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UNIVERSITY OF NAIROBI

SCHOOL OF BUILT ENVIRONMENT

**A thesis submitted in partial fulfillment of the requirements for the degree
of Masters of Arts in Urban and Regional Planning**

**URBAN CELEBRATIONS-GREENWAY NETWORK FOR
LIVABLE AND SUSTAINABLE CITIES:
Case of Nairobi Central Business District**

By

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I would have our ordinary dwelling houses built to last, and built to be lovely; as rich and full of pleasantness as may be, within and without; with such differences as might suit and express each man's character and occupation."

"When we build, let us think that we build forever. Let it not be for present delight or for our use alone. Let it be such work as our descendants will look upon with praise and thanksgiving in their hearts."

By Ruskin, John

DECLARATION

This thesis is my original work and has not been presented for a degree in any other university. No part of this thesis may be reproduced without the prior written permission of the author and/or the University of Nairobi.

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This thesis has been submitted for examination with my approval as a University Supervisor.

Name of Supervisor: **Prof. GEORGE N. NJUGUNA, Ph.D.**

Signature.....Date.....

DEDICATION

To Mumbi and Marwa

ACKNOWLEDGEMENT

I am obliged to express my gratitude to the Almighty God for granting me this opportunity to pursue a master's degree in Urban and regional planning. Further I am equally indebted to Dr. B. Mugwima and the late Dr. F. Mburu who introduced me to the field of urban and regional planning.

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ABSTRACT

There has been an explosive growth of urban areas that has brought fundamental changes, not only to the physical landscape, but also to people's perceptions of land and environment. Greenways, because of their key characteristics such as spatial configuration and multi-functionality, bring to an urban area a wide range of benefits. It is an important planning tool for achieving greater urban sustainability and Livability. This is brought about by the wide range of benefits greenways bring to a city. This study explores urban celebrations through greenway networks for Livable and sustainable cities. It establishes the socioeconomic and environmental benefits of greenways and further highlights the challenges facing the development of greenways. The study used a case of the Nairobi Central Business District.

The researcher used mixed methodology employing five sets of research instruments. These included; questionnaire, interview schedule with key informants, document analysis guide, observation schedule and photography. The questionnaire yielded 98 respondents while the interview schedules targeted several professionals in the construction and design profession. The findings of this study indicate that the socioeconomic and environmental benefits are many and lead to urban sustainability and Livability which enhances urban celebrations. Some of these benefits of greenways include the enhancement of the quality of life by improving the social health, an avenue of recreation and socialization. Greenways also provide connectivity, enhance mobility in urban settings, and provide contact with nature leading to a vibrant society. Greenways are an important aspect in the historical preservation of a people.

The study recommends that a greenways framework for the Nairobi Central Business District be formulated and implemented. The framework should take into consideration of the rich historical perspective of Kenya and which most of it can be captured within its capital city: Nairobi.

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ABBREVIATIONS AND ACRONYMS

CBD	Central Business District
CBS	Central Bureau of Statistics
CBM	City Beautiful Movement
CES	Consultancy Engineering Services
EGWO	European Greenways Observatory
GoK	Government of Kenya
HDI	Human Development Index
MoE	Ministry of Environment
NCBD	Nairobi Central Business District
NCC	Nairobi City Council
NEMA	National Environmental Management Authority
NMR	Nairobi Metropolitan Region
NMT	Non-Motorized Transport
PPP	Private Public Partnership
USA	United States of America

“...lively, diverse intense cities contain the seeds of their own regeneration with energy enough to carry over for problems and needs outside themselves...”

-Jane Jacobs



1.0. CHAPTER ONE

INTRODUCTION

1.1. BACKGROUND OF THE PROBLEM

Due to the side effects of economic development and increased rate of urbanization, the industrialization of agriculture, restructuring of land use, building of huge transport networks and metropolitan areas, there has been an increased loss of natural habitats, habitat structures and extinction of wildlife species. More so, there has been the emergence of problems between economic development and the protection of ecological environment in urban areas (Rob, Jongman, Mart & Kristiansen, 2004).

Greenways offer a mechanism that balances development and protection (Fabos, 1995). Though initially they were considered as just vegetated linear areas for preventive purposes, they have evolved into a resource that if well incorporated can meet the public's needs for such three benefits as recreation, environmental protection, historical and cultural resource preservation among other benefits.

Currently, greenway planning has become a worldwide movement, and has been embraced by governmental agencies, non-governmental organisations, and most importantly, by citizens of urban areas and small towns. In the United States, the growth of greenway planning and implementation has been the fastest one among all planning and design profession (Liu, Huang, Zeng & Li Xin, 2005). There has been a paradigm shift on greenway planning from one that focuses on environmental protection or recreation to one that considers greenways as a multipurpose process that allocates it as a resource to satisfy public's demand for all the three benefits (Ashley, We-Ning, Young & Whitley, 2004).

There is a growing body of research that suggests that quality of life is becoming an increasingly important factor in modern business location decisions, especially among high technology and knowledge firms. McNulty (1985) in assessing the links between the quality of life and the economic success of cities concluded that cities that are not livable are not likely to perform important economic functions in the future.

If we agree with McNulty, then, enhancing the quality of urban spaces would be a central objective in every city's economic strategy. It is no surprise that elements of enhancing quality of urban spaces are increasingly being employed as economic development tools.

Livability is generally defined by performance in three main areas: environmental quality, physical form and functionality and individual well-being. The key elements in a Livable city often include attractive public spaces that are walkable, mixed use, vibrant, sociable among others. These attributes make places pleasant and easy to live. These initiatives often meet environmental, economic and equity goals, which are also elements for the transition to sustainability.

The urban planning profession specialises in some aspect of the planning process for the urban environment. Urban planners therefore need to note that the complex system that underpins urban planning in the 21st Century of the city is a vastly different scenario from the era that gave birth to the role of the urban planner more than five decades ago. An urban planner working in a city in the 1950s did not necessarily require a lot of external expertise – for urban planning was a specialty in and of itself.

Increasingly, however, such complex systems in today's cities require inputs from multifaceted dimensions. The role of today's urban planner could include helping the community implement or enforce policy-planning strategies that create historic preservation and comprehensive neighbourhood plans (American Planning Association, 2009).

The acceptance that green spaces provide the lung for the city, breaks the monotony of the jungle, promotes a healthy society for social and leisure activities and counterbalances the hectic urban life has encouraged people in the world to formulate planning standards for open spaces.

The physical development guideline for Kenya requires 1-2 hectares of land recreational space for every 10,000 in areas with a population density of 50 persons per hectare (Republic of Kenya, 2002). The density of people in the CBD is estimated as 500 persons per hectare (Central Bureau of Statistics, 2002), an indication that there is a shortage of a recreational space for urban celebrations. Apart from the critical shortage of urban public space in our networks which would compel the residents to crave for the few available ones there seems to be other factors that would attract or repel the users of these networks. Jacobs (1961) discusses the studies on uses and meanings in people's everyday life. The relationships, however, between spaces quality and experiences, perception and activities have received less attention (Dwyer and Childs, 2004)

Nairobi was once proudly known as the City in the Sun before it stunted and today it is struggling to regain its glory. In the past few years Nairobi has been getting a face lift in the hope of regaining her glory as a metropolis that moves with the right rhythm, energy and development that its children so much yearn

for. This study focuses on urban celebrations through greenway networks for Livable and sustainable cities. It looks at benefits of incorporating greenways into urban planning in the process determining the challenges that hinder sustainable greenway development in the NCBD. The study will also seek to provide a sustainable planning and development framework that will enhance green circulation network of NCBD.

1.2. STATEMENT OF THE PROBLEM

The environment we live in determines our response to life's many challenges and opportunity. With the massive increase in urbanisation and the impact of urban areas on the global environment, there is need of creating more sustainable urban areas. More than ever, the quality of life and the legacy to future generations depend on the degree to which urban areas are successfully developing in a sustainable way (Ministry of the Environment, 2004). Since time in memorial one factor has remained a key feature to the growth of a city and its image. The way a city looks and feels has a direct psychological and social impact on its stability, economic drive, and growth of that city.

The explosive growth of urban areas has brought about fundamental changes, not only to the physical landscape, but also to people's perceptions of land and environment.

Plate 1: Some problem photos





The high concentration of population induces several problems, not only environmental but also economic and social. In other words, it induces problems and has an impact on the three parts of urban sustainability. Greenways, because of their key characteristics such as spatial configuration and multi-functionality, bring to an urban area a wide range of benefits. A Greenway is an important planning tool for achieving greater urban sustainability and their potential lies in the wide range of benefits greenways bring to an urban area. Through these benefits, greenways are a sensitive and appropriate response towards greater urban sustainability. Thus, greenways are a crucial planning tool and can help make progress towards greater urban sustainability (Vasconcelos, 2006).

Urban areas are and ever will be unbalanced in terms of environmental and socio-economic factors, since they 'consume' natural resources and 'produce' waste and pollution incessantly. The exceptional challenge is to try to compensate this situation.

In this context, it can be said that much can be achieved through practical incremental steps in a direction that seeks to 'reduce urban unsustainability' as much as to 'achieve urban sustainability'. Greenways, especially greenway networks, are one possible step to reduce these unbalance (European Commission, 1996).

Hu Xuwei (2000), Yang Zhifeng et al. (2004) notes that the greenway planning is still very limited and only found in few eco-city planning cases. Li Yunguo, Huang, Guangming & Li Xin (2005) in

“Greenways and the functions to Eco-Cities” recommended that it is significant to enhance the research and implementation of greenways planning. Despite the importance of greenways, the researcher notes that, greenway planning in Kenya has not been incorporated as an urban planning tool. Therefore the researcher through this study looks at the benefits of incorporating greenways into urban planning: A Case of the Nairobi Central Business District (NCBD).

The researcher focuses on the NCBD which is at the heart of Nairobi. The city is a leading city in the region, the capital city of Kenya, a centre for education, tourism and a commercial hub. Over the years, Nairobi has been affected by rapid urbanization and underinvestment that has created many urban challenges. The city today faces a number of problems in relation to its city form, functionality and image. Some of these problems are unique to Nairobi, though most of the urban areas in Kenya face similar challenges as a result of planning failures at the national and local levels. The researcher believes that greenways planning will go a long way into addressing these challenges and offer a Livable and sustainable urban setting for Nairobi and its residents.

1.3. PURPOSE OF THE STUDY

The study looks at urban celebrations-greenway network for Livable and sustainable cities: A case of the Nairobi Central Business District

1.4. RESEARCH OBJECTIVES

1.4.1. General Objectives

The study establishes greenway networks as an aspect of urban planning: Case of Nairobi Central Business District.

1.4.2. Specific Objectives

- i. To establish the socio-economic benefits of greenways in NCBD.
- ii. To establish the environmental benefits of greenways in the NCBD.
- iii. To determine the challenges that hinder sustainable greenway development in NCBD.
- iv. To provide a sustainable planning and development framework that will enhance green circulation network of NCBD..

1.5. RESEARCH QUESTIONS

The research questions for this study were

- i. What are the socio-economic benefits of greenways in NCBD?
- ii. What are the environmental benefits of greenways in the NCBD?
- iii. What challenges hinder the sustainable greenway development in NCBD?
- iv. How can a sustainable planning and development framework that will enhance green circulation network of NCBD be attained?

1.6. SCOPE OF THE STUDY

The purpose of this study was to determine the benefits of incorporating greenways into urban planning. The participants of the study consisted of people from all walks of life who visit or work in the NCBD. They were considered as appropriate for this study as they are in a position to understand the need for the creation of a sustainable and Livable central business district that attracts urban celebrations.

The key informants to this study include selected policy makers from the various authorities and professionals in the build environment and the real

estate. Their position in society allowed them to have come across many issues on urban planning and sustainability and thus their contribution was considered very valuable for this study as it was from a point of knowledge. The study involved field work within the NCBD.

1.7. LIMITATIONS OF THE STUDY

The following factors posed as limitations to this study:

- i. Most of the participants in this study were not conversant with the term ‘greenways’ and thus explanation and definitions had to be explained to them.
- ii. With the on-going security checks in the country to curb terrorism, the researcher and the research assistants was harassed on many occasions whenever security officers and the city council askaris found them taking photos of various places within the CBD.

1.8. ASSUMPTIONS OF THE STUDY

In this study, it was assumed that:

- i. All the respondents interviewed understood the meaning of greenways and those who didn’t were able to after the meaning was offered to them.
- ii. The respondents would be willing to provide honest responses that reflected the information stipulated in the questionnaires and interview schedule. This was to enhance valid interpretations, conclusions and generalizations.

1.9. OPERATIONAL DEFINITION OF TERMS

Askaris	Police officers.
Boulevards	A broad city street, often tree-lined and landscaped.
Chicane Street	is an artificial feature creating extra turns in a road, used in motor racing and on streets to slow traffic for safety
Climate Change	a long-term change in the statistical distribution of weather patterns over periods of decades to millions of years.
Eco-city	A sustainable city; a city designed with consideration of environmental impact.
Eco-friendly	Environmental/nature friendly
Ecological footprint	Measure of human demand on an ecosystem.
Greening:	Restoration of vitality or freshness; rejuvenation. An adoption or alignment with the ideals or practices of the Green movement
Green buildings:	A green building is an environmentally sustainable building, designed, constructed and operated to minimise the total environmental impacts.
Green infrastructure:	Green infrastructure is strategically planned and managed networks of natural lands, working landscapes and other open spaces that conserve ecosystem values and functions and provide associated benefits to human populations.

Greenway:	A linear open space established along either a natural corridor, such as a riverfront, stream valley, or ridgeline, a scenic road, other route
Landscape Architecture:	The design of outdoor public areas, landmarks, and structures to achieve environmental, social-behavioural, or aesthetic outcomes. It involves the systematic investigation of existing social, ecological, and geological conditions and processes in the landscape, and the design of interventions that will produce the desired outcome
Livability:	An aspect that promotes sustainability creating healthy urban life, easy mobility, aesthetically attractive, worthwhile and safe.
Livable cities:	cities that have both physical and social elements collaborating for a well-being and progress of the community and individual persons members of the community.
Maasai Market:	is term used to denote a Market day meant for the sale of Maasai goods which are usually curios and meant to attract tourists. The colourful Maasai markets sell mainly tourist fare ranging from wooden sculptures, beaded necklaces, batik wall hangings, shoes, soap stone carvings, sisal bags, kikois, textiles and a whole host of other exciting goods.

Sustainable Development: Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Transport corridors: Important zone of movement connecting places, often consisting of major road, rail and bus routes.

1.10. ANALYTICAL FRAMEWORK

Table 1.1: Analytical framework

RESEARCH OBJECTIVE	TYPE OF DATA	SOURCES OF DATA	TECHNIQUES FOR ANALYSIS	EXPECTED OUTCOME
1) To establish the socio-economic benefits of greenways in NCBD.	<ul style="list-style-type: none"> Physical character changes Social, economic and cultural effects functional changes 	<ul style="list-style-type: none"> Maps Photographs Interviews Social surveys 	<ul style="list-style-type: none"> visual interpretation sketching modelling 	<ul style="list-style-type: none"> Social and spatial dynamics due to appropriateness in time and space.
2) To establish the environmental benefits of greenways in the NCBD.	The problems <ul style="list-style-type: none"> Comfort Pollution micro climates physical Attributes. 	<ul style="list-style-type: none"> Social surveys maps photographs interviews 	<ul style="list-style-type: none"> Mapping Modelling Tables Graphs 	<ul style="list-style-type: none"> Health and comfort dynamics due to environmental variations in time and space. Likely possible interventions.
3) To determine the challenges that hinder sustainable greenway development in NCBD.	<ul style="list-style-type: none"> political planning guidelines space inhabitants' perception 	<ul style="list-style-type: none"> Interviews Literature review observation 	<ul style="list-style-type: none"> Descriptive statistics tables and graphs modelling Quality of environment in respect to spatial use and beauty. 	<ul style="list-style-type: none"> Dynamics in sustainable development due socio political controls. Variation in economic and spatial preference.
4) To provide a sustainable planning and development framework that will enhance green circulation network of NCBD in the contemporary setting.				<ul style="list-style-type: none"> Urban celebrations: Greenway networks for livable and sustainable cities.

1.11. OUTLINE OF THE THESIS

The research is classified into five chapters each focusing on different aspects.

Chapter One features the introduction, study objectives, the hypothesis and research variables, accompanying assumptions, justification, scope and limitations. The chapter looks at the concept of circulation networks from a global perspective.

The problem statement probes the existing problems on the circulation networks within the urban areas as relates to planning. The study objectives highlight the purpose of the study. The chapter also discusses the relevance of the study and its implication in today's society. The limitations of the study have also been highlighted in this chapter.

Chapter Two is a critical review of the existing literature and situational analysis. A look at the Nairobi Central Business District case depicts the existing character and perception of greenway networks as portrayed along the connecting streets in the CBD. The historical evolution and perception of greenway network is given a limelight in this chapter, and while reflected with combined theories that supported the greenways ideology, the section culminates into concluding frameworks aimed to achieve a solution to the existing problems proclaimed earlier.

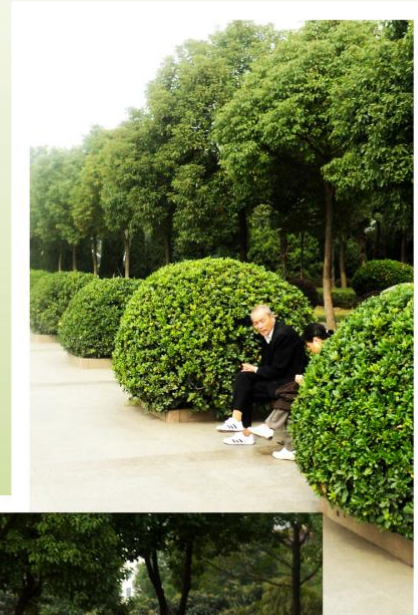
Chapter Three looks at the perception of the circulation network users followed by the attitudes towards modern developments and use. Accumulated facts and figures will be analyzed and presented in a comprehensible form. The challenges of planning and management of the circulation networks in the city will be addressed.

