AN ANALYSIS OF URBAN RESIDENTS' PARTICIPATION IN OUTDOOR RECREATION IN URBAN FORESTED AREAS: THE CASE OF NAIROBI CITY, KENYA.

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OCTOBER, 2010
DECLARATION

I declare that to the best of my knowledge and understanding, this thesis is my original work and has not been presented for a degree in any other University for any other award.

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This thesis has been submitted for the review with our approval as University Supervisors.

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DEDICATION

To my parents; Mama Teresa Aor Hayker and Dad the late Mr. William Hayker Masigah.

You showed me that the value of education is not about what level one attains but how much they are ready to sacrifice in support of others to scale the education ladder.
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OPERATIONAL DEFINITIONS OF KEY CONCEPTS AND TERMS

**Ego space** - the individual’s adaptation of observed to objective space, to produce a coherent and logically consistent view of sizes, shapes and distance.

**Environmental perception** – Sindiga (1981) says it is man’s awareness through one, or a combination of his/her senses, of the features of his immediate environment, e.g., land use patterns, perception of wilderness, and hazard perception in resource management.

**Extra-Environmental perception** - Sindiga (1981) notes that it refers to “invisible environment” – those areas of the world which man perceive, but has no direct experience. This is really a form of rudimentary perception of places that one has not visited. Perception of such places is gained through reading, stories, mass media etc.

**Immanent Space** – according to Sindiga (1981) it is inner subjective space, the space of the unconscious, of dreams, and of fantasy. This includes the spatial styles and orientations of the individual, and ingrained spatial notation of whole cultures. It is this space, which is involved in the image of our body. Spatial styles are the results of prolonged and complex exchanges between the individual and his/her environment and they derive from all the three kinds of space.

**Leisure** - basically time free from obligations.

**Level of Education** – Refers to the various levels of education; e.g., less than 8 years of schooling, 8 years of schooling, 10 years of schooling, 12 years of schooling, Diploma, Degree/equivalent levels.

**Nairobi City** – This is the area covered by the provincial administrative boundary and not only limited to the Central Business District (CBD) of the City.

**Objective space** - that which can be measured by international standards e.g., dimensions of distance, size, shape, and volume.
Occupation Categories – These include Employed, Business, Farming, Unemployed and Student.

Outdoor Recreation – passive or active participation in any leisure activity that occurs outdoors, both in the wilderness and in the urban environment, e.g., walking between cultural points of interest, or walking in the forests watching birds.

Preferential perception – Sindiga (1981) stated that it is a man’s preferences for movement towards particular places. Such studies are aimed to discover reasons for goal selection. Some elements of preferential perception are included in environmental perception.

Recreation - the action and activities of people engaging in constructive and personally pleasurable use of leisure time, [and] may include passive or active participation in individual or group [activities]

Urban forests – urban areas covered with trees in close stands, they may have thick or no undergrowth.
LIST OF ABBREVIATIONS AND ACRONYMS

FONA – Friends of Nairobi Arboretum

KFS - Kenya Forest Service

KWS – Kenya Wildlife Service

NCC – Nairobi City Council

RRI – Rapid Results Initiative
ABSTRACT

With the rapidly changing world coupled with changes in tastes and lifestyles among Urban residents, there is need to diversify the range of outdoor recreation opportunities in Urban areas. This is with specific reference to Nairobi city, which has a vast resource of forested areas such as Karura Forest, Ngong Road Forest, City Park and the Nairobi Arboretum. This study therefore sought to establish the preference of Nairobi residents on the use of urban forested areas as outdoor recreation sites, as well as identifying the opportunities existing within the forests for outdoor recreation. Survey research design was used to gather information on urban residents’ preferences on the use of forested areas for outdoor recreation. Factors under investigation were facilities within the forested areas as independent variables and urban residents’ preferences as dependent variables. A sample size of 200 residents was drawn from the study area by use of random probability sampling method. Data was collected by use of five – point Likert Scale questionnaire and closed ended questions, which was administered to residents within the study area (on-site). The researcher took photographs to determine available outdoor recreation opportunities and management factors within the urban forested areas. Frequencies and percentages were used to analyse the characteristics of respondents. Chi-square ($\chi^2$) was used to show a relationship between the extents of awareness of Nairobi’s residents on outdoor recreation opportunities available in Nairobi’s forested areas and level of education at a significant level of 0.05. The preferences of Nairobi City’s residents towards outdoor recreation and the factors that constrain Nairobi’s residents from using urban forests for outdoor recreation were determined using One-Way ANOVA. The study indicated that there are numerous opportunities in the urban forests for outdoor recreation and majority of Nairobi residents know about them. Most of the residents visited the urban forests for picnicking using private means of transport and mostly in the afternoons. Most of the respondents affirmed the benefits of outdoor recreation in urban forests, as including improved social ties, improved well-being and renewed energy. However there were issues that visitors to the urban forests felt should be addressed; ensuring safety and security within the recreation sites. The study recommends that the government should support the marketing of outdoor recreation in urban forests through funding, advertising and enacting of laws that will stimulate growth of outdoor recreation by the ministry of tourism and ministry of environment and natural resources. Managers of the various urban forests (NCC, FONA and KFS) should ensure a litter-free environment by posting notices directing recreationists to dump litter at designated points, along with clearly posted rules and regulations, safety and security at recreation sites, and cleanliness of washrooms and toilets to guarantee satisfaction to visitors. Improving these satisfaction attributes could help increase visitors’ overall experience, which could lead to repeat visits.
CHAPTER ONE
INTRODUCTION

1.1 Background to the Problem

The issue of outdoor recreation as part of culture and history involves basic questions about human perception of the environment, the role of place and landscape for identity, and the evolution of a modern commercialized welfare society (Tuan, 1990; Massey & Jess, 1995; Lundgren, 1999). Outdoor recreation is neither a single subject or discipline nor a static phenomenon. In tandem with the evolution of modern society, it started as a privilege for the upper class, then became a means to public health, national identity and equity in the welfare society, and today it is increasingly becoming specialized, commercialized and globalized (Gartner & Lime 2000).

In the Encyclopaedia of Leisure and Outdoor Recreation (Jenkins & Pigram, 2003:350) a "leisure explosion" in society is identified with parallels in outdoor recreation. However, two components remain constant over time: visits in outdoor environments and human recreation. One of the recurrent motives for outdoor recreation is individual and public health (Kaplan & Kaplan, 1989; Whatmore, 2002), but other recurrent themes include pedagogic, environmental education, personal development and team building (Sandell, 2005). Outdoor recreation activities are undertaken during leisure time. Leisure time is time free from obligations (Omondi, 1992). Outdoor recreation activities are undertaken voluntarily for the purposes of enjoyment and/or physical and mental well being. Outdoor recreation encompasses "the organized free-time activities that are participated in by people for their own sake and where there is an interaction between the participant and an element of nature" (Walker, 1985). Contrary to the activity-based approach, Shiferaw (1999) suggests that outdoor recreation is most appropriately defined in terms of motivations and benefits rather than participation in activities. Similarly, Williams (1995) states that in the case of outdoor recreation in an urban
setting, researchers should look beyond the activities and focus on the meanings and values assigned by participants. Recreation differs from both play and leisure because it is organized and mainly occurs in groups (Walker, 1985). In addition to being easily confused with other ways of spending free time, such as sports or play, outdoor recreation is further complicated by activities that take place in both indoor and outdoor settings such as swimming or a leisurely walk in the neighbourhood.

According to Ladani (2003) outdoor recreation in forests is necessary because it encourages physical activity and contact with nature to reduce stress. A U.S. Senate committee forum on outdoor recreation urged more government support for parks and recreation, citing evidence that people who regularly engage in outdoor activities enjoy greater physical and mental health (Cohen, 1993). This study therefore has been motivated by the need to diversify recreational activities in urban forests. In urban areas, outdoor recreation facilities are those designed for both passive and active leisure activities. Outdoor recreation facilities can include any developments on the land or in buildings and/or any objects intended to encourage or facilitate recreation.

1.2 Statement of the Problem

There is an increasing demand for outdoor recreational activities, especially in urban centres where life has become increasingly sedentary, hence the need for such activities (Kweyu, 2008). Omondi (1987) notes that despite awareness, majority of people rely on indoor activities such as boxing, aerobics, dance, and martial arts among other recreational activities. This has left most of outdoor recreational facilities such as the numerous urban forests that adorn Nairobi city like Karura forest, Ngong Road forest, City Park and the Nairobi Arboretum among others under-utilised despite their valuable contribution to people’s mental
and physical health. It is against this background that the present study attempted to
determine the perceptions of Nairobi residents on utilization of urban forests in Nairobi for
outdoor recreation. Whereas several studies have been carried out on planning and use of
public open spaces in Nairobi, none has specifically looked at recreation in the urban forests.
For example, Mwaniki (1981) and Muiruri (1990) looked at the uses of public open spaces,
Mwaniki (1994) and Omondi (1987) researched on planning for public open spaces and
Muiruri (2002) looked at the emergence and management of competing uses of public open
spaces in Nairobi.

1.3 Research Questions

The study explored the following research questions;

i. What outdoor recreation opportunities are available in Nairobi City’s forests?

ii. What are the preferences of the residents of Nairobi City on urban forests as outdoor
    recreation facilities?

iii. What are the constraints to the use of the City’s forests as outdoor recreation
    facilities?

1.4 Objectives of the Study

The research set out to determine preferences of the residents of Nairobi on the use of urban
forests for outdoor recreation, and whether there were factors that facilitated or hindered their
participation in the same. The specific objectives of this research were;

i. To assess the extent to which outdoor recreation facilities in urban forested areas are
   used for outdoor recreation.

ii. To assess the preferences of the residents of Nairobi on the use of the City’s forests as
    outdoor recreation facilities.
To determine factors that constrain the use of the City’s forests as outdoor recreation facilities.

1.5 Research Hypotheses

The study was guided by the following null hypotheses:

H₀₁ Education levels of Nairobi residents would not significantly determine their knowledge and awareness of outdoor recreation facilities in the City’s forested areas.

H₀₂ The preferences of Nairobi’s residents on outdoor recreation in Nairobi’s forested areas would not significantly differ across their age groups.

H₀₃ There would be no significant difference in factors that constrain the residents of Nairobi from accessing the urban forested areas for outdoor recreation across their occupation categories.

1.6 Justification and Significance of the Study

Recreation is a genuine human need (Nelson, 2000) that is geared towards physical and psychological health of the individual and the society as a whole. It is characterized by valued experiences and benefits that promote overall health (Shiferaw, 1999). Outdoor recreation in urban forests, in particular, has much potential in strengthening the human connection with the environment. This study sought to identify forms of outdoor recreation within the forested areas of Nairobi that were sustainable and would increase the overall recreational satisfaction of the city residents. The research identified those forms of outdoor recreational activities that were most frequented and preferred by Nairobi residents within the forest areas. This is important because it would be a source of information for residents on the existence of such outdoor recreation opportunities.
A gap exists in literature on the role of urban forested areas for outdoor recreation especially in Nairobi city, yet recreation in urban forests is one of the fastest growing forms of outdoor recreation (Shiferaw, 1999). Surveys, for example, indicate that urban forest-related recreation activities such as walking, bicycling, picnics, and hiking are among the top ten most popular outdoor recreation activities (Noss and Cooperrider, 2002). The popularity of forest recreation stems from individuals placing increased importance on health and fitness, and the growing desire of individuals to experience the natural environment. In addition, more people are increasingly becoming aware of the sociological and psychological benefits of wilderness recreation (Nelson, 2000). There is need therefore to diversify avenues of outdoor recreation in Nairobi by venturing into urban forests, and in this case Karura forest, Ngong’ Road forest, City Park and the Nairobi Arboretum are ideal due to their proximity to most residential settlements within the city, as well as existing recreational opportunities in the form of camp sites, hiking trails, horse riding trails, picnic sites, bird watching and caves.

This research explored the extent to which Nairobi City dwellers use the urban forests as sites for outdoor recreation. Findings of this study may be used by the City council and the Kenya Forest Service to market outdoor recreation in the forested areas in Nairobi City. The study will also enrich literature on outdoor recreation in natural environment.

1.7 Scope and Limitations of the Study

The focus of this study was on the preferences of Nairobi residents on the use of urban forested areas for outdoor recreation. For this reason, data was collected from Nairobi residents who visit the urban forested areas within the urban forests. The study was concerned with recreation activities that were possible within Nairobi City’s forested areas.
One factor that was a major setback was the lack of/or limited official data from the forest offices on the number of Nairobi residents visiting the forests. Literature on outdoor recreation in the City’s forested areas was also scarce.
CHAPTER TWO

LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

2.1 Introduction

This chapter covers literature that is related to the proposed study. It focuses on Perception studies in Geography, the concept of environmental perception, the process of Geographical perception, development of urban public forests, studies on urban public Forests in Nairobi, current recreation opportunities in urban public forests, significance of outdoor recreation in urban public forests and benefits of urban public forests. It also presents the conceptual framework that was adopted to guide the investigation into the use of Nairobi City’s forested areas as outdoor recreation sites.

2.2 Perception Studies in Geography

Sindiga (1981) postulates that geography is concerned with the environment not as a separate entity but as a field of human action. Mitchell and Draper (1993) recognize the importance of psychological and sociological factors in mediating between man and his environment and in influencing his behaviour on the landscape. Luckermann (1994) notes that geographers seek more than objective aerial patterns. He notes further that geographers wish to understand place as a factual event in human consciousness and the beliefs that people hold about the place. The latter is the subjective meaning, it is important because the basis of human action is in what is believed to be true, and not necessarily what is true from the scientific viewpoint. Whyte (1997) writes that man’s decisions and actions concerning his environment are based not only on objective factors but also on subjective ones and that this is the basis of environmental perception studies. Whyte (1997) further observes that current studies on environmental perception share a paradigm of man/environment relations in which man’s
individual and collective understanding of the environment is seen as major force in shaping that environment through the actions of man's choices and behaviour. Kates (1990) notes that there is an environment in the minds of people that exists in the form of perceptions, cognitions, attitudes, beliefs and behaviour. It is the environment, which people both respond to and seek to fashion. The most reliable indicators of human conceptual environments are human environmental actions. The way that people behave in the world may be the best clue as to how they view that world. According to Downs (1991), perception studies concentrate on the cognitive understanding of a person in his environment and the way the information is stored and organized in his mind. In this sense then, perception studies are concerned with the image of real world.

