

**THE USE OF MBAGATHI RIVER FOR RECREATIONAL
ACTIVITIES AND ITS IMPACTS ON
NAIROBI NATIONAL PARK**

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DECLARATION

I, Fredrick Wainana, Gathuru, declare that this research report is my original work and has never been submitted to any university for any award. Where the works of others have been cited, acknowledgment has been made.

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Signature.......... Date.....31/08/2010.....

APPROVAL

I certify that the work of this candidate has been under my supervision and is now ready for submission, to be evaluated for the award of a Bachelor of Tourism And hotel management Kampala International University.

Mr. John Baptist
Kampala International University.

Supervisor's signature..........Date..........

DEDICATION

I sincerely want to thank God, my parents Mr. and Mrs. Gathuru, all my classmates, friends, lecturers and all those who were instrumental in making this work a success. I dedicate this research work to them.

ACKNOWLEDGMENT

I would sincerely want to thank God the almighty for strength, peace of mind, guidance and his divine grace that he offered to me all through my study life in Kampala International University. My sincere appreciation to Madam Betty Abongo for being my supervisor and seeing me through my research work, may God bless you mightily. I would like to thank all respondents to in this research for their invaluable information that made the research a reality.

My heartfelt gratitude to my family Mr. and Mrs. Gathuru, Heta, Muigai and Ngugi who have supported me morally and financially. Their prayers and continuous dedication to my success has helped me through this work. Finally I would like to thank Kampala international University, and the Department of Tourism for the friendly academic exposure their have accorded me.

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CHAPTER ONE

INTRODUCTION

1.0 Definition of key terms

Impact: The strong effect of one thing, person, action on another.

National Park : an area of land set aside as national property to be kept in a more or less natural state for the public benefit, preservation of wildlife

Recreation: An activity or past time pursued, especially habitually for the pleasure or interest it gives.

1.1 Population growth and water use

We live in an exponential age. Six important environment issues are: population growth, increase in resource use, destruction and degradation of wildlife habitats, extinction of plants and animals, poverty and pollution. All these are interconnected and are growing exponentially. All over the world, in developed and developing countries alike, the increase in population has and is proving to be detrimental to the environmental resources in a very profound way. The United Nations statistics indicate that there were about 1.6 billion people on earth and by beginning of last century, this figure had increased to 5 billion. World population is expected to reach 8 billion by the year 2020 (Manzur, 1987).

As Lester Brown points out, however, when population exceed sustainable yields of their forests, aquifers, and croplands, they begin directly or indirectly to consume the resource base itself and gradually destroy it. The eventual result is an irreversible collapse of biological and environmental support.

Clean and fresh water, for example, is essential for nearly every human endeavor. Perhaps more than any other environmental factor, the availability of water determines the location and activities of human beings on earth, (Cunningham, 1999). Traditionally, humans have obtained most of the fresh water for homes, industries and irrigation from surface water.

1.2 Recreation and development in Africa

Tourism in Africa has brought about several consequences to the development of the various nations. In Kenya, for example, it affects the production of goods and services, accelerates the particular sectors catering directly or indirectly to the tourist demand. It also generates employment, motivates developments of skills and entrepreneurship, and affects the income distribution pattern. The Kenyan government is putting more emphasis on the public sector as well as the private sectors for proper planning in order to expand the tourism sector.

1.3 Background to the study

Mbagathi River like many other rivers in Kenya that is on the brink of drying up due to the rate of population increase in Karen, a suburb of Nairobi city. The catchment area of the river is found on the Empakasi forest, where it flows through the Nairobi west region to a dam in the Nairobi National Park. The quantity of the river has been decreasing over the decades due to the increase in population and continuous increase in usage that follows (Kerarapon Water Association, 2006). This has brought about the destruction of the catchment area, to cater for the ever increasing urban population and also the illegal diversion and pollution of the river.

1.4 Statement of the problem

There is a dynamic increase of human activities within the boundaries of the Mbagathi River as well as the Nairobi National Park. What worries most is the speedy development of West Nairobi region, its environs and its adverse effects on both the river and the park, billed as the wildlife capital of the world due to its proximity to a major city. The development explosion around the river and the Nairobi National Park is competing with the limited water supply the park gets.

According to a report by (UNEP-Kenya 2008) the change in climate in addition to human encroachment has caused a drastic decline in the volume of water in the Mbagathi River as it makes its way into the Nairobi National park. The report shows that, over the years in their quest for supplying vegetables and milk and others services in Nairobi, farmers and other investors have been continuously diverting water from the river for irrigation, farm use and other recreational spots and hence leading to the decline in water volume. Some of the major recreational spots such as the mamba village, the giraffe center, Karen Blixen country club and the Karen Blixen museum also use the water for their lawns as well as for other activities such as boat riding in the case of mamba village where a dam has been built for that purpose from the river. In addition to these, eucalyptus trees planted along the river also contribute to the decline in the river (plate 4), together with domestic users who pump water directly to their homes from the river.