Chapter Four summarizes the findings of the research and then gives recommendations based on these. Opportunities of land use sustainability are also explored. It also gives a proposed institutional framework on greenway networks on land uses. A detailed strategic intervention for the proposed Kenyatta Avenue will be given.

Chapter Five comprises conclusions and recommendations. It contains an integrated greenway network approach by outlining goals and strategies that provide direction on greenway networks for sustainability.

“To make a Greenway is to make a community“

-Charles E. Little



2.0. CHAPTER TWO

LITERATURE REVIEW

2.1. INTRODUCTION

This study defines greenways as a linear landscape with elements of trees and vegetation. This chapter will give further definitions of greenways, take a brief focus on the evolution of greenways and focus on the benefits of greenways in an urban setting. In terms of their formation and function, two types of greenways will be discussed: riparian greenways, which are associated with water corridors or water edges and parkways or road greenways, which are associated with terrestrial transportation systems including highways, railroads, country roads, and streets.

2.2. DEFINITION AND EVOLUTION OF GREENWAYS

2.2.1. Definition of Greenways

Although greenways have developed for several centuries in the North America and Europe, and a number of definitions have been put forward, the comprehension of greenways is diverse to different researches. In addition, a precise description is elusive partly because greenways take so many forms (Searns, 1995). Greenways can be; recreation-oriented, emphasizing trails, parks and even scenic routes; principally for the protection of wildlife, striving to preserve habitats and routes of travel for animals; for buffer development and provide a strip of green relief in the urban fabric and can focus on historic heritage and cultural resource preservation. (Smith & Hellmund, 1993)

The term "greenway" was first put forward by Whyte, who invented and used the term "greenways" in his monograph published in 1959, entitled '*Securing Open Space for Urban America*' (Fabos, 2004). During the 1960s and 1970s,

the concept of greenway developed quickly. However, it was not accepted by American government until 1987 (Rose, 1988).

Greenways was originally defined as "linear open space established along either a natural corridor, such as a riverfront, stream valley, or ridgeline, a scenic road, other route (Rob et al., 2004). Greenways are considered to be "corridors of various widths, linked together in a network in much the same way our networks of highways and railroads have been linked". In terms of their function, Fabos classified greenways mainly into three categories: ecological greenways, recreational greenways and historical heritage corridor. While greenway corridors were mainly considered as natural and pre-existent, they can also be completely man-made (Fabos, 1995).

Charles E. Little (1990) in his book, *Greenways for America*, defined greenways as the protection of linear corridors that improves environmental quality and provides outdoor recreation. Due to the development of greenways and the appearance of the concept of multipurpose greenways, the definition has become more comprehensive. Ndubisi defined greenways very expansively as "networks of linked landscape elements that provide ecological, recreational, and cultural benefits to the community (Ndubisi, Terry & Niels, 1995). Fabos (1995) defined greenways as corridors of ecological significance, recreational greenways or greenways with historic and cultural values. It is assumed that the concept and the evolution of greenways are closely associated with the form and progress of society and the geography and natural environment of individual nations.

2.2.2. Evolution of Greenways

The archetype of greenways dates back at least as far as ancient Rome where by then it was not known as greenways. These were the landscape axes and boulevards of Europe, and later the parkways of USA in the late 19th century (Searns, 1995). To trace the evolution of greenways, three distinct stages or "generations" have been identified:

a) **The First Generation Greenways (Pre 1700s - 1960)**

The first generation of greenways was the landscape axes and boulevards of Europe and parkways of USA. During this time landscape axes linked important buildings, and were a key element of the gardens of the palace at Versailles in ancient Rome. The emergence of boulevards, such as the Champs Elysees of Paris, led the way in establishing grand corridors as special elements in the urban setting. Until now, other examples of axes and boulevards can still be found throughout Europe (Searns, 1995). Within this period the axial landscape form became more identifiable as a greenway predecessor, and was joined with a conscious attempt to reintroduce nature into the cities in USA. The majority of early efforts in landscape planning have become greenways today.

Many American greenway planners consider Frederick Law Olmsted as the founder of the greenway movement. Olmsted's Boston Park System, has often been regarded as the first significant greenway in the United States. Besides Olmsted, several other "landscape architects planned significant green ways and greenway networks during this time. The best known are Charles Elliot, H.W.S. Cleveland and the Olmsted Brothers (Rob et al., 2004). The first

generation of green ways included the function of movement, utility, vision-experience, and linkage.

b) The Second Generation Greenways (1960-1985)

These greenways are associated with the emergence of automobile. With the emergence of the automobiles, bicyclists, and pedestrians sought to escape from the noise and fumes. Due to the need for new non-motorized routes of travel greenways gradually turned into hike-bike path. At the same time, many planners found that some areas along greenways were environmentally sensitive, so they created several approaches to protect them in their greenway plans. This generation was trail-oriented and its primary function was to provide recreational and linear parks that provided access to rivers, streams, ridgelines, rail beds and other corridors. The two major emphases of most of these greenways were basically non-motorised travel and analysis of sustainable land use (Yungua et al., 2005).

c) The Third Generation Greenways (1985 – to date)

During this period, the impact of human settlement had become explosively pervasive, since the development had expanded exponentially. More and more landscape ecologists and environmentalist recognized that, urbanization, agriculture and other human activities had induced fragmentation of landscape, chopped up wild places and left isolated "islands" of habitat. Due to the negative impacts of urbanization which included a serious threat to health and diversity of species, landscape Geologists and planners found that, in addition to urban beautification and recreation, greenways had some environmental or ecological functions, including linkages of spaces.

The two issues, *Landscape and Urban Planning*, published in 1995 and 2004 highlight the recent trends in greenway planning and have aroused the interest in greenways around the world (Noss, 1987). There has been the development of landscape ecology and the practices of greenway planning. The third generation greenways has evolved into multi-purpose greenways that address the needs of urban life, flood damage reduction, water quality, education, and other infrastructure needs in addition to urban beautification and recreation (Whitley et al., 2004). The evolution of greenways to more complex and broad development has impacted on both urban dwellers and the natural environment, increasing sophistication and understanding of the need to protect environmental values, and growing political and economic justification for investing in multi-objective greenway projects (Searns, 1995).

2.3. MAJOR DEVELOPMENT OF GREENWAYS IN THE WORLD

2.3.1. Greenway Development in Europe

Since the beginning of the 1990s, societal and scientific exchanges are being restructured as the conceptual approaches towards new nature conservation strategies have been renewed in Europe. (Rob Jongman, 2004).

Although, conservation movements have developed ideas of species preservation and conservation of national nature reserves on national and regional levels to mitigate the human impacts on nature caused by industrialization (Boardman, 1981) the in cooperation of greenway network planning in urban centres have surfaced to combat pollution and land use conflicts. The industrialization of agriculture, restructuring of land use, the building of huge transport networks and metropolitan areas has caused a

serious fragmentation of natural areas, deterioration of ecosystems, loss of natural habitats and habitat structures, and extinction of species (Stanners & Bourdeau, 1995). This is the case in the most densely populated areas of Europe. Thus, the natural habitats can in many regions be looked upon as if they were isolated islands on the sea. The smaller and more isolated these 'habitat islands' are as a consequence of the ever-increasing land use and road networks, the more likely the quality of life would depreciate with escalating environmental issues. (Rob Jongman, 2004)

European greenways provide a series of common characteristics that portray the following: ease of passage, continuity, safety and respect for the environment. They are to be planned and built in such a way that they are eco-friendly. The greenways along itineraries encourage its respect by the users by providing for common activities such as sitting under a shade, resting and relaxing. In the context of European integration, networks are becoming increasingly important in both social and ecological sense.

The European Greenways Observatory (EGWO) is a consultancy & inventory platform for greenways. Its objective is to record all possible greenways in Europe in order to provide a useful database for the public and associations which are working to create or promote these infrastructures.

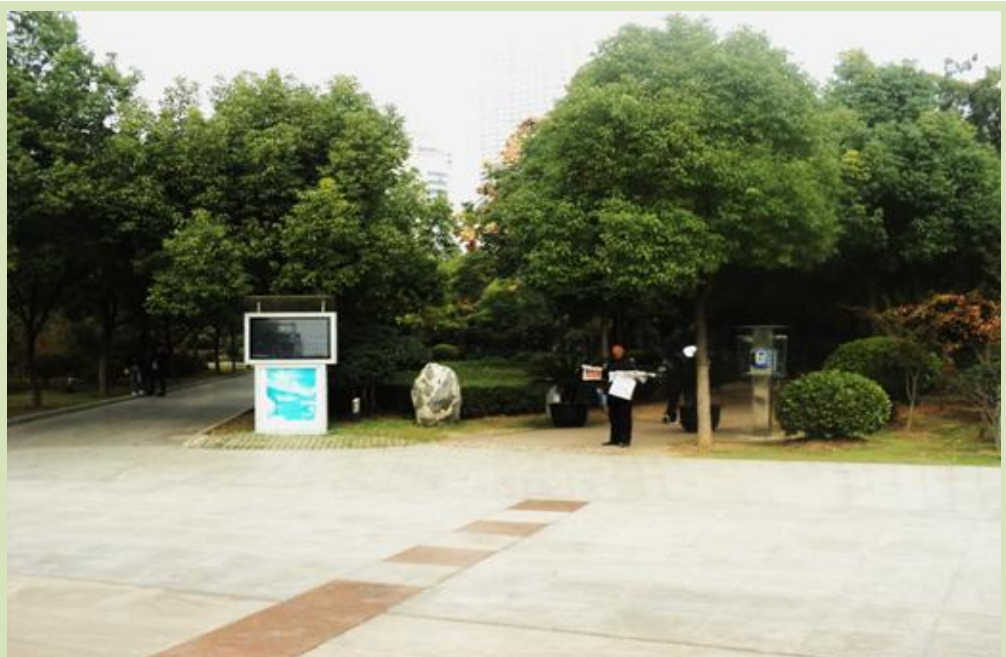
2.3.2. Greenway Development in Asia (A Case of China)

Chinese cities are famous for street trees. The tradition of planting trees along streets and roads dates back more than 2000 years with their main function being the provision of shade and shelter against wind, and protecting roads from flooding or other damages. Visual and perceptual functions are also one

of the main reasons for parkway construction. In the long history of road Greenways in China, there has been the evolution from capital streets and imperial highway trees to railroad Greenways to recent green corridor systems along highways because all are linear landscape elements. At the same time, feverish urban construction and the city beautiful movement following the import of Baroque style from Europe and America have turn road Greenways into cosmetic avenues (Yu and Li, 2003).

The Greenway concept has evolved in a very different geographical and environmental setting in China. Greenways evolution in China show for thousands of years, natural disasters such as floods, drought, sandstorms, desertification and soil erosion have shaped/damaged the land and its people. These natural disasters and poor decisions became triggers for the development of Greenways in China in history as well as today (Kongjian Yua, 2004). Thus, the uniqueness of the geographical and environmental situations in China, plus the social and political processes, provides an explanation of the evolution and formation of Greenways.

Figure 2.1
A Modern Bus Park in the
City of Wu Han, China



Source Author (2011)

The planting of trees along waterways has, through trial and error, proved to be effective in preventing floods and safeguarding property and human lives. As recent as the summer of 1998, people around the world watched a dramatic scene on television as a young girl named San held on to a tree all day and night to survive one of the most serious floods in the Yangtze River in recent history. The tradition of riparian Greenways, thus, began as a reaction to flooding and consolidating riverbank protection and evolved from individuals planting trees and shrubs along river and water channels in a piecemeal fashion to a more and more systematic approach in establishing Greenway systems along drainage ways.

This multifunctional ecological and disaster-prevention system is now considered to be fundamental in controlling floods (She and Wang, 1999).

Figure 2.2
Greenways Planted along
the Wen Yu He river at
the Ourskirt of Beijing

Source: (Kongjian Yu,
Dihua Li & Nuyu Li, 2006)



The construction of green corridors in China is an important strategy for greening the nation, and its main task has been greening and beautification along roads, railways, river banks and dams. In 2000, the State Council delivered a call for the construction of green corridors on a national scale. The Chinese State Council set several goals which included: greening of 60% of

the national and provincial highways, railways, river banks and dams by the year 2005, and that all areas suitable for vegetation be greened so that a Greenway network could be formed that was composed of green lines, green knots, and green areas by the year 2010. This Greenway network was expected to improve the natural beauty of the landscape and provide ecological security in the cities and countryside (Kongjian, et al., 2006). To date the concept of Greenway in China Cities has been maintained and is going. Figure 2.1 and 2.3 illustrate some of the greenways captured by the researcher through photography in the City of Wu Han China in 2011.

Figure 2.3
Modern Greenway along
the Yangtze River in Wu
Han City China



Source: Author (2011)

2.4. GREENWAYS AND URBAN PLANNING

2.4.1. Historical Perspective of Urban Planning

The first true urban settlement appeared around 3,000 B.C in ancient Mesopotamia, Egypt, and the Indus valley. Ancient cities displayed both ‘organic ‘and ‘planned’ types of urban form. These societies had elaborate religious, political, and military hierarchies. Precincts devoted to the activities

of the elite were often highly planned and regular in form. In contrast, residential areas often grew by a slow process of accretion, producing complex, irregular patterns that we term “organic”. Two typical features of the ancient city are the wall and the citadel: the wall for defense in regions periodically swept by conquering armies, and the citadel-a large, elevated precinct within the city-devoted to religious and state functions.

Greek cities did not follow a single pattern. Cities growing slowly from old villages often had an irregular, organic form, adapting gradually to the accidents of topography and history.

Colonial cities, however, were planned prior to settlement using the grid system. The grid is easy to lay out, easy to comprehend, and divides urban land into uniform rectangular lots suitable for development.

The Romans engaged in extensive city-building activities as they consolidated their empire. Rome itself displayed the informal complexity created by centuries of organic growth, although particular temple and public districts were highly planned. In contrast, the roman military and colonial towns were laid out in a variation of the grid. Many European cities, like London and Paris, sprang from these Roman origins.

We usually associate medieval cities with narrow winding streets converging on a market square with a cathedral and city hall. Many cities of this period display this pattern, the product of thousands of incremental additions to the urban fabric. However, new towns seeded throughout undeveloped regions of Europe were based upon the familiar grid. In either case, large encircling walls

were built for defense against marauding armies; new walls enclosing more land were built as the city expanded and outgrew its former container.

During the Renaissance, architects began to systematically study the shaping of urban space, as though the city itself were a piece of architecture that could be given an aesthetically pleasing and functional order. Many of the great public spaces of Rome and other Italian cities date from this era.

Parts of old cities were rebuilt to create elegant squares, long street vistas, and symmetrical building arrangements. Responding to advances in firearms during the fifteenth century, new city walls were designed with large earthworks to deflect artillery, and star-shaped points to provide defenders with sweeping lines of fire. Spanish colonial cities in the New World were according to rules codified in the Laws of the Indies of 1573, specifying an orderly grid of streets with a central plaza, defensive wall, and uniform building styles.

We associate the baroque city with the emergence of great nation-states between 1600 and 1750. Ambitious monarchs constructed new palaces, courts, and bureaucratic offices. The grand scale was sought in urban public spaces: long avenues, radial street networks, monumental squares, geometric parks, and gardens. Versailles is a clear expression of this city-building model; Washington, D.C is an example from the United States. Baroque principles of urban design were used by Baron Haussmann in his celebrated restructuring of Paris between 1853 and 1870. Haussmann carved broad new thoroughfares through the tangled web of old Parisian streets, linking major sub centers of

the city with one another in a pattern which as a model for many other modernization plans.

Towards the latter half of the eighteenth century, particularly in America, the city as a setting for commerce assumed primacy. The building of the bourgeoisie expands along with their owner's prosperity: banks, office building, warehouse, hotels, and small factories. New towns founded during this period were conceived as commercial enterprises, and the neutral grid was the most effective means to divide land up into parcels for sale.

The city became a checkerboard on which players speculated on shifting land values. No longer would religious, political, and cultural imperatives shape urban development; rather, the market would be allowed to determine the pattern of urban growth. New York, Philadelphia, and Boston around 1920 exemplify the commercial city of this era, with their bustling, mixed-use waterfront districts.

2.4.2. Integration of Greenways into Urban Planning

Urban theorists have not emphasized the amenity street, assuming that its primary traffic function was paramount. Lynch (1981) in discussing models of city form at the macro-scale, saw open-space systems as the necessary, essential counter form to the built environment. Greenbelts, wedges and networks could "give form" to the city but needed to be 'concentrated and continuous' or the definition would be ineffective or "fuzzy-edged". Urban form-making was not just an academic issue: Lynch and others demonstrated that people do relate strongly to places of marked character and identity, and do suffer from lack of orientation and a sense of placelessness in undifferentiated, anonymous surroundings. 'Sense' was one of the five criteria

of a 'good' city; 'access' was another. Multi-use streets, boulevards and parkways, were a circulation type permitting shared access by vehicles and people (Lynch, 1981).

Gosling and Maitland's (1984) international survey of 31 years' urban design case studies, though including regional plans, concentrated on the intermediate planning scale of central business districts, neighbourhoods and housing

(Lynch's 'central places' and general built-up areas making cities' 'grain').

Transportation/ circulation and open space systems were the basic organizing structure, whatever the scale. At the neighbourhood level were generic solutions representing opposite points of view about green spaces in development. In one, new housing was planned around existing roads and country lanes, converted into park-like pedestrian streets in the early phases and a combined walkway/public transit system in the later phases: a community route concept. In another, housing was planned around a substantial multi-use park of around 50 acres (20 ha) preserving major existing landscape features, with a cordon of buildings and perimeter streets: a superblock.

