

**THE EFFECTS OF HUMAN OCCUPANCY ON BASE CAMP WETLANDS,  
BASE CAMP VILLAGE, KASESE MUNICIPALITY, KASESE DISTRICT**

**BY  
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INTERNATIONAL UNIVERSITY**

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## DECLARATION

I Kato Asad, declare to the best of knowledge that this research report is my own work and that it has never been submitted before by any other researcher in any other institution of higher learning for an award of degree.

Name; Kato Asad

Signature.....

Date.....01/10/2011

## APPROVAL

This is to certify that this research study of KATO ASAD titled, **The Effects of Human Occupancy on Base Camp Wetlands, in Base Camp Village, Kasese Municipality Kasese District**, has been under my supervision its now ready for submission to the school of Engineering and Applied Sciences in partial fulfillment of the degree in bachelor of science in Environmental management.

Name: Ms. Katongole Hadijjah

Signature: 

Date: 01/10/2011

## DEDICATION

I dedicate this book to my dear parents Mr. Kato Mohammed and Mrs Nalongo Kato who are the reason as to why I have come this far, to my sisters Aisha, Babirye, Rehema, Asha and shamim for tirelessly encouraging and supporting me all through my life, most especially during my life at Kampala international university.

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May God greatly bless you all!!

## TABLE OF CONTENTS

DECLARATION.....	i
APPROVAL.....	ii
DEDICATION .....	iii
ACKNOWLEDGEMENT.....	iv
TABLE OF CONTENTS .....	v
LIST OF TABLES .....	viii
LIST OF FIGURES.....	ix
LIST OF ACRONYMS.....	x
ABSTRACT .....	xi
 CHAPTER ONE.....	 1
INTRODUCTION.....	1
1.0 Introduction .....	1
1.1 Background of the study.....	1
1.2 Statement of the Problem. ....	3
1.3 Purpose of the study .....	4
1.3 Objective of the Study.....	4
1.4 Research Questions; .....	4
1.5 Scope of the Study.....	4
1.6 Significance of the Study.....	5
 CHAPTER TWO.....	 6
LITERATURE REVIEW .....	6
2.0 Introduction. ....	6
2.1 The importance of wetlands .....	6
2.2.1 Causes of Human Occupancy on Wetlands.....	8
2.2.2 Effects of human occupancy on wetlands. ....	11
2.3 Possible control measures of human occupancy on wetlands. ....	16

CHAPTER THREE .....	19
METHODOLOGY .....	19
3.0 Introduction .....	19
3.1 Research Design. ....	19
3.2 Population and area of study .....	19
3.3 Sample frame work.....	19
3.3.1 Sample size.....	19
3.3.2 Sample Technique. ....	19
3.4 Methods for Data collection .....	20
3.4.0 Questionnaires; .....	20
3.4.1 Interviews .....	20
3.4.2 Informal interviews .....	20
3.4.3 Sources of Data.....	20
3.5 Data processing. ....	21
3.6 Data analysis.....	21
3.6.1 Graph .....	21
3.6.2 Pie charts .....	22
3.7 Ethical consideration of the study. ....	22
CHAPTER FOUR .....	23
PRESENTATION, INTERPRETATION AND DISCUSSION OF THE FINDINGS.....	23
4. 0 Introduction.....	23
4.1 Socio - Demographic Background .....	23
4.1.1 Age of respondents .....	23
4.1.2 Gender of Respondents.....	24
4.1.3. Respondents level of education .....	25
4.1.3 Occupation of respondents. ....	26
4.2.0 Objectives of the study. ....	27
4.2.1 Importance of wetlands to the people.....	27
4.2.2 Causes of human occupancy on a wetland .....	29
4.2.3 Effects of human occupancy on a wetland .....	31

4.2.4 Possible control measures of human occupancy on a wetland .....	33
CHAPTER FIVE .....	37
SUMMARY OF THE MAJOR FINDING, CONCLUSION AND RECOMMENDATIONS. ....	37
5.0 Introduction .....	37
5.1 SUMMARY OF FINDINGS .....	37
5.2 CONCLUSION: .....	37
5.3 RECOMMENDATIONS .....	38
BIBIOGRAPHY .....	41
APPENDICES .....	43
APPENDIX I: QUESTIONNAIRE .....	43
APPENDIX II: INTERVIEW GUIDE:- .....	45



## LIST OF TABLES

Table 1: Age of respondents.....	23
Table 2: Gender of respondents.....	24
Table 3:: Respondents levels of education. ....	25
Table 4:. Occupation of respondents. ....	26
Table 5: The importance of wetlands. ....	27
Table 6:. Causes of human occupancy on the wetland .....	29
Table 7:. The effects of human occupancy on wetlands. ....	31
Table 8: Possible control measures of human occupancy on a wetland.....	34

## LIST OF FIGURES

Figure 1:: Age of the respondents. ....	24
Figure 2::shows respondents level of education.....	26
Figure 3:: The importance of wetlands in Base camp. ....	29
Figure 4: The effects of human occupancy on a wetland.....	33
Figure 5:: Possible control measures of human occupancy on a wetland. ....	36

## LIST OF ACRONYMS

NAPE	National Association of Professional Environmentalist
NGO	None governmental organization
KIU	Kampala International University
CO2	Cabondioxide
USA	United States of America
NEMA	National Environmental Management Authority
NFA	National Forestry Authority
WMD	Wetlands Management Department
MWE	Ministry of Water and Environment
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries

## ABSTRACT

The purpose of this study was to assess the effects of human occupancy on Base Camp Wetlands in Base Camp Village, Kasese municipality.

