of energy, particularly in Ayigya, Kaase, and Ahinsan Estate. While income levels determine more of the amount of energy consumed, the form of energy used was mostly determined by availability, both for lighting and for cooking. Further, it was revealed that, despite the observable transit to more modern forms of energy about 25% of the households still stick to the traditional stoves, 12% used kerosene, 5% and 1% used the improved coal pot, and Gas cooker respectively, while 4% use electric cooker. Figure 5.3 illustrates the household distribution of energy used for lighting and the major cooking appliance used.

Figure 5.3: Source Energy for Cooking in the Study Area



Source: Source: Field Survey, 2014

It was also revealed that, about 64% of the respondents prefer to use fuel wood, 30% prefer to use charcoal and the remaining 6% prefer other sources (electricity, paraffin, Solar) for household cooking. For household lighting, about 20% prefer solar energy, 60% prefer the use of paraffin, and 20% prefer electricity.

Plate 5.10 PV Solar Home System Mounted on Rooftop at Ahinsan Estate



Source: Field Survey, 2014

CHAPTER SIX

SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSION

6.1 Challenges Going Forward and Operational Prospects

This chapter summarizes the analyses above and synthesizes the results into key concerns on green plants and spaces, extensive outlooks, likelihoods and probabilities. The results are summed up, re-interpreted and compared. With the primary aim of contributing to the working knowledge in urban green space management, the study set forth with the specific objectives which have been depicted in the previous chapters.

6.2 Institutional Capacity Building and Collaborations in Green Space Management

A sustainable and liveable city, as observed above requires well-functioning legal and policy frameworks. Within the context of existing legal and policy framework for managing green space, some of the key challenges observed in the study are given as follows:

6.2.1 Untapped Potentials within Connectivity and Knowledge Sharing

Communication is a rare issue of concern or where it is, it is of a lesser priority in the context of greening cities. In this study however, one of the critical issues worth addressing is human resource development. The staff strength of the Assembly as at the end of April, 2013 totaled 1,508. Interviews showed that it is the interim plan of KMA to motivate its staff in various ways to “bring out the best in them to enable them give of their best in service to the communities with commitment and dedication”.

It is necessary also to fill the essential communication gap observed to exist between close stakeholders including the Department for Parks and Gardens, the Environmental Protection Agency, the Works Department and others. In the field survey there seemed to exist a virtual disjoint in the extent to which information flows among these key stakeholders.

6.2.2 Why Chieftaincy still Matter in Urban Green Development

Interviews and observations show that the traditional authority is beset with some problems, including, as already stated, indeterminate boundaries of customary lands, poor records or no record keeping, which sometimes results in the allocation of the same parcel of land to more than one person, registering at Deeds Registry and at Land Title Registry of the same document by different people, agricultural tenancies based on oral agreement, different tenurial arrangements at different parts of the country, depending on the Traditional area, chieftaincy / land disputes between two Traditional Overlords, claims and counter claims over disputed land due to lack of proper maps and plans of scientific accuracy and the disappearance of natural features marking the boundaries leading to lack of security of tenure. A case in point is the demolition of Adehyeman gardens (Box 6.1).

In 2012, the head of the Kwaku Krah Family of Ahenkro instituted an action against the KMA claiming ownership of the parcel of land in contention and sought an order of perpetual injunction to restrain the KMA from interfering with the land. The assembly entered appearance and filed a statement of Defense.

The plaintiff further filed a motion for an order for interlocutory injunction against the assembly and again filed an opposition to the application of KMA. The KMA provided evidence to back its claim that the KMA had legitimately possessed the land for over half a century.

The High Court presided over by Justice Eric Baah on the 22nd day of June, 2012 dismissed the application of the Head of the Kwaku Krah family and ruled that the Assembly had the legitimate right to possess the said parcel of land.....

Source: Field Interviews with KMA Official, 2014

The nature, role and rules governing chieftaincy are therefore determinable by reference to customary law. Article 267 (1) also provides that “All stool lands in Ghana shall be vested in the appropriate stool on behalf of and in trust for the subjects of the stool in accordance with customary law and usage”. Customary lands support the livelihoods of the majority of the population and therefore the sustainable management of such lands is critical to the socio-economic development of the

country. Therefore Traditional Rulers (Chiefs) who hold those lands in trust for their subjects are important stakeholders in customary land administration and could play a key role in complimenting KMA's efforts in the sustainability of the city.