2.2.1 The Concept of Environmental Perception

Scholars in a wide range of areas; geography, planning, psychology, architecture, and urban sociology have studied how people make sense of and cope with their surroundings. The essence of these studies is that if we are to understand people's responses to places and their actions within them, it is necessary to understand what and how they think. Carter (1997) indicates that the conception which people have of the environment in which they find themselves is the scientific key to understanding the way the environments have come to being and the impact of human processes upon them. According to the International Encyclopaedia of the social sciences, Volume ii (1998), study of perception is an attempt to understand those aspects of observations of the world of things and people that depend on the nature of the observer. Though rooted in many disciplines, perceptual studies are predominantly psychological.

The field of environmental perception is sometimes referred to as "environmental cognition". These terms are, however, used in a variety of contexts by different psychologists and other
behavioural and social scientists. Moore and Golledge (1996) attempt to illuminate the contexts in which these terms are used. Perception can be defined in more than one way. It is often defined narrowly as the *conscious* awareness of the objects and events in the perceiver’s environment. Such definitions are in line with the constructivists’ approach, and almost totally exclude dorsal system functions from "perception" leaving only the ventral system to partake in perception (Sindiga, 1981). Whyte (1997) states that experimental and physiological psychologists take perception to refer to the reception of external stimuli through the physiological excitation of peripheral sensory receptors. Social and personality psychologists refer to perception as the sensory awareness of people as social objects and more broadly the overall impressions that persons form of other persons.

To many behavioural and social geographers, sociologists, and political scientists, perception has become an all-encompassing term referring to images, memories, preferences, and attitudes. In brief, all the psychological factors are assumed to affect broad spatial behaviour. Cognition itself subsumes the more specific concepts and sub stages of sensation, perception, imagery, retention, and recall, reasoning, problem solving, judgement and evaluation. According to Sindiga (1981), the distinction between perception and cognition appears unclear and fades into differences of degree and focus. Whyte (1997) takes environmental perception to mean human awareness and understanding in a general sense and includes much more than individual sensory perception. According to Whyte (1997), environmental perception should not be confused with the more rigorous and narrower concept of direct sensory perception as used in psychology.

Brookfield (1999) differentiates between the perceived environment and environmental perception. He takes the “perceived environment” to mean the whole monistic ‘surface’ on
which decision is based, including natural and non-natural, visible and non-visible, geographical, political and economic, and sociological elements in terms of its ‘scientific’ classification. Environmental perception is the perception of either the whole environment, or of specific selected elements within it, or even of ‘space’ in the abstract: “especially environmental perception is a property of the mind rather than a construct of the mind.”

As a field of study, environmental perception is multidisciplinary. It has grown to bind various research interests that share a common philosophy and origin, rather than close disciplinary origins. For this reason, concepts from one focus of inquiry are transferred and methods are borrowed between disciplines (Whyte, 1997).

2.2.2 The Process of Geographical Perception

Goodey (1994) states that in any environment, man selectively perceives certain information by means of his various senses and adds this information to his store of mental images. As Lowenthal (1991) puts it, for different people there exist separate personal worlds of experience, learning, and imagination. A person has much more knowledge on the small part of the world where he/she lives. This is to say that there are many personal environments (territorial) and each is both more and less inclusive than the common realm. The personal environment is complex and several aspects of it are less accessible to inquiry than the shared world is. Lowenthal (1991) argues further that the general world view, like the personal, transcends objective reality.

Moore and Golledge (1996) notes that images that people form about an environment may be certain or uncertain, clear or vague, global or particular, they may be about probable or improbable events, about the physical environment or about the undifferentiated totality of
the socio-cultural environment. According to Lowenthal (1991), what people perceive always pertain to the shared “real” world. Even the landscapes of dreams come from actual scenes recently viewed or recalled from memory, consciously or otherwise, however much they may be distorted or transformed. People who stay in the same environment form recognizably similar individual views and that is why people within a cultural group evolve a common worldview. Beck (1997) writes that whole cultures, through the use of myths, render certain spatial configurations distinct and important. The basic process of perception is that the individual has built-in assumptions about the world in which he lives; Beck (ibid) concludes that meaning and perception are inseparable.

Canter (1996), Goodey (1994), and Lowenthal (1991) all agree that the purpose and circumstances of observation materially alter what is seen. As Goodey (1994) puts it, behaviour itself will be varied by motivation and the play of social, economic, and political factors. During an activity within an environment, the environment will be affected and the individual’s information about that environment will be supplemented. Beck (1997) notes that the study of spatial distributions; real or perceived, is the cornerstone of investigations of interactions between humans and their physical environments. Beck distinguishes three kinds of space; objective space, ego space, and immanent space.

Geographical interest in perception begun in 1974 when Wright (1947) suggested that geographical inquiry should incorporate and use the subjective geographical conceptions of the world that is in the minds of countless ordinary folk. Hitherto, geography was concerned only with studying physical processes having little relationship to historical and cultural conditions. Thus Wright’s proposition for a study of geosophy was to cover geographical ideas, both true and false, of all manner of people, with their desires, motives, and prejudices.
Watson (1995) writes, ‘image’ geography should be a significant part of applied geography helping to pin down those likes and dislikes, hopes and fears, which motivate people to move from one place to another – within a city or within a country, or from one country to another. Goodey (1994) states that it is too often forgotten that geographical studies are not descriptions of the real world, but rather, perceptions passed through the double filter of the author’s mind and his available tools of argument and representation. Hence Watson (1995), notes that geography tries to get an objective view out of a whole lot of subjectivities.

Saarinen (1996) notes that the motivation for developing interest in environmental perception is partly a result of the geographers’ growing involvement in planning for the quality of environment and in resource management. Pioneer studies on geographical perceptions were done at the University of Chicago with the aim of discovering relationships between people’s beliefs about natural hazards and their subsequent behaviour. These studies developed in response to the need for more thoughtful solutions to the problems of dealing with natural hazards (Saarinen, 1996).

Goodey (1994) notes that geographical perception studies are moving away from the initial dependence on psychological and sociological studies. He recognizes three foci around which geographers appear to be developing their research; that is, Environmental Perception, Extra-Environmental Perception and Preferential perception.

2.3 Perception Studies in Geography

Wood (1990) states that perception studies have been done under such headings as landscape, hazard, recreation, urban, movement, and space preference. Landscape studies begin from the basic premise that man’s attitudes and views about nature affect the way he/she uses resources. Such knowledge is mainly gained through examining written accounts of different
groups to gain their views on the environment. Hazard studies deal with response of individuals and social groups to extreme events in nature. Such may include storms, temperature inversion, drought, flood, volcanism, erosion, earthquakes and diseases (Burton 1998). Recreation studies mainly deal with perception of wilderness or countryside as a recreational resource. Similar studies can also be done in urban open spaces. The purpose is to determine different people’s perception as an aid to better land use management. Movement perception is based on the assumption that there is interaction between man and environment. Studies of patterns of human activity provide a valuable framework for gaining insight into such interaction. Urban studies consider the image that residents hold about the city. The purpose is that such image influence their decisions and hence spatial behaviour within the city. Space studies deal with the way people perceive and evaluate the geographical space that surrounds them, such as space preferences of individuals, especially of residential desirability of particular areas. One idea that emerges from the above synthesis is that human beings form views about the environment in which they live or visit. These views influence their behaviour on the landscape and dictate the way they use resources.

2.4 Development of Urban Public Forests

Ladani (2003) notes that urban forests date from ancient urban centres, The Romans, for example, created some great parks, which included gardens and athletic fields. As Muiruri (2002) puts it, the Roman Forum, for instance, was a central point where Roman citizens could meet for a variety of pursuits ranging from social, political, to economic issues. Lawrence (1993) notes that the early residential square in Britain was an open space surrounded by buildings and provided a place for valued recreation and leisure.
Muiruri (2002) further observes that the concept of open spaces dates back to the days of Sir Ebenezer Howard of Britain and his followers. Harther (1998) introduced the Garden city concept in the planning of towns. The main objective of this concept was to achieve a balance between countryside and town conditions in the urban environment. Garden cities would have their own industries, zoned sections for commerce, culture and schools. Muiruri (2002) notes that most importantly there would be large expanses of green open spaces. Muiruri further states that garden city approaches had important implications for subsequent urban planning. They led to the adoption and application of policies for green belts and green open spaces to ensure that the city region retained a mixture of built-up areas and readily accessible green spaces. In the 1970s, other approaches to link nature and the built environment emerged. Wright (1994) supported the promotion of dispersed or decentralized settlement development with emphasis on low-density development of individual households where people would be closer to nature.

2.5 Studies on Urban Public Forests in Nairobi

Muiruri (2002) notes that a number of studies focusing on various themes pertaining to urban open spaces have been done on the city of Nairobi (see table 1). The studies have focused on provision and location of public open spaces, their recreational uses and functions and their role in the environment. This study will go a step further to determine urban residents’ perceptions towards the use of urban forests for the purpose of outdoor recreation. Residents’ perception on the use of urban public forests for outdoor recreation has not been explored in-depth. Below is a summary of the findings of selected studies on Nairobi’s open spaces.
Table 2.1 Summary of Findings of Selected Studies on Open Spaces in Nairobi

<table>
<thead>
<tr>
<th>Author, Year</th>
<th>Theme of study</th>
<th>Main findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adebayo, 1992</td>
<td>Effects of urbanization on climate</td>
<td>Growth of the city has affected the climate of Nairobi in form of high temperatures partly attributed to loss of vegetation cover.</td>
</tr>
<tr>
<td>Nakamura, 1967; Okoola, 1990; Meffert, 1986</td>
<td>Effects of urbanization on climate</td>
<td>Have confirmed presence of heat island in the city, which can be ameliorated partly by urban open spaces.</td>
</tr>
<tr>
<td>Khroda, 1992</td>
<td>Hydrology and flood management strategies</td>
<td>Increased impervious surface has increased the magnitude of flooding. One strategy is to increase natural open spaces and protect existing ones to serve as rain water retention zones.</td>
</tr>
<tr>
<td>Greenbelt movement, 1997</td>
<td>Role of Karura forest</td>
<td>It is an important catchment area, stabilizes the soil, combat soil erosion, and has a cooling effect on the city's climate.</td>
</tr>
<tr>
<td>Lado, 1990; Lee-Smith, et al., 1987; and Freeman, 1991</td>
<td>Urban agriculture</td>
<td>Recognize the importance of urban agriculture in economic and environmental terms. Cultivation of food crops for subsistence is done on open spaces in the city.</td>
</tr>
<tr>
<td>Mwaniki, 1981; Maina, 1982; Kangai, 1990; Muiruri, 1990; Buttuk, 1992.</td>
<td>Uses of public open spaces</td>
<td>Public open spaces are used for active and passive recreational activities although they lack basic recreational facilities; other uses are social, economic and religious activities.</td>
</tr>
<tr>
<td>Mwaniki, 1994 and Omondi, 1987</td>
<td>Planning for public open spaces</td>
<td>The spatial distribution of parks is uneven especially in Eastlands, attributed to colonial planning policies. Public open spaces rate a secondary consideration in the planning and management of Nairobi evident by declining standards and encroachment by other land uses.</td>
</tr>
<tr>
<td>Muiruri, 2002.</td>
<td>Emergence and management of competing uses of public open spaces in Nairobi</td>
<td>Urban public open spaces are increasingly under pressure from competing uses, which have led to change in their size, uses, and ownership in Nairobi city.</td>
</tr>
</tbody>
</table>

Source: Adopted and modified from Muiruri, (2002).

2.6 Current Recreation Opportunities in Urban Public forested Areas

Since its establishment in 1899, Nairobi city has grown tremendously both in size and population. Maina (1982) states that different types of outdoor recreation areas have simultaneously evolved. These include major open spaces owned and managed by the
Nairobi City Council (NCC), and the Government as well as by parastatals and private bodies such as neighbourhood parks and a number of sports clubs. These have developed basically in response to the expanding recreational needs of Nairobi city. The Nairobi Arboretum, which is located around 2.5kms from the city centre, is open to the public but is more accessible to the car-owning residents. It can be used for both active and passive recreation in the form of picnics and ball games for children. It is mostly used during the weekends. City Park is an urban park landscaped and facilitated for recreation within a forested area. The park is within a natural forest and has carefully selected areas for lawn, walks and resting. It has the popular 'Mtego wa Panya' (maze) and other facilities for children and adults’ recreation (Maina, 1982).

2.7 Outdoor Recreation in Forests, in Sweden

According to Sandell, (1991), the Nordic tradition of outdoor recreation is characterised by simplicity and popularity, emphasising its difference from the more commercialised and specialised outdoor life activities of North America and Continental Europe. The most frequently visited facilities are nature areas; outdoor recreation areas and places for bathing. Clearly, it is the inexpensive facilities like nature- and recreational areas, tracks and paths that commuters prefer and use most frequently. National Board of Forestry, (1991) notes that during recent decades, the number of outdoor recreation activities has multiplied, where new activities have been added: Mountain biking, windsurfing, snowboarding, etc. For large groups of the population, however, the traditional and simple outdoor recreation still plays an important role (Ahlstrom, 1999). Regarding recreation in the forest environment, the dominating use in Sweden is concentrated to urban forests, where visitor frequency is estimated to be 250 times higher than in other forested areas (National Board of Forestry 1991). Approximately one percent of the total forest area in Sweden is classified as urban.
Rydberg and Falck (2000) gives a detailed description of urban forests in Sweden including historical origin and development of the forests, their main functions and urban silviculture in the past and present. Urban forests are defined by the National Board of Forestry as forest land primarily used for recreation in the relative proximity of urban areas or other recreational facilities. Ode and Fly (2002) notes that it should be expected that the interest for urban forests will increase. They further point to the fact that urban forests are an increasingly valuable component of the urban environment not only for recreational purposes but also because urban forests may enhance the environment by influencing wind, soil erosion and air quality.