The researcher therefore was to investigate the potential harm that would come about on to the tourism industry in Kenya and in particular, to the animals in the Nairobi National Park if their main source of water for the park happened to dry up. The purpose of this research was to find out if the residents living along the park were aware of the impact of their activities in the Nairobi National Park.

1.5 The scope of the study

The focus of the study was mostly at the catchment area of the river and in estates such as Kerarapon, Langata and Karen that were along the banks of the Mbagathi River up to the point where the river crosses into the national park

The research focused on the answers obtained from the questionnaires that administered at the point of doing the research as well as a review of other articles and works done by other researchers.

1.6 Justification of the study

The results of the study shall be of benefit to the Nairobi National Park management, the business community, the local population, academicians and the researcher. The park authorities shall have an understanding on how to protect the wildlife from loosing their only source of water. To the business community, they shall be able to see their impact intermesh of the illegal diversions for their different reasons. And this might help them other stake holder's interest. The local population would also understand their impact on the river and which might help in conserving of the river together with the catchment area. To the academicians, the study might present a strong basis for further academic research by those who seek to understand how unplanned use of surface water might affect the surrounding ecosystem. Lastly, to the researcher, the study was a partial requirement for award of Bachelor of Hotel and Tourism Management in addition to developing research skills.

1.7 Objectives of the study

- i. To find out how the recreation activities along Mbagathi River impact on Nairobi National Park.
- ii. To find out whether different people using the Mbagathi River water are aware of the impact they are causing to the park
- iii. To determine the appropriate measures to be implemented in sustaining the river for the national park.

1.8 Research questions

- i. Do recreation activities along Mbagathi River have negative impact on Nairobi National Park?
- ii. Are people carrying out recreation activities along Mbagathi River aware of the negative impact on Nairobi National Park?
- iii. What mitigation measures can be subscribed to protect Nairobi National Park, from negative impact from recreational uses along Mbagathi River?

1.9 Limitation of the study

Limitation of the study included:

- i. Lack of adequate funds led to limited data been collected
- ii. Since the researcher was inexperienced in research work, there was a possibility of many few errors not to be noticed.
- iii. Some respondent were reluctant to offer information due to fear of eviction.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.0 Introduction

This chapter looks at various literatures on the concept of water use, it investigates the different types of water uses and how they impact on the environmental resources. It extends its focus to the existing literature and all materials used to study on the impact of the different water uses on the environmental.

2.1 Water use

The importance of water to living organisms cannot be over emphasized. All living organisms are composed of cells that contain at least 70 percent water (Kormelink, 1983). For most humans as well as commercial uses, the quality in water is as important as its quantity. Water uses can be measured by either the amount withdrawn or the amount consumed. Water withdrawn for use is diverted from its natural course. It may be withdrawn and later returned to its sources as to be used again in the future. Water that is incorporated into a product or lost to the atmosphere through evaporation and transpiration cannot be reused.

Human migration routes and settlements are certainly influenced by the availability of drinking water. The factors affecting usable water supplies include: a steadily increasingly demand for fresh water for industrial, agricultural and for personal needs. Water use can be classified into four categories: domestic use, agriculture, in stream use and industrial use.

substances that are a cause of concern. Pollution of surface water has a very strong impact on human beings and other living organisms and the environment in general. Generally, the impact of pollution on water resources is manifested through deterioration of water quality, toxicity to mammals and aquatic life, environmental health effects and loss aesthetic values. (Hashmi, 1987).

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

In this chapter, the researcher describes the study area, the research design and a brief summary of study population, sample framework, sampling technique and the data collection instrument used. The data analysis methods is here in expounded.

3.1 Study area

The research concentrated on the Nairobi west region and part of Ngong division, Kajiado North District which comprised of Empakasi forest and settlements such as Kerarapon, Karen, and Langata that were along the boundaries of the Mbagathi- River.

3.1.1 Location

The area of study was located in Nairobi province, langata division west of Nairobi city, and Kajiado north division

3.1.2Climate

The rainfall pattern is bimodal with long rains between March and mid-may, and short rains coming between October and December. The area receives rainfall that varies between 600mm and 1000mm, with a medium average longest dry spell of nine months. The temperature varies between 15 degrees and 32 degrees (Kerarapon Water association, 2006)

3.1.3 Social- economic aspect

The study area was mostly a residential area due to its proximity to the city. There were farms which people used to cultivate vegetables for commercial use. The forest area was used as a tourist attraction especially for bird watching and hiking.

3.1.4 Study population

The population of interest was the residents of Karen, Kerarapon and Agnate estates, suburbs of Nairobi. The areas had population exceeding 800 households. The researcher concentrated on houses adjacent to the Mbagathi River. The study focused on farmers, domestic house workers and people offering recreation spots.

3.1.5 Sample size

A sample size of 40 respondents was selected to fill in the questionnaires and to be interviewed.