Hough (1984) argued that a better understanding and application of natural processes (climate, water, plants, soils, wildlife and food-growing) could shape a more productive and sustainable design form for the modern city. His urban design strategy for more productive and diversified city landscapes emphasized, besides parks, institutional grounds and converted derelict lands-multi-use streets. Streets were the primary social place for people, besides being space-intensive, occupying upwards of 40% of the total available land (Hough, 1984).

For these or other greenway models to make or shape urban form, planners need to get ahead of urban growth, not react to it. Conventional growth-shaping tools (such as overlay zoning, special districts, conditional approvals with covenants or deed restrictions, tree-protection ordinances, land trusts, Transfer of Development Rights, etc.), used separately or in concert, can go a long way, but only partly steer and guide development (President's Commission on Americans Outdoors, 1987). The majority of greenways presented in Little were residual leftovers after development, natural corridors and abandoned railroads, canals and other rights of way. These should not be disregarded because maybe they are no longer 'needed. They are useful in other ways because of their continuity, linearity, reticulated patterns maximizing their edge influence, and low acquisition costs (Little, 1990).

Greenway is a formative device for stitching together fragmenting cities and their urbanizing hinterlands is attracting widespread attention. Environmental groups are supportive of the idea for preserving natural habitats, native plant communities and wildlife corridors. Planners, urbanists and landscape architects see it as a way to bring order to spread-out suburbs and rebuild inner-city neighbourhoods. Community activists are attracted by the egalitarian aspects of equalizing open-space access for the greatest number of people. City and municipal officials regard the greenway concept positively, since it stands to improve the image of their communities, attracting new development or investment and hence creating jobs and tax base (Little, 1990). Greenways are a powerful and persuasive idea around which to structure communities. The historic initiatives of greenway planning and design, which guided and influenced the growth of North American cities in a predominantly

pre-automobile age, can be rediscovered and reinvented anew for today's decentralizing urban conurbations, multiple movement systems, information explosions, fast communications, mobile life-styles and multi-cultural societies. For an all-inclusive system serving the entire populace and joining downtowns and inner-city neighbourhoods, through the suburbs to the countryside, the concept of a green infrastructure must be applied at all scales. At the micro-scale, congested downtowns must be relieved with walkable tree-shaded streets and avenues, 'vest-pocket' parks, playgrounds, waterfront promenades and urban plazas that respond to solar orientation, notable buildings, public congregation needs and significant views; parks, playgrounds, squares and community gardens must be established around which new neighbourhoods can coalesce; and, remnant watercourses, natural formations and wastelands must be reclaimed and consolidated with institutional and private grounds. At the macro-scale, formless 'edge cities' must be given form through boulevards and parkways for intra-neighbourhood, non-commercial travel of all types (be they walkers, joggers, bikers, horse-riders, carriage drivers, skate-boarders, roller-bladders and short-trip, slow-speed transit and vehicle operators); linear parks and campgrounds must be linked up into continuous trail systems, incorporating stream valleys, hillsides, ridge-lines, historic and public properties of all kinds having high scenic or cultural interest; and, working landscapes, aquifer recharge areas, regional reservations, 'Rails to Trails' networks, recreational rivers and canals, historic towns and landscapes, and scenic byways must be maintained for the larger public good (Walmsley, 1995).

Olmsted's ideal that 'no part of the town should be finally many minutes' walk away from someone (parkway segment or another) ... so that passing through them ... some substantial recreation advantage may be gained" is even more germane for today's urbanizing populations. New versions of 'town/country' have to be invented if this vision of providing people access to open-space close to where they live is to be achieved. They are not likely to be as hard-edged as the Garden City protagonists advocated, though absolute preservation must still be the goal in special cases. To achieve a comprehensive regional green network that joins inner cities to the countryside, cities' urbanizing hinterlands will need greenway corridors to interweave with development in more structured and articulated patterns than hitherto. The urban environments of today's mega-cities should be increasingly shaped by Lynch's open-space counter forms. Among them, greenways of all scales and categories have a strongly formative and integrative role to play.

2.5. URBAN SUSTAINABILITY AND LIVABILITY

In 1987 a United Nations committee addressed sustainability in the following terms: a sustainable condition for this planet is one in which there is stability of both social and physical systems, achieved through meeting the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987). Whilst sustainability is a very general concept that is not easily implemented in practical work (Entropy, 2005), in many ways it is multi-dimensional, comprising the maintenance of natural resources and spatial patterns of land use which have ecological, social and economic benefits (Leila & Ahern 2002).

“...the greenway area is distinctive in its proximity to exciting and convenient commercial districts. Over time, it will grow as a place where the natural and built environments work together” (Jacobs 1961)

Many cities in the world today are experiencing a paradigm shift in transportation investments and urban development policies. As cities continued to suffer from serious traffic congestion, blighted neighbourhoods, and deteriorating environment, urban authorities such as San Francisco and Boston in the United States switched their focus from mobility to accessibility, Livability and urban amenities. Increasingly, making cities green and transit-oriented is viewed as an option for encouraging sustainable urban economic prosperity (Ewing, Bartholomew, Winkelman, Waters, and Chen, 2008).

Figure 2.4
The Cypress Creek
Greenway System



Source:

These efforts are geared towards providing urban amenities and better transit service in the contexts of globalization in that the Livable urban settings are vital elements of incubating new ideas, promoting competitiveness and creativity. It is important to note that compact urban

development with open space and public transit enhancements is a critical component to reduce carbon emissions.

City leaders have turned their attention to deconstructing freeways and reforming public transit services in order to spur urban economic activities, improve urban environments, and offer a higher quality of life.

Well-known examples of this process include bus rapid transit (BRT) in Bogotá, Colombia, and the deconstruction of Embarcadero Freeway in San Francisco in the United States. (Chang, 2009).

Figure 2.5 Bogotá's Bus Rapid Transit



Source: Peyton & Kent (2009)

Contemporary global cities face many challenges, such as serious traffic congestion, a deteriorating quality of life, and social injustice. Many cities are looking to new opportunities in the knowledge-based or creative economy to become more attractive to industry. This has led to many civic authorities to search for a paradigm to make their cities more sustainable and economically viable. Freeway removals in the United States and reforms of public transit in Latin America are examples of the emerging paradigms in urban transport sector.

Innovative policies in cities like Curitiba, Brazil, and Bogotá, Colombia, have restructured land markets, firm and employment geographies, and improved the quality of urban living (Chang, 2009).

Cars promise mobility, and in a largely rural setting they provide it. But in an urbanizing world, where more than half of us live in cities, there is an inherent conflict between the automobile and the city.

Figure 2.6
Traffic Jam at the Khoja
Stage, Nairobi



After a point, as their numbers multiply, automobiles provide not mobility but immobility, as well as increased air pollution and the health problems that come with it. Urban transport systems based on a combination of rail lines, bus lines, bicycle pathways, and pedestrian walkways offer the best of all possible worlds in providing mobility, low-cost transportation, and a healthy urban environment.

Cities are the concentrated places of people and economic activities. As the flow of people and freight increasingly depends on automobiles, cities face growing transportation and environmental crises (Rodriguez *et al* 2006). As a consequence of greater motorization, contemporary cities suffer from noxious traffic congestion and air pollution, contribute to climate change and consume

large quantities of energy, and have a poor record of providing accessibility for those who do not or cannot drive (Cervero, 1998).

According to Kondratieff's wave theories that explain changes in urban spatial structure in terms of technological innovations, we are in a fifth wave, which generates city wealth through information technology, new industrial space, and new production processes (Montgomery, 2007). This new trend of urban economic growth requires attractive urban settings for highly skilled workers, because workers in the knowledge based and creative economy prefer such specific living and working environments. To make places more attractive and Livable, many empirical studies have suggested a few key components and new roles of city governments. Many theoretical and empirical studies suggest developing dense and mixed-use complexes, adapting places to neighbourhood changes, creating pedestrian-oriented street designs and landmarks, providing public spaces for social interaction, improving accessibility, building green spaces and waterfronts, and encouraging architectural aesthetics (Montgomery, 2007). These principles have been applied to transit-oriented development concepts to harmonize public transit and urban development (Dunphy, Cervero, Dock, McAvey & Swenson, 2004).

Urban economists pay attention to the importance of the inner city in generating agglomeration advantages. An "agglomeration economy" is a core principle of urban and regional economic development, in those firms near labour pools and specialized services tend to generate higher productivity and cost savings (Jacobs, 1969). Many firms seek to relocate in places with concentrations of skilled human capital and diverse industries (Porter, 1998).

For a long time, regional economic planners have tried to increase agglomeration advantages among firms. As the urban economy globalizes and innovative ideas produce competitive goods and services, urban scholars argue that the agglomeration economy comes from human capital-based interaction (Glaeser & Saiz, 2004). An important role for city planners is to provide more urban amenities, a higher quality of life, and Livable places to attract and retain skilled workers (Clark, 2004). Particularly, knowledge-based workers are willing to live and work in inner cities so they can enjoy greater face-to-face interaction, information exchange, and transportation cost savings. Sustainable urban development is an essential component in urban planning and design to make cities appealing to skilled-workers' living and working.

Inner cities are the engine of urban economic growth in that they enjoy better access to other areas, strong local clustering of related businesses, and their own market demand (Porter, 2008). As many central cities suffer from diverse constraints and challenges, cities need new paradigms to make them more sustainable and enhance their competitiveness.

Freeway removals in the United States and reforms of bus rapid transit policies in Latin America are examples of promising new paradigms in the urban transport sector. The opposition movement of citizens against highways in San Francisco led to freeway removal and pedestrian-friendly boulevards (Levy, 2003). Some cities sharing the need of freeway demolition have torn down (or plan to tear down) freeways in order to create urban greenways and pedestrian areas. Urban greenways, through their linear open space nature, provide recreation, education, and preservation (Imam, 2006).

Freeway removal and human-oriented urban planning are not anomalies that only a few cities have adopted, but are the new emerging policies cities are increasingly adopting.

Pedestrian Space; plazas, streets, sidewalks, pass, and alleys bring people together and bind communities. Need to note that movement in these spaces is crucial; the ease of movement for pedestrians is reinforced by considerations of connectivity and permeability. Movement in an urban community is enhanced by; roads, footpaths and public spaces connected into well-used routes, easy accessibility, direct routes that lead to where people want to go and choice of safe, and high quality routes. Other considerations include; Safety- Street planning should relate to overall community planning and provide a safe and pleasant environment for residents, pedestrian, and bicyclists while facilitating mobility of all modes of transportation (IBI, 2009).

2.5.1. Dom's Criteria of Livable Cities

Table 2.1 Attributes of a livable City

Sector	Attributes
Transportation	Traffic calmed Tree lined streets Adequate on street parking Slow moving traffic in the city centre Vibrant sidewalks Quality transit Quality bicycle and pedestrian facilities Non- pollution transport system
Recreational	High Quality public squares and public parks Quality urban life
Economical	locally owned cuisine some of which feature outdoor cafes found on a vibrant sidewalks vibrant economy diverse retail potentials
Historical and cultural heritage	Quality culture Magnificent Historic architecture

Source: Nozzi (2011)

Urban community safety issues are considered in the design and location of facilities, Character - well designed streetscape provides an identity that is unique to each site and place and sets the framework for future development to ensure a cohesive signature that will stand the test of time. This is reflected in the; gateways/public art/identity elements, and banners/signs (IBI, 2009). Multi-Modal Accessibility - there is a paradigm shift in the way we want to live our lives today. Transit-oriented development, downtown living, being a part of a community that promotes walkability, live-work environment are becoming more important than our dependence on the automobile. More focus should be given to create streetscape that supports alternative transportation modes.

2.5.2. Qualities of a Successful Public Place

The promotion of sustainable and Livable cities requires the sophisticated design and management of green and transit-oriented policies that consider local context and market demand. A policy package that includes urban development and infrastructure provisions should be incorporated into a systemic approach. Specifically, the de-regulation of land use and the design of streets and public spaces to human scale are fundamental to creating compact and attractive urban settings. The findings in location choice models of creative industries strongly suggest that public policy should focus on expanding urban amenities and providing convenient public transit service to make cities more productive and competitive in the global economy.

Regarding to conferred benefits from the urban greenway projects, policy makers should consider how to recapture some share of benefits from property owners to support public finances. This study demonstrates that urban

greenway and bus rapid transit projects are an effective means of promoting dense land development and attracting creative industries, which make central cities more Livable and competitive.

Figure 2.7
Attributes of a Successful
Public Space



Source: Guidelines for
Public Spaces (2008)

2.6. FUNCTIONS AND BENEFITS OF URBAN GREENWAYS

Urban greenways can offer important benefits to the communities in which they are located. Environmentally, they help protect vital ecological processes and resources by buffering different land uses, filtering pollutants, connecting fragmented habitats, and slowing the movement of flood waters. They protect important habitat and provide corridors for people and wildlife.

Greenways help improve air and water quality. Pollution from road unworthy vehicles' exhausts raises the levels of smoke and dust in cities. Plants in greenways trap this dust and aid in 'cleaning' the air. Fragrant plants help screening foul odour from industrial and commercial urban areas. Plants also

breathe in Carbon dioxide and exhale Oxygen that supports animal and human lives.

Hence, communities with greenway streets provide enjoyable and safe options for transportation, which reduces air pollution. The plants could also trap sediments in surface runoff water, and help clean water that goes to streams and underground recharge. By protecting land along rivers, streams and roads, greenways prevent soil erosion and filter pollution caused by road runoff. Apart from being used as pollution abatement strategies, they could be used to screen pedestrians from noisy vehicular movement.

Greenways also provide safe, convenient, and pleasant routes for pedestrian and bicycle travel. The use of greenways for non-motorized transportation can lead to the additional environmental benefits of reducing fossil fuel use and improving air quality. Greenways provide a safe, inexpensive avenue for regular exercises for people living in urban and suburban areas. The need for a sedentary lifestyle in most modern cities is demanding, but greenways offer the opportunity to increase physical activities at a low cost.

Figure 2.8
Urban Celebrity – Wu
Han City, China

Source: Author (2011)



Greenways also offer opportunities for recreational activities such as walking, jogging, and bicycling. Such activities can have important health benefits, including reduced risk of heart disease, hypertension, and diabetes. Greenways act as getaway niches for city workers: reduces stress in working-class individuals in urban areas. (Penalosa, 2002) Work has become the dominant fact of human life-leisure and recreation a more or less after-thought which is fitted in around it. (Garret, 1986) Recreation is an activity that rests men from work, often by giving them a change that restores them to their 'normal state'. By taking them away from their offices to have a break outdoors the greenways provide for social integration and recreation for all, and thus a source of good health.

Everyone is looking for an opportunity to socialise. Marcus (1998) says that people no longer go to public spaces to buy food, a pump for water or to a central space to hear the town declare the news; they socialise in the privacy of their homes where everything from water, electricity to news, mail advertising and even computer based work is piped in.

For this reason many people yearn for public life. Marcus(1998) say that we lead anonymous life isolated and confined to cars. There is hunger for pedestrian life people are looking for ways to get out of their cars and like on a human level in urban centre (Morgan 1996). Public activities require to work in special places and streets. This includes purchase performances, sports, meetings, public life has not disappeared it has been reconstructed.

Kaplan's research study on the preference of urban built and natural environments is the most frequently cited psychological evidence which shows how nature promotes well-being. Porteous (1996) quotes Kaplan's findings of

the subjects, who were given slides to choose from, vastly preferred natural material over the urban slides. Recreation for the public became important as house lots became smaller with the rise of congestion in urban areas. In general the park of the 20th century was no longer a multifunctional landscape park, but a place for active recreation (Volkman, 1999).

Economically, greenways benefit communities by attracting new development and tourism, raising property values, and reducing public expenditures for natural hazard control. Additionally, greenways can help preserve historic and cultural sites and improve the aesthetic quality of neighbourhoods. Greenways can also be valuable educational resources, providing accessible places to study the natural environment. Urban greenways promote community pride and solidarity and help foster an environmental ethic.

The ability of greenways to support natural environment, offers an opportunity for the users of greenway and streets to enjoy the fresh air from plants and the sounds of singing birds. Greenways are hands-on environmental classrooms. They provide users with knowledge of nature. People of all ages can see for themselves the precious and intriguing natural world from which they often feel so far removed; as is the situation with urban built environment. (Bischoff)

In summary, greenways provide lose-to-home recreational areas, community meeting places, historic preservation, educational experiences, natural landscapes and beautification.

Greenways help communities build pride by ensuring that their neighbourhoods are good places to live, so that children can safely walk or

bike to a park, school, or to a neighbour's home. Greenways help make communities more attractive and friendly places to live in. Though the health of the urban community has been compromised by the same environment they dwell in, the same environment can be enhanced to create a healthier vibrant community. Adaptation of greenways as infrastructure can become part of the solution to the problems urban communities face: obesity, depression, heart attacks, and other health issues; traffic congestion; global warming; and economic downturn.

2.7. CHALLENGES TO GREENWAY DEVELOPMENT

The benefits of greenways in environmental, social, health, cultural and economic terms are wide ranging but there are significant challenges to greenways development. It is important to note that greenway development involves public and many stakeholders.

As Bryant (2006) notes, the role of communities is significant in the development and implementation of greenways. The success of greenways is dependent on the level of public involvement. Where the level of public involvement is high the possibility of greenways implementation is high and vice versa (Ryder, 1995). Multiple jurisdictions are another major challenge to the greenways development. In most instances the implementation of greenways cuts across several jurisdictions.

Ryan, Fabos and Allan (2006) suggest that implementing greenways through such multiple jurisdictions can be not only challenging but at times impossible. The number of stakeholders involved in the development and implementation and who may include; the local government authority, the central government, local community groups, residents and landowners are many. Where these

groups differ, there lies a challenge to greenway development. Erickson and Louisse (1997) note that largest challenge in greenways implementation is coordination between government agencies and organizations.