2.8 Outdoor Recreation as Culture and History

Tuan (1990), Massey and Jess (1995) and Lundgren (1999) concur that the issue of outdoor recreation as culture and history involves basic questions about human perception of the environment, the role of place and landscape for identity, and the evolution of a modern commercialized welfare society. And, as stated above, outdoor recreation is not a single subject or discipline, nor is it a static phenomenon. In tandem with the evolution of modern society, it started as a privilege for the upper class, then became a means to public health, national identity and equity in the welfare society, and today it is increasingly becoming commercialized, specialized and globalized (Gartner & Lime, 2000). In the Encyclopaedia of Leisure and Outdoor Recreation (Jenkins and Pigram, 2003:350), a "leisure explosion" in society is identified with parallels in outdoor recreation. However, two components remain constant over time: visits in outdoor environments and human recreation. Kaplan & Kaplan (1989) and Kahn and Kellert (2002) agree that one of the recurrent motives for outdoor recreation is individual and public health, but other recurrent themes include pedagogic, environmental education, personal development and team building. Sandell (2005) notes that
around the beginning of the 20th century, the rapid industrialization and urbanization processes formed the background to great interest in physical leisure activities involving the establishment of various organizations.

2.9 Outdoor Recreation Participation and Non-Participation

Tuan (1990) notes that there is a challenge ahead to better understand both outdoor recreation participation and non-participation. The increased recognition of social and economic values in nature conservation emphasizes the need for relevant and accurate visitor information. According to Sandell (2005), quantitative and qualitative visitor information is needed in area management, tourism development and regional planning. Because outdoor recreation participation takes many different forms, at different places during different seasons of the year, studies of outdoor recreation in a changing society call for good data that capture the core elements of activity participation, use patterns, attitudes, constraints, social and economic values, impacts and so on (Emmelin et. al., 2005). Understanding why people do or do not travel to different places to participate in certain activities is also fundamental to understanding the mechanism of nature based tourism demand (Ryan, 2003). Kaplan and Kaplan (2002) notes that current data on outdoor recreation in most recreation destinations are often not collected systematically in different research projects using different methodologies, and official statistics include only a limited number of outdoor recreation parameters. Tuan (1990) points out that outdoor recreation participation can be measured in two fundamental ways – by means of general population surveys or on-site visitor surveys. He further says that the program will empirically and methodologically benefit from international experience with general population surveys of outdoor recreation participation. Mc.Donough (1998) states that recreation demand does not always equal participation. He further notes that while much outdoor recreation research has been directed to individuals
who visit certain places or participate in certain activities, less focus has been on non-visitors and non-participants. Research on non-participants is important because it will facilitate understanding of the complex relationship between demand and participation. It is not enough to look at participation and interpret this as reflecting what people want to do since it also reflects what they are able to do (Pigram and Jenkins, 2006).

2.10 Recreation Constraints and Conflicts

Jackson (2005) notes that two themes with long traditions in outdoor recreation research are recreation constraints and conflicts. Although explicit research on leisure constraints is a recent phenomenon, its roots stretch back over a very long period of time – in fact, implicit notions of constraints have been central to practice in the parks and recreation field since its inception and subsequently to the emergence of leisure studies as a focus of academic investigation (Jackson and Scott, 1999). Ewert et. al., (1999) note that in the early studies, some 40 years ago, questions about barriers began to be asked explicitly, while during the 1980s more generic concepts of leisure constraints were developed. Today, research on leisure constraints has emerged as separate discipline of outdoor recreation research with numerous articles and several books published in the field (Jackson and Burton, 1999; Jackson, 2005). However, compared to North America, the European tradition of constraints research seems to be weaker (Ravenscroft et al., 2005).

Recreation conflicts has also been at recurrent theme in studies of outdoor recreation. It coincided with increases in outdoor recreation participation in the 1960s and in the 1970s. A theoretical basis for explaining and describing conflict in recreation settings was pursued with various models of recreation conflicts emerging (Ewert et. al., 1999). Perhaps the most common and basic definition of recreation conflict is "goal interference attributed to
another’s behaviour" (Jacob and Schreyer, 2000; Manning, 1999). The presence or behaviour of other recreationists may lead to a discrepancy between these desired or expected goals and those that are actually achieved; this discrepancy may reduce experience quality and thereby lead to dissatisfaction. Alternative concepts of conflict have appeared in the literature, including Vaske et al.'s (2000) focus on normative beliefs about unacceptable behaviours. They further state that time, income, distance, security and accessibility could constrain outdoor recreation among urban residents. Many different types of recreation conflicts have been identified in the literature, including outdoor recreation viz a viz other resource uses, outdoor recreationists viz a viz resource managers, interactivity conflicts and intra-activity conflicts (Schreyer, 2003). Today recreation conflicts are expanding as technology contributes to development of new equipment and activities and as contemporary lifestyles become increasingly diverse (Manning, 1999).

2.11 Significance of Outdoor Recreation in Urban Public Forests

The broadest definitions regard urban public forests as the entire greens space area influenced by the urban population. In a more restricted sense, urban public forest relates to trees and woodland in towns and cities: garden and farm trees, street and park trees, remaining woodlands and emerging woodlands on vacant and derelict land. Trees are an important part of the natural life support system, and they have a vital role in the sustainability of towns and cities. Shiferaw (1999) indicates that there is a growing recognition that urban forests improve the quality of urban life in many ways; providing both tangible benefits (food, energy, timber, fodder) and social benefits (Health, Employment and Recreation). There are a number of public benefits that come from the forest. But from an economist’s point-of-view, difficulties arise. Betlik (1998) noted that some of these benefits are likely to diminish, renewable products such as wood or clean water; others are economic impacts such as
tourism income that is derived from landscape character or wildlife-centred recreation spending. Others still, are unquantifiable, such as biological diversity or social meaning.

2.12 Benefits of Urban Public Forests

Sullivan (1992) argues that clean water is our most important forest product, a resource essential to all life, human and non-human alike. Whether water comes from a large or small reservoir, or a public or private well, the hydro-geologic conditions of this region dictate that forests play a critical role in providing clean drinking water. These ecosystems protect water quality and influence water production (water yield). When forest cover is maintained, deep organic layers develop, as do soils full of macro pores with storage and holding capacity; these characteristics enable water to stay longer in the ground. This increased retention time lowers sediment and nutrient pollution before water ultimately enters a nearby tributary. Forest ecosystems generally reduce water yield compared to land in either grassland, or under various levels of agricultural, residential, commercial, industrial development; but none of these land types retain and filter water as forests can, with high quality water the result, (Dickson and McAffee, 1998).

The influence of urban green spaces on climate is very important and well recognized. The climatic benefits of trees and forests are complex and occur at several scales—from very local to global. Individual trees provide shade and reduce the effects of wind. In residential and urban situations, trees can moderate the heat island effect, thereby lowering the amount of fossil fuel burned and subsequent heating and cooling costs. Significant changes in the total amount of forest over a large land area can influence general weather patterns. At the largest scale, forests are critical in the global carbon equation. Although controversy continues as to whether "global warming" is occurring, it is indisputable that the
concentration of atmospheric carbon dioxide has risen steeply during the last several decades as the combustion of petroleum has increased. Efforts to reverse the build-up of atmospheric carbon dioxide involve reducing "sources" of carbon dioxide and finding ways to increase long-term storage, or sequestration, of carbon in "sinks", functioning both as "source" and "sink", the role that forests play in carbon sequestration is complex; the soil and smaller plants are involved, too. Trees remove carbon dioxide from the air and store carbon in the form of wood and other tissues (sink). When trees respire or decompose, the stored carbon is returned to the atmosphere (source). Since nearly half the dry weight of wood is carbon, forests sequester enormous total amounts. Forests that are growing and accumulating wood are net carbon sinks. Young stands accumulate carbon at a high rate; older stands contain more stored carbon than younger stands, but accumulate additional amounts at a lower rate. When trees are harvested, some of the stored carbon is returned to the atmosphere in the form of limbs, leaves and roots. Other portions converted to long-lasting products continue to store carbon well into the future. The bottom line is that continued forestland use produces a net carbon benefit, compared to residential, industrial, and commercial development.

As defined by Noss and Cooperrider (2002), biodiversity is "the variety of life and its processes; it includes the variety of living organisms, the genetic differences among them, the communities and ecosystems in which they occur, and the ecological and evolutionary processes that keep them functioning, yet ever changing and adapting." From a human perspective, biological diversity can be likened to a savings account, providing resilience to the landscape to buffer climate change, human impacts such as introduced species and unforeseen social uses. We may know the names of every tree in the forest, but we don’t begin to understand the complex matrix of organisms and relationships that comprise the web of life. We are not capable of predicting the consequences of losing a species; nor can we
predict the future importance of some as-yet-undiscovered human use of a forest organism. Therefore, an economic impact analysis is beyond reach and perhaps even trivializes the profound meaning of biological diversity to life on earth; in short, this benefit is unquantifiable.

Green spaces are valuable to society for enhancing the quality of life: they buffer the visual severity of development and urban sprawl; they muffle sounds of traffic and human activity. Trees are central to society's notion of scenic beauty and numerous studies show that people prefer landscapes with trees. Research has also shown that a 35 to 100 foot swath of trees can reduce noise as much as 50 percent (McDonough, 1998).

An often unspoken, yet very real benefit of trees and forests is its social meaning to people. Though this benefit defies economic quantification, a large body of literature (McDonough, 1998) documents the range of ways that trees figure heavily in peoples' lives. For instance, peoples' satisfaction with their neighbourhood is strongly affected by views of woods and trees and the number of trees near their home. And in fact, large wild lands and parks do not contribute to satisfaction as much as neighbourhood trees. Another example is health benefits and McDonough (1998) in his study shows the restorative effects that derive from access to trees like reduced post-surgical complications, reduced need for pain killers, lower incidences of health-related stress symptoms like headaches, and lower attention fatigue associated with the stress of having cancer were all documented. Cultural values are another aspect of social meaning. Trees figure prominently in folklore, myth, religion and literature, more so than any other plant. Trees and forests are also planted or gifted to commemorate special events and people.
In summary, forests provide many benefits in urban areas. Forests offer physical and mental well being; offer the opportunity for solitude or to socialize with friends and family; preserve and enhance the natural environment through the establishment of natural outdoor areas; preserve local biodiversity of plant and animal life through protection of these outdoor areas, and protect and link habitats by providing natural greenways through urban areas. Forests also offer linear corridors for wildlife; provide an outdoor educational classroom; cleanse and improve the air and water quality of the area through the preservation of trees and vegetation; provide economic benefits by enhancing business and tourism opportunities; create a sense of place in the landscape, and promote a healthy community (Hardt and Hastings, 1999).

2.13 Conceptual Framework

This study will be based on a modification of Harther (1991) Expectance Theory which focuses on what leads people to participate and choose specific recreation activities and what makes them withdraw from their pursuits (Crespo, 2001) with a view to establish whether the situation could be the same within Nairobi’s forested areas. Whyte (1997) notes that participants’ feeling of efficiency and inherent pleasure may in turn enhance or maintain their competence, increase or decrease their incompetence. Efforts may not necessarily lead to effective performance; personality, physique, knowledge, skills and the way in which one perceives his/her role is vital. Other factors such as gender, stereotypes and cultural values may also affect performance.

In the current study, the individual may be motivated by factors such as the level of awareness, accessibility of the recreational site, affordability, popularity of the recreational site, need for self improvement from recreation, current cultural trends on outdoor recreation and the individual’s assurance of safety at the recreation site (See figure 2.1). On the other
hand an individual may be de-motivated by lack of awareness, environmental barriers, inability to afford the cost of the recreation, lack of access to the recreation site and insecurity at the recreation site.

All the above factors will further be compounded by the facilities within the recreation site like nature trails, caves, water points and picnic sites. The availability of the facilities will determine an individual’s satisfaction of set goals when they set off for the outdoor recreation trip. Introduction of new facilities into the city’s forested areas can either motivate or de-motivate participants who visit the urban forests.

**Figure 2.1 Factors that Motivate People’s Participation in Recreation in Forested Areas**

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

In this chapter, a set of systematic techniques used to collect and analyse data have been presented. In particularly, the study design, research instruments, study area, target population, sample size and sampling techniques, pilot study, validity and reliability, data collection tools and data type as well as data analysis are covered.