The objectives of the study were to find out the importance, the causes, the effects and the possible control measures of human occupancy on base camp wetlands in base camp village, Kasese municipality, and Kasese district.

The research questions were; what are the importance of wetlands in base camp village, Kasese municipality?, what are the causes that have lead to human occupancy on wetlands in base camp village, Kasese municipality?, what are the effects that have lead to human occupancy on wetlands in base camp village, Kasese municipality?, what are the possible control measures of human occupancy on wetland in base camp village, Kasese municipality?

Data was collected through use of Questionnaires, Interviews, Informal Interviews and source of data and the categories of the respondents in Base camp village, Kasese district. And the study covered 80 respondents, the data collected was analyzed by use of frequencies, percentages and interpretation done and then presented using tables, graphs and pie charts.

The findings of the study indicated the following; Human occupancy has lead to wetland encroachment in Base camp wetlands, so there is need to overcome this problem. The study further discovered that there should be a sound and effective re-allocation of people from this place to other free lands for better environment.

In conclusion Base camp village as a community should look for solutions for the human occupancy on the wetlands such as use of simplified language, providing feedback, use of meetings, suggestion boxes to mention but a few, in order to have effective environment in Kasese district.

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.0 Introduction**

Chapter one of this study serves to discuss the theoretical frame work and the background for this proposed research; state and define the problem that the research attempted to address or solve, state the aim and objectives of the research work and give an indication of how the work was to Progress.

#### **1.1 Background of the study**

According to Cunningham (2002), a wetland area is an ecosystem in which the land surface is saturated or covered with standing water at least part of the year. Wetland vegetation is adapted for growth under saturated conditions. There are many kinds of wetlands, but we can group them into three major categories, swamps, marshes, and bogs and fens. In general swamps are wetlands with trees, marshes are wetlands without trees, and fens are waterlogged areas saturated by the ground water or rain water. Wetlands are especially valued as a major breeding, nesting and migration, staging areas for water fowl, shorebirds and other living organism.

According to National Association of Professional Environmentalists (NAPE) 2008, wetlands constitutes 13% of the total land area in Uganda. They are important breeding sites for many fish species, contribute significantly to the treatment and purification of wastewater discharged from domestic, commercial and industrial functions and erosion, and act as reservoirs of water that continuously recharge lake system. They are also an important source of livelihood for many urban and rural dwellers. Wetlands are a source of fish, raw materials for crafts and building materials, and offer opportunity for recreation, tourism and water transport. Despite their important roles and functions,

wetlands in Uganda have for a long time been considered as wastelands and areas of low economic value. This misconception about wetlands is the reason why they have been severely abused today.

Those areas are inundated or saturated by surface or groundwater with a frequency sufficient to support or that under normal hydrologic conditions does or would support, a prevalence of vegetation or aquatic life typically adapted to saturated or seasonally saturated soil conditions. Examples of wetlands include, but are not limited to swamps, fresh and salt water marshes, estuaries, bogs, beaches, wet meadows, sloughs, potholes, mud flats, river overflows, and other similar areas. This definition of wetlands is intended to be consistent with the definition utilized by the Service in the 1979 publication by Cowardin, Classification of Wetlands and Deep Water Habitats of the United States.

In 1994, Uganda became the first country in Africa to develop a national wetlands policy. The National wetlands policy promotes the conservation of Uganda's wetlands encourages sustainability for their ecological and socio-economic functions for present and future generation. One of the main goals for this is to maintain biodiversity functions, values and establish principles whereby wetland resources can be optimally used, and their productivity maintained into future.

Human occupancy on the other hand is a situation when the area is colonized by people with increase in the size. A rate of growth of human population has become a change in the distribution of people over the earth's surface largely as a result of increasing urbanization. Human occupancy has several implications on the natural resources which force people to occupy the place which result from social, economical, political and cultural problems. During this period Britain human occupancy witnessed huge changes in geography, environment and climate. A succession of ice sheets and intervening warm phases meant that the landscape of Britain varied from polar desert and tundra with reindeer, bison and mammoths to dense deciduous forest with elephant, hippos and rhinos.

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

The problem of human occupancy on a wetland amongst families in Base Camp community was intense. According to the senior environmental officer Kasese district local Government, in three blocks one can find three or four cases of wetland encroachment in Base Camp village, therefore the problem of human occupancy on a wetland is so rampant in Base Camp village, Kasese Municipality, Kasese district.