3.1.6 Research design

The researcher employed a combination of both descriptive and casual survey method while conducting the research. The researcher was open-minded. while interviewing the respondents

3.1.7 Data collection methods

Primary data was collected from the sample of respondents by use of questionnaires and interview schedules that contained both closed and open ended questions. The data collection methods used included:

- i. **Primary sources:** the researcher reviewed books and literature from libraries. The researcher also reviewed soft copies, newsletters and materials used in showing the

various uses of surface waters. The libraries visited included Kampala International University and the Nairobi National Museums library in Kenya.

- ii. **Secondary sources:** the researcher got first hand information by giving out questionnaires to be filled by employees in different households and conducted interviews with local residents.

3.2 Data collection instruments

The instrument used to collect data included questionnaires and interview schedules and observations.

3.2.1 Questionnaires

The questionnaires were structured in relation to the objectives of the study. The questionnaire had open and closed questions and were prepared before the researcher proceeded to the field. The purpose of using questionnaire was to get first hand information from residents and their general views.

3.2.2 Interview schedule

The researcher used structured and non-structured questions in relation to the study area as shown in the interview guide. The use of non-structured questions ensured greater flexibility as there was opportunity to restructure and probe the respondents as the interview continued.

3.3 Data analysis

The data collected was analyzed and summarized by way of descriptive statistics. The variables used were use of Mbagathi river, impact on the Nairobi national park and the

intervening variables will be; urbanization, deforestation and climate. The results were presented using tables, graphs and pie charts to represent the response rate and variables that the study considered.

3.4 Data presentation

The steps followed in data processing included:

- i. Data clearing to eliminate bias and mistakes
- ii. Data interpretation and classification to make it clear and descriptive
- iii. Quantitatively analysis and presentation using pie charts, graphs and tables.

CHAPTER 4

RESULTS AND DISCUSSIONS

4.0 Introduction

The main objective of the study was to find out how the different uses of the Mbagathi River for recreational activities impact on the Nairobi National park. The research was carried out in Kerarapon and Karen, residential areas along the Mbagathi River and also in the Nairobi National Park and based on the data collected the information will be discussed briefly.

4.1 Age

The respondents were asked by the researcher to indicate their age group which ranged from 18-22 to 43 and above. The results were as indicated on the table below.

Table 1: The age brackets of respondents (source farmers)

| AGE BRACKET | NUMABER OF RESPONDENTS (N) | PERCENTAGE (%) |
|--------------|----------------------------------|-------------------|
| 18-22 years | 0 | 0 |
| 23-27 years | 2 | 5 |
| 28-32 years | 5 | 12.5 |
| 33-37 years | 13 | 32.5 |
| 38-42 years | 6 | 15 |
| 43 and above | 14 | 35 |
| TOTAL | 40 | 100 |

(Source;farmers)

As indicated on the graph below, most respondents were of the age group of 28 to 43 and above. This was mainly due to the fact that the lower age group of 27 and below were either in their colleges and high school as per the day of the research or they were did not participate on anything to do with farming.

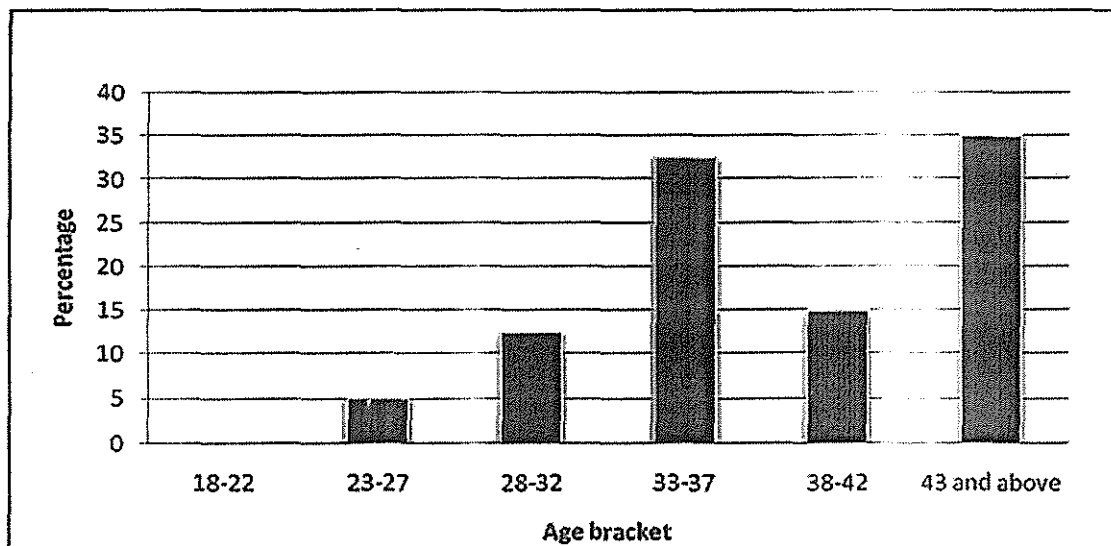


Figure 1: Age brackets of respondents Source (farmers, 2010)

4.2 Educational level

The educational level depicts the illiteracy levels of the respondents. The researcher categorized them from those with no formal education to those that were in college/tertiary institutions.