Successful greenway projects require adequate funding which is a crucial challenge.

Though greenways require relatively small amount of land as compared to other large non-linear spaces their implementation too comes with a cost (Searn, 1995). These funds are for the planning, designing and for the construction elements of greenways. This can be obtained from government agencies, non-profit organizations, businesses and individuals. Currently funding for greenway projects is mainly from the public coffers.

This is usually through the central government or the local government. Human resources through volunteering of community groups and NGOs may also contribute to resources for a greenway. Therefore inadequacy signifies that there is the possibility of no meaningful greenways development being realized.

Physical Barriers, Public Acquisition of Land and Private Property Rights too pose a challenge to greenway development. In an urban setting greenway development will encounter several physical barriers such as roads, railroads and residential/commercial development. They are also susceptible to emerging changes in land use and their use and very existence is can be affected by various developments e.g. road construction, housing, industry or other government initiated projects (Cooper and Hull, 1979).

The development of greenways is also dependant on political goodwill. Where it is politically unacceptable due to various reasons like issues to do with

private property rights then their very implementation or development is hampered (Bryant 2006). Private land owners may perceive a public corridor as an encroachment on their property rights and choose to oppose the greenway. Land owners may be concerned about privacy loss, liability, illegal parking, access, noise and safety (Ryan et al 2004).

2.7.1. Nairobi in 1898

Located in Africa, East Africa, Nairobi owes its origin to the construction of the East Africa Railway (connecting Mombasa to Kisumu). The commitment of the British Company to the colonization of East Africa was marked by the decision to connect Uganda with the Kenyan Coast by rail (Mitullah, 2003).

The site in which the city has grown was chosen from its suitability as a railway depot due to the geographical location roughly halfway between Mombasa and the final destination of the railway line at Port Florence (now Kisumu).

2.7.2. Nairobi in 1905

Figure 2.9
Aerial Sketch of
Nairobi in 1905



The development of the city of Nairobi was as a result of the development of the railway line, indicated in black in figure 2.4.

Source: Nairobi City
Council (NCC)

2.7.3. Nairobi in 1906 – 1910: A plan for a railway town

Figure 2.10

The Nairobi Master Plan
in 1927



Source: Nairobi City



Before the railway Nairobi, there was need a railway town. The of the area dictated the the same. The maps show the segregated neighborhoods for and Asians.

Figure 2.11

The Nairobi Master Plan
in 1927



Source: Nairobi City

2.7.4. Nairobi Today

Rapid urbanization coupled with increasing population increase characterizes the city of Nairobi. Evidence of urban sprawl to the surrounding towns is evident.

Figure 2.12

Topographic Layout of Nairobi

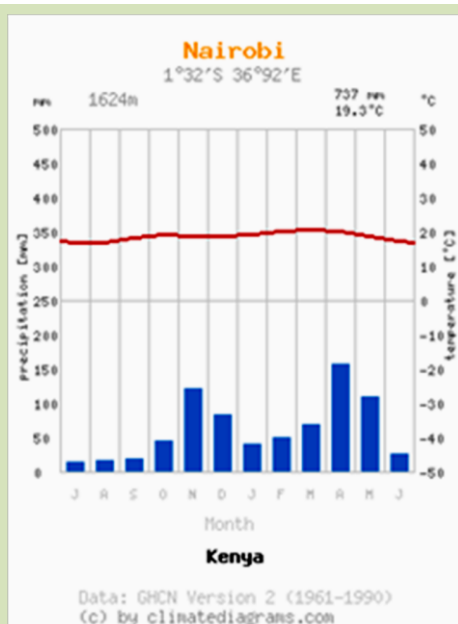


Source: Author (2012)

2.8. THE CLIMATE AND PHYSICAL ENVIRONMENT OF NAIROBI CITY

2.8.1. The climate

Figure 2.13
Nairobi Climate



A temperate tropical climate with two rainy seasons characterizes the City of Nairobi. The long and short rainy seasons are experienced between the months of March and April and between November and December respectively. The mean annual rainfall

Source:
climatediagrams.com
(accessed 2012)

ranges between 850mm to 1050mm (Lakin undated).

Nairobi is usually dry and cold between July and August, but hot and dry in the months of January and February (CBS 2003). The mean daily temperature ranges between 12⁰C and 26⁰C. The mean monthly Relative Humidity varies between 36 and 55 per cent. The mean daily sunshine hours varies between 3.4 and 9.5 hours (CBS 2003a).

The cloudiest part of the year is just after the long rains season. These conditions continue until September when it becomes overcast with drizzle.

2.8.2. Physical Environment

The current traffic situation in Nairobi is as follows:

1. There are 7,500,000 person trips per day translating to 2.5 trips per person;
2. By purpose of trips home bound trips command 46.5%, work 25%, school 9.8%, while other trips e.g. hospital command 18.7%;
3. Trip composition by travel mode is:
 - Matatu - 29%
 - Bus - 3.7%
 - Private Car/Taxi/Truck - 15.3%
 - Two – wheel mode - 1.2%
 - KR (Railway) - 0.4%
 - School or College Bus - 3.1%
 - Walking - 47%
 - Others - 0.2%
1. Main trip flows are concentrated into the central area from WESTLANDS (west area of Nairobi) and KASARANI and EMBAKASI (Eastland's area of Nairobi). A big chunk of the trips from west also emanate from Athi River and

Kitengela areas which border Nairobi and have lately harboured a big proportion of people working or trading daily in Nairobi. From the East, large trips also emanate from Kiambu and Thika areas.

The major transport challenges include:

- a) Urban structure problems including high population growth (3.9%) and urbanization (7-8%). There is also concentric urban structure with radial transport corridors in the Nairobi metropolitan Area. Another structural challenge is the concentration of work places in Nairobi City.
- b) Stiff competition for limited road space including few parking spaces. Most of the space in the city centre is utilized as one big car parking area and the roads lose their function as a transport facility. Most of the on road parking space is occupied by the commuters' private cars.

2.8.3. Drainage

Natural undulating terrains with a large network of natural streams form an excellent combination, which assists drainage evacuation immensely.

Rainwater harvesting is also practiced quite extensively. In some areas combined sewers are also in place to provide relief.

As such, no serious drainage problem has been identified, though no organised system of drainage exist.

Large scale development activities, as likely to be taken up through the Vision period, may cause problem of water logging, especially in low lying areas. A planned approach, therefore, is required to be initiated in this sector.

2.8.4. Urban Storm Water Drainage

A structured policy or strategy on urban storm water drainage at regional and national level is not in force. Stagnated storm water drainage in an urban locality has negative environmental and health impacts, and causes inconvenience to community. Undulating topography with large network of natural channels, one of the characteristic features of Kenya, eases out storm runoff and no significant problem due to the storm water is reported. However, with increased developmental activities due to urbanisation, problem of urban drainage are likely to increase, specifically in the NMR. Adequate provision for storm water drainage has to be implemented.

The rainfall pattern and topography may encourage disposal of surplus storm runoff into sewer lines planned as combined sewers. Rainwater harvesting for groundwater recharge is also being practiced. Both modes as above have inherent deficiencies and associated with certain level of risks. Necessary Policies, Guidelines, Acts, Laws, By-Laws, etc. may be formulated, enacted and implemented covering all aspects of urban storm water drainage for the NMR and Kenya as well.

Action Plan:

Drainage catchment are already identified which have to be reviewed and reorganised in consideration of developments proposed through the planning horizon. Comprehensive rainfall-runoff analysis is to be carried out. Drainage plans for developed urban areas and for future developments need to be developed in consideration of existing natural drainage channels, retaining, rehabilitating and improvements of those. Comprehensive catchment treatment

programme comprising primarily afforestation and silt prevention device is to be developed and executed.

2.9. BEAUTIFICATION OF NAIROBI – THE KENYAN FORM OF GREENWAYS

The Physical Planning Handbook for Nairobi (2008) offers different opportunities, embodied in strategies of planning, for greenway development along urban roads and streets. The handbook recognizes the importance of buffer zones. These, it continues by stating that, ‘they should include ten to twenty meters of green- belts on either side of urban ring roads and by-passes and green –belts created to prevent pollution between conflicting and non-compatible land uses.’ The requirements for the provision of these buffer zones should include refuse disposal strategies. They should be open spaces that are landscaped with provision of recreational opportunities. The significance of this is that we would be having more people coming to make use of these open spaces for visual relief, organized sports, sitting under shaded avenues, appreciating open air exhibitions of paintings, sculptures and photography. Physical Planning Handbook p. 18(2008). The handbook also stipulates that the urban network of roads should have a reserve that requires a more generous space provision because of additional street furniture and infrastructural facilities that have to be provided for. The requirement to have street furniture is an indication to have people spending time along the streets.

Page 40 of the handbook, under infrastructure Standards for Carriageways widths, states that roads have to accommodate multiple functions that have to be independently provided in the planning design. Another opportunity is recognized in the circulation of pedestrians. It is stated that ‘the pedestrians

shall be separated from moving vehicles by a barrier such as an up stand curb, open drain or wide verge. ‘ The planning and designing of such barriers could be utilized to make streets more usable not just circulation but for urban celebrations.

In the year 2009 Kenya launched an ambitious program of embarking to restore Nairobi back to its former glory of being a ‘Green city in the sun’. The then government spokesman was tasked to bring together the various departments required to start work of reclaiming Nairobi's image. These included the Nairobi Metropolitan, the Local Government, Provincial Administration & Internal Security, Ministry of Roads, Land's Survey Department, City Council of Nairobi and the Nairobi Central District Business Association.

The aim of the beautification program was to:

- a) Internationalize Nairobi City
- b) Promote Physical Aesthetics & Discipline
- c) Promote Efficiency and Organization
- d) Promote Individual Responsibility
- e) Promote Community Policing & Security through use of CCTV
- f) Promote Youth Empowerment through ‘Kazi kwa Vijana’
- g) Appeal to Investors and Tourists
- h) Enhance National pride and Patriotism

The program was intended to improve the image of the City of Nairobi and thus the Government, in partnership with the private sector, embarked on a major facelift of the City of Nairobi. This facelift encompasses the areas of

beautification, security, street address system and proper road maintenance and signage system. The beautification was to use available resources and the beauty of our land and greenery to transform haphazard landscaping of mostly bushes, to beautiful manicured lawns, plants and hedges that communicate order and success. The government spokesman noted that, Kenya had the ability to have the most beautiful and functional city in the world and urged the people of Kenya not to wait until 2030 but to embark on the process then. He further noted that a beautiful city would propel us psychologically and socially towards more economic progress. As former British Prime Minister, Winston Churchill, said "You shape your environment and then your environment shapes you". We can do it and so we are doing it, today. What we are launching is a pilot program that will be rolled out to the rest of the city roads.

Figure 2.15

**Launch of the Uhuru
Highway Beautification
Initiative**

**Source:
Republic of Kenya
(2009)**



The roles of riparian areas vary from ecological, aesthetic or theatrical roles, commercial roles to other general non-consumptive uses. However, since these

functions often do not entail large-scale constructions, such areas have been perceived as underutilized and have been subject to spontaneous encroachment and illegal occupation, mostly by the urban poor.

The perceived open access triggers dense settlement devoid of supporting infrastructure whose ultimate effect on the receiving environment is degrading.

Over the years, the Nairobi riparian areas have come under intense pressure from various sources, namely human settlements, industrial activity, and urban agriculture. The main causes of degradation of the riparian environment in Nairobi have been noted as habitat loss, solid waste, liquid waste, and raw sewage. The riparian reserves of the three Nairobi Rivers (Mathare, Ngong, and Nairobi) feature numerous informal settlements without adequate sewerage and sanitation services. More often than not, the rivers are used for discharging raw sewage. In addition to contributions of raw sewage from informal settlements, most of the industries find it cheaper to discharge their effluent into the rivers without any satisfactory treatment.

The Nairobi River Basin is home to more than 50% of Kenya's manufacturing and service enterprises and is the most polluted river basin in the country (UNEP, 2003).

On its part the Ministry of Environment and Mineral set out a "Programme of Action" outlining activities that were to be implemented in the short, medium and long term with the aim to restore the Nairobi River Basin. The Ministry emphasized on a ten point intervention plan that was to involve:

Creating awareness and assessing social impacts; Carrying out surveys and delineation of riparian reserve; Stopping discharges; Completing work on the 2.5Km demo stretch;

- 1) Relocating displaced economic activities and informal settlements;
- 2) Developing integrated solid waste management;
- 3) Restoring Nairobi Dam;
- 4) Installing sewerage and associated infrastructure;
- 5) Landscaping and beautification of riparian zone;
- 6) Developing master plan for main tributaries and the final crosscutting intervention being programme coordination.

Through these efforts the Nairobi Central Business District was able to have several greenways which included the Jeevanjee Gardens, Waiyaki Way and Mama Ngina Drive.

2.10. THEORY OF THE GARDEN CITY

As farmers became workers in the factories during the Industrialization Era, living conditions became worse due to congestion in the urban cities. The quality of life literally reduced as it was influence by different environmental issues. The Garden City Concept is one out of many attempts to reduce and solve social problems during this period. This urban planning method idealized a self-sufficient city, concentric in pattern with open spaces, public parks and six radial boulevards, extending from the centre. The idea of the Garden City was formulated by Sir Ebenezer Howard in his book: "To-morrow: A Peaceful Path to Real Reform", 1898. (Wikipedia, 2012). Howard identified and analyzed various reasons for people to move to the city or to the country side.

He found out that both have significant advantages and that they function as magnets.

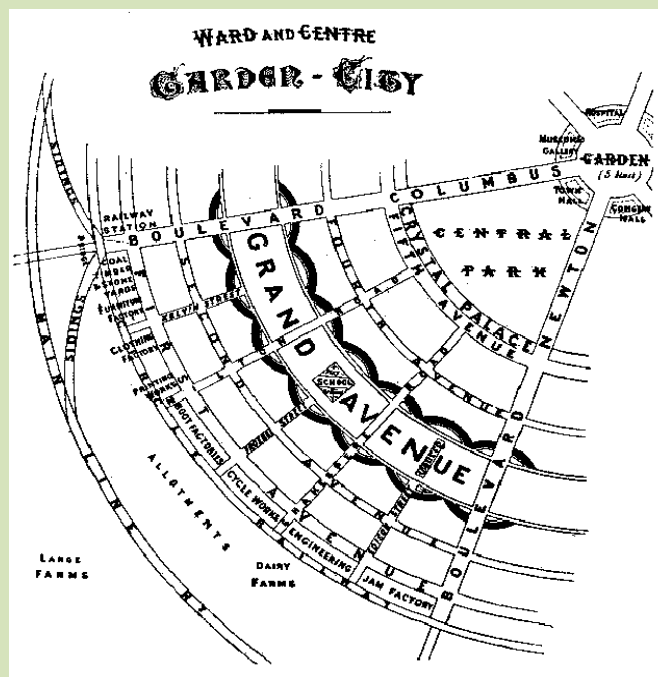
Therefore, his solution was to develop a city structure which contains the advantages of a city and those of the countryside. He expressed this in his image of “The three magnets” In short, the plan was to raise the standard of health and comfort of all true workers of whatever grade-the means by which these objects are to be achieved being

a healthy, natural, and economic combination of town and country life, and this on land owned by the municipality. (Osborn and Mumford, 1946)

The main objective of the concept is to find a new city. This is a very important aspect because the common strategies of city expansion (suburbs) did not work because you always had to adapt to old structures and usually the suburbs were too close to the mother cities. The surrounding area of the Garden City is used for agriculture and recreation.

Figure 2.16
The Garden City Concept

Source:
Howard, (1902)



The Garden City structure pays attention to the provision of network of connectivity in terms of avenues, street types and green, in different zones.

The core in the centre

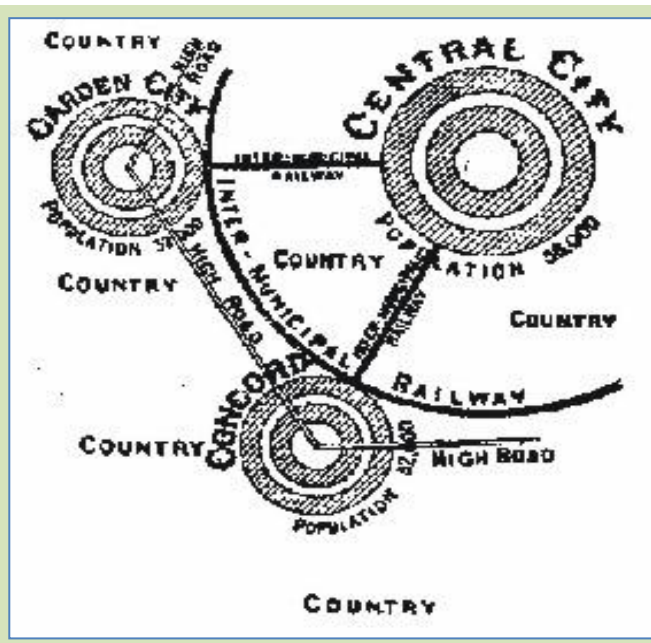
is about 4 km² and contains a central park, surrounded by a commercial, cultural and administrative zone. Six magnificent boulevards connect the centre with the circumference, dividing the city into six parts. A wide Grand Avenue and some smaller First to Fifth Avenue ring roads are arranged circular around the centre, and together with the radial roads, they form the city's living area. Social infrastructure (i.e. schools) is located along the Grand Avenue. The outer ring is supposed for small scale industries and manufactories to keep the inhabitants away from emission and a green belt and a circle railway mark the border to the countryside.