In Kumasi, this has become an especially important source of chiefly power, family wealth, cultural leadership and it is also highly significant in peri-urban and commercial farming areas. The evidence of these reflects the increasing interruptions of spatial development within the Kumasi Metropolis as confirmed in this study. Strategic efforts are what it would take on the part of administrative authorities to resolve these conflicting needs between traditional authority and sustainable city proponents.

6.2.3 Participatory Learning in Green Space Management

Across the communities it was revealed that different actors were involved in managing the 'off plot' green spaces. The actors originated from different parts of the country and the city itself, before settling in the communities of Ahinsan Estate and Kaase. Low- and middle-income groups migrated to both studied communities of Ahinsan Estate and Kaase. With the exception of Ayigyia, in almost all the rest of the communities, some actors, particularly residents, seemed to have co-operated in solving the ad hoc environmental problems whenever they occurred. In Ahinsan Estate, where government, had strong footing, co-operation in, among others, safeguarding the green spaces from development encroachment was almost non-existent.

Across the communities of Ahinsan Estate and Kaase most residents seem to have come from different parts of the country. They have different traditions, cultures, ethnicities and gender or sexuality. Social networks and relations were seen to be bonded by insecurity of land ownership. Tied up with the findings from Ahinsan Estate and Kaase it was observed that the loose networks, exhibit low degrees of formalization but they constitute organized activities. Some social scientists agree that in such networks lies an important source of 'social capital'. Sometimes the networks may remain dormant, as a latent organizational resource to be activated and mobilized in times of need. Or they may be operative continuously, as a permanent feature of the social life of its members.

6.3 Prospects and Challenges for Sustainable Paradigms

This sub section presents the challenges as well as prospects observed in this study. These cut across, household roles, community capacities and capabilities as well as livelihood strategies that could be leveraged upon or harmonised for the development of a sustainable city.

6.3.1 Households in Plot Management

The interviews revealed that across the studied communities individuals often supplied the 'on plot' green plants. Plant seedlings were either obtained from neighbors, government nurseries or purchased from individuals. This finding accentuates the understanding that in urban settings individuals tend to react to the unsatisfactory states of affairs involving decisions to take matters into their own hands so as to solve problems identified in their locality. This involves allocation of their own resources, be it in time, labor or funds so as to bring about the desired changes. This study has also noted that in Kumasi, as elsewhere, plants are beneficial either for food, medicine, shade or energy purposes. The above benefits of plants highlights the notion of motive as noted by Olson (1995) that individuals tend to act the way they act so as to meet certain demand. It was also observed that in Kumasi such individual initiatives to improve their living environment have a spillover effect that induces different actors, including NGO's, to focus attention on alleviating existing problems. The individual initiatives also induce other individuals to join such actions in participation, among other things, leading to collective actions in solving the environmental problems.

6.3.2 Green Consciousness of Local Community and Local Authority

The care of 'on plot' green plants was observed in most studied communities of Ahinsan Estate and Kaase. Despite the inadequacy of water supply, most individuals kept pruning and added fertilizer to them. Where more plants were needed in plots replenishment through planting more was observed in almost all the communities. The observations done during the fieldwork however showed that particularly 'off plot' spaces were not that much cared for as mentioned during the interviews.

The moves of individuals towards caring for their plants and spaces are in congruent with the notion of a motive. Olson (1995) argues that motives, drives or incentives make somebody perform certain action. The benefits the green plants and spaces

offered to the residents are incentives. The low level of caring for the 'off plot' or public green spaces coincides with observations noted by North (1998:135) who argues that incentives were the underlying determinants of performance. It can be economic, political or social. They vary from time to time, place-to-place and individual-to-individual. The incentives are being measured in various forms of individual or individuals' gains from doing or not doing a certain action. In many circumstances incentives are measured using costs and benefits.

6.3.3 Shadow Participation in City Planning

One of the subtle realities that this study sought to brighten is the common need to build synergistic alliances toward ensuring that urbanization takes into account growing negative externalities in space; how to build sustainable cities. Wheeler (2004) defines sustainable urban development as "development that encompasses compact, efficient land use; less automobile use, yet better access; efficient resource use; less pollution and waste; the restoration of natural systems; good housing and living environments; a healthy social ecology; a sustainable economy; community participation and involvement; and preservation of local culture and wisdom.