Table 2: Education level of the respondents

| LEVEL OF EDUCATION | NUMBER OF RESPONDENTS (N) | PERCENTAGE (%) |
|-----------------------------|--------------------------------------|---------------------------|
| No formal education | 2 | 5 |
| Lower primary | 2 | 5 |
| Upper primary | 6 | 15 |
| Secondary | 20 | 50 |
| College/ tertiary education | 10 | 25 |
| TOTAL | 40 | 100 |

(Source;farmers)

Of all the respondents, a whopping 75 % had gone through secondary and college/ tertiary education and so this indicates that most of them are illiterate and thus are aware of the environmental changes going on around the study area. The above information can be graphically represented as follows;

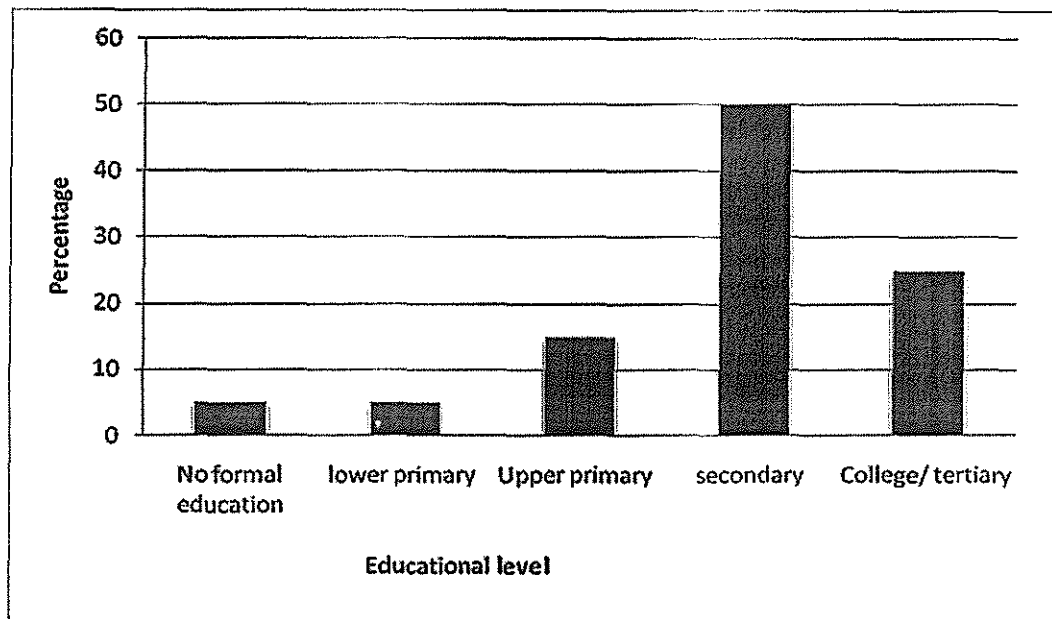


Figure 2: Respondents level of education

Source (farmers, 2010)

4.3 Duration of stay near the river

The researcher wanted to know how long the respondents had stayed near the river in order to establish if they had any knowledge of the environmental changes that had occurred on the area of study for the past 20 to 30 years.

Figure 3: Duration of stay along the river.

| DURATION OF STAY NEAR THE RIVER | NUMBER OF RESPONDENTS (N) | PERCENTAGE (%) |
|---------------------------------------|---------------------------------|-------------------|
| 0-10 years | 1 | 2.5 |
| 10 years and above | 39 | 97.5 |
| TOTAL | 40 | 100 |

(Source;farmers)

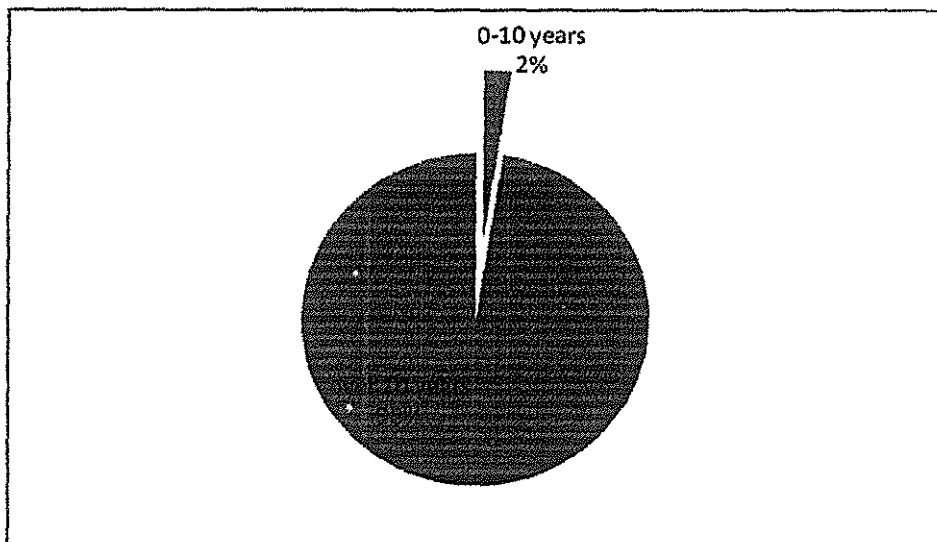


Figure 4; (Source;farmers)

Figure 5 : Duration of stay near the river.