According to Ramsar convention about wetland conservation 2005, say over the past 10000 years, billions of hectares of forests, woodlands and grasslands have been converted to commercial forests, croplands or grazing lands. Humans now use about 50 percent of the world's wetlands for crop production and about twice that amounts settlement and other activities.

Temperate broad-leaved forests are the most completely human-dominated of any major biome. The climate and soils that supports such forests are especially congenial for human occupation, for example temperate grasslands such as the US and Canadian Great Plains also has been widely converted to agricultural production (Mary 2002).

The continued encroachment of wetland is threatening the survival of the fisheries industry, altering the micro- and macro- climate in the region, worsening waterborne diseases and enhancing the occurrence of droughts in many parts of the country. Many wetlands in the vicinity of urban centers have severally been encroached upon for agriculture, domestic settlements, commercial and industrial development. All these are happening despite the existence of laws preventing such encroachment in the country. This violation of the law is often promoted by the very authorities mandated to uphold the law. (NAPE 2008).

Between A.D 1600 and 1880, human activities and occupancy appears to have eliminated two or three species per decade, about double the natural extinction. The rate at which species are disappearing has increased dramatically over the last 150 years due human occupancy in wetlands. Human activities appear to have eliminated two or three species per decade, about double the natural extinction rate. In the last 150 year up to day the

extinction rate has increased to thousands per decade. More, today human occupancy on a wetland is the largest single loss of biological biodiversity.

### **1.3 Purpose of the study**

The study was to assess the effects of human occupancy on Base Camp Wetlands in Base Camp Village, Kasese municipality.

### **1.3 Objective of the Study.**

- i) To find out the importance of Base Camp Wetland on the people of Camp Village, Kasese Municipality.
- ii) To study the causes of human occupancy on base camp wetlands in Base Camp village, Kasese municipality, Kasese District.
- iii) To study the effects of human occupancy on base camp wetlands in Base Camp village, Kasese municipality, Kasese District.
- iv) To suggest possible control measures of human occupancy on wetlands in Base Camp Village, Kasese municipality.

### **1.4 Research Questions;**

- i) What are the importances of wetlands in Base Camp Village, Kasese Municipality?
- ii) What are the causes that have lead to human occupancy on wetlands in Base Camp Village, Kasese Municipality?
- iii) What are the effects that have lead to human occupancy on wetlands in Base Camp Village, Kasese Municipality?
- iv) What are the possible control measures of human occupancy on wetland in Base Camp Village, Kasese Municipality?

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

The researcher focused mainly on the importance of human occupancy on wetlands, causes and effects of human occupancy on wetlands and some possible control measures of human occupancy on wetlands. This was done through consulting the available work



of authors and by getting into the field where the researcher gathered views from people themselves.

The research will be carried out in Kasese municipality, Kasese district western Uganda. The area covers kigoro, kilembe, Nyakasanga small towns. This exercise/study will be conducted in all the cells- from each cell at least some 20-25 household members will be sampled to participate in the study thereby making all the cells represented.

Human occupancy on wetlands is common and it appears to have escalated in Kasese district as early as 1985- (records from Uganda police, health units 1985-1995). But as per this research, the researchers' main emphasis of study was to cover a period of three years starting from (2007), when Kasese was conferred upon a district status.

#### **1.6 Significance of the Study.**

At the macro level, informed decisions in policy formulations and in the building of the institutions aimed at stopping the practice regulatory frame work might be made basing on the findings from the research.

A number of NGOs and governmental organizations responsible for the human occupancy against wetlands may adopt the recommendations put forth, and use the findings to address issues in the report.

The research will help future researchers and academicians to increase on the available literature for further studies.

To the researcher, if presented and approved by Kampala International University (KIU), the researcher will qualify for the award of degree in Bachelors' sciences in Environmental Management.

The research findings of the study will contribute to cumulative knowledge and help raise awareness about the human occupancy among the local population, not only in Base Camp Village but also other parts of the country (Uganda).

It also acted as a bench mark upon which local leaders could get acquainted on the need to sensitize the community members on how to reduce/wetland encroachment.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.0 Introduction.

This chapter reviews literature as an account of the knowledge and ideas that have been established by accredited scholars and experts in the field of study.

#### 2.1 The importance of wetlands

Uganda's National Policy for the Conservation and Management of wetland Resources (1995) defines wetlands as areas "where plants and animals have become adapted to temporary or permanent flooding." It includes permanently flooded areas with papyrus or grass swamps, swamp forests or high-altitude mountain bogs, as well as seasonal flood plains and grasslands. While all wetlands are characterized by impeded drainage, the length of their flooding period, depth of water, soil fertility, and other environmental factors vary with different wetland types.