This study confirmed that community involvement in the planning process and continuous learning is one of the indispensable ingredients in the cooking pot of sustainable cities. City planners cannot act alone in the bid for sustainable cities. Development inspectors may have adequate capacity but without adequate cooperation from households, their efforts end fruitless. It was deduced that owing largely to the interplay of local politics and local governance structures in most jurisdictions, sustainable planning measures must be widely supported before they can affect institutions and regions. Actual implementation, especially of greening projects in the city, is often a complex compromise. This brings to light the Collaborative Strategic Goal Oriented Programming (CoSGOP) approach in greening the Kumasi Metropolis.

6.3.4 Increasing Urban Browning

The study also discerned that despite the observation that plants and green spaces offered a number of tangible and intangible benefits to the residents across the studied communities most residents were observably felling down trees and shrubs, extending their buildings in the plots and around them, replacing soft surfaces with concretes

and changing plant fences into solid block work walls. The reasons behind such actions ranged from a mere felt need of shelter, economic (livelihood and money), environmental (dust control, harvesting plants for energy fuel and building materials etc) and social security from burglary. Studying the informal areas in the city of Accra, Ghana, Bartone, (1994) similarly noted that residents developed their plots to the extent that the adjacent public open spaces were encroached. This is also the case in public spaces in communities of Ahinsan Estate, in Kumasi.

It is also perceived through this study that the action of substituting plant materials with, for example, concrete in private plots depend on the individual preference and choices of doing or not doing such actions. The building extensions, replacing plot fences with solid walls and soft surfaces with concretes often disturb and extinguish green plants and spaces. The reasons of extinction of the green spaces accentuate the theory of motivation or hierarchy of needs. The theory of motivation is based on the notion that all human needs have primary needs. These needs have to be met first before embarking on the secondary needs that are situated at a higher level.

6.3.5 Green Inhibiting Livelihood Strategies

The study also gathers that livelihood strategies in Kumasi, range from small scale to large-scale productivities. Included in small-scale production are livelihood activities such as food selling (pastries, ice creams, fruits, etc) and urban agriculture where vegetables such as amaranth are grown. Large-scale livelihood includes building of rental houses and urban farming in which poultry and animal husbandry such as cow keeping and pigsty are practiced. Most notably, urban agriculture is being practiced in green spaces and in residential plots by mainly low-income level residents and to a small extent high-income level.

6.3.6 Changing Household Types and Urban Densification

One rationale provided for increasing higher density housing is that there is an imbalance in the market and that apartments are needed to provide a greater mix of housing. The Metropolitan Strategy states that “many are expected to be living alone or in small households and this will lead to greater demand for smaller housing with good access to shops, transport and services such as health”. It was clear that there is an assumed greater demand for smaller households based on increasing number of people living alone. What is still obscure in KMA’s approach is that the proliferation

of apartments does not necessarily address all the needs within the housing market. For example, the development of one and two-bedroom apartments does not meet the needs of families with children, and is therefore not socially sustainable.

6.4 Recommendations

The above mentioned findings provided a sound ground to offer the following recommendations taking into consideration the institutional and environmental framework for effective and efficient implementation. Apart from providing policy interventions for sustainable and liveable green cities, the study also ends by suggesting other possible areas for further study. The study recommendations are as follows:

6.4.1 Piloting of Plot Greening at the Community Level

Having identified and interpreted the significance of household involvement in green space management, this study recommends that it would be extremely beneficial for the Department of Parks and Gardens to begin to shift attention to household partnerships to facilitate the generation of on-plot green spaces in Kumasi. KMA is currently embarking on a project to halt all unauthorized developments and collaborate with key stakeholders to undertake a special “Greening Kumasi” project aimed at planting about One Million trees by 2017.

However, learning from the experience of past programmes, it is worth pointing out that tree planting is not the end of the greening process. There has to be a management that cares. Given the inauspicious monitoring capacity of the environment institutions and resource constraints of the Assembly, it would be good to bring households into the “greening Kumasi” project and give them a role to play. One promising way to do this is to begin a plot-tree-planting. This could be piloted sub-metro by sub-metro and the results taken into consideration for improvement.

6.4.2 Promoting Environmental Consciousness in Energy Use

The study recommends that the various sub-metros should collaboratively design and implement integrated environmental consciousness-raising programme that would filter down the concept of environmental sustainability to the household level. This would include raising the household knowledge and awareness in environmental

externalities of special development and enhancing community alertness and willingness to undertake proactive measures that promote environmental sustainability. The study perceived that environmental consciousness could play a crucial role in the global outcry for sustainable cities. This would however require a sustainable political commitment to promote environmental sustainability at the local, provincial and national levels.