It is evident, as shown on the above chart, that 98% of the respondents were people who had stayed in the area of study for more than 10 years and thus they have reliable knowledge on the environmental changes in that area and more specifically the river.

4.4 Water use

The Mbagathi River had a variety of uses, and thus the researcher wanted to know what the respondents used the river for. The domestic category involved; drinking, laundry, house use, fish ponds or for any other business. The irrigation category involved farm use only.

Table 3: Uses of River Mbagathi Waters

| WATER USE | NUMBER OF RESPONDENTS (N) | PERCENTAGE (%) |
|----------------------|--|---------------------------|
| Domestic | 15 | 37.5 |
| Domestic/ irrigation | 25 | 62.5 |
| TOTAL | 40 | 100 |

(Source;farmers)

A majority of the respondents (62.5%) were using the river for both the Domestic and irrigation purposes and this were mainly respondents who had farms and their residences near the river. The other 37.5% were only using the river for domestic purposes and which was mainly drinking, laundry, wash room and for small businesses near their homes.

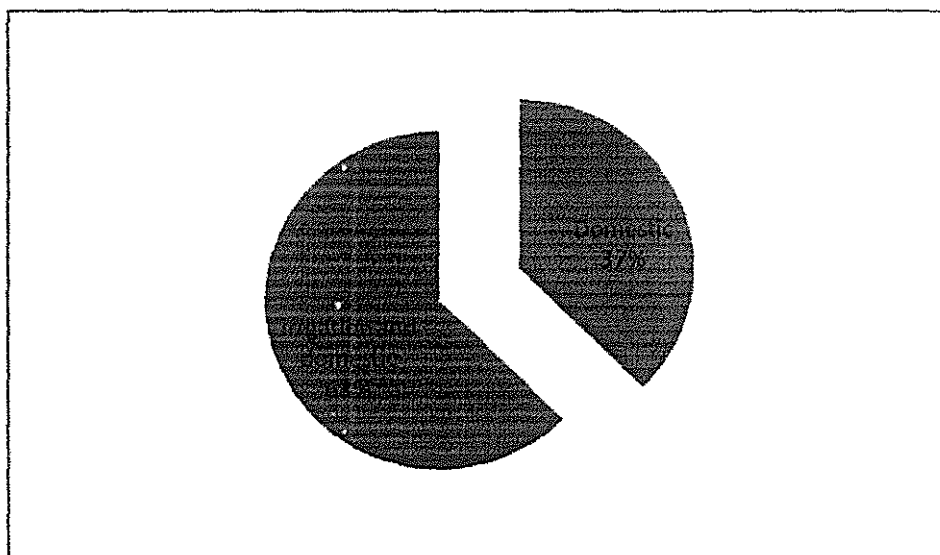


Figure 6 : Uses of the river

Source (farmers, 2010)

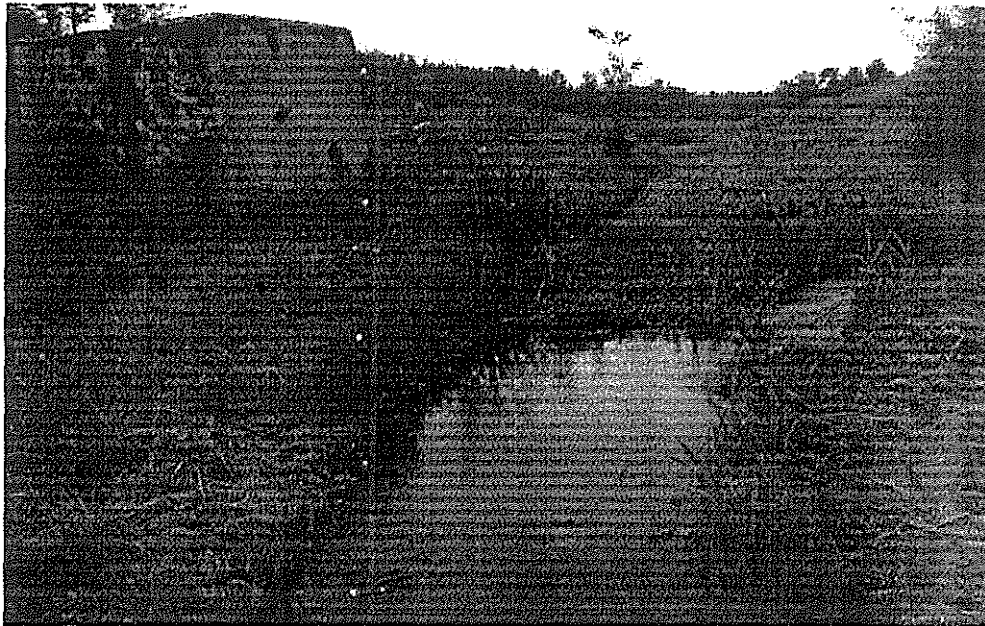


Plate 1: River Mbagathi and a building housing fuel water pump near the river.