3.2 Study Design

This study employed descriptive research design which is a scientific method that involves collecting data that enables the description of subjects or a situation (Mugenda & Mugenda, 1999). It provides descriptions of the variables in order to answer the research questions. The type of description that results from the design depends on how much information the researcher has about the topic prior to data collection. In cases where the researcher has little or no prior knowledge of the topic, exploratory descriptive designs are employed. Where the variables are known but their action cannot be predicted, descriptive survey designs are employed. On this basis, urban residents’ perceptions variables such as renewed energy, feeling safe within the urban forested areas, well-being, social ties and family not liking outdoor recreation were known but their outcome could not be predicted. Thus a descriptive survey design was considered appropriate to ascertain their influence on the use of urban forested areas for outdoor recreation.
3.3 The Study Area

The study was conducted in four sites; Karura forest; the Nairobi arboretum; City Park, and Ngong Road forest (Sanctuary) within Nairobi City. The city is located at the south eastern end of Kenya’s agricultural heartland, at approximately 1°9’S, 1°28’S and 36°4’E, 37°10’E. It occupies an area of about 696 Km² (CBS, 2002) and the altitude varies between 1,600 and 1,800 metres above sea level [a.s.l.]. The western part of Nairobi is on high ground approximately 1,700-1,800 metres [a.s.l] with rugged topography, the eastern side is generally low approximately 1,600 metres [a.s.l.] and flat (Sang’, 2009). Nairobi city is some 140 Kms south of the equator and 480 Kms from the Indian Ocean coast. Because it lies approximately 1700 metres above the sea level, the climate is generally cool; seasonal changes in temperatures are minimal but there is a wide range of temperatures throughout the
day. In the hottest months of the year from January to March, temperatures rise above 27ο Centigrade (80ο farenheight) during the day while the nights are cooler. There are two rainy seasons; the long rains come between March and May while the short rains between October and December, (Muiruri, 1990).

To the northwest of the city is an undulating grassland area with rich red coffee soils. To the north and northeast of the city, sloping land is dissected by flowing ridges and valleys while to the south and eastern sides are the arid and grassland areas of black cotton soils. To the west of the city is the Nairobi Arboretum, to the southwest is the Ngong’ Road forest and finally stretching from the northwest to the northeast are City Park and Karura forests.

Plate 2 A Section of the Winnie Duku Nature Trail at Ngong Road Sanctuary

Source: Fieldwork, (2009)
In 1994 the city's population was estimated to be 1.5 million and its growth rate was estimated to be about 5 per cent per annum (Republic of Kenya, 1994). A population of between 2.8 and 4.0 million persons was projected by the year 2010. With a population density of 3,079 people/Km² above the national average of 52 people/Km² (Institute of Economic Affairs, 2002). With such a population density, there is need to diversify areas of outdoor recreation for Nairobi residents. Figure 3.1 below shows the location of the forested areas.

**Figure 3.1 Map of Nairobi Showing the Location of the Urban Forested Areas**

3.3.1 City Park

Part of City Park is landscaped with lawns, flower borders, and ornamental trees, and there is a stream that is canalized between concrete banks. However, some of the land comprises remnants of the forest, sheltering a diversity of plants and animals.

City Park features lawns and picnic benches, walking paths, frames for swings a bandstand for concerts. On weekdays one can buy-or rent plants grown by staff, or visit the Boscawen Collection of rare and unusual plants. There is an eco-toilet to offer washroom services to residents visiting the park. There are hawkers who sell toys as well as photographers who offer photography services. A small tea kiosk and open-air restaurant provides food and beverages.
The sykes' monkeys are the most prominent of the Park's wildlife. The monkeys are dark-grey in colour with a thick collar of white fur, and have a long tail. They feed on wild fruits and leaves in the forest but also beg for fruits and nuts from visitors. Sykes monkeys are friendly and gentle and seldom bite. Baboons and vervet monkeys (which are light grey in colour, with a black face) can also be seen in City Park. They are not supposed to be fed, because they can bite. Small forest antelopes may survive in the thickest thickets.

City Park is the best place in Nairobi to see butterflies. The caterpillars feed on the forest trees and the colourful adult butterflies sip nectar in the flower gardens. On a sunny day the air is usually alive with fluttering butterflies. Over a hundred different kinds of birds can be seen in City Park. Among them are Hadada Ibis, big birds with long curved beaks; bright yellow and black weaver birds that nest in the acacias along the entrance drive; and large black and white hornbills with heavy beaks.

3.3.2 The Nairobi Arboretum

The Nairobi Arboretum covers some 70 acres, lying between State House Gardens and the Kirichwa River in Kileleshwa. Begun in 1907 by Mr Battiscombe of the Forest Department, it was in the early years used for trials of introduced tree species. Later, a Mr Gardner brought in many more ornamental trees from all over the tropical world, especially from Australia.

On the original plot, there are many indigenous trees and shrubs which have continued to grow there. Other native trees were brought in from other parts of Kenya, including the coast. Today there is a rich collection of plants that attract birds and butterflies and even small mammals such as monkeys and squirrels.
The Nairobi Arboretum has a great selection of exotic and indigenous trees of all varieties. Throughout its 30 acres of lawns, a multitude of pathways criss-cross and inter-connect the open grassland areas and cool shaded woodland. It is one of few places in Nairobi that children can really have the space to run around in.

Guided tree walks are on from 9:30 a.m. Visitors meet at the FONA offices within the Arboretum grounds. These meetings are held on the second Saturday and last Monday of every month. Those who are not members of FONA (Friends of Nairobi Arboretum) or Nature Kenya, pay 100/- fee on arrival at the gate.

Nature walks are also led by the Arboretum foresters and guides. Classical concerts and open-air picnics are arranged annually. Tree and bird lists and trails have been made for children and for the public. Monthly Tree Walks have been introduced.

3.3.3 The Karura Forest

The forest has a 50-foot waterfall, the famous ‘Father of Trees’, the Mau-Mau Caves, 50 kms of nature trails, a forest filled with wildlife, a marshland for bird-watching, a bamboo jungle, three rivers to explore, a camping site, an historical church hidden deep in the wood and many places for picnicking.

3.3.4 Ngong Forest Sanctuary

The Ngong Forest Sanctuary comprises 538 hectares of forest; 80% indigenous forest and the rest exotic Eucalyptus plantations, located within the larger Ngong Road Forest Reserve. It is rich in biodiversity as compared to other nearby forests and is home to over 120 bird species,
over 35 mammals and numerous insects, reptiles, amphibians and fish. The Sanctuary provides much potential for recreation and leisure. Visitors are encouraged to use the forest for a variety of non-invasive outdoor activities including walking, bird-watching, jogging, picnicking, camping, cycling and horse-riding. Along with Kenya Wildlife Service trained guards, there are forest guards supplied by the Forest Department. These personnel patrol the forest to ensure security of visitors and help control theft of trees.

3.4 Target Population

Information was sought from the study population on the use of Nairobi City’s four (4) main forested areas, that is, Karura forest, City Park, Ngong’ Road Forest and The Nairobi Arboretum for outdoor recreation activities. These urban forests were chosen due to their potential in outdoor recreation status. The population was mainly the Nairobi residents who visited the urban forested areas for outdoor recreation. Records from the four urban forested areas that were targeted in this study showed that they received an average of 2,000 visitors per month. Therefore this number of visitors formed the target population for this study.

3.5 Sample Population

For the purpose of getting the desired sample population, the researcher used simple random sampling. This is a technique of sampling in which each item (in this case each Nairobi resident visiting the urban forests) has an equal chance of inclusion in the sample (Walker, 1995). Out of the 2,000 visitors who were received in the four urban forested areas a month, a portion of 10% were randomly selected for the study. Since the research was a descriptive survey, ten percent of the visitors were representative (Mugenda and Mugenda, 1999). The researcher therefore worked with a sample population of 200 respondents.
3.6 Pilot Study

Pilot study was conducted before the actual data collection in the four urban forested areas. Ten respondents were randomly picked from Thika town which is 42 Kms from the study area to fill the questionnaires. Piloting was to help determine validity and reliability of the research instruments.

3.7 Validity and Reliability

The research instruments were validated through the application of content validity procedures. This is a judgement made better by a team of professionals (Mugenda and Mugenda, 1999). In this connection, the researcher established content validity by seeking expertise judgements from the supervisors while developing and revising the research instruments. Any ambiguity and inconsistency were addressed based on the supervisors' comments.

The reliability of the research questionnaire was determined using the split-half technique. The items were divided on the even-odd basis and then correlated. A reliability index of 0.88 was obtained, and this was accepted as being high enough.

3.8 Data Collection and Data Type

This study collected data using both primary and secondary sources to get information on the use of urban forested areas for outdoor recreation by Nairobi City residents.

3.8.1 Primary Data

Data were collected in an on-site survey within the four urban forested areas on every alternative day during the months of July and August 2009. Although it was not possible to
obtain a “strictly defined” random sample using the on-site sampling scheme, research assistants attempted to get a representative sample of those who were on the urban forested areas that day.

A questionnaire was used to collect the primary data required for the study. One part of the questionnaire was constructed on a Five - Point Likert Scale, mainly to capture data on perceptions while the other part of the questionnaire had open and closed ended questions that targeted Nairobi residents who visited the urban forested areas for outdoor recreation. The data collected included available recreational opportunities within the urban forested areas, educational and occupational backgrounds of the respondents, perceptions of the City’s residents on the use of the urban forested areas for outdoor recreation, challenges faced by residents within the urban forested areas like accessibility, time for outdoor recreation, money for outdoor recreation, distance to urban forested areas, wildlife to be observed within the urban forested areas and security issues within the urban forested areas as well as duration of visit by the residents to the urban forested areas.

3.8.2 Secondary Data

Published materials, journals, articles and reports constituted secondary sources of data. Secondary data were collected by means of literature review through which objective and systematic inferences from books, articles, journals, and internet search were done.

3.9 Variables, Research Instruments and Analysis Tools

Table 3.1 shows a summary of the objectives, variables, data collection tools/methods and data analysis procedures employed in this study.
Table 3.1 Summary of Variables, Research Instruments and Analysis Tools

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Hypotheses</th>
<th>Variables</th>
<th>Data Collection Tools</th>
<th>Data Analysis Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To assess the extent to which outdoor recreation facilities in urban forested areas are used for outdoor recreation.</td>
<td>Education levels of Nairobi residents would not significantly determine their knowledge and awareness of outdoor recreation facilities in the City’s forested areas</td>
<td>Nature Trails, Caves, Water points, Picnic sites, Water bodies, Benches, Camp Sites</td>
<td>Use of the Five-Point Likert Scale, Questionnaire and Existing Records in the Forested areas</td>
<td>Descriptive statistics including deriving means, median, modes and Chi-Square</td>
</tr>
<tr>
<td>2. To assess the preferences of Nairobi residents, towards the use of the City’s forests as outdoor recreation facilities.</td>
<td>The preferences of Nairobi’s residents on outdoor recreation in Nairobi’s forested areas would not significantly differ across their age groups</td>
<td>Accessibility of site, Awareness, Affordability, Popularity of site, Self improvement, Cultural trends, Safety</td>
<td>Use of the Five-Point Likert Scale and Questionnaire</td>
<td>One Way ANOVA</td>
</tr>
<tr>
<td>3. To evaluate factors that constrain the use of the City’s forested areas as outdoor recreation facilities.</td>
<td>There would be no significant difference in factors that hinder the residents of Nairobi from accessing the urban forested areas for outdoor recreation across their occupation categories</td>
<td>Lack of awareness, Physical barriers, Affordability, Environmental barriers, Inaccessibility, Insecurity</td>
<td>Use of the Five-Point Likert Scale and Questionnaire</td>
<td>One Way ANOVA</td>
</tr>
</tbody>
</table>


3.10 Data Analysis

The data collected were analysed qualitatively. This allowed the findings on the preferences of Nairobi city’s residents on the use of urban forested areas for outdoor recreation to be synthesised. The information elicited through the questionnaires was subjected to computation of simple statistics such as frequencies, totals and percentages. Some of the data were further subjected to chi-square and one-way ANOVA. The SPSS (version 16) programme was used for this analysis.
Chi-square test is a statistical test used to determine if observed data deviate from those expected under a particular hypothesis (Mugenda & Mugenda, 1999). In this study, chi-square was used to test the null hypothesis (H₀). The chi-square formula is:

\[ \chi^2 = \sum \frac{(o-e)^2}{e} \]

Source: Grant & Warren, (2001)

That is, chi-square (\(\chi^2\)) is the sum of the squared difference between observed (\(o\)) and the expected (\(e\)) data (or the deviation, d), divided by the expected data in all possible categories (Grant & Warren, 2001). The results were then tested for significance at 0.05 (95% confidence level). The chi-square test was used due to the nominal nature of data collected. It enabled a decision to be made on whether or not a significant relationship existed between awareness and participation in outdoor recreation in urban forested areas. The advantages of chi-square test is that there is no need for parameter values, relatively less mathematical detail scales of measurement such as nominal and ordinal.

One way ANOVA is a statistical technique that is used to compare the means of more than two groups. When comparing the means of more than two populations based on a single treatment factor, then it said to be one way ANOVA (Cardinal & Aitken, 2006). In one way ANOVA, total variance is the sum of the squares of the differences of each mean with the grand mean. In one way ANOVA, there are \(k\) samples involved in analysis, and then the degree of freedom will be equal to \(k-1\) (ibid).

In one way ANOVA, within group variance is the individual variance due to the sample. In one way ANOVA, within group variance is denoted by SS (W). SS (W) can be computed by subtracting the between group variance from the total variance. In SS (W), the degree of
freedom will be equal to N-k where N is the number of sample size (Cortina and Nouri, 2000).

**Decision Rule:** If the calculated critical value is greater than the table value, then the null hypothesis is rejected and concludes that there is a difference between the group means. If the calculated critical value is less than the table value, then the conclusion will be that there is no difference between the group means. In one way ANOVA, most researchers consider the probability value for decision making (Algina and Olejnik, 2003).
CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the results and discussions emanating from the study. The interpretation was done on the basis of study objectives. The analysed data are presented in tables, pie charts and bar charts. A demographic overview of the respondents precedes testing of the hypotheses.

4.2 Characteristics of Respondents

The following characteristics of respondents were collated and analysed. They included: age, educational level and occupation.