6.4.3 Collaborative Strategic Goal Oriented Programming (CoSGOP)

Collaborative Strategic Goal Oriented Programming (CoSGOP) is a collaborative and communicative way of strategic programming, decision-making, implementation, and monitoring oriented towards defined and specific goals. It is based on sound analysis of available information, emphasizes stakeholder participation, works to create awareness among actors, and is oriented towards managing development processes.

CoSGOP provides a framework for communication and joint decision-making, in a structured process characterized by feedback loops. It also facilitates stakeholder learning. The essential elements of CoSGOP are analysis of stakeholders (identifying stakeholders' perceptions of problems, interests, and expectations); analysis of problems and potentials (including, those perceived by stakeholders); development of goals, setting priorities and alternatives (requiring intensive communication and active stakeholder participation); specification of an improvement programme and its main activities (based on priorities defined with the stakeholders); assessment of possible impacts of the improvement programme; definition and detailed specification of key projects and their implementation; continuous monitoring of improvement activities, feedback, and adjustment of the programme (including technical and economic information and perceptions of stakeholders). CoSGOP would for instance have been a very essential tool in the disputed Nhyieso development project.

6.4.4 The Eco-Schools Experience

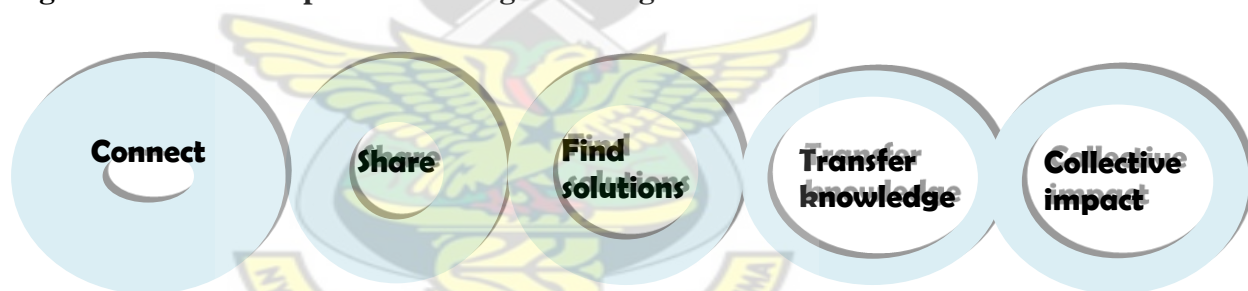
It is again not just enough to end with households. The study perceived that drawing from the Eco-Schools experience would be useful for sustainable city Planning. The Eco-schools programme is an international programme for environmental and sustainability education, management and certification. Eco-schools provide an ideal

way to implement local agenda 21 in the school and the neighbouring community. The concept of eco-school derives from the notion of putting the environment at the centre of learning in the school. This entails ensuring that environmental concerns form part of the curriculum and the day-day running of the school. This may also require taking environmental issues from the curriculum and applying them to the day-day running of the school. The school serves as the entry point for Eco-schools related activities. As schools are integrated within a community, there are interactions between school and community, and these should be promoted and supported.

6.4.5 Partnership in Knowledge Building

Knowledge building creates the foundation for informed action. Clean development international (CDI) is a non-governmental organization committed to generating and implementing new ideas in the sphere of environmental management. CDI's model is based on integration, sharing experiences, finding new solutions, transferring knowledge and creating collective impact (See figure 6.1)

Figure 6.1 Partnerships in Knowledge Building



Source: Adapted from CDI Development Model

Spurred by a collective sense of urgency and shared responsibility within its network, CDI provides members with a constant flow of new solutions and lessons learned for better environmental management.

6.4.6 Further Areas of Research

This study mainly focused on evaluating the socio-economic and environmental challenges as well as prospects of green space development in Kumasi for the purpose of sustainable city planning. For the purpose of comparison, this study could be replicated in a different city or on a larger geographic area with different philosophical framework, data collection methods or different analytical tools. Other potential areas of research include:

- A Comparative evaluation of the impacts of private verses public management of green spaces in Cities
- An integration of Private Sector in the Management of Urban Green Spaces in Growing Cities.

6.5 Conclusion

The study concludes that, environment and green areas protection, regulations and law enforcement plays crucial role in ensuring good management of green spaces in Kumasi. The study revealed that, the main factors for the poor management of green spaces experienced in the metropolis to the great extent is attitudinal. Most strategies and efforts made so far have failed to bring about significant attitudinal change and awareness to the stakeholders to enable them to know the benefits of green spaces.