Many animals that live in other habitats use wetlands for migration or reproduction. For example, herons nest in large old trees, but need shallow areas in order to wade for fish and aquatic life. Amphibians often forage in upland areas but return to the water to mate and reproduce. There is more life in a one acre of a healthy wetland than there is in one acre of almost any other kind of habitat. Wetlands are virtual havens for the endangered species; about 35% of all plants and animals listed as threatened or endangered live in wetlands or depend on them in some way. While wetlands are truly unique, they must not be thought of as isolated and independent habitat. To the contrary, wetlands are vital to the health of all other biomes and to wildlife and humans everywhere. (Dugger 1993).

Wetlands also release vegetative matter into rivers, which helps feed fish in the rivers. The thick vegetation found in wetlands provides a safe haven and plentiful food supply for the young of many fish, crabs, and other small creatures that begin life in wetlands, remain safely until they are not so vulnerable, and move to open waters when the time

comes. So, wetlands help to counter balance the human effect on rivers by rejuvenating them and surrounding ecosystems.

Wetlands also improve water quality by acting as a natural water purification system; it cleans the water by filtering out sedimentation, decomposing vegetative matter, removing silt and absorbing nutrients and toxins in water and converting chemicals into useable form. Unlike most other habitats, wetlands directly improve other ecosystems. Because of its many cleansing benefits, wetlands have been compared to kidneys. The analogy is good one. Wetlands and kidneys both help control water flow and cleanse the system. The flow of ground water through coastal marshes prevents saltwater intrusion that would otherwise contaminate wells. Besides improving water quality by natural water purification system, wetlands provide a natural filter for sediments and runoffs. This filtration process allows time for water to be biologically cleaned before it enters larger bodies of water, such as lakes, and oceans, and reduces the sediment load carried by runoff. Wetlands also protect shoreline from erosion. (Harlow 1996)

Climate modification. Wetlands are ecosystems in which plants rapidly extract carbon dioxide in the atmosphere. The atmospheric carbon dioxide controls the earth's temperature through green-house effects. Peatlands store carbon in partially decayed plant material due to lack of oxygen to accelerate decomposition which would otherwise lead to more CO<sub>2</sub> being released to the atmosphere.

Coastal wetlands help stabilize shorelines and reduce storm damage. Wetlands are an important storage site for organic carbon; storage is in living plants, animals, and rich organic soils. (Nusser 2000)

They are also an important source of livelihood for many urban and rural dwellers. Wetlands are a source of fish, raw materials for crafts and building materials, and offer opportunity for recreation, tourism and water transport.

Wetlands prevent flooding by holding water much like a sponge. Some wetlands, particularly those on floodplains and in coastal areas, function in flood control by storing and decreasing the velocity of excess water during heavy rainfall. As water flows into

wetlands, it naturally loses velocity as it collects and continues to spread out. Wetland vegetation provides another natural barrier to fast moving water and therefore aids in flood speed reduction. The result of wetland activity during floods is often decreased damage to surrounding areas. When flood waters are slowed by wetlands, they drop sediments among the roots and stems of the plants. This protects downstream water bodies by preventing a dangerous build-up of gill clogging and egg damaging silt. By doing so, it helps keep river levels normal and filter and purify the surface water in this process it also accept water during storms and whenever water levels are high. When water levels are low, wetlands slowly release water.

Finally, Hunting, fishing, hiking, boating, photographing, and bird watching opportunities are abundant in America's wetlands. According to the Terrene Institute, wetlands support and annual commercial fur and hide harvest of \$300-\$400 million and the 50 million people who observe and photograph birds and wildlife in wetlands spend close to \$10 billion a year supporting their hobby.

### **2.2.1 Causes of Human Occupancy on Wetlands.**

The rate at which wetlands are disappearing has increased dramatically over the last 150years. Human activities appear to have eliminated many wetlands, which doubles natural extinction rate of species.

According to Cunningham (2002), one of the causes of wetland encroachment by human is famine which leads to over exploitation of resources through hunting and fishing. As the human population increases the demand for food rises which results into Overharvesting through over hunting and over fishing in wetlands that is responsible for depletion or extinction of many species. Classic example is the extermination of the American passenger pigeon (*Ectopistes migratorius*).

Population growth. This is another cause of wetland encroachment, when the human population has increased excessively; they start to compete for lands which contribute to environmental problems like encroaching wetlands looking where they can settle. In this process many species suffocate to death other migrate from that their habitants to another

which contributes to environmental problems. It is clear that the areas of the world where human population is growing most rapidly are those that have the lowest standards of living. The more the human population the more the wetland is encroached and other natural resources. Enger (1998).

Poverty. This is a major contributing factor to land degradation as it forces millions of people to destroy the resources that are around them in order just to survive. Poor people often do not have access to the best land, leaving them to depend on the most fragile areas and resources. Their situation may mean that they have no other choice other than to use what resources are available to them, even if these result in the degradation of the land. More to that poor people can not afford to control birth and, since they are often poorly educated, they may not be able to read and understand the importance of preserving natural resources and they can not read the direction correctly. Therefore, they can produce many children than they may wish to have. (Smith 2006).