4.2.1 Age of Respondents

The respondents were divided into age groups with a range of 10 years from 10 – 19 years to 50 years and above. Figure 4.1 shows that the age group 20 – 29 years registered the highest attendance of 80(40%) followed by age group 30-39 years at 46(23%), age group 40 – 49 years was at 32(16%), age group 10 – 19 was at 29(14%) and eventually age group 50 years and above had 13(7%). These findings are congruent with those of Jackson (1994) which showed that interest in participation in outdoor recreation activities increased slightly from the youngest to the middle-age respondents and declined steadily thereafter. He found out that ages 18 – 41 years were very active in outdoor recreation and as ages advanced, for example, above 45 years participation in outdoor recreation declined. Muiruri (1990) found out that for ages 15 – 39 years, recreation interests are at their most diverse and intense level. The low representation among respondents of 50 years and above could explain the fact that most people in this age group are supposed to have retired from active duty and usually
retreat to their rural homes. Few of them will continue living in towns save for those who have a source of income in the urban forested areas. Thus, the low frequency of respondents above 50 years is normal since, although, they probably have the greatest amount of leisure time, the constrain of age, immobility and low income are more important than in any other age group. Nevertheless there is a general tendency for urban outdoor recreationists to decline with age. Bolen et al., (2000) compared participation by age and concluded that as age increases, participation in outdoor recreation and physical activity decreases. With regard to physical activity specifically, as people age there is a decline in the prevalence of physical activity participation. They further noted that 60% of people 55 years of age and older report participating in no physical activity.

Arising from the findings of this study, the city will have to meet the prime recreational needs of its residents that are still active, although the effect of age in participation in passive recreation is much less than active recreation.

Figure 4.1 Age of Respondents

Source: Fieldwork, (2009)
4.2.2 Educational Levels of Respondents

Data on education level indicated that 62(31%) of diploma holders were the most represented among the residents in the urban forests, figure 4.2, secondary School leavers and first degree holders/equivalent were at 48(24%) respectively, residents with 10 years of education were 15(7.5%) of the respondents, residents with post-graduate education had 14(7%) of the residents, residents with Primary School certificates were 9(4.5%) of the residents while residents with less than 8 years of education were 4(2%).

Level of education is a factor that appears to influence patterns of participation in outdoor recreation. Studies by Maguire and Younger (1998) and, Cosgrove and Jackson (1999) supports the Council of Europe’s statement of 1966 that the less educated a person is, the more his leisure will depend on his customary environment. Muiruri (1990) noted that the interest in recreational activities which is fostered in schools and other educational establishments is carried on into later life. The same author further notes that people with less education are less likely to appreciate and know about parks as recreation places. From the study it is evident that participation increased from residents of 10 years of education and peaking at residents with diploma level of education then declined with residents with postgraduate education recording only 7%. The findings of this research are in agreement with Cosgrove & Jackson (1999) who found out that people with high levels of education are infrequent park users. It follows that that they are likely to have better paying jobs and with the increased income they are able to visit recreation places that are not free. Maguire and Younger (1998) noted that high levels of education have been found to stimulate participation in a whole variety of leisure activities. It does not only increase the opportunity to participate in leisure activities but also increases awareness and desire. This is partly a reflection of the influence that education has on occupation and income.
4.2.3 Occupation of the Respondents

Outdoor recreation is an activity that involves setting aside time and, at times, travelling. In this light, the occupation of the residents was sought and figure 4.3 shows that 85(42%) of the residents were business people. Students and the employed persons both recorded 44(22%) of the residents, the unemployed were 20(10%) of the residents while 8(4%) of the residents earned their income from farming/agricultural sector. Attitudes towards, and tastes for, outdoor recreation vary between individuals. Manfield (2001) suggests a strong relationship between income and participation in outdoor recreation. Cosgrove and Jackson (1999) postulate a threshold income above which expenditure on recreation begins to rise rapidly and it is presumably above this level that Mansfield (2001) found that the ‘income elasticity of demand is more than one’. Loomis & Walsh (1997) notes that the value of an outdoor recreation experience is more than simply the out of pocket expenditures paid to participate.
This is only a lower bound on the value, and often has little to do with the total value individuals place on goods or services.

Cosgrove and Jackson (1999) do not define the income threshold at which spending on recreation begins to rise sharply and, in any case, this is likely to be specific within a particular economy and to sub-groups of that economy. For example, it might be influenced by the perceived worth of a given type of activity relative to its cost in relation to income. Therefore, for the case of Nairobi residents it was deduced that business people have expendable income since they were the majority of respondents visiting the urban forests for outdoor recreation. This study is in agreement with Debbage’s (1991) hypothesis that, the more disposable income one has, the longer distance someone is able to travel to reach a recreation destination, in effect, the more money they are likely to spend in their destination.

**Figure 4.3 Occupation of Respondents**

Source: Fieldwork, (2009)
Plate 4 The Karura River Waterfall

4.3 Frequency of Visits to the Urban Forests

Karura forest was the most visited as an outdoor recreation site by Nairobi residents. Eighteen (9%) of the residents visited Karura weekly, forty five (22.5%) of the residents were monthly visitors, fifty six (28%) of the residents visited Karura forest annually while eighty one (40%) of the residents had not been to Karura forest. Ngong forest was the second most visited with four (2%) visiting weekly, twenty eight (14%) of the residents visited Ngong forest monthly, nineteen (9.5%) of the residents visited Ngong forest annually while one hundred and forty nine (74.5%) of the residents had not visited the Ngong forest. City park got fifteen (7.5%) of the residents that visited weekly, twenty five (12.5%) of the residents visited the park monthly, twenty three (11.5%) of the residents visited City park annually while one hundred and thirty seven (68.5%) of the residents had not visited City
park before. Nairobi Arboretum got thirteen (6.5%) of those visiting weekly, seventeen (8.5%) of the residents visited the Nairobi Arboretum monthly, twenty eight (14%) of the residents visited Arboretum while one hundred and fourty two (71%) of the respondents had not visited the Nairobi Arboretum before. From the above results, Figure 4.4 shows that Ngong road forest registered the lowest number of visitors and the highest number who did not visit. This could be pointing to issues of security because visitors to the facility must make reservations in advance with the management and be accompanied by forest guards to the forest for recreation. Cosgrove & Jackson (1999) noted that users' perceptions of personal safety in urban recreation parks are more important than the visual attractiveness of urban recreation parks. They found out that when naturalistic dense vegetation increases, sense of safety decreases in urban areas. The nature trails at Nairobi arboretum and City park also requires recreationists to be accompanied by security personnel. The situation is different at Karura forest because, since the official opening of the 4 kilometres Karura forest family trail on 16th May 2009, there are forest guards on standby to accompany recreationists to the woodland track winding through the trees along the Gitathuru River from the Old Kiambu Road forest entrance to Limuru Road. The presence of forest guards has boosted public confidence in terms of their security within the forest.
Figure 4.4 Visitors to Urban Forests

Plate 5 Part of the Winnie Duku Nature Trail at Ngong Road Forest

Source: Fieldwork, (2009)
4.4.1 Awareness of Availability of Recreation Opportunities in Urban Forested Areas.

Information about location of services or goods is vital and determines whether people will make decisions pertaining to their provision. The importance of adequately informing people about public recreation opportunities cannot be downplayed by the service providers. Clark and Stankey (1999) notes that publicising recreation sites facilitates satisfying recreation experiences by directing people to those sites that can provide the specific experiences they desire, and helps disperse recreationists among available sites thereby reducing crowding, environmental damage, and conflicts among different types of recreationists.
Of the Nairobi residents who visited the urban forests for outdoor recreation, Figure 4.5 shows that 62 (31%) agreed that they had information on outdoor recreation, 61 (30.5%) strongly agreed that they had information on outdoor recreation, 33 (16.5%) disagreed on having information on outdoor recreation, 29 (14.5%) strongly disagreed on having information on outdoor recreation while 15 (7.5%) of the residents who visited the urban forests were undecided on whether they had prior information on outdoor recreation.

From Figure 4.5, 61.5% of the respondents generally agreed that they were aware of the outdoor recreation opportunities available within the urban forested areas. Therefore, the results suggest that the respondents set out to the urban forested areas with prior knowledge of what to expect. All of these findings indicate that urban forests and recreation administrators need to take greater cognisance of the information levels of their clientele and allocate more resources to information dissemination.

Information can be one of the most powerful tools under the control of the urban forest administrators, but only if they choose to use it. Unless they do so, recreation opportunities will continue to be unavailable to many urban residents, and people can hardly be expected to be supportive of the public provision of recreation if they are not aware of what is being provided.
Figure 4.5 Awareness of Availability of Recreation Opportunities

![Bar chart showing awareness of availability of recreation opportunities.]

Source: Fieldwork, (2009)

A cross tabulation (table 4.1) between education categories and information on recreation facilities yielded a Chi-Square result of 1.367 at 24 degrees of freedom that was significant at 0.000, as seen in table 4.2.

Table 4.1 Cross-Tabulation of Education and Information on Recreation Facilities

<table>
<thead>
<tr>
<th>Educational Category</th>
<th>strongly agree</th>
<th>agree</th>
<th>undecided</th>
<th>disagree</th>
<th>strongly disagree</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;8 yrs of school</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>1</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>8 yrs of school</td>
<td>7</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>16</td>
</tr>
<tr>
<td>10 yrs of school</td>
<td>11</td>
<td>14</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>37</td>
</tr>
<tr>
<td>12 yrs of school</td>
<td>55</td>
<td>27</td>
<td>2</td>
<td>23</td>
<td>24</td>
<td>131</td>
</tr>
<tr>
<td>Diploma</td>
<td>48</td>
<td>69</td>
<td>12</td>
<td>35</td>
<td>15</td>
<td>179</td>
</tr>
<tr>
<td>Degree</td>
<td>28</td>
<td>43</td>
<td>2</td>
<td>27</td>
<td>20</td>
<td>120</td>
</tr>
<tr>
<td>Post-graduate</td>
<td>11</td>
<td>13</td>
<td>0</td>
<td>6</td>
<td>4</td>
<td>34</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>168</td>
<td>32</td>
<td>98</td>
<td>66</td>
<td>524</td>
</tr>
</tbody>
</table>

Source: Fieldwork, (2009)
Therefore, the first null hypothesis ($H_0$) that there would be no significant difference between information on outdoor recreation facilities and level of education of Nairobi residents was rejected. In conclusion, the relationship between education categories and level of information on recreation facilities in the city's forested areas was strong and significant. This implies that the level of education of the city's residents was significant determinant of their level of information on recreation facilities in the urban forested areas. Results from the study indicate that more people with secondary school level of education and above visited the urban forested areas for outdoor recreation than those with lower levels of education. This affirms that these categories of people were well informed on outdoor recreation opportunities available in the urban forested areas.

Table 4.2 Chi-Square Test for Awareness on the basis of Levels of Education of the Respondents

<table>
<thead>
<tr>
<th>Chi-Square Tests</th>
<th>Df</th>
<th>Asymp. Sig. (2-Sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\chi^2$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.367</td>
<td>24</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Source: Fieldwork, (2009)

4.4.2 Duration of Visiting the Urban Forested Areas for Recreation

Recreation time is spent by people in varying intensities, for example, figure 4.6, shows that 51(25.5%) of the urban residents who visited the urban forests spent 3 hours and 4 hours respectively, 29(14.5%) spent 5 hours in the urban forests, 28(14%) of the urban residents spent 2 hours in the urban forests, 16(8%) of the residents who visited the urban forests spent the whole day within the forests, while a paltry 7(3.5%) of the visitors spent only 1 hour within the urban forests. The average amount of time spent in the urban forested areas on a
typical visit was between three and four hours. Forty seven percent tended to spend more than this whilst sixteen percent spent the whole day. Muiruri (1990) postulated that there is higher frequency of visits and density of use, and generally a shorter length of stay (mainly 1 hour) by Nairobi residents who used open spaces for recreation.

Hammitt & Brown (1984) noted that periods of time and places where people can be away, even for brief periods, are basic human and leisure needs. Close to home urban forests/parks were shown to be important leisure environments for serving being away and privacy needs in people’s everyday lives. Collins (2008) notes that length of time spent in an outdoor recreation activity is a critical variable for dealing with obesity, stress reduction, and other health issues. Therefore, in this study duration of stay in the urban forests by Nairobi residents was determined by distance travelled to the recreation sites. Many recreationists who stayed for short durations lived close to the urban forested areas while those who stayed for longer durations travelled relatively longer distances to the urban forested areas. This is in agreement with Debbage (1991) who hypothesized that distance could be a good predictor of recreation behavior such as the longer distance someone has to travel to reach a destination, the more expensive the trip becomes, the longer they tend to stay, and the more they want to see and do, in terms of activities and variety. Moutinho and Trimble (1999) also found that those who travel further spend more time at the recreation destinations and are more likely to be first-time visitors.

Often, the most rewarding outdoor recreation experiences require sustained time. Because people have so many demands, they often feel that they cannot afford the half-day or weekend to participate. The perceived value for them does not match the perceived length of time.
It is therefore important to note that; time is required to have a safe and enjoyable outdoor experience. Preparation of outdoor gear, food and logistics is required, and people feel pressed to get this organised. In schools, there are time restrictions such as the length of the school day, or the structure of the timetable, competing extracurricular activities which can limit the opportunity for participation in outdoor recreation.

Figure 4.6 Duration of Visiting the Urban Forests

![Bar chart showing duration of visits to urban forests]

Source: Fieldwork, (2009)

4.4.3 Transportation Means to the Urban Forests

Transport emerges as a significant component in outdoor recreation, not having access to means of transport is a significant restriction, particularly for urban residents. People cannot get to more remote informal recreational sites without proper and convenient means of transport. In Table 4.3, 77(38.5%) of the urban residents who visited the urban forests for outdoor recreation used public means, 66(33%) of the respondents walked from their point of origin to the urban forests, 65(32.5%) of the respondents used private means of transport to the urban forests, 28(14%) of the respondents cycled to the urban forests, while 21(10.5%) of
the respondents used taxi as means of transport to the urban forests. The results show clearly that most of the respondents walked to the urban forested areas or used public means, indicating that majority of the respondents live close to the urban forested areas. In the same strength, even though the study did not delve into distances travelled by the respondents to the urban forested areas, the number of visits from people who reside further from the urban forested areas decline as can be noted from respondents who used personal transport and taxis. Collins (2008) noted that the most heavily used parks are those situated within urban areas. This is not unexpected given that such areas have the most dense populations and most people who use parks tend to visit the one closest to them.