It was revealed that, the attitude of stakeholders towards management of green spaces in Kumasi is not promising; the study also, found that, in managing green spaces, voluntary compliance alone cannot be the best approach in ensuring sustainability of green spaces in Kumasi. The Metropolis needs radical change in the attitude for all stakeholders towards green spaces. It is, however, recommended that the KMA engages in vigorous environmental education and enforcement of the bye-laws to make the populace responsive to the environment and green spaces in particular..

The efficient and effectiveness of the Institutions and Departments in the Metropolis which are engaged in the management of green spaces has also been undermined by various factors such as shortage of manpower, political interferences, inadequate inputs or logistics and insufficient funding that could ensure sustainability in green spaces management. Also, the lack of coordination between the various institutions, stakeholders and departments in undertaking their activities is another prohibiting factor.

There is a need for institutional capacity building and proper coordination between stakeholders which deals with the management of green spaces in the KMA. The effective coordination mechanism will play a great role in ensuring good environmental protection of green spaces structures, facilities and services. Also, the enforcement of environmental bye-laws, public education would go a long way to help the KMA achieve the programme of greening the Kumasi Metropolis.

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APPENDICES

Survey Questionnaires

**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF PLANNING**

Appendix A: QUESTIONNAIRE FOR INDIVIDUAL HOUSEHOLD HEADS

| |
|--------------------------------|
| Name of enumerator:..... |
| Date of interview:..... |
| Start time:.....End time:..... |

Introduction

The researcher is a student of Kwame Nkrumah University of Science And Technology working on urban green spaces in Kumasi. The information is required to identify the challenges and prospects of maintaining green spaces in Kumasi. Please, I assure you that any information provided would be treated with the deserving confidentiality and will be used purely for academic purpose.

| SECTION 1: Background | | |
|-----------------------|---------------------|----------|
| No. | Variable | Response |
| 1. | Name of Institution | |
| 2. | Name of respondent | |

| | | |
|----|--|---------------------------------------|
| | | |
| 3. | Sex and Age of respondent | 1= Male 2= Female, Age.....(in years) |
| 4. | Status/ position held | |
| 5. | <p>What in your view are the benefits of the following green spaces in the city:</p> <ul style="list-style-type: none"> • Forests <p>.....</p> <p>.....</p> <p>.....</p> <ul style="list-style-type: none"> • Play grounds <p>.....</p> <p>.....</p> <p>.....</p> <ul style="list-style-type: none"> • Gardens <p>.....</p> <p>.....</p> <p>.....</p> <ul style="list-style-type: none"> • Wetland <p>.....</p> <p>.....</p> <p>.....</p> <ul style="list-style-type: none"> • Fallow land <p>.....</p> <p>.....</p> <p>.....</p> | |

| | | |
|---|---|--|
| 6. Do you own the house you live in? | yes [] no [] | |
| 7. How did you get access to this land? | 1. Family inheritance [] 2. Chief [] 3. Bought from another person [] 4. Squatter [] Not applicable [] | |
| 8. For how long have you been living in the area? | Below 5years [] 5-10 years [] 10-15 years [] 15-20 years [] more than 20 years [] | |
| <p>Please rank the following options according to the criterion below: 0= no change/no influence/no contribution/nothing, 1=... 2= ... 3=... 4=... in increasing order to 5=highest increase/most influential/most contribution.</p> | | |
| 9. What do you do for a living? | 1. Trading 2. Farming 3. Artisan (e.g. car fitting/Saw milling/carpentry etc.) 4. Tie-dye manufacturing 5. Oil extracting (palm oil/palm kernel oil etc.) 6. Formal sector job 7. Nothing/unemployed/dependant Other, (Please Specify) | |
| 10. What are the predominant economic activities in this area? | 1. Agriculture (vegetables, animals, etc.) 2. Tie-dye industries 3. Hunting | |

| | | |
|---|---|--|
| | 4. Fishing 5. Car washing bays 6. Car fitting/spraying shops 7. Carpentry/sawmill 8. Trading Others (Please Specify) | |
| 11. What was the previous use of this green space to the people of this area? | | |
| 12. What is/are the current uses of this stream/green space to the people of this area? | 1. Agricultural purposes 2. Tie-dye industries 3. Waste disposal 4. Car washing bays 5. Car fitting shops 6. Carpentry 7. Water supply 8. Fishing 9. Rangeland/forage area for cows sheep and goats 10. Recreation/tourism Others, (Please Specify) | |
| 13. What are the major land use activities around the green space (100 m from water channel)? | 1. Agriculture (vegetables, animals) 2. Tie-dye industries 3. Waste disposal 4. Car washing bays 5. Car fitting shops 6. Carpentry 7. Rangeland/forage area 8. Recreation/tourism 9. Housing/construction | |