Agricultural practices. Wetlands provide critical habitat for waterfowl populations. The drainage of U.S. and Canadian prairie potholes for agricultural production has been linked to a concomitant 50% - 80% decline in waterfowl populations since 1955 (USEPA 1995). Since the Swamp buster legislation was promulgated, the waterfowl population has begun to increase. Swamp buster rendered drainage of prairie potholes costly, and encouraged farmers to allow prior converted wetlands to revert to their previous natural wetland state and to construct farm ponds or restore marshes. Duck populations in 1994 increased by 24% over 1993 populations, and were the highest since 1980, when duck populations had plunged to a low (USEPA 1995).

Unfair land allocation. In Namibia is often the root of land degradation and is closely linked to poverty. This is because poor people often have little choice over how to use their land. In conditions of poverty people do not have access or money to purchase the most appropriate or effective resources for farming. During the colonial period people were often forced to live in designated areas, this resulted in overcrowding and subsequently overuse of the land.

Industry development. Some people occupy wetlands to develop industries which at the end adverse effects on wetlands like: reduction of wetland acreage, alteration of wetland hydrology due to industrial water intake and discharge, water temperature increases, point and nonpoint source pollutant inputs, pH changes as a result of discharges, and atmospheric deposition.

Today, less than half of the nation's original wetlands remain. Activities resulting in wetlands loss and degradation include: agriculture; commercial and residential development; road construction; impoundment; resource extraction; industrial sitting, processes, and waste; dredge disposal; silviculture; and mosquito control (USEPA 1994). The primary pollutants causing degradation are sediment, nutrients, pesticides, salinity, heavy metals, weeds, low dissolved oxygen, pH, and selenium (USEPA 1994).

Weak policies. For many people, wetlands are worthless, disagreeable, and dangerous places full of spiders, insects, snakes, and mud. This attitude was reflected in public policies such as U.S Swamp Lands Act of 1850 that allowed individuals to buy swamps and marshes for as little as 10 cents per acre. During the 1930s and 1940s, the U.S government subsidized wetland drainage for conversion to farmland. Until 1977, dumping (landfill) into wetlands was considered a convenient way to dispose of waste as well as a good way to create building space for highways and housing developments. The first protective measures for wetlands in the United States were passed in 1899, to prevent dumping rubbish into navigable water ways. The 1972 clean water Act required discharge permits (called section 404 permits) intended to protect surface water quality. The Act was interpreted by the courts in 1977 to prohibit both pollution and filling (but not drainage) of wetlands unless an exception is granted. (Cunningham 2002)

Wetlands usually are located at the bottom of valleys or in lowland areas. In a wetland, the water table is at or very near the surface: Picture a bog, marsh or swamp. They are important to the ecosystems of their regions. Wildlife and plant systems often depend on wetlands, but urban or agricultural development, along with deforestation, can threaten these important ecosystems. In British Columbia, for example, the southeast corner of Vancouver Island, the Gulf Island and nearby areas of the mainland have many swamps

and marshes but most of them have been altered by human activities and some have completely disappeared [source: BC Ministry of Forests].

### **2.2.2 Effects of human occupancy on wetlands.**

Since most people have occupied wetlands, wetlands will be cleared for their use benefit which may result into erosion or alteration of the soil that may not be sustainable for living organisms.

Disappearance of species. The rate at which species are disappearing has increased dramatically over the last 150 years due human occupancy in wetlands that leads to many problems like floods, soil erosion among others. Human activities appear to have eliminated two or three species per decade, about double the natural extinction rate. In the last 150 year up to day the extinction rate has increased to thousands per decade. If a present trend continues, biologist Paul Ehrlich warns, somewhere “Between” one-third to two-thirds of all current species could be disappearing by the middle of the twenty-first century. Conservation biologists call this the sixth mass extinction, but human impacts that this time its not asteroids or volcanoes, but human impact that are responsible. (Bernard 2000).

The frequent or prolonged presence of water at or near the soil (hydrology) is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface. Wetlands can be identified by the presence of those plants (hydrophytes) that are adapted to life in the soils that form under flooded or saturated conditions (hydric soils) characteristic of all wetlands (Mitsch and Gosselink 1993). Thus alteration of wetland hydrology can change the soil chemistry and the plant and animal community. Alteration which reduces or increases the natural amount of water entering a wetland or the period of saturation and inundation can, in time, cause the ecosystem to change to an upland system or, conversely, to a riverine or lacustrine system. This alteration can be natural, such as through the successional process of stream impoundment by beavers or climate change.

Wetland loss and degradation through hydrologic alteration by man has occurred historically through such actions as: drainage, dredging, stream channelization, ditching, levees, deposition of fill material, stream diversion, ground water withdrawal, and impoundment. In the 1600's, over 220 million acres of wetlands existed in the lower 48 states (Dahl and Johnson 1991). Since then, extensive losses have occurred, with many of the original wetlands drained and converted to farmland.