Plate 2: Farmers working on their irrigated land behind the researcher

4.5 Changes in river volume

After establishing the number of years the respondents had stayed in the area along the Mbagathi River, the researcher further wanted to know whether there had been any noticeable change in the river for the last 5- 10 years.

Table 4: Respondents' views on river volume changes

| Change in river volume | Number of respondents (N) | Percentage (%) |
|-------------------------------|----------------------------------|-----------------------|
| Yes | 35 | 87.5 |
| No | 4 | 10 |
| No response | 1 | 2.5 |
| TOTAL | 40 | 100 |

(Source;farmers)

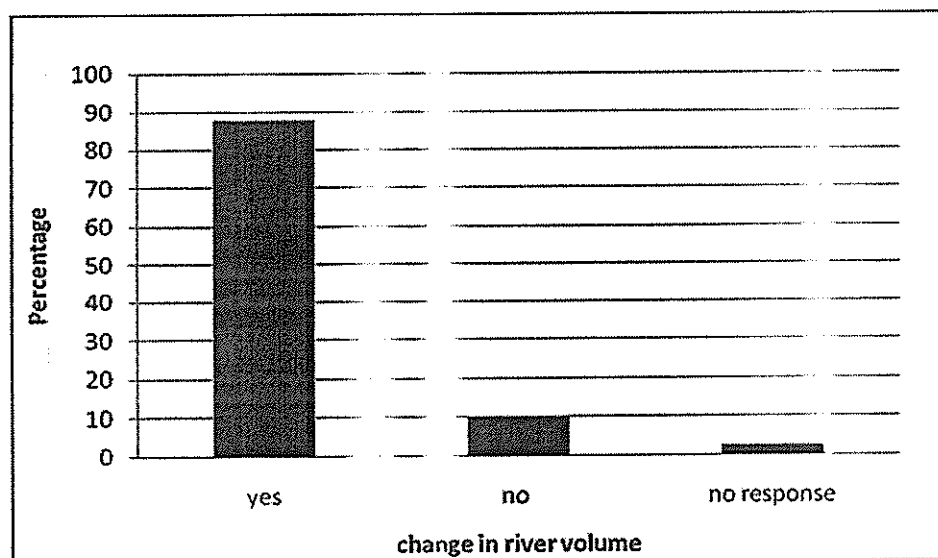


Figure 7: Respondents responses to whether the volume has changed Source
(farmers, 2010)

From the above results, a majority (87.5%) of the respondents had witnessed the river decline over the years. With the rate of population increase around the area, deforestation in the Empakasi forest and global warming effect, the river volume is still expected to decrease.