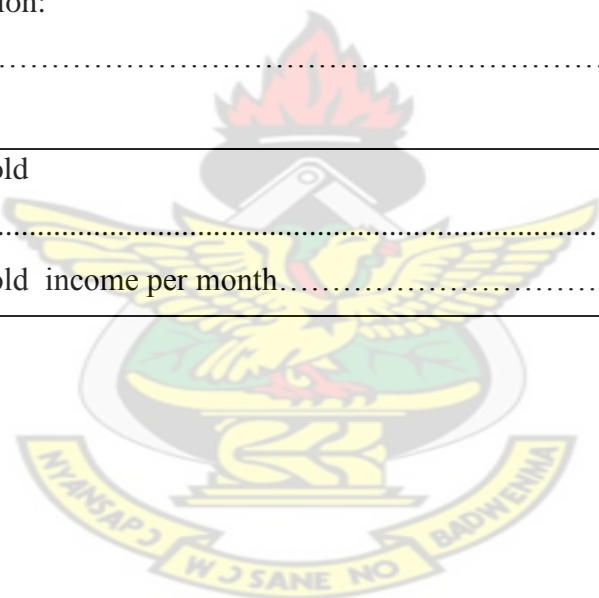
| | | |
|--|---|--|
| | 10. Others, (Please Specify) | |
| 14. What has been the effect of these activities (1.8 above) on the environment/green space? | 1. Channel width (size of the river) 2. Water depth 3. Number and type of living organisms (e.g. fish, plants animals) 4. Storm flow (amount of water in the river/channel immediately after rainfall) 5. Suitability of water for domestic/industrial purposes 6. Others (Please Specify) | |
| 15. What changes have you observed in the green space vegetation since you first settled? | 1. Plant species diversity 2. Number of woody plants (e.g. trees) 3. Number of herbaceous plants (e.g. grasses) 4. Distribution of plants 5. Density of plants 6. Plant cover 7. Loss of some species 8. Presence of new species 9. Others, (Please Specify) | |
| 16. Buildings in green space areas are major problems in Kumasi. | Strongly agree [] Agree [] Disagree [] Not sure [] | |
| 17. What are some of the effects that socio-economic activities have on | 1. Nothing 2. Causes flooding | |

| | | |
|---|---|--|
| green space areas | 3. Makes the environment dirty 4. No place to dump wastes anymore 5. Does not make the city beautiful 6. Others, (Please Specify) | |
| 18. Why do you think people build in green space areas? | 1. Green space areas are cheap 2. Close to amenities 3. Direct use of the water for domestic purposes 4. Close to family 5. Do their economic activities 6. It is “no man’s land” 7. Others, (Please Specify) | |
| 19. Have you ever been educated on the usefulness of a green space? | Yes [] no [] | |
| 20. If yes, give the name(s) of the organization(s) | | |
| 21. Has there been any attempt by an organization to move you from this site? | yes [] no [] | |
| 22. If yes, name of organization..... | | |
| 23. What will make you move out of this place? | 1. Nothing, I love it here 2. Money 3. New land/plot somewhere 4. When the water gets too much 5. When we are forced 6. I am already preparing to move 7. If I am provided alternative shelter | |

| | | |
|--|--|--|
| | 8. Others, (Please Specify) | |
| 24. Do you think the green space should be protected? | yes [] no [] | |
| 25. How are you and your community protecting this green space? | 1. We are doing nothing 2. Stop waste disposal on green space 3. Stop building too close to green space 4. Create channels for easy flow of water 5. Dredge stream 6. Build embankments along stream 7. Stop all economic activities on green space 8. Complain to authorities 9. Others, (Please Specify) | |
| 26. Have houses in this neighborhood ever been marked for demolition because of green space? | Yes [] No [] | |
| 27. Has any demolition been carried out in this area? | Yes [] No [] | |
| 28. Do you support the demolition in green spaces? | Yes [] No [] | |
| 29. Who are responsible for the management of the green spaces in Kumasi? | 1. KMA 2. Hydrological Services Department 3. Town and Country Planning Department 4. The community and Assemblyman 5. NGOs (e.g. IWMI, Friends of Rivers and Water bodies) | |