Askins (2004) postulates that lack of (safe and accessible) public transport exacerbates this effect. Some people have particular needs in their use of public transport, which may not be well provided for. He further says that some people with disabilities need allowance for their assistance dog or wheelchairs and some people may wish to transport a cycle. It is therefore imperative that more forested areas or green places be established close to the urban residences to counter transport problems.

<table>
<thead>
<tr>
<th>Table 4.3 Means of Accessing the Urban Forests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transportation means to urban forests</td>
</tr>
<tr>
<td>-----------------------------------------</td>
</tr>
<tr>
<td>Public</td>
</tr>
<tr>
<td>Walk</td>
</tr>
<tr>
<td>Private</td>
</tr>
<tr>
<td>Cycle</td>
</tr>
<tr>
<td>Taxi</td>
</tr>
</tbody>
</table>

Source: Fieldwork, (2009)
4.4.4 Companionship of Visitors to the Urban Forested Areas

The presence of urban trees and forests can make the urban environment a more pleasant place for residents to live, work, and interact while spending leisure time. In Figure 4.7, analysis reveals that most of the people who exploited the recreational opportunities were in groups of friends/couples. The second largest group was those who visited as individuals, comprising 27%. Those people who went as families accounted for only 21%. The categories of visitors then declined sharply with 12% of the people going as members of a faith group, a proportion of 10% of the respondents went as members of youth groups, 9.5% as educational trip groups, 8% as business friends, 7.5% as a sports groups, 5.5% as corporate groups, and only 4% of the respondents visited the urban forests as neighbours.

The high number of people visiting as friends could be due to courtship because the majority of visitors by age were in the 20-29 years age bracket. Majority of city residents visiting the urban forests as per their occupations also revealed that students accounted for a significant percentage of the respondents (22%). Single people have time that they can spare for outdoor recreation, a premise that is in agreement with Muiruri (1990) who notes that most unmarried residents of Nairobi utilise their leisure time making friends and courting.
4.4.5 Reasons for Visiting the Urban Forested Areas by Nairobi Residents

City residents visit the urban forests for different reasons. Analysis of the data collected indicated that 52% of the respondents visited the urban forests to picnic, while 47% of the respondents went to stroll. Only 34% of the respondents visited the forests for solitude and nature trails respectively. Respondents who went to the urban forests to exercise accounted for 33%. Those who went to watch birds/butterflies also accounted for 33%. The numbers kept declining with 30% of the respondents visiting the urban forests to look at trees and flowers, 27% of the respondents visited the urban forests to pray while only 9% of the respondents visited the urban forests to collect wild fruits.
The results suggested that respondents had an image of urban forested areas as places that are important to them and highly valued as natural environments. Respondents reported that they made a significant number of visits to the nearby urban forested areas. They placed high priority on the natural attributes of the urban forests and expressed the need for the Forest Service to undertake activities that protect, preserve, restore, and maintain these attributes and the areas that support them, such as strolling, picnicking, watching birds and butterflies, looking at trees and flowers, having solitary moments and praying. They placed a lower priority on the use of the urban forests for consumptive outdoor recreation like fishing, collecting wild fruits and hunting. These responses were quite consistent with previous studies of residents of Vermont and Massachusetts concerning the Green Mountain National Forest (Manning, 1999) and the White Mountain National Forest (Morrissey and Manning, 2000). Parks and Recreation Department (1999) in their study of effectiveness of public parks in Singapore found that for many of the residents, the neighborhood park also provided a
convenient place for social contact and interaction. They used neighborhood parks as a stimulus for social activity: to be with friends, to 'people-watch', and to do something that a family can do together. These places offer opportunities for teenagers to meet and play, isolated mothers to meet others, the elderly to sit and watch the world go by, the housewives, grandmothers, extended families, or a few friends to gather and drink tea together or married couples to get away from their extended families for a while.

From the results, residents of Nairobi city affirmed that urban forested areas are very important to them. They indicated that they see these urban forested areas as important natural areas that should be managed and used in a way that preserves, protects, and restores the natural character and the experiences that they provide. They are not as highly supportive of active outdoor recreation, particularly consumptive activities such as hunting and fishing, collecting wild fruits and collecting firewood. The overall results suggest that there is ample room for outreach efforts such as the Urban Connections program that emphasises connectivity network formation among urban residents. These efforts can build on the high level of personal significance that individuals place on the urban forested areas as well as the high priority that they place on natural environments in those forested areas. Fleishman (2005) in his study of Outdoor Recreation Patterns among Immigrants in Jerusalem noted that in terms of their specific motivations, the immigrants give more weight to the factor of "seeking solitude in nature," either alone or with family and friends, compared with the other visitors to the parks and forests.

The results of this study further suggest that people who visit the urban forests use them most for gentle recreation and leisure activities such as going for a walk or enjoying the surroundings, rather than for more vigorous pastimes like informal games, exercise and organised sport. Within the recreation grounds, organised sport only constitutes a small
proportion of the activities that take place there. Gentle recreational activities and informal exercise, such as jogging or a kick-about are more likely to take place. This suggests that the provision of sports facilities in urban forests meet the needs of only a small proportion of users.

4.4.6 Time of Day Residents Visit the Urban Forested Areas for Recreation

Nairobi residents visit the urban forests during various times of the day. Table 4.4 shows that over half of the respondents visited the urban forests in the afternoon hours, 40% of the respondents visited the urban forests during mid-day, while 20% of the respondents visited the urban forests in the morning hours.

As the public becomes more mobile and finds more leisure time available, conflicts between conservation and recreation interests can be expected to increase, particularly in areas such as urban forests and public open spaces that have been set aside to fulfil multiple purposes. Analysis of data from the study indicate that recreational use of urban forests vary in intensity within any area, and patterns of attendance differ markedly with the season of the year, day of the week, and time of day. Since over fifty percent of the respondents visited the urban forested areas in the afternoon, this indicated that this was the most convenient time for them to visit the urban forests for recreation. This premise is further supported by the 40% of the respondents who visited the urban forested areas during mid-day. As Omondi (1992) postulated that leisure time is basically time free from obligations, it could be concluded that this was the respondents’ time free from obligations. Walker (1985) notes that outdoor recreation activities are undertaken voluntarily for the purposes of enjoyment and/or physical and mental well being. He further states that outdoor recreation encompasses the organised “free-time” activities that are participated in by people for their own sake and where there is
an interaction between the participant and an element of nature. It is therefore safe for the study to conclude that most Nairobi residents have time for outdoor recreation from mid-day to afternoon hours.

**Table 4.4 Time of Day**

<table>
<thead>
<tr>
<th>Time of day</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morning hours</td>
<td>40</td>
<td>20</td>
</tr>
<tr>
<td>Mid-day</td>
<td>80</td>
<td>40</td>
</tr>
<tr>
<td>Afternoon hours</td>
<td>87</td>
<td>56.5</td>
</tr>
</tbody>
</table>

Source: Fieldwork, (2009)

**4.5 Preferences of Nairobi Residents on the Use of Nairobi City’s Forests for Outdoor Recreation**

Urbanites' preferences and behavior confirm the strong contribution that trees and forests make to the quality of life in urban areas. Trees and forests are a prominent component of the landscape in most urban areas. They also provide significant outdoor leisure/recreation opportunities for urbanites. Figure 4.9 below indicates that there was a general agreement by Nairobi residents that outdoor recreation improves social ties, their well being and also ensured renewed energy.
The fact that 44.5% and 37% of the respondents strongly agreed and agreed respectively that outdoor recreation boosted renewed energy in them while only 3% of the respondents were undecided implies that Nairobi residents know the benefits of outdoor recreation in urban forested areas. This was further supported by 29% and 16% of the respondents who strongly disagreed and disagreed respectively that their family members did not like outdoor recreation. However on the other hand 32% of the respondents strongly disagreed that they felt safe within the urban forests whenever they visited.

According to Scott and Munson (1994) when urban recreationists were asked about their preferences of outdoor recreation in forest parks, visitors were most likely to indicate that the park was compatible with recreation needs, facilities were easy to use, and that its purpose was easily understood and benefited them immensely.
Nairobi City residents hold various preferences towards the use of the urban forests for outdoor recreation. According to Mowen and Minor (2001) in their Survey of Upper Saddle River, individual perceptions can play an important role in determining the adoption and continued use of new products and services. From figure 4.9 there was a general agreement by Nairobi residents that outdoor recreation improves social ties, their well being and also ensured renewed energy. These results agree with Manning, (1999) who found out that park and arboretum visitors reported that trees and forests provide settings for significant emotional and spiritual experiences. These experiences are therefore extremely important in Nairobi residents' lives, and can lead to a strong feeling of attachment to particular places and people that they interacted with.

Plate 7 A Section of Recreationists at the Nairobi Arboretum

Source: Fieldwork, (2009)
To ascertain the differences between urban residents’ age groups as a factor that determined preferences towards outdoor recreation in Nairobi’s forested areas and the nature of visits, one-way ANOVA test was done. Age group was considered a variable factor that determined peoples’ preferences towards outdoor recreation. The several preferences captured through likert scaling were subjected to an ANOVA test as dependent to the factor variable age group. The results indicated that family, neighbourhood social ties, and relaxation and getting renewed energy recorded significances of 0.000, 0.002 and 0.000 respectively across age groups (Table 4.5). This indicated a strong significant difference between the age groups on preferences. However results on outdoor recreation in urban forested areas increasing well-being and safety of recreationists within urban forested areas recorded significances of 0.168 and 0.142 respectively do not differ across the age groups. Therefore, the second null hypothesis ($H_{02}$) that preferences of Nairobi’s residents on outdoor recreation in Nairobi’s forested areas would not significantly differ across their age groups was rejected. The conclusion is that the difference between preferences of Nairobi residents and their age group categories was strong and significant. This indicates that ages of Nairobi residents was a significant determinant on their preferences on outdoor recreation in urban forested areas.
Table 4.5 Residents' Preferences of Outdoor Recreation in Urban Forested Areas on the Basis of their Age Groups

<table>
<thead>
<tr>
<th>ANOVA</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>family members don't like outdoor recreation</td>
<td>Between Groups</td>
<td>71.391</td>
<td>4</td>
<td>17.848</td>
<td>12.332</td>
</tr>
<tr>
<td></td>
<td>Within Groups</td>
<td>751.151</td>
<td>519</td>
<td>1.447</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>822.542</td>
<td>523</td>
<td></td>
<td></td>
</tr>
<tr>
<td>urban forests increases stronger neighbourhood social ties</td>
<td>Between Groups</td>
<td>27.791</td>
<td>4</td>
<td>6.948</td>
<td>4.200</td>
</tr>
<tr>
<td></td>
<td>Within Groups</td>
<td>858.520</td>
<td>519</td>
<td>1.654</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>886.311</td>
<td>523</td>
<td></td>
<td></td>
</tr>
<tr>
<td>outdoor recreation in urban forests increase well-being</td>
<td>Between Groups</td>
<td>11.392</td>
<td>4</td>
<td>2.848</td>
<td>1.617</td>
</tr>
<tr>
<td></td>
<td>Within Groups</td>
<td>913.890</td>
<td>519</td>
<td>1.761</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>925.282</td>
<td>523</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel safe within urban forests</td>
<td>Between Groups</td>
<td>14.403</td>
<td>4</td>
<td>3.601</td>
<td>1.730</td>
</tr>
<tr>
<td></td>
<td>Within Groups</td>
<td>1080.519</td>
<td>519</td>
<td>2.082</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>1094.922</td>
<td>523</td>
<td></td>
<td></td>
</tr>
<tr>
<td>urban forests help relax and get renewed energy</td>
<td>Between Groups</td>
<td>41.901</td>
<td>4</td>
<td>10.475</td>
<td>8.042</td>
</tr>
<tr>
<td></td>
<td>Within Groups</td>
<td>676.069</td>
<td>519</td>
<td>1.303</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>717.969</td>
<td>523</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Fieldwork, (2009)
4.6 Effects of Management of Urban Forests on Outdoor Recreation

As might be expected from individuals who want to experience a natural environment, respondents expressed the highest degree of agreement with statements that called for more facilities to be introduced within the urban forests, followed by creating a conducive environment to facilitate a variety of outdoor recreation activities such as boating, hiking, and enjoying peace and quiet. Figure 4.10 indicate that 43% of the respondents agreed that outdoor recreation is not popular among Nairobi City residents. A proportion of 25% and 24% respondents disagreed and strongly disagreed respectively that urban forests are not fashionable for outdoor recreation.

Hansen (2006) notes that people's preferences for urban forest environments are expressed in their choices of which sites to visit and how to use those sites. Knowledge of how urban
forest sites are used is essential for deciding on how the sites should be managed and maintained. Driver (2009) notes that the organizations that manage outdoor recreation opportunities should plan, manage, lead, and evaluate their programmes for health benefits.