In trying to be self sufficient the garden city ideology had a population limitation that could only allow an accommodation of 32,000 people. Hence a solution had to be formulated to curb this overflow of city urbanites. Further growing of the Garden City is not possible. Therefore a new city has to be founded in a reasonable distance of about 7 km to the others to protect the countryside. The cities are well connected through a railway system to

Figure 2.17

The Three Magnet
Concept of the Garden
City

Source: Hall, 1988



2.11. THE PLACE MAKING CONCEPT

Sustainable ecological greenways require the user participation. This will ensure livability for the greenways will always meet the requirements of the users. The project for public spaces and metropolitan planning council gives the concept of place making (Council, 2008). Place making is the art of creating “public places of the soul that uplifts and help us connect to each other” unlike a space which is a physical description of a piece of land, a place connotes an emotional attachment to the piece of land. A place is not necessarily a design (Council, 2008) The sense of a place involves creative of economic activities and active uses. It is usually an act of looking at, listening to and asking questions of the people who live, work and play in a particular space to discover their needs and aspirations.

Observing space allows you to learn how the space is used. The sense of a place is also achieved by triangulation where elements relating to each other in a way that foster activity and are grouped together. Elements placed together have synergies. Place making is a dynamic human function (Council, 2008)

It is an act of liberation of staking claim and beautification and true human empowerment. Greenways will make a place great and create spaces where celebrations are held, social and economic exchange takes place, friends run into each other and culture mix (council, 2008). Street as places usually have variety of uses which ensure that spaces can be shared effectively, street width are appropriate to the function and how sustainable transports options can be supported and encouraged.

In green way concept Marcus (1998), suggests that most successful streets will have highly visible location, sunny during lunch hour, has food available, has a variety of seating locations, and offers a passing parade of pedestrians and traffic. Users seem to enjoy the combination of being both spectators and on display.

The greenway should have abundant seating with casual nature of sitting. Crocker plaza and street is a successful area that have a casual seating arena and “people sit watching people watching people” Marcus (1998).

Through the qualities of public space on mobility, socialization, safety and health and land uses, it is possible to analyze a city’s circulation networks and opportunities for greenways in enhancing circulation networks for sustainable city.

2.12. THEORETICAL FRAMEWORK

This study relies heavily on the theory of Human Ecology. This is a term that has come to refer to the symbiotic interaction of humans with their environment, the ways in which people influence, and are in turn influenced by their environment (Machlis, 1989). In this definition, environment refers to the full range of social, cultural, biotic and abiotic settings of individual and collective human activity.

Human ecology recognizes that the relationship between people and place is dynamic, and that humans are but one component of the larger functioning of the ecosystem. Principles common to the study of ‘natural’ (i.e. no human dominated) ecosystems are also applied to the study of the human environment interaction (Machlis, 1989).

These principles include adaptive responses to the environment that maximize the physical, psychological and social well-being of the user (Appleton, 1975). In this theory the environment is seen as a habitat which sustains and supports life's processes. The theory makes a basic assumption that when given a choice, people will seek for environments that maximize their ability to survive and thrive, and that are healthy and supportive of life process (Kaplan and Kaplan, 1989).

In urban greenways, this assumption thus implies that people will be expected to interact with the open space in such a way that maximises their well-being. This well-being is not limited to physical safety but extends to their social, psychological and physical comfort. In essence the human ecological theory supports that human beings will opt for sustainable, attractive and Livable environments that contribute to their overall well-being or celebration.

2.13. CONCEPTUAL FRAMEWORK

Sustainability has emerged as a major theme in planning. Urban environmental planners frequently recommend greenways as one approach to making places greener, healthier, and more Livable. As indicated in fig 1.1, the Conceptual Framework, greenways' directly affects the URBAN CELEBRATIONS of communities by creating sustainable and Livable urban settings. The factors that contribute to URBAN CELEBRATIONS are enhanced by the various benefits of greenways and which for this study have been grouped into socio-economic and environmental benefits. Despite this, there are challenges that impact on greenway development and implementation.

Figure 2.18 Conceptual Framework



Source: (Author)

This can only be addressed through greenway planning as the intervening measure that gives birth to greenways that lead to Livability and sustainability in urban centres.

In this study the researcher looks at the benefits of greenways in enhancing URBAN CELEBRATIONS through the creation of sustainable and Livable

urban centres. The researcher takes a look at the Nairobi Central Business District and its current greenway structure and provides a greenway-planning framework that if implemented will enhance the celebration of the NCBD by creating a sustainable and Livable NCBD.

2.14. SUMMARY

In this chapter the literature review of the study has been extensively highlighted. Several definitions of greenways have been laid out and the study has been able to offer insights on to the type of greenway that forms the fundamental of this study. To give the readers a clearer perspective of greenways the study has been able to give insights into the evolution of greenways in the world. The discussion on greenways is carried out from a global to a regional perspective and localised for the Kenyan case.

Background information from existing literature geared towards answering the research objectives has been put forward in this chapter. Existing literature has been able to reveal that the socio-economic and environmental benefits are immense and necessitate the inclusion of greenway planning into the urban form. By so doing cities are turned into livable and sustainable places where urban celebration is enhanced. Finally, existing literature that has been put forward reveal that greenway planning in Kenya is lacking and brings out the need of its implementation.



3.0. CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1. INTRODUCTION

This chapter focuses on the research design, target population, sample and sampling procedures, research instruments, instruments validity and reliability, data collection procedures and data analysis procedures.

3.2. RESEARCH DESIGN

Cresswell (2007) asserts the importance of illustrating the research design as an effective strategy to increase the validity of social research. In this study the researcher adopted a mixed method approach of data collection. The major part of this chapter is the presentation of the research approach. Thus the study adopts both quantitative and qualitative research approaches. According to Corbetta (2003) quantitative data is hard, objective and standardized while qualitative is soft, rich and deep (depth and superficiality). In this research, the nature of data needed was hard, objective and at the same time rich and deep to be able to accommodate the researcher's aim. The richness of information was necessary to identify the benefits of incorporating greenways in urban planning while the hardness and objectivity of information was valuable in identifying possible intervention measures of integrating greenways into urban planning.

Ethnography relies on observations in which the researcher is a participant in the situation and collects the required information (Orodho, 2009). During the entire period of this study the researcher was able to visit various parts of the NCBD to observe the various activities and human behaviour within the walkways. Hence, the analysis of the data collected was done without constraining, manipulating or controlling the variables.

3.3. STUDY LOCATION

The study was carried within the Central Business District (CBD) of Nairobi. Nairobi city has been popularly referred to as ‘the green city in the sun’ and the Central Business District is the heartbeat of the city. From humble beginnings in the late 1890’s, Nairobi city has grown from a simple rail road depot on the railway linking Mombasa to Uganda, to become the 4th largest City in Africa, in terms of infrastructure development and size. The CBD resembles a concrete jungle, with tall, modern skyscrapers adorning the beautiful landscape and overlooks the Central and Uhuru Park.

Figure 3.1

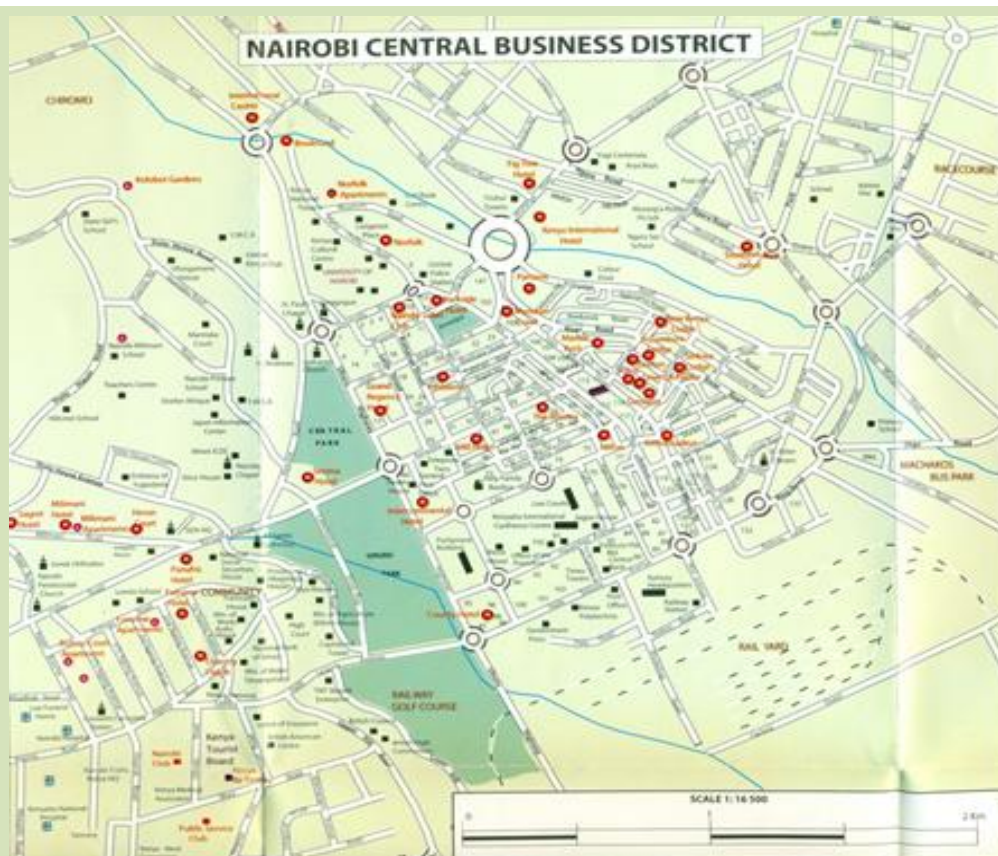


Source:

Nairobi City is one of the few cities in the world that has spacious, recreational parks sitting next to office apartments. The bomb blast memorial park and the Jevanjee gardens lie within the CBD.

The city is located at 1°17'S 36°49'E and is set almost in the middle between Kisumu and Mombasa cities. The business district is boxed within the four main roads; Uhuru Highway, Haile Selassie Avenue, Moi Avenue and University Way.

Figure 3.2
A Map of the Nairobi
Central District



Source: NCBDA

3.4. TARGET POPULATION

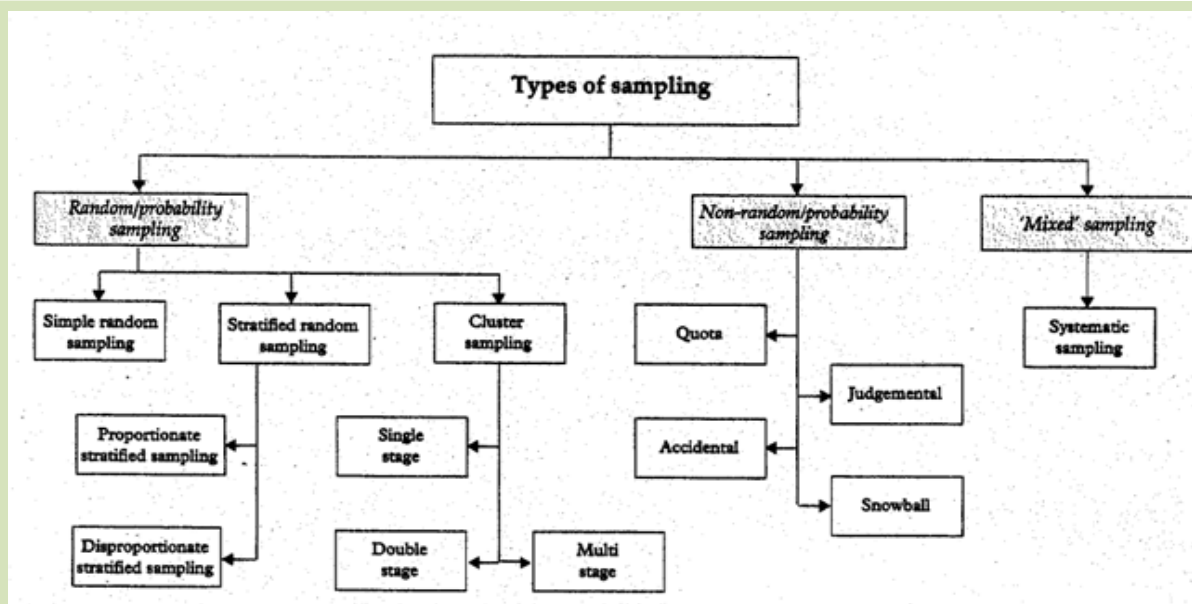
According to Mugenda (1999), a population is a complete set of individual cases or object with some common observable characteristics. The study targeted persons from all walk who visit the Nairobi Central Business District.

3.5. SAMPLE AND SAMPLING PROCEDURES

Sampling is “observing a part in order to glean information about the whole is an almost instinctive human act” (Corbetta, 2003). In order to glean the information about the whole in this case, all sampling techniques were

checked and the appropriate ones chosen. Kumar (1999) demonstrated the different sampling techniques (see the figure below).

Figure 3.3 Types of Sampling



Source: Kumar (1999)

In this study the entire NCBD was involved. In this study the area of study was grouped into five stratas. In other words stratification of the NCBD was done in order to be able to administer the questionnaires. In each strata 20 questionnaires were administered to non-key informants who were systematically sampled. In each strata the time interval between one interview and the other was one hour. Purposive sampling was used to identify the key informants who included professional in the built environment and this included architects, landscape Architects, planners, valuers and real estate managers. Purposive sampling was also employed in the identification of participants from the National Management Authority (NEMA), Nairobi City Council and the Nairobi Central Business District Association.

3.6. DATA COLLECTION INSTRUMENT

The study employed the use of several sets of instruments which included: a questionnaire, interview schedule, document analysis and observation schedule.

3.6.1. Questionnaire

This is a research instrument that gathers data over a large sample. As started by Orodho (2009) a questionnaire has a diverse number of merits upon which a researcher may opt to use it as an instrument to collect data.

The researcher therefore used the questionnaire for the following reasons:-

- The questionnaire enabled the researcher to collect information from a large number of people and the questions were easy to analyse.
- Questionnaire is anonymous and this helped produce more candid answers than was possible with the interview schedule.
- Questionnaire saved on time since the researcher was able to have the administered and collected later after the respondents hand filled them.

This method was used to solicit data from the selected population in the study area. The questionnaires had open ended and closed ended format.

3.6.2. In-Depth Interview Schedules

The researcher used in-depth interview schedules as it enabled him to be in a position to use both open and closed ended questions in order to get a complete, clear and detailed understanding the questions under study. The researcher collected information through personal interviews in a structured way which involved the use of a set of predetermined question which were to be asked in the form and order prescribed.

Though time consuming, the research interviews were able to yield a high response rate in the survey research and also allowed the researcher to clarify ambiguous answers and when appropriate, seek follow-up information.

3.6.3. Document Analysis Guide

Document analysis guide was used to assist in collecting in depth information on issues that needed confirmation such as the efforts that have been or are on-going in terms of adopting greenways in the NCBD.

3.6.4. Observation Schedule

This was used in order to obtain variable information on aspects of human interaction and behaviour within the various greenways and within the NCBD. Use of an observation schedule helped the researcher make judgments on first hand personal observation.

3.6.5. Photography

Photographs are an important way of recording findings in the urban and regional planning field. Through photographs the researcher has been able to capture important aspects of the study field. Many photographs were taken during the research work and the researcher had to take time to take selected excerpts which were considered crucial for the research work.

3.7. VALIDITY AND RELIABILITY OF THE RESEARCH INSTRUMENTS

Somekh and Lewin (2007) defined reliability as: The truth of the findings being established by ensuring that they are supported by sufficient and compelling evidence. It refers specifically to the consistency of the research tools. Davies (2007) states that the concept of reliability is related to the rigour with which a researcher approaches the tasks of data collection and analysis. He equates the term 'reliability' to methodological 'accuracy'. These scholars all point to three main aspects to achieve reliability, namely: sufficient data collection, compelling evidence and the rigour of data collection and analysis. In this research, sufficient and compelling evidence was achieved, through undertaking different methods of research, i.e. semi-structured interviews; document analysis; self-administered questionnaires and an observation schedule. Cresswell (2007) suggests eight strategies for validity that has been used by different researchers. He advises to stick with two of them at least in any given study. These strategies are: prolonged engagement and persistent observation in the field; triangulation; peer review or debriefing; refining hypotheses as the inquiry advances; clarifying researcher bias from the outset of the study; the researcher solicits participants views of the credibility of the findings and interpretations; rich and thick description and external audits. Most of these strategies were adopted in this research.

The researcher was able to use a variety of instruments except questionnaires such as interview schedules, observation and document analysis guide, hence ensuring methodological triangulation which is applied when a researcher uses

two or more methods of data collection. Peer review or debriefing was attained in this research through the supervision of a professor who was keen to check the instruments and discuss its results with the researcher. Qualitative data through interviews and document analysis was presented to give as much information about the results to the reader to allow him/her to evaluate its credibility. Through this the researcher was able to attain rich and thick description validation strategy.

3.8. DATA COLLECTION PROCEDURES

Primary data was collected through administration of questionnaires, observation and carrying out scheduled interviews. There were two types of questionnaires, i.e. structured and unstructured which were prepared in advance and were definite, concrete and preordained. The structured questionnaires were used to initiate formal enquiry, supplementing and checking previously accumulated data.

The questions aimed at capturing the benefits of incorporating greenways into urban planning from the various participants in the research.

The study involved administering mixed questionnaire to a randomly sampled population within the NCBD. The researcher was able to successfully undertake this process through the help of trained research assistance whom the researcher employed to aid in the process of data collection. The work of the research assistance entailed administering the questionnaires to randomly selected respondents in the assigned zones.

The use research assistants enable the researcher to play a supervisory role as far as the administration of the questionnaires was concerned. This was able to

give the researcher an opportunity to make observations and take photographs for the study and make field notes of important aspects. The researcher personally held interviews with the selected key informants and made notes of all the issues discussed.