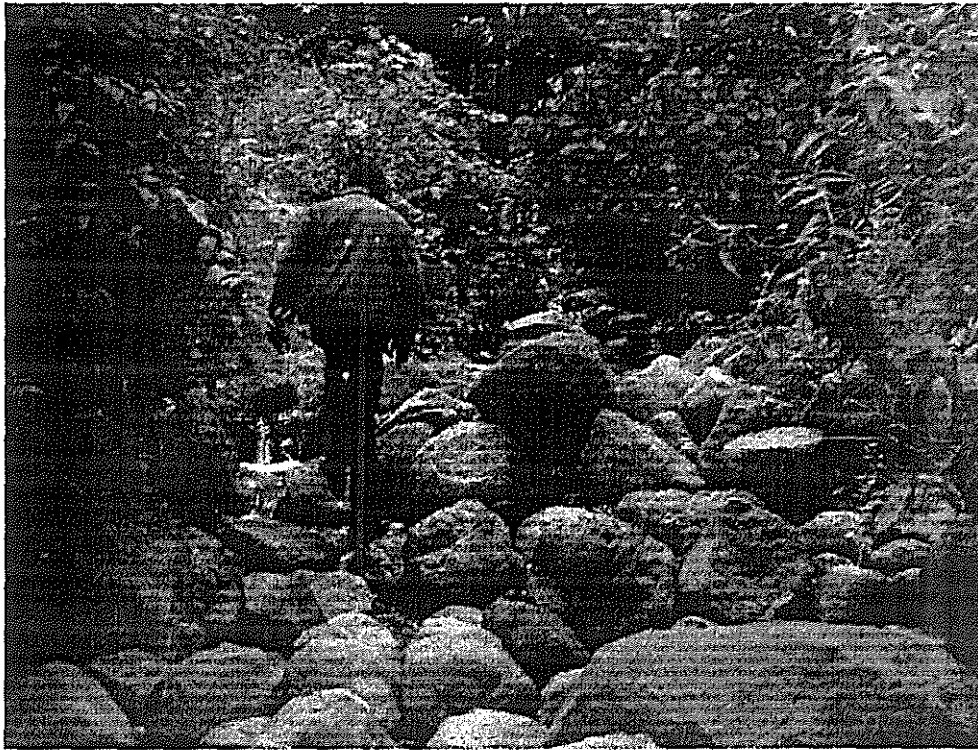


Plate 3: Empakasi forest the source of Mbagathi River Source (own survey, 2010)

4.6 Impact on the Nairobi National Park

In this section, the researcher wanted to establish from the residents and farmers if they were aware that the river flows directly to the national park and also if they knew that their different uses of the river affects the national park heavily during the dry season. Their response was captured as follows;

Table 5: Response to whether water uses affect wildlife in Nairobi National Park

| Impact on the National Park | Number of respondents (N) | Percentage (%) |
|--|--------------------------------------|---------------------------|
| Yes | 39 | 97.5 |
| No | 1 | 2.5 |
| TOTAL | 40 | 100 |

(Source; Park Authorities)

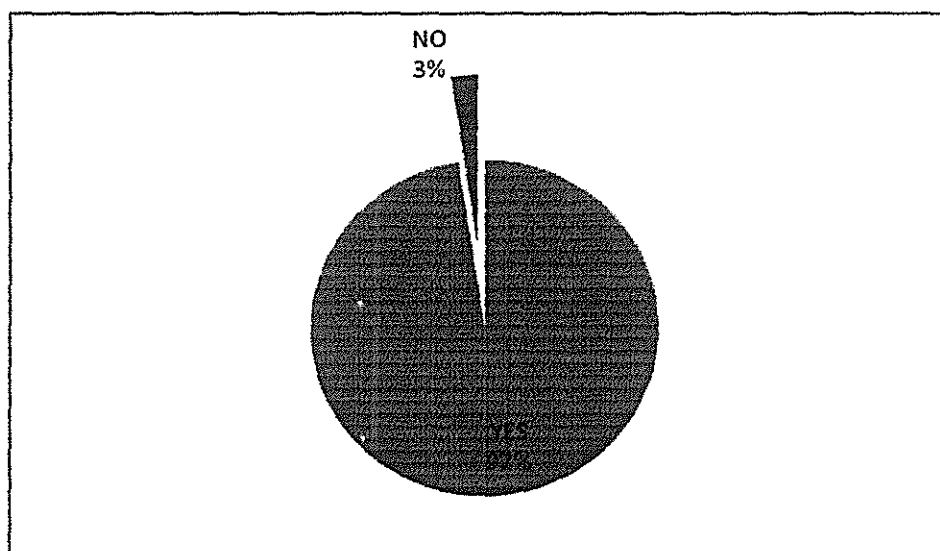


Figure 8 : Respondents awareness on the impact of the water use to the Nairobi National Park (Source, Park Authorities)

Ninety seven percent 97% of the respondents were fully aware that the river flows directly to the national park. When asked if the park authorities had complained on this matter, most respondents answered on the affirmative, while others claimed to having their fuel pump taken by the park authorities and the police.



Plate 4 River Mbagathi flowing through eucalyptus trees at Karen about eight kilometers from Nairobi National Park.



Plate 5 Mbagathi River's entry point to Nairobi National Park

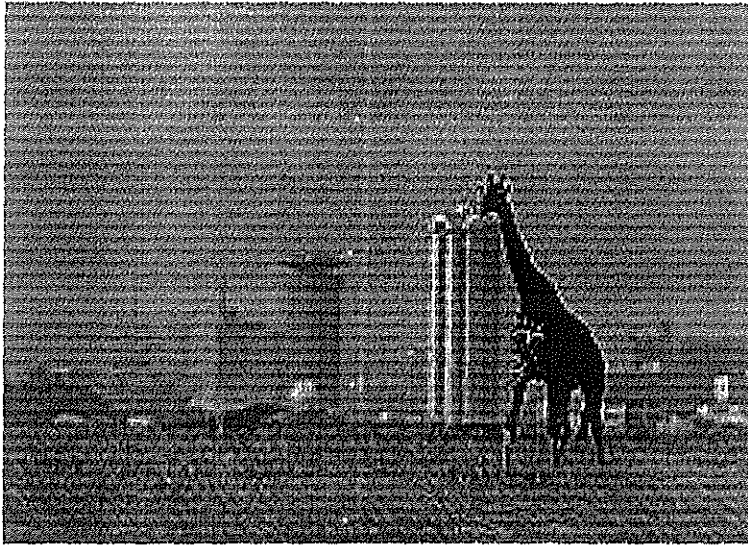


Plate 6 Nairobi National Park with Nairobi's skylines at the horizon. (Source Wikipaedia)

The decrease in the volume of water in the river during the dry season really affects the animals in the national park due to the fact that Small dams built along the Mbagathi River give the park more water resources than these outside areas. The dams later on attract water dependent herbivores during the dry season. In addition to this, it affects the aquatic wildlife species such as the hippopotamus and the crocodiles when they do not have enough water to cater for them.