Hoots and Buist, (2002) posulate that two important goals of park managers are to provide physical and social settings and to manage facilities and programs that help park clientele have satisfying experiences. Meeting these goals is not easy, especially in urban areas where park space is limited, use is high, and demand for activities is diverse. The difficulty is increased when the clientele are diverse. In urban settings like Nairobi, it would seem particularly important to understand how external factors such as costs and transportation alternatives and internal factors such as site facilities encourage or discourage use by a diversity of individuals. Allison (2002) in her study of management of the Lincoln Park noted that access to park opportunities is a key planning and management issue, hence, the need to establish a relationship between urban park use and access to the unique opportunities that some parks provide. She further suggests that management which facilitates social use patterns might include table and seating arrangements that accommodate larger groups; a simplified information/permitting system for obtaining picnic areas for organized group festivals; and location and maintenance of restroom facilities throughout the park that provide safe and clean access.

In light of the findings regarding the recreation of various Nairobi residents, urban forest managers should give attention to the functional division of the sites and plan different elements in each site (parking areas, trails, attractions, playgrounds, sports fields, etc). Plans must consider the demographic-cultural profile of the visitors in order to satisfy the requirements and expectations of each population segment. Since a significant portion of the
residents who visit the urban forests ascribe importance to “communing with nature.” There is need of taking appropriate steps in planning the parks, e.g., effective use of the natural features of the landscape, a wider array of hiking trails inside the woods and parks, etc.

Results from observation schedule indicate that parts of the urban forested areas are not kept clean as can be observed in plate 8. In some of the urban forested areas there are litter bins clearly marked and residents are keen on using them to dispose waste as seen in plate 9.

Plate 9 A Recreationist Dumping Litter at the Nairobi Arboretum

Source: Fieldwork, (2009)
4.7 Evaluation of Factors constraining the use of City’s Forests for Outdoor Recreation

From figure 4.11 it was noted that 47.5% of the residents agreed that distance from the urban forests played a prohibitive role to outdoor recreation. Lack of money to finance outdoor recreation had 72 (36%) and 54 (27%) of the residents agreeing and strongly agreeing respectively that this was a barrier to outdoor recreation. Time for outdoor recreation was also a factor that included 74 (37%) and 48 (24%) residents agreeing and strongly agreeing respectively that it was a barrier to outdoor recreation. On the other hand, 64% and 36% of the residents strongly disagreed and disagreed respectively with the statement that they feel safe within the urban forested areas when they visit for outdoor recreation.

Source: Fieldwork, (2009)
Buchanan & Allen (1988) and Searle & Jackson (1985a, 1985b) framed the leisure constraints in terms of barriers to recreation activity participation with the implicit assumption that encountering barriers necessarily resulted in nonparticipation. Constraints were defined as factors that may inhibit activity participation or limit satisfaction (Jackson, 1988). Crawford and Godbey (1987) argued that constraints affect not only participation but also acquisition of recreation preferences. They categorized constraints into three categories: intrapersonal constraints defined as individual psychological qualities that affect the development of leisure preferences (e.g., shyness), interpersonal constraints defined as social factors that affect development of recreation preferences (e.g., lack of companions), and structural constraints comprising factors that intervene between development of recreation preferences and participation (e.g., financial resources). Crawford, Jackson and Godbey (1991) extend this line of thinking and present their hierarchical model of recreation constraints, which posited that intrapersonal and interpersonal constraints affect recreation preferences whereas structural constraints intervene between preferences and participation. The study therefore concludes that the proximity of recreation sites, safety, accessibility, money, time for recreation, and wildlife to be viewed within the urban recreational spaces are important factors in predicting participation in outdoor recreation.

Occupation was considered a factor that is instrumental in mitigating constraints to outdoor recreation. The several constraints captured through likert scaling were subjected to an ANOVA test as dependent to the factor variable occupation. The results indicate that money for outdoor recreation, distance to and from the urban forested areas, accessibility of the urban forested areas, time for outdoor recreation, wildlife within the urban forested areas and security within the urban forested areas with significance values of 0.011, 0.008, 0.000, 0.011, 0.000, and 0.016 respectively stressed that there was a significant difference across
the occupation categories. Therefore the third null hypothesis that stated, “There would be no significant difference in factors that constrain the residents of Nairobi from accessing the urban forested areas for outdoor recreation across their occupation categories” was rejected. In a nutshell, the researcher found that the difference between occupation categories and factors that hinder Nairobi residents from accessing urban forests for outdoor recreation was strong and significant. From the five occupation groups discussed in section 4.2.3, the unemployed and farm workers accounted for only 14% of the respondents who visited the urban forested areas for outdoor recreation. This indicates that occupations of Nairobi residents were a significant determinant on how they overcame the factors (money, distance, accessibility, time and security) that hindered access to outdoor recreation in the urban forested areas.

Plate 10 Nairobi residents spending their leisure time at the Nairobi City Park

Source: Fieldwork, (2009)
Figure 4.11 Factors that Constrain Outdoor Recreation

Source: Fieldwork, (2009)
Table 4.6 Constraints to Outdoor Recreation in Urban Forests across Occupation Groups

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>money for outdoor recreation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>20.772</td>
<td>4</td>
<td>5.193</td>
<td>3.285</td>
<td>.011</td>
</tr>
<tr>
<td>Within Groups</td>
<td>820.411</td>
<td>519</td>
<td>1.581</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>841.183</td>
<td>523</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>time for outdoor recreation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>20.003</td>
<td>4</td>
<td>5.001</td>
<td>3.322</td>
<td>.011</td>
</tr>
<tr>
<td>Within Groups</td>
<td>781.279</td>
<td>519</td>
<td>1.505</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>801.282</td>
<td>523</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>distance from residence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>16.771</td>
<td>4</td>
<td>4.193</td>
<td>3.506</td>
<td>.008</td>
</tr>
<tr>
<td>Within Groups</td>
<td>620.664</td>
<td>519</td>
<td>1.196</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>637.435</td>
<td>523</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>urban forests not accessible</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>37.620</td>
<td>4</td>
<td>9.405</td>
<td>5.221</td>
<td>.000</td>
</tr>
<tr>
<td>Within Groups</td>
<td>934.884</td>
<td>519</td>
<td>1.801</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>972.504</td>
<td>523</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>not enough wildlife in urban</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>forests</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>39.996</td>
<td>4</td>
<td>9.999</td>
<td>6.522</td>
<td>.000</td>
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<tr>
<td>Within Groups</td>
<td>795.661</td>
<td>519</td>
<td>1.533</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>835.656</td>
<td>523</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i feel safe within urban forests</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>25.235</td>
<td>4</td>
<td>6.309</td>
<td>3.061</td>
<td>.016</td>
</tr>
<tr>
<td>Within Groups</td>
<td>1069.686</td>
<td>519</td>
<td>2.061</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1094.922</td>
<td>523</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Fieldwork, (2009)

4.8 Point of Origin to the Urban Forests

Nairobi residents visit the urban forests from various points of origin. Figure 4.12 indicates that 53% of the respondents visited the urban forests from home, 28.5% from their places of work, 17.5% of the respondents visited the urban forests from church service, 16.5% from school, while only 5.5% of the respondents visited the urban forests from hospital.
Figure 4.12 shows that outdoor recreation is an iconic part of human nature. This premise is supported by the fact that majority of the respondents make a decision to visit the urban forested areas from home. It is therefore, part of human heritage, birthright and a worldwide reputation. Outdoor recreation supports socialization, getting out to formal sport be it golf, football, rugby; informal outing like a leisurely stroll in the woods or mountain biking with mates. Being outdoors helps de-stress and renews people’s energy, the reason why a significant number of respondents visited the urban forested areas from work/office. Natural settings in urban forested areas offer an opportunity to urban residents a serene environment to commune with their creator in an extraordinary way, hence the sizeable number of respondents that visited the urban forests from church. Urban forested areas present City residents with an avenue for non-academic achievement by providing new experiences and opportunities. A different set of skills are developed beyond the regular classroom, this is why 16.5% of the respondents visited from school. They further enable communities to understand and value the environment and develop principles of environmental conservation, like “leave no trace”. Since 5.5% of the respondents visited the urban forested areas from hospital, it showed that outdoors significantly contributes to community health & wellbeing. Godbey (2009) notes that being outside in natural surroundings may improve health since physical activities benefit participants. Particular attention is given to children’s health problems that can be mitigated through outdoor play, sports, and nature study. Therefore, replacement of vigorous outdoor activities by sedentary, indoor lifestyles has far-reaching adverse consequences for urban residents’ physical and mental health, for the economy, and for natural resources themselves.
Figure 4.12 Point of Origin

![Bar chart showing point of origin]

Source: Fieldwork, (2009)

4.9 Time of Week during which Residents Visit the Urban Forests for Recreation

Nairobi residents visited the urban forests for outdoor recreation during different times of the week. Figure 4.13 shows that a larger proportion of the respondents, 67.5%, visited the urban forests during weekends for recreation, while 36.5% visited the urban forests on working days for recreation. From the results it can be noted that most Nairobi residents set aside the weekends for outdoor recreation save for those who visited the urban forests from work/office to unwind opted for the weekdays (Monday – Friday). For most city residents, the weekends offer free time from work thereby enabling them to utilise this time for recreation.
Figure 4.13 Time of Week

Source: Fieldwork, (2009)

Plate 11 Nairobi City Residents Spending their Leisure Time at the Nairobi City Park

Source: Fieldwork, (2009)
CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction
This study investigated the preferences of Nairobi residents on the use of forested areas for outdoor recreation. The data was collected using questionnaire which was administered to 200 respondents within the urban forested areas. Further the opportunities for outdoor recreation available within the urban forested areas were also established by use of the questionnaire. Data processing and analysis involved checking for completeness of questionnaire, verifying consistency, data coding and entry, computation and presentation of descriptive statistics. Tests of significance were done using chi-square and one-way ANOVA. This chapter summarises the findings of the study, draws conclusions, makes recommendations and suggests areas for further research.

5.2: Summary of Findings
The main findings of the study were summarised as follows;

5.2.1: Characteristics of Respondents
Most of the respondents were of age bracket 20 – 29 years which accounted for 40% of the total sample population. The most dominant group of residents who visited the forested areas were business people comprising 42.5% of the respondents. With regard to education, many of the respondents had attained diploma level, with 31% of the residents falling in this category. However, in terms of visits to the urban forested areas, Karura forest recorded higher number of visits and the lowest number of respondents who did not visit at all. Most of the respondents did not visit Ngong road forest (Sanctuary) for outdoor recreation.
5.2.2: Nature of Visits to the Urban Forested Areas

The study revealed that Karura forest was the most visited urban forested area for outdoor recreation with most of the respondents visiting during weekends. It was also evident that most of the respondents visited the urban forests for 3-4 hours during their visits accounting for 51% of the total population of the respondents with only 8% of the respondents staying the whole day within the urban forests. Most of the respondents, 56.5% visited the urban forested areas in the afternoon hours.

5.2.3: Awareness of Availability of Recreation Opportunities in Urban Forested Areas

The first null hypothesis ($H_{01}$) that there is no significant difference between information on outdoor recreation facilities and level of education of Nairobi residents was rejected. In conclusion, the relationship between education categories and level of information on recreation facilities in the city's forested areas was strong and significant. This implies that the level of education of the city's residents was significant determinant of their level of information on recreation facilities in the urban forested areas. Results from the study indicated that more people with secondary school level of education and above visited the urban forested areas for outdoor recreation than those with lower levels of education. This affirms that these categories of people were well informed on outdoor recreation opportunities available in the urban forested areas.
5.2.4: Availability of Outdoor Recreation Opportunities in Urban Forested Areas.

Empirical data from the study revealed that there were numerous recreation opportunities in the City’s forested areas in form of picnic sites, bird watching sites, spaces for exercise, sites for day camping, nature trails, places for solitude, a variety of indigenous trees to look at, caves and swimming pool at Ngong road forest (Sanctuary) and numerous varieties of butterflies to watch at the arboretum and Ngong Road forest.

From the study, results have shown that most of the respondents visited the urban forested areas for picnic, 51.5%. This was an indication that most of the respondents took part in both passive and active forms of recreation.

5.2.5: Preferences of Nairobi Residents towards the Use of Urban Forested Areas for Outdoor Recreation

From the results of the study it is evident that most of the respondents were in agreement that recreation in urban forested areas benefited in the following ways; outdoor recreation led to improved social ties, enhanced their well-being, ensured renewed energy and a significant number (44.5%) of the respondents indicated that their family members liked outdoor recreation.

To ascertain the difference between urban residents’ age groups as a factor that determined preferences towards outdoor recreation in Nairobi’s forested areas and the nature of visits, one-way ANOVA test was done. Age group was considered a variable factor that determined peoples’ preferences towards outdoor recreation. The several preferences captured through
likert scaling were subjected to an ANOVA test as dependent to the factor variable age group. The results indicate that family, neighbourhood social ties, and relaxation and getting renewed energy recorded significances of 0.000, 0.002 and 0.000 respectively across age groups (Table 4.4). This indicated a strong significant difference between the groups. However results on outdoor recreation in urban forested areas increasing well-being and safety of recreationists within urban forested areas recorded significances of 0.168 and 0.142 respectively do not differ across the age groups. Therefore, the second null hypothesis (H₀₁) that preferences of Nairobi’s residents on outdoor recreation in Nairobi’s forested areas would not significantly differ across their age groups was rejected. The conclusion is that the difference between preferences of Nairobi residents and their age group categories was strong and significant. This indicates that ages of Nairobi residents was a significant determinant on their preferences on outdoor recreation in urban forested areas.

5.2.6: Effects of Management of Urban Forests on Outdoor Recreation

From the results of the study, most respondents agreed with statements that called for more facilities, and on the other hand disagreed with statements that stated there was good management in the urban forested areas. The respondents also supported statements that called for introduction of more activities like hiking and boating. The respondents also strongly disagreed with statements that noted that urban forested areas were not fashionable for outdoor recreation.
5.2.7: Factors Constraining the Use of Nairobi City’s Forests for Outdoor Recreation

From the results of the study lack of money, distance of the urban forests from respondents, accessibility of the urban forests, time for recreation and lack of wildlife in the urban forests came out as the most significant constraints. Distance of the urban forests from the homes of Nairobi’s residents was number one constraint with 47.5% of the respondents agreeing with that statement. It was noted that accessibility did not feature as a strong constraint to Nairobi’s residents.