3.9. DATA ANALYSIS PROCEDURES

Primary data in this study was generated from the questionnaires, the interview schedules and through the researcher's own personal observation. This data was checked, edited organized and coded by computer to reduce the mass of data obtained into a form suitable for analysis. The quantitative data was coded and analysed using Statistical Package for Social Science Programme (SPSS). The statistical analysis was then summarized into frequencies and percentages and presented in tables, bar charts and figures. Frequencies and percentages were adopted to present, discuss and interpret findings obtained.

The research questions giving qualitative data were analysed using content analysis procedures. The findings obtained were discussed and formed the basis for the research findings, conclusion and recommendations.

**“The only way of finding the limits of possible is by going beyond
them into the impossible”**

-Arthur C. Clarke



4.0. CHAPTER FOUR

PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA

4.1. INTRODUCTION

This chapter provides the presentation, analysis and interpretation of all the data collected from study area. This data was collected through various research instruments which included questionnaires, interview schedule with key informants, document analysis, and observations that also involved photography. The research instruments provided both quantitative and qualitative data. The quantitative data was analysed using descriptive statistics and was presented in the form of tables, percentages, graphs and charts. The qualitative data was analysed through the use of content analysis. Results of the data analysis provided information that formed the basis for discussion, conclusion, and interpretation of the findings and recommendations of the study. The Use of Statistical Package for the Social Science (SPSS) was extensively deployed by the researcher in statistical analysis, data management (case selection, file reshaping, creating derived data) and data documentation. Photographs were analysed through subjective analysis as they were objective while descriptive statistics was attained through cross tabulation, frequencies, and descriptive ratio statistics. Qualitative data was analysed through content analysis which allowed for the classification, sorting and enabled the researcher to arrange information and examine the relationships in the data. The analysed data was later exported to Microsoft Word where the researcher was able to come up with the conclusions of the analysis.

4.2. INFERENCES

For this study, the researcher administered one hundred (100) questionnaires to various randomly selected respondents in the NCBD over a period of two weeks. Before the commencement of the field work the researcher took a week to induct the research assistants on the manner and mode of administering the questionnaires to the various randomly selected respondents. This involved training the assistants on the process of gathering data and how to administering the questionnaires. To avoid the assistants all going to the same area, the researcher did a zoning and assigned two research assistants to each of the four mapped out zones.

Due to the nature of the research and the fact that the chances of meeting the respondents again were minimal the questionnaires were administered on site with the help of the research assistants. Of all the 100 questionnaires dispatched by the researcher, 98 were fully filled and returned back to the researcher for analysis.

4.2.1. Response Rate

Table 4.1 Response Rate	RESPONSE	FREQUENCY	PERCENTAGE (%)
	Responded	98	98
	No Response	2	2
	Total	100	100

Source: Author (2012)

The response rate for this study was 98% and which the research considered to be appropriate for this study. The high response rate was attained due to the nature of how the questionnaires were administered. Since the questionnaires were administered on site and the research assistants didn't leave them with the respondents to collect them at a later date, this meant that

all respondents who agreed to fill the questionnaires did so and handed them back to the research assistants. Thus questionnaires not administered will be retained for later day use.

4.2.2. Gender of Respondents

Table 4.2
Gender of Respondents

GENDER	FREQUENCY	PERCENTAGE (%)
Male	72	73.5
Female	26	26.5
Total	98	100

Source: Author (2012)

Most of the respondents interviewed for this study, 73.5% were male while the remaining 26.5% were female. The researcher had put in place measures to curb gender bias during the data collection process by ensuring that the number of the male and female research assistants was equal. The researcher employed the help of eight research assistants where by four were male and four female. This was to help curb bias that would arise by the use of assistants from one gender. Therefore the researcher considers the gender of the respondents to be more of a reflection the composition of the study area.

4.2.3. Marital Status of Respondents

Table 4.3
Marital status of
Respondents

MARITAL STATUS	FREQUENCY	PERCENTAGE (%)
Married	56	57.1
Single	35	35.7
Separated	4	4.1
Widowed	3	3.1
Total	98	100

Source: Author (2012)

In other words, all the areas visited had a higher population of male than females. As indicated in the table 4.3 above, most of the respondents, 57.1% were married, 35.7% were single while 4.1% were separated with remaining 3.1% being widowers.

4.2.4. Respondents Level of Education

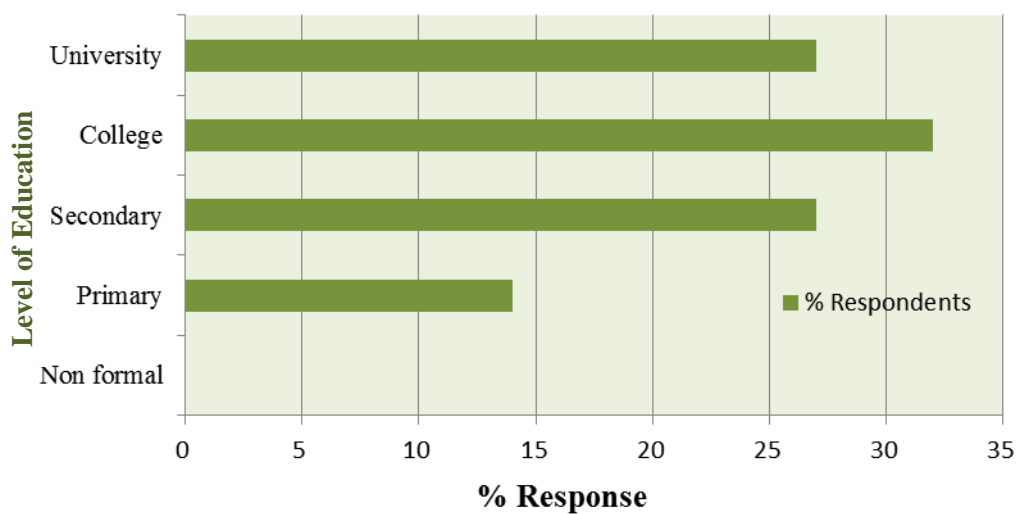
Table 4.4 Respondents Level of Education Source: Author (2012)	EDUCATION	FREQUENCY	PERCENTAGE (%)
	Non Formal	0	0
	Primary	14	14.3
	Secondary	27	27.6
	College	30	30.6
	University	27	27.6
	Total	98	100

From table 4.4 above, most of the respondents had attained an O level and above with most of the respondents, 30.6%, having attained a college level while those who had attained secondary and university education each had 27.6%. Those who had basic primary education were 14.3%. Clearly, all the respondents in this survey had attained basic education and therefore the researcher considered this sample appropriate as they could all be in a position to answer to the research questions and thus providing the necessary primary data for this study.

This composition is further shown in figure 4.1.

Figure 4.1
Respondents Level of Education

Source: Author (2012)



4.2.5. Occupation and Frequency of Visiting NCBD

Table 4.5
Frequency of Visiting the NCBD

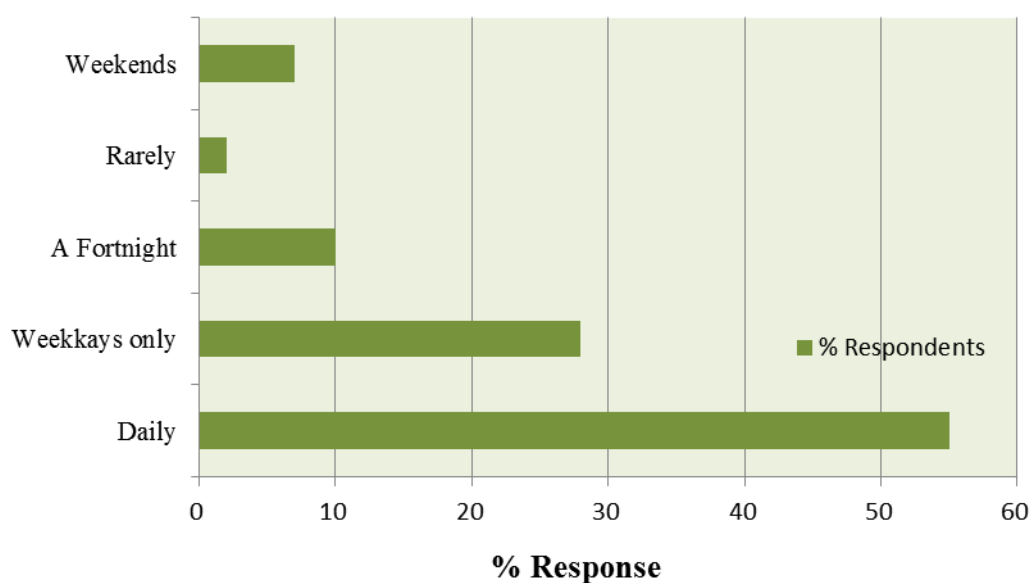
Source: Author (2012)

VISITS	FREQUENCY	PERCENTAGE (%)
Daily	47	55.3
Weekdays only	24	28.2
A Fortnight	8	9.4
Rarely	1	1.2
Weekends	5	5.9
Total	98	100

The findings of the study indicate that most of the respondents interviewed visited the NCBD on a daily basis and they composed 55.3% of the study sample. 28.2% came to the NCBD on weekdays alone. Those who visited the NCBD fortnightly were 9.4% while 5.9% visited the NCBD only on weekends. In the study sample only one respondent happened to have visited the NCBD for the first time and which coincided with field survey for this research.

Figure 4.2
Frequency of Visiting the
NCBD

Source: Author (2012)



The people who visited the NCBD were from all walks of life. As noted during the study, the respondents who participated in this study were varying in occupation. A good number of them were unemployed while others were students, casual labourers and business people. The professionals too were many. Some of them included lecturers, lawyers, accountants, consultants and doctors. The researcher was satisfied with this composition as it added to the enrichment of this study by having and incorporating views from people of all walks of life.

4.2.6. Satisfaction with the Natural Amenities in Nairobi

Table 4.6
Satisfaction with the
Natural Amenities in
Nairobi

Source: Author (2012)

RESPONSE	FREQUENCY	PERCENTAGE (%)
Yes	56	57.1
No	42	42.9
Total	98	100

As indicated in table 4.6, most of the respondents were satisfied with the natural amenities that Nairobi has been endowed with. 57.1% of the respondents were while 42.9% were not. Of those who were satisfied they noted that Nairobi had many natural amenities and some of those cited included the Central Park, the Nairobi National Park, Uhuru Park, the National Museum and the Arboretum. These places were considered clean, well maintained and smart. These areas had also been visited by most of the respondents.

Despite Nairobi being endowed with ample natural amenities the Nairobi Central Business District was considered wanting. Of those who expressed dissatisfaction with the city's natural amenities noted that the Central Business District did not have natural amenities. Some respondents indicated that they could not enjoy nature during their working days as the available natural facilities were a little bit far from their offices. Others were of the view that trees and flower beds were scarce in most part of the town centre. The available greenways that respondents noted in the CBD were only the Aga Khan Walk, the Jeevanjee Gardens and the Mama Ngina Street.

Nevertheless, the respondents were all in agreement that the state of the available natural amenities had improved in the recent past. The beautification of the Nairobi city program was hailed as bearing fruits. There were calls from some of the respondents that there is more that needs to be done as far as greenways are concerned.

4.2.7. Visits to Parts of Nairobi that have Greenways

Table 4.7 Visited Parts of Nairobi with Greenways	RESPONSE	FREQUENCY	PERCENTAGE (%)
	Yes	85	86.7
	No	13	13.3
	Total	98	100

Source: Author (2012)

The researcher sought to find out whether the respondents had visited various greenways by posing the question; *Have you been to any parts of Nairobi that have greenways?* It was encouraging for the researcher to note that 86.7% of the respondents had indeed made visits to various places with greenways.

Only 13.3% answered to the contrary. The Aga Khan Walk, Race Course, City Park and State House Road added to the list of greenways mentioned in the previous section.

4.2.8. Importance of Greenways

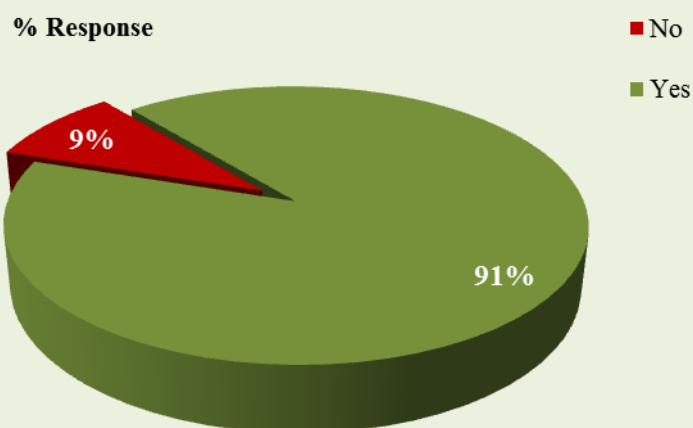
The researcher sought to find out the respondents take on greenways by posing the question: *Do you think Greenways play an important role?* This section discusses the findings of the study with regard to this question. Majority, 90.8%, of the respondents agreed that greenways play an important role while 9.2% were of the contrary. Greenways were found to contribute to the beauty of the city while at the same time promoting nature and calmness. It was also noted that greenways kept the environment cool and provide shade during the hot days.

Table 4.8
Importance of Greenways

RESPONSE	FREQUENCY	PERCENTAGE (%)
Yes	89	90.8
No	9	9.2
Total	98	100

Source: Author (2012)

Greenways were also found to be an important aspect of urban linkages. They were considered to add value to the transportation choices and also provided an ease of movement. They provided an alternative form of transport that helped ease movement around the city.

Figure 4.3
Importance of Greenways

Source: Author (2012)

4.2.9. Use of Greenways**Table 4.9**
Use of Greenways

RESPONSE	FREQUENCY	PERCENTAGE (%)
Yes	87	88.8
No	11	11.2
Total	98	100

Source: Author (2012)

As indicated in table 4.8, most of the respondents used greenways while 11.2% did not. One of the respondents who responded not to using greenways indicated that he considered frequenting greenways as a preserve for job seekers and ‘hustlers’. Other respondents failed to use greenways due to the fact there were none which were in existence along their daily travel routes. Essentially, there exists a general prevalence of the use of greenways from the residents of Nairobi.

The researcher also sought to explore factors that greenway users consider when choosing a travel path. The next section looks at these factors.

4.2.10. Factors Considered when Choosing a Greenway Path**Table 4.10**
Factors Considered when
Choosing a Greenway Path

FACTORS	FREQUENCY	PERCENTAGE (%)
Vegetation	45	51.7
Trail Surfacing	24	27.6
Security	61	70.1

Source: Author (2012)

Of the 87 respondents who admitted to using greenways, 70.1% considered security along the greenway an issue worth their concern while 51.7% considered the nature of vegetation only 27.6% of them considered trail surfacing.

4.3. GREENWAYS CONTRIBUTION TO THE QUALITY OF LIFE

By asking: *Do greenways contribute to the quality of your life?* The researcher sought to determine the percentage of people who considered greenways as a contributor to the quality of life for its users.

Table 4.11
Greenways as a Contributor
to the Quality of Life

Source: Author (2012)

RESPONSE	FREQUENCY	PERCENTAGE (%)
Yes	82	94.3
No	5	5.7
Total	87	100

94.3% of the respondents who had been using greenways admitted that greenways contributed to the quality of their life. While 5.7% found it not to have any significant contribution to their lifestyle. Ways in which the greenways contribute to the quality of life as captured from the respondents is discussed in the next section.

4.3.1. Greenways Contribution to the Quality of Life

Table 4.12
Ways in Which
Greenways Contribute to
the Quality of Life

Source: Author (2012)

CONTRIBUTION	FREQUENCY	PERCENTAGE (%)
Health/Fitness	34	41.5
Offer Natural Areas	54	65.9
Reduce Pollution	47	57.3
Reduce Transportation Costs	13	15.9
Increase Interaction with Friends	39	47.6

For most of the respondents (65.9%) greenways offered natural areas while 57.3% noted that greenways helped to reduce pollution. Greenways increased interaction with friends and this was supported by 47.6% of the respondents. Health and fitness had the support of 41.5% of the respondents while reduction in transport cost had 15.9%.

4.3.2. Socio Economic Benefits of Greenways

This section looks at the various socio-economic benefits of greenways. The researcher provided the respondents with a list of socio-economic benefits which are listed in table 4.12. From table 4.12 above the ability of greenway to increase awareness of the natural environment rated the highest. 51% of the respondents strongly agreed to this while 38.8% agreed. Improve leisure time and sports facilities had 50% strongly agreeing while 36.7% agreed. Greenways allow people to create contact with nature as indicated where 48% strongly agreed and 38.8% agreed.

They were also rooted as having a positive influence on human behaviour with 41.8% of the respondents strongly agreed while 40.8% agreed. The aspect of greenways easing public mobility had 42.9% strongly agreeing, 26.5% agreeing while being cost effective for outdoor recreation had 41.8% strongly agreeing and 28.6% agreeing. Greenways also attract tourism. 48% of the respondents agreed to this while 35.7% agreed. 40.8% and 37.8% of the respondents strongly agreed and agreed respectively to greenways contributing to an increase in real estate property values. Helping to reduce crime had 40.8% strongly agreeing while 22.4% agreed while their abilities to induce healthier lifestyles had 37.8% strongly agreeing and 36.7% agreeing. Greenways contribution to commercial opportunities was immense. This was supported by 43.9% of the respondents who agreed and 28.6% who strongly agreed. Induce positive publicity for business had 44.9% agreeing and 24.5% strongly agreeing while its ability to stimulate expenditure had 37.8% agreeing and 32.7% strongly agreeing.

The researcher also made an effort to visit a recently developed park along the Nairobi River behind the National Museum of Kenya. In this park there were well laid paths, which had been well surfaced and maintained. The pictures are captured in plate 1 below.