4.7 Implications of the drying up of the Mbagathi River

Here the researcher looks at the various implications that may come around if the river happens to dry. These are discussed below.

4.7.1 Environmental implications

Animals such as the antelopes, zebras, elephants, buffalos and rhinos, migrate into the open plains during the rainy season and when the dry season comes in, they come to the dams that have been constructed along the Mbagathi River. The fact the size of the river has been continuously decreasing is a worrying fact and a very serious issue. If the river

happens to dry up, all these animals will be highly affected and might even die due to lack of water during the dry season.

Aquatic species that mostly rely on water for survival such as crocodiles, hippopotamus and frogs might also lose their habitats and thus they might end up dying.

4.7.2 Social implications

Nairobi National Park is the main tourist attractions for visitors in Nairobi. It is unique by being the only protected area in the world with a variety of animals and birds close to a capital city. Tourists come from all over the world to come and view animals in the national park. This brings about the intermingling of different cultures in less than one area. Among the most looked after attractions are the big five (lion, elephants, buffalos, rhino and the giraffe). To all these animals, the Mbagathi River is their only source of water during the dry season from which they come from the open plains to quench their thirsts and from where tourists can easily see them.

The generations of this and past time will always be lucky to have witnessed this terrific scenery, just five miles from the city center. The main concern would be for the future generations to come, who if animals happen to die due to the river drying up and the encroachment of the national park will not have a chance to witness this beautiful scenery.

Now, the fact that wild animals depend on the Mbagathi River for water, the drying up of the river may cause some cases of animals and people losing their lives. This might be the case, where animals invade people's home to look for water and in the process, they

might end up causing harm to the people around. For example, cases where elephants go into peoples farms and they end up being killed by the locals.

4.7.3 Economic implication

Tourism is the second revenue generating industry, after agriculture. Tourists coming into Kenya through Nairobi have to pass by the Nairobi National park and thus the government gets a lot of revenue in terms of taxes. The park is always busy with visitors throughout the year. If Kenya witnesses another dry spell that lasts for another 3 years and above, most animals will be forced to migrate to other areas and others might end up dying. This might affect the number of visitors who come to visit the park which in turn would reduce the revenue that is got from this park.

In addition to this, most people who are directly or indirectly employed in the national park would end up losing their jobs when tourists stop coming to the national park due to this environmental setback. This might later on reduce the standards of living of these people as well as the income tax to the government that would really be affected.

CHAPTER 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

River Mbagathi is one of the rivers that are on the verge of drying up in Kenya if proper measures are not taken care of. The Nairobi National park is in danger of losing one of its vital sources of water for the park and this in turn might make the wildlife to be in danger as well. After carrying out the research on the use of Mbagathi river for recreational purposes and its effects on the Nairobi National Park, it is evident that population increase in Nairobi, change in climate and ignorance among the people are the major factors that have made the river to be decreasing in volume over the last 10 years.

People are relocating from rural to urban areas at a very high rate. This has really brought about pressure in the city in terms of land to host this people as well as sources of food stuffs. Forests and hills near the city have faced encroachment by people who end up cutting trees without knowledge that they are the main catchment areas of the rivers that pass near the city.

The world all over has in one way or another been affected by climate change. Africa and more specifically Kenya has not been left out in this environmental change where prolonged drought periods that can last for three consecutive years have been noticed in some parts of the country. Nairobi is located near a semi-arid area and thus it was heavily affected. The rainy season is back and the volume of the river has greatly improved.

Farmers and domestic users have been ignorant to the fact that the river flows to the national Park. They have been using the river selfishly to the point of most farmers and

domestic people using fuel water pumps to get water from the river. Others have been illegally diverting a huge volume of water to their farms and this has made the amount of water heading to the park to be very minimal. According to the farmers, there have been cases of park officers and police confiscating the fuel pumps in the area in order to mitigate the method of irrigation using them. This has also been done to those diverting water for personal use.

5.2 Recommendations

1. A committee to be formed that will comprise of all people using the water in the river. This will help to educate the members on the importance of saving the river for now and also the future generation.
2. There also needs to be a regular water quality monitoring to ensure that the water is not polluted and thus become toxic to the animals using the park.
3. The government, in partnership with the park authorities should ensure that people do not illegally divert water from the river in any way, either using pumps or digging terraces.
4. All stakeholders to plant indigenous trees in the catchment area as well as the areas surrounding it to ensure sustainability of the river.
5. The National Environmental management authority together with the residents leaving near the river to cut down eucalyptus trees that take in a lot of water from the river.

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