Occupation was considered a factor that is instrumental in mitigating constraints to outdoor recreation. The several constraints captured through likert scaling were subjected to an ANOVA test as dependent to the variable occupation. The results indicate that money for outdoor recreation, distance to and from the urban forested areas, accessibility of the urban forested areas, time for outdoor recreation, wildlife within the urban forested areas and security within the urban forested areas with significance values of 0.011, 0.008, 0.000, 0.011, 0.000, and 0.016 respectively stressed that there was a significant difference across the occupation categories. Therefore the third null hypothesis that stated, “There would be no significant constraints across occupation categories that hinder the City’s residents from accessing the urban forested areas for outdoor recreation” was rejected. In conclusion, the researcher found that the difference between occupation categories and factors that hinder Nairobi residents from accessing urban forests for outdoor recreation was strong and significant. From the five occupation groups discussed in section 4.2.3, the unemployed and farm workers accounted for only 14% of the respondents who visited the urban forested areas for outdoor recreation. This indicates that occupations of Nairobi residents were a significant
determinant on how they overcame the factors (money, distance, accessibility, time and security) that hindered access to outdoor recreation in the urban forested areas.

5.3: Conclusions

The findings of this study revealed that within the Nairobi City’s forests there are a variety of outdoor recreation opportunities (bird watching, picnic, exercise, camping, nature trails, wildflowers, butterfly watching, caves, indigenous trees and places for solitude and prayers) and Nairobi’s residents used various modes of transport (public transport, private transport, cycling walking and taxis) to access the urban forests for outdoor recreation. Data also showed that majority of the respondents visited the urban forested areas to picnic making. Most of the respondents visited the urban forests in the afternoons during weekends for durations between 3-4 hours. Most of the respondents were aged between 20-29 years making 40% of the total sample population. Education played a significant role in the way most of Nairobi residents made decisions regarding outdoor recreation in urban forested areas, since 86% of the respondents had attained education levels of above 12 years leaving only 14% with education levels of less than 10 years to make up for the rest of the respondents. Occupation as well played a big role among the respondents with business people making 40% of the total population, indicating availability of expendable income. Majority of the respondents also visited the urban forested areas as a group of friends making 41.5% of the total population. Majority of Nairobi residents agreed that outdoor recreation in urban forests improved social ties, improved their well-being and ensured renewed energy; however most of the respondents that disagreed they felt safe within the urban forested areas whenever they visited. Most of the respondents were of the opinion that management of the urban forests be improved in terms of creating opportunities for boating, improve cleanliness of the urban forests and give guidelines in terms of littering.
What becomes evident from respondents' experiences is that they value natural settings for the diverse opportunities they provide to walk, to see, to think, to play. The multiplicity of experiences in the urban forested areas points to the positive role of diversity in the visual and recreational environments of these urban forests. In other words, a successful urban forest would be one that promotes a variety of opportunities for human action and interaction. By providing a convenient setting for a broad variety of leisure and recreational activities, urban forests can serve the needs and interests of all kinds of people and many subgroups of the population; young and old, groups and individuals, male and female. This wide appeal makes urban parks an asset to the city's residents in a social and behavioral sense as well as a physical sense. It further underscores the importance of parks in the city, an issue that can no longer be ignored by planners and policy makers.

5.4 Policy Recommendations

The government should support the marketing of outdoor recreation in urban forests through funding, advertising and enacting of laws that will stimulate growth of outdoor recreation by the ministry of tourism and ministry of environment and natural resources.

Managers of the various urban forests (NCC, FONA and KFS) should ensure a litter-free environment, along with clearly posted rules and regulations, safety and security at recreation sites, and cleanliness of washrooms and toilets to guarantee satisfaction to visitors. The managers should look at these items within specific recreation areas to ensure that they meet visitors' expectations in terms of different ages. Improving these satisfaction attributes could help increase their visitors' overall experience, which could lead to repeated visits, or at least satisfy the requirements of the government's RRI's programme.
Managers of the urban forests should ensure that there are responsive staffs posted within the recreation areas that are knowledgeable in areas of flora and fauna and can readily assist visitors.

Managers of the urban forests should also include the satisfaction attributes on comment cards, in order to continue monitoring and evaluating their visitors’ overall experience at their recreation sites. Farmer, (2004) states that comment cards are an efficient and effective way to capture the perceptions of visitors that will help to maintain quality recreation sites.

Finally the government should develop policy compelling residential building developers to set aside land for developing urban forests around the residential areas to counter constraints such as distance, accessibility, lack of money for outdoor recreation and time.

5.5: Suggestions for Further Research

a) There is need to conduct a study on the outdoor recreation sites, using seven quality domain items (sanitation and cleanliness, safety and security, condition of facilities, responsiveness of staff, natural environment, weather conditions and information services) to elicit visitors’ satisfaction levels.

b) The study was delimited to only four urban forests, that is, Karura, Arboretum, City Park, and Ngong road Forest (Sanctuary), hence the need for conducting a study on the benefits and constraints associated with the use of urban parks (forests) in all the City’s forests.

c) There is also need to conduct a study on outdoor recreational patterns and preferences among the residents of Nairobi City.

d) Given Nairobi City’s fast changing social, economic and demographic conditions, as well as the increasing pressures on the environment and the uncertainties around
climate change, the subject of outdoor recreation is one that needs to be kept continually under review.
REFERENCES


APPENDICES

APPENDIX 5.1: QUESTIONNAIRE FOR NAIROBI CITY RESIDENTS
My name is Sylvester W. O. Hayker, a Masters student in the Department of Geography, Kenyatta University. I am carrying out a research titled; Urban Residents’ Perceptions on the use of Forested Areas for Outdoor Recreation: The case of Nairobi City. The research seeks to gather academic information about the preferences of Nairobi residents on the use of urban forests for outdoor recreation and is purely for academic purpose. Any information that you may volunteer to give will be treated with complete confidentiality and for the purpose of this study. I kindly ask for your assistance.

Questionnaire no------------------------
Date of interview ------------------------- Time -----------------------
Place of interview -------------------------
Name of research Assistant-----------------------------

A) Tick as appropriate

<table>
<thead>
<tr>
<th>Item</th>
<th>SA</th>
<th>A</th>
<th>UD</th>
<th>D</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>I lack information about existing outdoor recreational facilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>and activities within the City’s Forests</td>
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<tr>
<td>I lack money for outdoor recreation</td>
<td></td>
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<tr>
<td>I lack time for outdoor recreation due to pressure from work</td>
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<tr>
<td>The urban forests are located far from my residence</td>
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<tr>
<td>I need company to visit the urban forests for outdoor recreation</td>
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<tr>
<td>My family members don’t like outdoor recreation</td>
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<td></td>
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<tr>
<td>It is not fashionable to visit urban forests for recreation</td>
<td></td>
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<td></td>
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<td></td>
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<tr>
<td>The urban forests’ location are not accessible</td>
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<tr>
<td>There aren’t enough wildlife to watch in the urban forests</td>
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<tr>
<td>Urban forests are not popular for outdoor recreation</td>
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<tr>
<td>There is no provision for a variety of activities within the urban</td>
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<tr>
<td>forests</td>
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<tr>
<td>More facilities should be introduced into the urban forests</td>
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</tr>
<tr>
<td>Outdoor recreation facilities within the urban forests are well</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>managed</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>The outdoor recreation facilities are not well maintained</td>
<td></td>
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<td></td>
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<tr>
<td>Urban forests increase stronger neighbourhood social ties</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outdoor recreation in urban forests increases my well-being</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>I feel safe within the urban forests</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The urban forests help me relax and get renewed energy</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Key:
- SA - Strongly agree
- A - Agree
- UD - Undecided
- D - Disagree
- SD - Strongly Disagree
B) Tick where appropriate

1. Indicate the means of transport to the urban forests.

<table>
<thead>
<tr>
<th>Means of transport to the urban forests</th>
<th>Tick appropriately</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public</td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td></td>
</tr>
<tr>
<td>Taxi</td>
<td></td>
</tr>
<tr>
<td>Walking</td>
<td></td>
</tr>
<tr>
<td>Cycling</td>
<td></td>
</tr>
</tbody>
</table>

2. Indicate the preferred urban forest that you visit and the frequency.

<table>
<thead>
<tr>
<th>Urban Forest visited</th>
<th>Frequency of visits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Weekly</td>
</tr>
<tr>
<td>Karura forest</td>
<td></td>
</tr>
<tr>
<td>Ngong road</td>
<td></td>
</tr>
<tr>
<td>Nairobi arboretum</td>
<td></td>
</tr>
<tr>
<td>Nairobi City Park</td>
<td></td>
</tr>
</tbody>
</table>

3. I go to the urban forests from.

<table>
<thead>
<tr>
<th>Point of Origin to urban forests</th>
<th>Tick appropriately</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home</td>
<td></td>
</tr>
<tr>
<td>Work/office</td>
<td></td>
</tr>
<tr>
<td>Church</td>
<td></td>
</tr>
<tr>
<td>School</td>
<td></td>
</tr>
<tr>
<td>Hospital</td>
<td></td>
</tr>
</tbody>
</table>
4. I go to the urban forests to.

<table>
<thead>
<tr>
<th>Reasons for visiting urban forests</th>
<th>Tick appropriately</th>
</tr>
</thead>
<tbody>
<tr>
<td>To pray</td>
<td></td>
</tr>
<tr>
<td>To stroll</td>
<td></td>
</tr>
<tr>
<td>To look at trees and flowers</td>
<td></td>
</tr>
<tr>
<td>For solitude</td>
<td></td>
</tr>
<tr>
<td>To collect wild fruits</td>
<td></td>
</tr>
<tr>
<td>To pick flowers</td>
<td></td>
</tr>
<tr>
<td>To collect firewood</td>
<td></td>
</tr>
<tr>
<td>For nature trail</td>
<td></td>
</tr>
<tr>
<td>To watch birds</td>
<td></td>
</tr>
<tr>
<td>To watch butterflies</td>
<td></td>
</tr>
<tr>
<td>To picnic</td>
<td></td>
</tr>
<tr>
<td>To exercise</td>
<td></td>
</tr>
</tbody>
</table>

5. I visit the urban forests on.

<table>
<thead>
<tr>
<th>Time of week</th>
<th>Tick appropriately</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekdays</td>
<td></td>
</tr>
<tr>
<td>weekends</td>
<td></td>
</tr>
</tbody>
</table>

6. I visit the urban forests for.

<table>
<thead>
<tr>
<th>Duration</th>
<th>Tick appropriately</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Hour</td>
<td></td>
</tr>
<tr>
<td>2 Hours</td>
<td></td>
</tr>
<tr>
<td>3 Hours</td>
<td></td>
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<tr>
<td>4 Hours</td>
<td></td>
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<tr>
<td>5 Hours</td>
<td></td>
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<tr>
<td>6 Hours</td>
<td></td>
</tr>
<tr>
<td>Whole Day</td>
<td></td>
</tr>
</tbody>
</table>
7. Visit the urban forests in the:

<table>
<thead>
<tr>
<th>Time of Day</th>
<th>Tick appropriately</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morning hours</td>
<td></td>
</tr>
<tr>
<td>Mid day</td>
<td></td>
</tr>
<tr>
<td>Afternoon hours</td>
<td></td>
</tr>
</tbody>
</table>

8. I visit the urban forests as:

<table>
<thead>
<tr>
<th>Category</th>
<th>Tick appropriately</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual</td>
<td></td>
</tr>
<tr>
<td>Family</td>
<td></td>
</tr>
<tr>
<td>Friends</td>
<td></td>
</tr>
<tr>
<td>Faith group</td>
<td></td>
</tr>
<tr>
<td>Corporate group</td>
<td></td>
</tr>
<tr>
<td>Sports group</td>
<td></td>
</tr>
<tr>
<td>Neighbours</td>
<td></td>
</tr>
<tr>
<td>Educational trip</td>
<td></td>
</tr>
<tr>
<td>Youth group</td>
<td></td>
</tr>
<tr>
<td>Business friends</td>
<td></td>
</tr>
</tbody>
</table>

9. Please choose your age group

<table>
<thead>
<tr>
<th>Age group</th>
<th>Tick appropriately</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – 9yrs</td>
<td></td>
</tr>
<tr>
<td>10yrs – 19yrs</td>
<td></td>
</tr>
<tr>
<td>20yrs – 29yrs</td>
<td></td>
</tr>
<tr>
<td>30yrs – 39yrs</td>
<td></td>
</tr>
<tr>
<td>40yrs – 49yrs</td>
<td></td>
</tr>
<tr>
<td>50yrs +</td>
<td></td>
</tr>
</tbody>
</table>
10. Please choose your occupation

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Tick appropriately</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employed</td>
<td></td>
</tr>
<tr>
<td>Business People</td>
<td></td>
</tr>
<tr>
<td>Farming</td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td></td>
</tr>
<tr>
<td>Students</td>
<td></td>
</tr>
</tbody>
</table>

11. Please choose your educational level

<table>
<thead>
<tr>
<th>Educational Category</th>
<th>Tick appropriately</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 8 yrs of schooling</td>
<td></td>
</tr>
<tr>
<td>8 yrs of schooling</td>
<td></td>
</tr>
<tr>
<td>10 yrs of schooling</td>
<td></td>
</tr>
<tr>
<td>12 yrs of schooling</td>
<td></td>
</tr>
<tr>
<td>Diploma</td>
<td></td>
</tr>
<tr>
<td>Degree or Equivalent</td>
<td></td>
</tr>
<tr>
<td>Post-graduate</td>
<td></td>
</tr>
</tbody>
</table>