| | | |
|---|--|--|
| | 6. NADMO 7. The chief/land owners 8. Others, (Please Specify) | |
| 30. Are there any on-going management practices to protect the green space? | Yes [] No [] | |
| 31. What factors affect the implementation of green space policies and management plans? | 1. Political influence 2. Changes in government 3. Corruption 4. Poverty levels 5. Lack of political will 6. Cost of demolition 7. Cultural values 8. Other, (Please Specify) | |
| 32. Do you know any of the laws regarding building or sitting of infrastructure in green space areas? | Yes [] No [] | |
| 33. If yes what is it? | | |
| Background Information | | |
| 34. Age: | below 20yrs [] 20-30yrs [] 30-40yrs [] 40-50yrs [] 50-60yrs [] | |

| | | |
|-------------------------------------|--|--|
| | above 60yrs [] | |
| 35. Sex: | Male [] Female [] | |
| 36. Education: | Primary [] Middle School/JHS [] Secondary/SHS [] Post-secondary/Tertiary [] No formal education [] Other [] | |
| 37. Occupation: | | |
| 38. Household size:..... | | |
| 39. Household income per month..... | | |



KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF PLANNING

**Appendix B: QUESTIONNAIRE FOR THE PLANNING DEPARTMENT AND
THE TOWN AND COUNTRY PLANNING DEPARTMENT IN KUMASI**

Introduction

The researcher is a student of the Kwame Nkrumah University of Science and Technology working on urban green spaces in Kumasi. The information is required to identify the challenges and prospects of maintaining green spaces in Kumasi. Please, I assure you that any information provided would be treated with the deserving confidentiality and will be used purely for academic purpose.

Name of enumerator:.....
Date of interview:.....
Start time:.....End time:.....

| SECTION 1: Background | | |
|-----------------------|---|-------------------|
| No. | Variable | Response |
| 1.1 | Name of Institution | |
| 1.2 | Name of respondent | |
| 1.3 | Sex of respondent | 1= Male 2= Female |
| 1.4 | Status/ position held | |
| 1.5 | What are the roles or responsibilities of your institution in the planning and management of green spaces in the Kumasi metropolis? | |

Section II: General Perception of Green Space Management

2. In your opinion; what has been the overall change in the state of the green space?

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.....

KNUST

3. What are the tasks of inspectors/ officers-in- charge of developments on green space areas?

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4. How often do developers who flout the regulations come to your notice?

.....

.....

.....

.....

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| | | |
|--|-------|--|
| <p>.....</p> <p>.....</p> | | |
| <p>5. What punitive measures are there for such offenders?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> | | |
| <p>.....</p> <p>.....</p> <p>.....</p> | | |
| <p>5. Are these punitive measures effective?</p> | | |
| a. Yes | b. No | |

Section III. Institutional Linkages in Green Space Management

| | |
|---|-----|
| <p>6. Which of these departments/agencies does your department relate with in the performance of its duties?</p> <p>✓ Please Check (✓) in the right box</p> | (✓) |
| a. The Survey Department | |
| b. The Kumasi Metropolitan Assembly | |
| c. The Environmental Protection Agency | |
| d. The Lands Commission | |
| e. The Traditional Authorities | |
| f. Department Of Parks And Gardens | |
| g. The Lands Title Registry | |
| h. The Town and Country Planning Department | |

| |
|-------------------------------------|
| i. Any other..... |
| 7. How do you relate with the: |
| a. Survey Department? |
| |
| |
| |
| |
| b. The Kumasi Metropolitan Assembly |
| |
| |
|c |
| . Environmental Protection Agency |
| |
|d |
| . Lands Commission |
| |
|e |
| . Traditional Authorities |
| f. Department Of Parks And Gardens |
| |
| |
| ...g. Land Title Registry |
| |
| |

| | | | |
|---|---|-------|--|
| 8. How frequent does the department coordinate with the other land agencies | a. Monthly b. Quarterly c. Half yearly d. Annually e. As and when the need arises | | |
| 9. Are there any reasons attributable to the above situation | | | |
| | | | |
| 10. How do you coordinate with these other institutions? (seminars, stakeholder meetings, workshops etc.) | | | |
| 11. Does the nature and frequency of interaction with the other land institutions enhance effective operation of the green spaces? | a. Yes | b. No | |
| | | | |

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|--|---|---|---|---|---|---|---|---|---|----|--|
| 12. What recommendations would you offer for improvement in operations? | | | | | | | | | | | |
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| | | | | | | | | | | | |
| 13. How do you grade (1-10) the current spatial development of Kumasi? (one being lowest and 10 being highest) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 14. How would you rank the management of green space facilities in KMA in terms of: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| • Security | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| • Road connectivity | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| • Electricity | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| • Seating | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| • Cleanliness | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 15. What reasons would you give to the above grading? | | | | | | | | | | | |
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| 16. How do you think the situation could be improved? | | | | | | | | | | | |
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I sincerely appreciate your time spent to provide me with this useful information.