Twenty-two states have lost at least 50 percent of their original wetlands. Indiana, Illinois, Missouri, Kentucky, and Ohio have lost more than 80 percent of their original wetlands and California and Iowa have lost nearly 99 percent (USEPA 1995). Since the 1970's, the most extensive losses of wetland acreages have occurred in Louisiana, Mississippi, Arkansas, Florida, South Carolina, and North Carolina (Dahl and Johnson 1991). Between the mid-1970's and the mid-1980's, approximately 4.4 million acres of inland freshwater wetlands (4%) and 71,000 acres (-1.5%) of coastal wetlands were destroyed (Dahl and Johnson 1991). Inland forested wetlands were impacted the most during the mid-1970's to the mid-1980's, with a loss of 3.4 million acres (6.2%), primarily in the Southeast (Dahl and Johnson 1991). Approximately 900,000 acres were converted from forested wetlands to other wetland types. Conversion to agricultural usage of land was responsible for 54 percent of the losses of both freshwater and coastal wetlands; drainage for urban development for 5 percent and "unspecified usage" (planned development) was responsible for 41 percent of the losses. This is in contrast to the mid-1950's to mid-1970's, when agricultural drainage of wetlands was responsible for 87 percent of the losses and urban development for 8 percent.

Habitant destruction. Human occupancy in wetlands is the largest single cause of loss of biodiversity. Over the past 10,000 years, billions of hectares of wetlands are converted into commercial forests, croplands, and settlement areas by constructing houses for commercial use. By some estimates, we now preempt about 40 percent of the net primary productivity of the biosphere either by consuming it directly, by interfering with its production or use, or by altering the species composition or physical processes of human dominated ecosystem. About half of wetlands in USA have been drained, filled, polluted and disrupted or otherwise degraded for over the past 250 years, so extensively, wetland



loss is a key factor for biodiversity loss, (Nusser.2000). More to that, as wetlands are drained or hydrologically altered, may result in changes in species composition as wetlands species are replaced by upland species; loss of large, wide-ranging species; loss of genetic integrity when isolated habitats are too small to support viable populations; reduced populations of interior species that can only reproduce in large tracts; and increased numbers of competitor, predator, and parasite species tolerant of disturbed environments (Harris 1988; Fleming 1994).

Eutrophication. As roads, buildings, and parking lots are constructed, the amount of impervious surface increases. Impervious surfaces prevent rainfall from percolating into the soil. Rainfall and snowmelt carry sediments; organic matter; pet wastes; pesticides and fertilizers from lawns, gardens, and golf courses; heavy metals; hydrocarbons; road salts; and debris into urban streams and wetlands (USEPA 1993). Increased salinity, turbidity, and toxicity; and decreased dissolved oxygen, all affect aquatic life and, therefore, the food web (Crance 1988). Excessive inputs of nutrients can lead to eutrophication or result in the release of pollutants from a wetland into adjacent water resources (USEPA 1993).

Runoffs. As runoff moves over warmed impervious surfaces, the water temperature rises and dissolved oxygen content of the runoff water decreases (USEPA 1993). Increased water temperature, as well as the lower dissolved oxygen levels, can cause stress or mortality of aquatic organisms. Rising water temperatures can trigger a release of nutrients from wetland sediment (Taylor 1990). For example, as temperature rises, sediments release phosphorus at an exponential rate. Thus water temperature increases can lead to eutrophication.

Impervious surfaces decrease ground water recharges within a watershed and can reduce water flow into wetlands (USEPA 1993). Significant increases in storm water peak flow rates, and longer-term changes in wetland hydrology, as a result of storm water discharge, can cause erosion and channelization in wetlands, as well as alteration of species composition and decreased pollutant removal efficiency (USEPA 1993). Changes in frequency, duration, and timing of the wetland hydro period may adversely affect

spawning, migration, species composition, and thus the food web in a wetland as well as in associated ecosystems (Crance 1988; USEPA 1993).

Waste water treatment plant effluent and urban storm water are a source of pollutants that continue to degrade wetlands (USEPA 1994). The "aging" of wetlands can occur when wetlands filter organic matter. "Aging" is the saturation of the ecosystem by nutrients and heavy metals over time that results in the reduced effectiveness and degradation of the wetland (Mitsch and Gosselink 1986). Wastewater and storm water can alter the ecology of a wetland ecosystem if high nutrient levels can extend eutrophication and metals to cause plants and aquatic organism toxicity. Iron and magnesium, in particular, may reach toxic concentrations, immobilize available phosphorous, and coat roots with iron oxide, preventing nutrient uptake.

Degradation. Water discharges, hydrocarbon contamination, and radionuclide accumulation from oil and gas production can significantly degrade coastal wetlands (Rayle and Mulino 1992). Most petroleum hydrocarbon inputs into coastal wetlands are either from coastal oil industry activities, from oil spills at sea, from runoff, or from upstream releases (Kennish 1992). Oil can alter reproduction, growth, and behavior of wetland organisms, and can result in mortality. Plants suffocate when oil blocks their stomata (Dibner 1978).