Table 4.13 Socio-Economic Benefits of Greenway

Benefits		Strongly Agree	Agree	Disagree	Strongly disagree	Total
Induce positive publicity for business	Frequency	24	44	19.0	11	98
	%	24.5	44.9	19.4	11.2	100
Attract tourism	Frequency	47	35	14.0	2	98
	%	48	35.7	14.3	2	100
Enable commercial opportunities	Frequency	28	43	20.0	7	98
	%	28.6	43.9	20.4	7.1	100
Increase real estate property values	Frequency	40	37	15.0	6	98
	%	40.8	37.8	15.3	6.1	100
Stimulate expenditure	Frequency	32	37	18.0	11	98
	%	32.7	37.8	18.4	11.2	100
Cost effective for outdoor recreation	Frequency	41	28	17.0	12	98
	%	41.8	28.6	17.3	12.2	100
Improve leisure time and sports facilities	Frequency	49	36	10.0	3	98
	%	50.0	36.7	10.2	3.1	100
Increase awareness of the natural environment	Frequency	50	38	9.0	1	98
	%	51.0	38.8	9.2	1.0	100
Eases public mobility	Frequency	42	26	17	13	98
	%	42.9	26.5	17.3	13.3	100
Creates contact with nature	Frequency	47	38	13	0	98
	%	48.0	38.8	13.3	0.0	100
Induces healthier lifestyles	Frequency	37	36	18	7	98
	%	37.8	36.7	18.4	7.1	100
Positive Influence on human behaviour	Frequency	41	40	13	4	98
	%	41.8	40.8	13.3	4.1	100
Help to Reduce Crime	Frequency	40	22	32	4	98
	%	40.8	22.4	32.7	4.1	100

Source: Author (2012)

Plate 2: Various activities and wares at the Maasai Market



Vendors talking on the phone



Walkway along the Park



Wares on display for sale



Maasai vendors at the market



A surfaced walkway



Beaded Necklaces on Display



Vendors selling Calabashes



Vendors seated along a
walkway



Wooden Sculpture and Batik
Wall Hangings



Tourists making purchases

Compiled by Author

The reason for the researcher to have visited this park was because the park played host to the '*Maasai Market*' every Tuesday. The researcher was able to take photos of the park to highlight some of the benefits that arise in greenways and greenway parks.

The researcher noted all the goods on sale at the market were of 'Made in Kenya'. This goes to show how the implementation of successful greenways can contribute directly to the national economy. If well enhanced greenways are a great contributor to the national economy as it offers varying economic benefits as seen in the park.

Being a traditional market day and borrowed from the concept of the African traditional market practice where there were set market days, the Maasai Market has been able to attract various people from all lifestyles thus a source of social cohesion. Its location goes further to contribute to this cohesion by adding to the sustainability and Livability of the market thus contributing to urban celebrations.

Though the study undertook a case of the NCBD the researcher further sought to look at several developments along the Thika Highway that were considered as initial steps towards the greenway development in Kenya. The researcher was able to hold discussions with the CES consultants and contractors some of them who were Chinese on their view of the developments. The use of photography was employed to capture various aspects of the developments.

The pictures below best illustrate the findings from this particular area beyond the study area but also creating a connection to the study area.

Plate 3

Initial Stages of the
Construction of the
Museum Hill Interchange
Plaque

Source: Author



Plate 4

Pictures of the Plaque
after Completion

Source: Author



The researcher uses figure 4.4 above and the pictures on plate 2 to illustrate the transformative nature of adopting a greening concept to the environments. Though the development of this point was more of a landscaping effort, the researcher is concerned that these efforts would have been more enhanced if the aspect of greenway planning had been incorporated in the landscaping aspect.

With a greenway in place, connections from the interchange to the NCBD and Westlands would have been articulated well. As it stands now, space within the interchange and named the Turning Point Park does not provide pedestrians and cyclist with enough connections from landscape to landscape. Pedestrians and cyclist do not have access to enter to the park thus making it very isolated. There is therefore great need to link the turning park and the globe round about through greenway so as to generate diversity. Jacobs (1961) argues that a circulation network must serve more than the primary function.

This must ensure the presence of people who go outdoors on different schedules and are in the place for different functions and are able to use many facilities in common. The fabric of cities must be continuous networks throughout a district of potential sub-city and power (Jacobs, 1961).

The development towards the Turning Point Park as it is now being called, has had its share of benefits that the researcher feels can also be attributed to the greening concept and by extension to greenway development. From discussions with the foreign consultants and contractors on site they considered the developments to be more of greenway concept than landscaping. Thus going by this notion of greenways development activities during the period of construction of the park can be attributed to any implementation of a greenway. The pictures below give the visual illustrations to this.

Plate 5:

Activities during the Early
Development of the
Turning Point Park



Source: Author

The researcher uses these pictures to indicate the contribution that greenway development can contribute towards economic Livability by creating employment opportunities. Considering that there are a number of materials that would be need towards their realization this means more economic opportunities through employment and related activities.

4.4. CHALLENGES TO GREENWAY DEVELOPMENT IN KENYA

The challenges affecting the development of greenway in Kenya are many. Most of the respondents cited poor planning by the Nairobi City Council as the major challenge. The participants noted that there was no modern physical plan for the Nairobi City.

Some of the issues that were cited as indicators to planning was the laying of underground fibre cables that end up disrupting vital services like water supply to buildings.

Therefore the development of greenways would require excavations which would end up destroying some of these facilities.

The cost of developing of greenways was considered high and one which involved a lot of logistics. Some of the respondents noted that there were some structures which had already been erected along possible greenways and therefore efforts to implement a greenway along the given paths would need to be demolished. This they noted would increase the cost of laying out greenways.

Discussions with the key informants indicated that there were by far too many institutions whose permissions would need to be sought before any meaningful greenway can be implemented. Examples were given of Nema, The Nairobi City Council, the Ministry of Environment, the Ministry of Roads and the Nairobi Metropolitan Ministry. Thus a lot of time and money would be wasted in the pre-development stages than on the actual development of the greenways.

Lack of public support for greenways was another challenge that was highlighted. Several participants felt that far too many people were ignorant or were not concerned of the initiatives going around them.

They considered most developments as efforts of funds embezzlement by the people in authority. To add on to lack of public support, there were participants who felt that vandalism of greenways was also a major challenge. In times of strikes or civil unrest where plants within the city ended up being destroyed by hooligans.

Corruption and lack of adherence to the rule of law were also major challenges to note. Most of the funds that would go into the development and sustenance of greenways would end up being embezzled. Where there is implementation, respondents felt that due to poor or lack of adherence to the laid standards would lead to substandard greenways as some contractors would do a shoddy job.

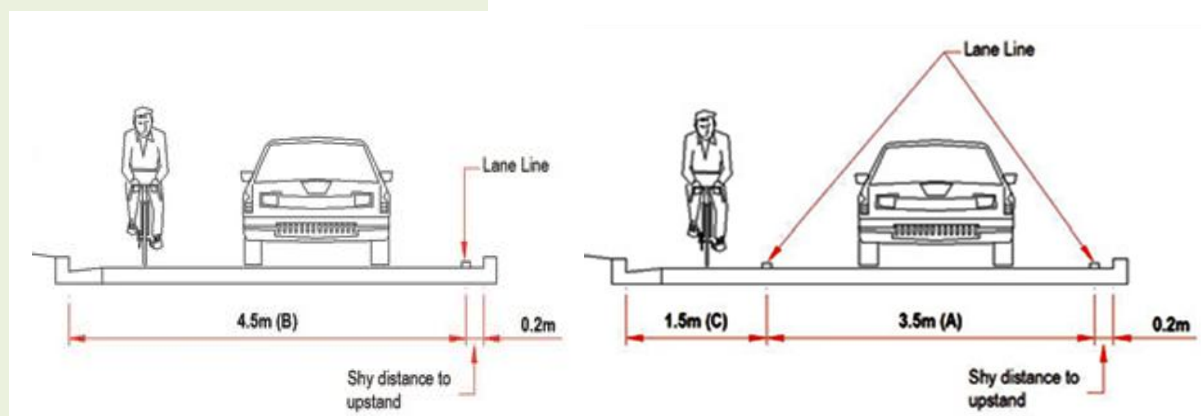
4.5. **AREAS THAT GREENWAYS WOULD SUITE BEST WITHIN THE NCBD AND ITS ENVIRONS**

The researcher sought to find out areas of interventions by posing the question: *Which streets or places in NCBD do you think greenways should be integrated?* Most of the respondents felt that there was need to develop greenways in the entire town centre. Some of the streets most cited were Ronald Ngala Street, Tom Mboya, Kenyatta Avenue, Moi Avenue, Muindi Mbingu Street, Koinange Street, Luthuli Avenue, Harambee Avenue, Accra Road and Haille Selassie Avenue. A few respondents felt that there was need to develop the existing bus terminuses e.g. the former Kenya Bus Terminus along Race Course Road and the Kencom Bus stop into modern bus stations with adequate greenway facilities and resting points. The need for outdoor cafes, toilets, dustbins and clear signage were recommended.

4.5.1. Facilities that should be considered when planning for Greenways

Most of the respondents felt that there was the need to set up several additional facilities within the possible greenways routes. These included more public seats, outdoor cafeterias, public toilets, water points, disposal bins and shade facilities. There was also the need of a well-surfaced walkway within the NCBD. The addition of these facilities would enhance the sustainability of the greenway infrastructure. The need for a better layout structure that encompasses the various modes of transport was another area that was considered wanting and whose intervention was long overdue. The general feeling was that a clear separation of different modes of transport be laid within the city and should take into consideration the needs of cyclists and motorists. Cycle lanes should be provided in each direction of travel. Where possible, the vehicular lane should be narrowed to give room to cycle lanes. The plate 4 below illustrates these dimensions.

Plate 6: Provision of Cycle Lanes



Source: Pamela, (2012)

Figure 4.4
A Road with well Enhanced
Cycle Network



Source:

The researcher considers greenway as a possible intervention measure to this existing situation. The sketches below best illustrate ways in which greenways can be integrated into urban design to enhance sustainability and Livability.

Figure 4.5
Integration of Greenway
into Urban Designs



Source: Author (2102)

Figure 4.6
Possible Layout of
Greenways in the NCBD



Source: Author (2012)

Figure 4.7
Form of urban celebrations
Along a Greenway

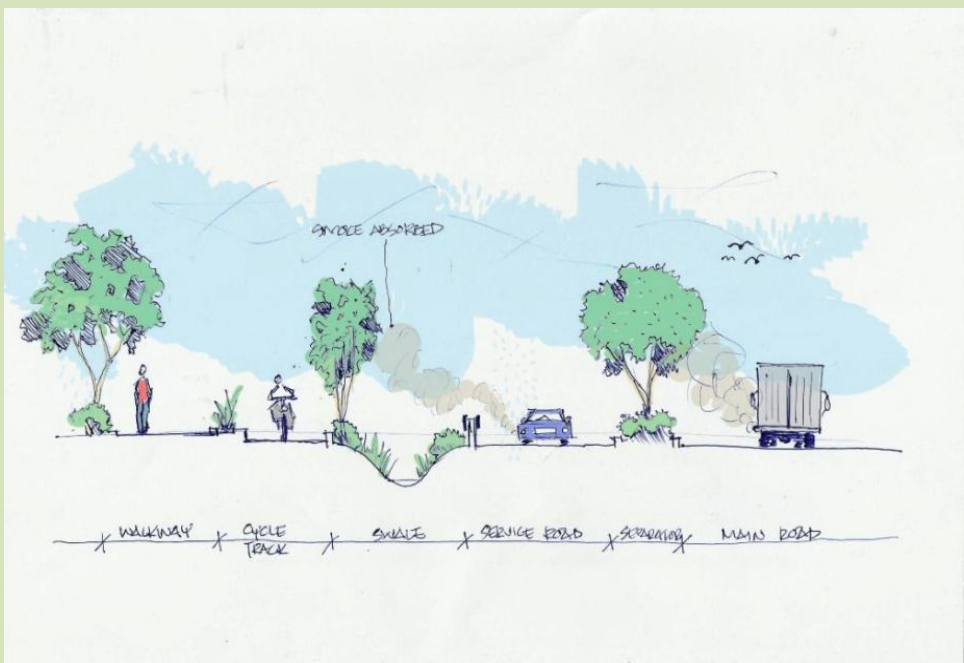


Source: Author (2012)

Figure 4.8

A Sectional
Layout of a
Possible
Greenway
Network along the
Thika Rd
Initiative

Source: Author (2012)



Some of the areas that were considered wanting included Tom Mboya Street where there was neither a single public seat nor a public toilet, Ronald Ngala Street, River Road and all adjoining streets to the two roads. Some of the proposed facilities are shown in the pictures below.

Figure 4.9

Public Seats Along a
Greenway

Source: Cooper (1998)



Most of the respondents who resided in the Eastlands part of Nairobi, and who formed the bulk of respondents, felt that their travel to the NCBD would be more enjoyable and lively if a greenway network was to be set up along the Railway line. They noted that the entire stretch from Embakasi and Dandora to the town centre was a natural and possible route for a modern greenway. A number of them indicated that they used the trains as their modes of transport to the town centre and any efforts along this route would enhance the quality of life of many a people who frequent the NCBD. The railway mode of transport, they noted, at times was overcrowded and was not functional throughout the day.

Figure 4.10

Passengers in an Overcrowded Train Heading Towards the City Centre



Source:

Figure 4.11 A Possible Greenway Path along the Railway Line



Source: Author’s edition (2012)

Plate 7: Congestion and Lack of Order along Tom Mboya Road



Source: Author

4.6. OTHER EMERGING ISSUES

From personal observations and discussions with key informants, the researcher noted that there were emerging issues.

Areas within the NCBD that did not have any form of greenway enhancement tended to be disorganized, clumsy and crowded. The lack of order in this area was evident, as many activities did not merge to each other. There was lack of triangulation and most of the key informants felt that with the implementation of a successful greenway plan there would be more order and vibrancy.

Carbon pollution from the motorized transport within the CBD was high. The issue of other forms of pollution related to the motorized transport e.g. noise from touts and constant hooting were indicators of a disorganized centre.

*“There are always hearts and hands ready to make generous intentions
become noble deeds”*

-Hellen Keller



5.0. CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1. INTRODUCTION

This chapter gives the summary, conclusions, recommendations and suggestions for further study drawn from the findings of the study. Greenways do more than link just linking people to scenic places. They move people closer to being a healthier and more vibrant community. The aim of this study was to determine the benefits of incorporating greenways into urban planning: a Case of the NCBD.

5.2. SUMMARY OF FINDINGS

5.2.1. Benefits of Greenways

The socio economic benefits of greenways are immense and varying. The study found out that greenways help in the generation of revenues and jobs for Kenyans.

Figure 5.1

Iko Toilet at the
Jeevanjee Gardens

Source: Author (2012)



“The potential in improvement of physical health by walking is only one benefit from provision of more walkway downtown plaza, more areas of inner city reserved for pedestrians also means less pollution, less noise and fewer accidents.”

Marcus 1996

The presence of ‘Iko Toilet’, which incorporates a public toilet, a shop and a shoe shining point, at the Jeevanjee Gardens was one of the most notable examples of the economic benefits of greenways.

By adding value to the urban landscape, greenways ended up improving business and value of surrounding property. This in turn helped in the generation of revenues and jobs for various people. It emerged that greenways offered transportation options giving users the opportunity to reduce the amount of driving they did or use of public transport which in turn helped save on money and pollution by encouraging less driving. Thus greenways not only help to reduce public costs but also help shape growth. Greenways were found to be cost effective for outdoor recreation and greatly improved people’s awareness of nature and their environment. It induced healthier lifestyles and had a positive influence on human behavior.

5.2.2. Challenges that Hinder Sustainable Greenway Development

The study found out that the challenges affecting greenway development in Kenya were many and diverse. Poor planning by local authorities and lack of a political support to implement greenway development in Kenya emerged as key challenges.

Currently the concept of greenways in Nairobi has been confused to beautification and there is no set master plan that accommodates greenways. Their presence of too many institutions whose involvement is required posed also as a challenge. The establishment of any greenway plan would require authorization from different institutions and authorities. Thus increasing the cost of establishing greenways.

Lack of public support and the high prevalence of corruption in Kenya were considered as other challenges to greenway development in Kenya.

5.3. CONCLUSIONS

This study emphasizes the need of incorporating greenways into all forms of urban planning. The increase in urban sprawl calls for a paradigm shift in both in development and planning. There is the need now than ever before for us to think of open spaces as a form of infrastructure, just as we think of roads and airports as infrastructure. Greenways today are a necessity, not an amenity and must therefore be preserved through public investments. Greenways should be looked at as a “green infrastructure” and its importance equated to that of grey infrastructure. It must be preserved as a connected, contiguous system, not fragmented and preserved in isolation. Since greenways are supported by theories from landscape ecology, particularly those concerning spatial configuration and connectivity and a relatively new concept in landscape planning, new theory, planning strategies, and planning methods are needed.

The application of greenways as a component of sustainable landscape planning requires new approaches which integrate abiotic, biotic, and cultural resources and issues.

5.4. RECOMMENDATIONS

“A greenway has all the benefits and urban open space would have but also have more benefits in terms of linkage between areas. This adds to multi facilitated land uses on a day to day activity in life.” Vasconcelous 2006

From the researchers own personal observation, greenways attracted many visitors. By investing in an efficient greenway, the Nairobi Central Business District will become more competitive in the world market as a destination of choice and will be one of the many reasons that will force companies to relocate in the Central Business District. It is therefore important for the Government of Kenya to set a budget allocation for greenways.

Figure 5.2

A Food Cafeteria erected
along a Greenway in China



Source: Author (2012)

Where greenways have been integrated in Kenya, they have been adopted primarily as a beautification tool and for recreation purposes. The researcher recommends that planners and policy makers should support the evolving of greenways to support multipurpose/multi-functional planning goals and objectives.