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF PLANNING

**Appendix C: QUESTIONNAIRE TO NGO's AND OTHER
GOVERNMENT AGENCIES IN KUMASI**

Introduction

The researcher is a student of the Kwame Nkrumah University of Science and Technology working on urban green spaces in Kumasi. The information is required to identify the challenges and prospects of maintaining green spaces in Kumasi. Please, I assure you that any information provided would be treated with the deserving confidentiality and will be used purely for academic purpose.

Name of enumerator:.....
Date of interview:.....
Start time:.....End time:.....

| SECTION 1: Background | | |
|-----------------------|---|----------------------------------|
| No. | Variable | Response |
| 1.1 | Name of Institution | |
| 1.2 | Name of respondent | |
| 1.3 | Sex of respondent | 1= Male 2= Female |
| 1.4 | Status/ position held | |
| 1.5 | What are the roles or responsibilities of your institution in the planning and management of green spaces in the Kumasi metropolis? | |

Section II Institutional Capacity and Capabilities

| |
|---|
| <p>2. In your opinion, what has been the overall change in the state of the green space?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> |
| <p>.....</p> <p>.....</p> |
| <p>.....</p> |
| <p>.....</p> |
| <p>3. What are the tasks of inspectors/ officers-in- charge of developments on green space areas?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> |
| <p>.....</p> <p>.....</p> |
| <p>.....</p> |
| <p>.....</p> |
| <p>4. How often do developers who flout the regulations come to your notice?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> |
| <p>.....</p> <p>.....</p> |
| <p>.....</p> |
| <p>.....</p> |
| <p>5. What punitive measures are there for such offenders?</p> |

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|---|
| <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> |
| <p>.....</p> <p>.....</p> <p>.....</p> |
| <p>.....</p> |
| <p>6. Are these punitive measures effective?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> |
| <p>.....</p> <p>.....</p> <p>.....</p> |
| <p>.....</p> |
| <p>7. How can the effectiveness be improved?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> |
| <p>.....</p> |
| <p>.....</p> |
| <p>8. Are prospective (building) developers aware of these regulations/rules?</p> <p>.....</p> <p>.....</p> |

| | |
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| <p>.....</p> <p>.....</p> | |
| <p>.....</p> <p>.....</p> | |
| | |
| | |
| <p>9. How often does your outfit organize educative seminars for people living on green spaces?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> | |
| <p>.....</p> <p>.....</p> <p>.....</p> | |
| | |
| | |
| <p>10. What medium do you use for such educative forum?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> | |
| <p>.....</p> <p>.....</p> | |
| | |
| | |
| <p>11. Are there any risks/dangers your inspectors/ officers face in visiting development sites in green space (e.g. from land guards, mob attack, etc)?</p> <p>.....</p> <p>.....</p> | |

| |
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| <p>.....</p> <p>.....</p> |
| <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> |
| <p>.....</p> |
| <p>.....</p> |
| <p>12. Under what circumstances are buildings on green spaces pulled down?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> |
| <p>.....</p> <p>.....</p> <p>.....</p> |
| <p>.....</p> |
| <p>13. Are there maps/demarcations showing green space areas?</p> <p>.....</p> <p>.....</p> |
| <p>.....</p> <p>.....</p> |
| <p>.....</p> |
| <p>14. What major constraints affect the implementation of green spaces management plan?</p> <p>.....</p> <p>.....</p> |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|----|
| <p>.....</p> <p>.....</p> | | | | | | | | | | |
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| | | | | | | | | | | |
| <p>15. How do non-economic variables other than per capita income, such as the features of the political system, and some cultural values, affect the implementation of green space policies and management plan?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> | | | | | | | | | | |
| <p>.....</p> <p>.....</p> | | | | | | | | | | |
| | | | | | | | | | | |
| <p>16. What are your resource mobilization strategies?</p> <p>.....</p> <p>.....</p> | | | | | | | | | | |
| <p>17. What are your areas of operation and interest?</p> <p>.....</p> <p>.....</p> | | | | | | | | | | |
| 18. How can you rank your internal capacity in terms of finance, human resource and logistics? | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

I sincerely appreciate your time spent to provide me with this useful information.