Polynuclear Aromatic Hydrocarbons (PAHs) are extremely toxic compounds that can enter estuarine wetlands through industrial effluent and atmospheric deposition. PAHs concentrate in sediments and thus contaminate benthic organisms (Kennish 1992). Fish contaminated with PAHs exhibit external abnormalities, such as fin loss and dermal lesions.

Heavy metals may bioaccumulate in estuarine wetlands, causing deformities, cancers, and death in aquatic animals and their terrestrial predators. Heavy metal ingestion by benthic organisms (including many shellfish) in estuarine wetlands occurs because the metals bind to the sediments or the suspended solids that such organisms feed on or settle on the substrate where such organisms live.

Depletion of water. Urban and industrial storm water, sludge, and wastewater treatment plant effluent, rich in nitrogen and phosphorus, can lead to algal blooms in estuaries. Algal blooms deplete dissolved oxygen, leading to mortality of benthic organisms. Some algae are toxic to aquatic life (Kennish 1992). Excess algae can shade underwater sea grasses (part of the coastal wetland ecosystem), preventing photosynthesis and resulting in sea grass death (Batiuk 1992). Because sea grass meadows reduce turbidity by stabilizing sediments and provide critical food, refuge, and habitat for a variety of organisms, including many commercially harvested fish, the death of these plants profoundly impairs the estuarine ecosystem. (Dennison 1993).

Habitat loss and fragmentation. In Louisiana, coastal areas are subsiding as a result of the redirection of sediment by the Mississippi River levees, subsurface withdrawals of water, oil, gas, sulfur, and salt, from under wetlands, channelization of wetlands, and drainage of wetlands for development (Carney and Watson 1991; Boesch 1983; Duffy and Clark 1989). As the coast subsides, sea levels rise, essentially, to cover the land. The loss of \$300 million worth of coastal real estate in the next 50 years is possible if subsidence continues (Carney and Watson 1991). The cost of the loss of wetland habitat as the sea levels rise to cover the land has not been determined. Land subsidence also allows saltwater intrusion into freshwater wetlands and causes shifts in the plant and animal community (Pezenski 1990). Saltwater intrusion and the subsequent modification of wetlands habitat threaten the billion dollar fishery industry as well as the multi-million dollar trapping business (Boesch 1983; Duffy and Clark 1989).

Impoundments. Impoundment of natural wetlands for storm water management or wildlife and habitat management may exploit one function of wetlands at the expense of others (USEPA 1993; Mitsch and Gosselink 1993). Impoundment alters the natural wetlands' hydrology and decreases water circulation. Decreased water circulation causes increased water temperature, lower dissolved oxygen levels, and changes in salinity and pH; prevents nutrient outflow; and increases sedimentation (USEPA 1993).

Sedimentation reduces the water storage capacity, smothers vegetation, reduces light penetration, reduces oxygen content and affects the entire ecosystem richness, diversity, and productivity. Toxic substances, adhering to sediments, may accumulate in

impoundments as a result of decreased water circulation and bioaccumulation of contaminants by wetland biota may occur.

Grazing livestock can degrade wetlands that they use as a food and water source. Urea and manure can result in high nutrient inputs. Cattle traffic may cause dens and tunnels to collapse. Overgrazing of riparian areas by livestock reduces streamside vegetation, preventing runoff filtration, increasing stream temperatures, and eliminating food and cover for fish and wildlife. As vegetation is reduced, stream banks can be destroyed by sloughing and erosion. Stream bank destabilization and erosion then cause downstream sedimentation (Kent 1994). Sedimentation reduces stream and lake capacity, resulting in decreased water supply, irrigation water, flood control, hydropower production, water quality, and impairment of aquatic life and wetland habitat (USEPA 1993).

### **2.3 Possible control measures of human occupancy on wetlands.**

It is important that we learn to prevent human from encroaching the wetlands through the following ways:

Human occupancy on wetlands is largely due to high population growth. One of the necessary cornerstones of ecopsychology and environmental psychology is a contribution to understanding and solving environmental problems. If these fields are to have any lasting benefit, they must help us solve the very real problems of environmental degradation and devastation. These solutions must come on broad, cultural, bioregional, even global levels, as well as on individual and local levels. My purpose in this section is to outline some of the ways environmental psychology and ecopsychology can respond to environmental problems and how they can understand and support sustainable and effective action. This is a bold, even grandiose claim, but I think it is both necessary and possible.

Family planning. This is the best way of controlling high population growth from encroaching wetlands, in the way that family planning allows couples to determine the number and spacing of their children. It doesn't necessarily mean fewer children, people may use family planning to have the maximum number of children possible-but it does

imply that the parents will control their reproductive lives and make rational, conscious decisions about how many children they will have and when those children will be born, rather than leaving it to chance of producing any how. As a desire for smaller families becomes more common, birth control often becomes essential part of controlling high population which may reduce pressure on wetlands and other natural resources.