Greenways represent a distinct spatial strategy based on the particular characteristics and advantages of integrated linear systems. It should be considered as a complement to comprehensive landscape and physical planning and should be integrated into the landscape and physical planning curricula.

The researcher recommends that efforts be made to protect other important landscapes that are not linear and for those elements that may not benefit from linkage or multiple use. The focus on linear greenway elements should not cause less concern for other non-linear areas with equally important landscape planning issues, but as a strategy, it has intrinsic merit. It is important for the political class to understand that greenways are based on the particular characteristics and opportunities inherent in linear systems, which offer distinct advantages in terms of movement and transport. Linkage is a key greenway characteristic and where attempts to implement it arise, it shall be of necessity to realize a synergy based on the advantages of linkages across spatial scales. This is because when a system is linked, it acquires the synergistic properties of a network.

5.4.1. Proposed Greenway System for NCBD and its environs

The researcher proposes a framework of greenway that is sustainable and derived from natural patterns, and captures the historical background of Nairobi and the country. This proposed greenway model outlines three predominant design typologies of greenways: connector design, containment design and composite network design for the NCBD and its environs.

It advocates for composite network design typology of greenways for its scalar versatility-enabling neighbourhood to city level applications and illustrates the sustainable development outcomes related to socio-cultural, ecological and economic wellbeing as generated through green network design. This proposed greenway plan for the NCBD and its environs articulates greenways as synergistic landscapes that create harmony amongst the urban system with broader biophysical system.

The essence for this NCBD and its environs greenway master plan is enhance the approach to greenways design and planning practice in order to start meeting sustainable development challenges more effectively and advocates for landscape synergism approach to design for sustainability and harmony. Nairobi encompasses most of the cultural and historical development of the nation of Kenya. This can easily be traced back to year 1901 when the railway station came into being. Uhuru Park reminds us of the struggle for independence and the nation's determination of self-rule that actualized with Kenya's independence. In essence, Nairobi is endowed with most of this country's historical heritage that is worth preserving.

These ranges from the Railway Station, Uhuru Park, the Parliament Buildings, Kenyatta Conference Centre, the university of Nairobi, The Freedom Corner, The Kamukunji Grounds, Nyayo House with its infamous Nyayo Chambers, The Nairobi River, the Bomb Blast Memorial Park and even the new Interchange at the Museum Roundabout along Waiyaki Way.

*“...far and away the best price that life has to offer is the chance to work
hard at work worth doing”*

-Theodore Roosevelt

Figure 5.3

Proposed Greenway
Framework for the NCBD
and its Environs



Source: Author (2012)

Figure 5.4 Capturing the H

Greenwa



Source: Author (2012)

SUMMARY

Objectives	Findings	Possible Interventions
Socio-Economic Benefits of Greenways	<ul style="list-style-type: none"> • Attract tourism • Enable commercial opportunities • Stimulate expenditure • Cost effective for outdoor recreation • Improve leisure time and sports facilities • Increase awareness of the natural environment • Eases public mobility • Induces healthier lifestyles 	<ul style="list-style-type: none"> • Integrate greenways in urban planning • Enhance greenways • Increase other facilities along greenways e.g. sits, open cafeteria • Provide lighting along greenways • Create an urban greenway authority to manage and develop greenways
Environmental benefits of greenways	<ul style="list-style-type: none"> • Restores/Protects the Environment • Enhances Environmental Quality • Supports Biodiversity • Induces better utilisation of land • Limits urban Growth • Shapes the urban form • Helps Reduce Pollution • Provides safe and Convenient Routes • Interconnects networks of open spaces 	<ul style="list-style-type: none"> • Integrate greenways in urban planning • Enhance greenways • Creation of greenways along roads to absorb carbon emissions • Formation of greenways along river beds to increase biodiversity • Create an urban greenway authority to manage and develop greenways
Challenges that hinder sustainable greenway development	<ul style="list-style-type: none"> • Poor Planning • Absence of a modern physical plan for Nairobi • High costs • Lack of Space • Bureaucracy • Lack of public support • Corruption 	<ul style="list-style-type: none"> • Integrate greenways in urban planning • Create an urban greenway authority to manage and develop greenways • Earmarking space for greenways • Use local materials and plants to minimize costs • Raise capital through advertisements along greenways

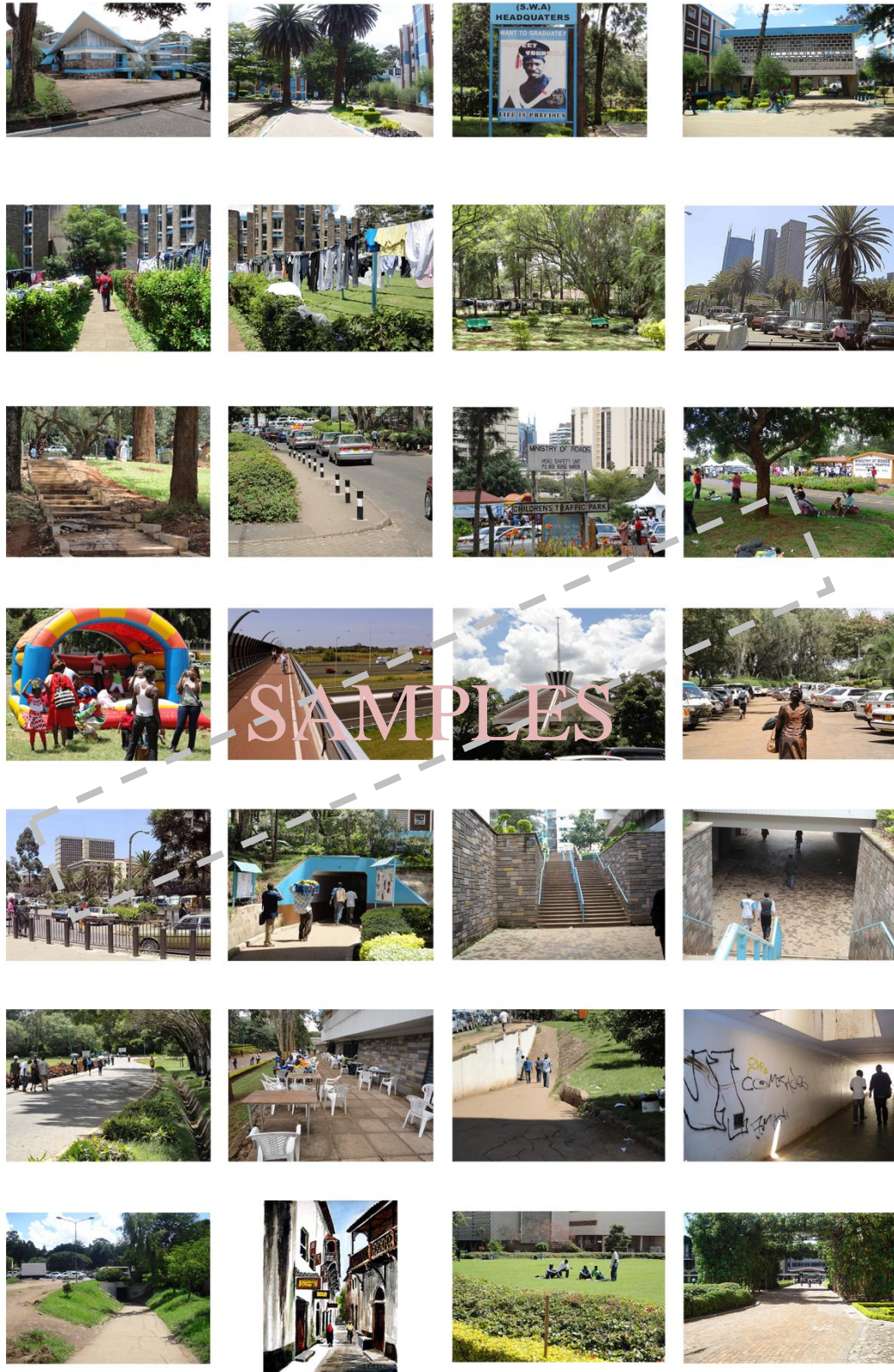
5.5. SUGGESTIONS FOR FURTHER RESEARCH

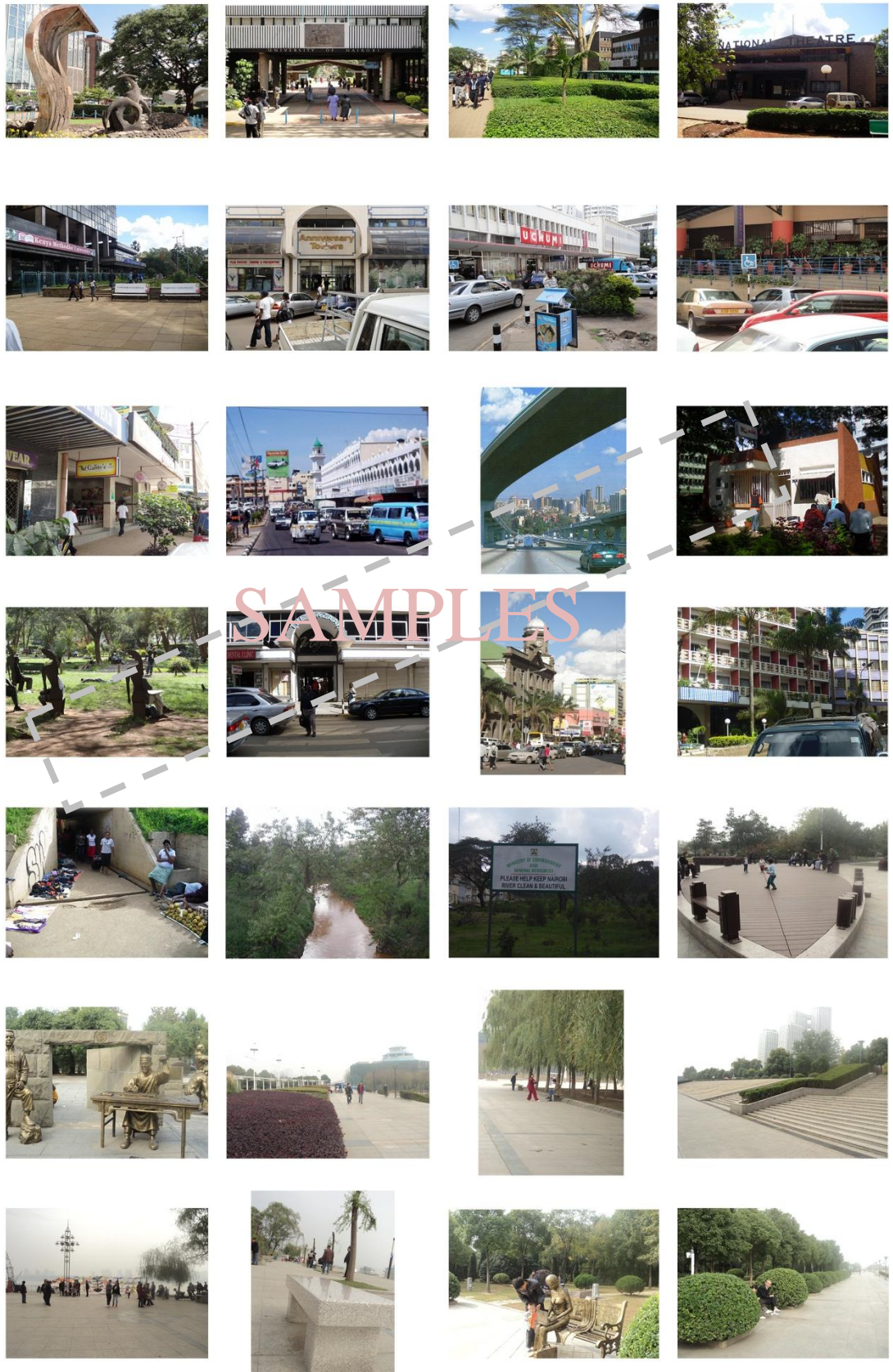
Considering the importance of greenway sustainability and its multi-objective nature and the benefits it bestows on an urban setting, it is necessary that further research be undertaken to determine the factors relevant to greenway planning in Kenya. This study is based on a selected case of the Nairobi Central District. Therefore, the researcher recommends that the breadth of greenway research be extended beyond this one case to encompass other urban centres in the country. By so doing, there would have been extensive research works on greenways that would go a long way into helping us as a nation come up with a national greenway framework.

The importance of implementing greenways has been well highlighted in this study and therefore there is need for a detailed research on factors of greenways development and implementation strategies in Kenya. There is also need to consider a study on the legal frameworks that can be enhanced to foster greenway development in the country. This will enable for the setting up of a strong foundation for greenways in Kenya.

6.0. APPENDICES

6.1. THE RESEARCH PHOTOS









6.2. SAMPLE QUESTIONNAIRES

QUESTIONNAIRE

Dear Respondent, the researcher is a **Master of Arts Student** in the University of Nairobi, undertaking a **Degree in Urban and Regional Planning**. This questionnaire is aimed at collecting information on the importance of incorporating greenways into urban planning. All information provided will be used for academic purpose only. Please tick/respond to each item appropriately.

Section A: General Information

1. Which is your area of residence
2. Contact address.....
3. What is your Gender?
 - a). Male ☐ b). Female ☐
4. Marital Status.
 - a) Married ☐ b) Single ☐ c) Separated ☐ d) Widowed ☐
5. Level of education
 - a) Non Formal ☐
 - b) Primary ☐
 - c) Secondary, A-level ☐
 - d) College ☐
 - e) University ☐
6. What is your current occupation?
7. How often do you frequent Nairobi?
8. i) Are you satisfied with the natural amenities in Nairobi?
 - a) Yes ☐ b) No ☐

ii) Briefly explain.....

Section B: Socio-economic Benefits of Greenways

9. i) Have you been to any parts of Nairobi that have greenways?

a) Yes ☐ b) No ☐

ii) If yes, which ones?

10. i) Do you think greenways play an important role?

a) Yes ☐ b) No ☐

ii) If Yes, how.

11. i) Do you use greenways?

a) Yes ☐ b) No ☐

If No, Why? (If yes, please answer Q12 & Q13).....

12. Which of these factors do you consider when choosing a greenway path?

a) Vegetation ☐

b) Trail surfacing ☐

c) Security ☐

13. i) Do greenways contribute to the quality of your life?

a) Yes ☐ b) No ☐

ii) If yes, how do they contribute?

a) Health/fitness ☐

b) Offer natural areas ☐

c) Reduce pollution ☐

d) Reduce Transportation costs ☐

e) Increase interaction with friends ☐

Any other? Please specify.

14. The table below provides a list of socio-economic benefits of greenways. Please tick the response that best matches your feelings of the benefits provided.

Benefits	Strongly Agree	Agree	Disagree	Strongly Disagree
Induce positive publicity for business				
Attract tourism				
Enable commercial Opportunities				
Increase real-estate properly values				
Stimulate expenditure by residents				
Cost effective for outdoor recreation				
Improve leisure time and sport facilities				
Increases awareness of nature and the environment				
Eases public mobility				
Creates contact with nature				
Induce healthier lifestyles				
Have a positive influence on human behaviour				
Help to reduce crime.				

Section C: Environmental Benefits of Greenways

15. The table below provides a list of environmental benefits of greenways. Please tick the response that best matches your feelings of the benefits provided.

BENEFITS	Strongly Agree	Agree	Disagree	Strongly disagree
Restores and protects the natural environments				
Enhance environmental quality				
Contain different kinds of vegetation				
Supports biodiversity				
Help to reduce journeys to and pressures on the countryside				
Induce a more efficient utilization of land				
Limit urban growth				
Makers and shapers the urban form				
Helps reduce pollution				
Provide safe and convenient routes				
Create interconnected networks of open spaces				
Improve the overall appeal of NCBD				
Improve environmental quality				

16. Which other environmental benefits can you attribute to greenways?

.....

.....

Section D: Challenges towards Sustainable Greenway Development

17. In your own opinion, which challenges do you think exist in the development of sustainable greenways for the NCBD?

.....

.....

.....

Section E: Ways in which Greenways can be developed and sustained?

18. Which streets or places in NCBD do you think greenways should be integrated?

.....

.....

.....

19. The table below provides a list of facilities that can be included along the green ways.

Please tick the response that best matches your feelings of the facilities.

Facilities	Very Necessary	Necessary	Not Necessary
Seats			
Outdoor cafes			
Monuments			
Signs			
Dust bins			
Water features			
Paved walkways			
Water points			
Toilets			
Fountains			
Kiosks			

20. Which other facilities do you think should be added to greenways?.....

.....

.....

21. In what ways can each of these groups contribute to the development of a sustainable greenway programme for the NCBD?

a) Pedestrians

.....

.....

.....

b) Nairobi Business Community

.....

.....

c) Motorists

.....

.....

d) Cyclists.....

.....

.....

e) City Council

.....

.....

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6.4. INTERVIEW SCHEDULE

KEY INFORMANTS

1. Profession.....
2. No. of Years in the Profession

Greenways

3. Understanding of Greenways.....
4. What is your view on the general linkages of open spaces in the NCBD?....
.....
.....
.....
5. What opportunities exist for the NCBD as far as planning for linkages of open spaces is concerned?
.....
.....
.....
.....
6. What Challenges exist for the NCBD as far as planning for linkages of open spaces is concerned?
.....
.....
.....
7. What benefits can be accrued from greenway planning in Kenya?
.....
.....
.....
8. Who are the main players in planning for Greenway for the NCBD?.....
.....
.....
9. In your own opinion, what needs to be done to enhance livability and sustainability of the NCBD?
.....
.....

6.5. CHECKLIST

Street

Observations	Comments
Time Spent on an area	
Number of Persons	
Socio Activities	
Economic Activities	
Nature of Greenway	
Facilities Present	
Possible Improvements	
Interferences & Interactions	