Co-ordination and co-operative approach. Wetland conservation can be achieved through a co-ordinated and co-operative approach involving all concerned people and organizations in the country, including local communities to participate in decision making. This can create a good co-operation, friendship and awareness against wetlands which may promote sustainable development. (Schwartz. 1953).

Public awareness. Enhancing public awareness on usefulness and conservation need on wetlands, this may help the local community to be aware and to know that wetlands have value on earth, this may through sensitization, monitoring, and educating hence achieving sustainable development.

Government rules and regulations. There is a need for the government to put wetland rules and legislation that are function that can not any individual to exploit the wetland areas. This can be done through government organizations like NEMA, NFA and other non governmental organizations like wetland conservation society among others. (Rhymer, 2001).

Re-allocation of people. There is a need for the government to re-allocate people from densely populated areas to sparsely populated areas. This may reduce on encroachment of wetlands and other natural resources thus creating a favourable environment. (Rhymer,2001).

Better farming methods. There are certain traditional farming methods which are better for the land and are more sustainable than some of the methods used by commercial farmers. Rather than monoculture (a practice which involves only the growing of one just crop type) which removes all of the goodness from the soil and leaves crops very

susceptible to disease, mixed crops or crop rotation can be a good way to replenishing valuable nutrients in the soil along with maintaining a high level of biodiversity in the area. (Rhymer,2001).

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.0 Introduction**

This chapter explains the methods that the researcher used to select the geographical areas, from which this research was carried out and methods of selection of respondents. It also explains the methods that were used to collect process and analyze data

#### **3.1 Research Design.**

A case study research design was adopted, while employing both qualitative and quantitative designs. Given the duration of the study, this gave the study abroad coverage and made it representative enough.

#### **3.2 Population and area of study**

The population of the study was carried out in Base Camp Village, Kasese Municipality, Bukonjo West County, Kasese district. This study was intended to focus on community leaders, wetlands NGO officials and community members.

The study was conducted in Base Camp Village, Kasese Municipality Bukonjo west County (Kasese District) because of the rampant cases of wetland encroachment in the Village.

#### **3.3 Sample frame work.**

##### **3.3.1 Sample size.**

The respondents were randomly selected and categorized. They comprised both sexes (females and males) and the study used 80 respondents. This was intended to get a variety of views and unbiased responses which made the study a reality. Also this sample size was selected.

### **3.3.2 Sample Technique.**

Using a random sampling Technique, a total of 80(eighty) respondents were selected for this study. Random sampling was used because it was cheap and did not take a lot of time trying to figure out who should be selected for the study.

### **3.4 Methods for Data collection**

The methods that were used to collect data include personal interviewing, informal interviews, and sources of data.

#### **3.4.0 Questionnaires;**

These were pre-formulated set of questions to which the respondent recorded their answers. It is efficient data collection instrument since the researcher knew exactly what is required and how to measure the variables of interest. This was basically self administered questionnaires, which comprised of open ended and closed ended questions that required respondents answer all the questions to the best of their knowledge. The questionnaires were personally delivered to the respondents. Personal delivery of the questionnaires was chosen because it helped the researcher explain the importance of the study to the respondents and also clarify some aspects of the questionnaire were not clear to the respondents. Questionnaires were also used because they are cheap, time saving and convenient for the respondents.

#### **3.4.1 Interviews**

Face-to-face interviews were held within the community members since they could not be easily administered with questionnaires on the topic of the study.

#### **3.4.2 Informal interviews**

The personal interviews were supplemented by informal interviews between the researcher and key informants. The informal interviews were constructed on the basis of variables under the study and consisted mainly the statements or topics related to study objectives.



### **3.4.3 Sources of Data.**

This study used both primary and secondary data.

Primary data was collected using interview guides, which were given to community members, wetland NGOs leaders and community leaders. These were self administered since these respondents were considered to be literate. For community members, focused group discussions were held using also an interview guide. Secondary data was through Document analysis in the form of reports, training manual, news papers, and journals for the period under study that were read and the required data were collected from them.

### **3.5 Data processing.**

Qualitative data involved three sets of activities, which included editing, coding and frequency tabulations. Editing were done by looking through each of the field responses from interview guides and focus group discussions ascertaining that every applicable question had an answer and all errors eliminated, for purposes of completeness, accuracy and uniformity.

### **3.6 Data analysis.**

The researcher then proceeded to carry out coding of the various responses given to particular questions that lack coding frames, he then established how many times each alternative response category was given an answer using tally marks which later was added up. Data was then presented in frequency tabulations, rendering it ready for interpretation.

Quotations and field notes made were also included in the process.

#### **3.6.1 Graph**

The main objective of a bar graph was to present data in a way that was to be easy to understand, interpret, and interesting to look at data. The bar graph was captured on wetland NGO officials, community leaders and community members who constitute the greatest number.

### **3.6.2 Pie charts**

The main objective of using pie charts was to present data in a way that it could be easy to interpret and understand to the community member and respondents involved in the study.

### **3.7 Ethical consideration of the study.**

The researcher acquired a letter of introduction from the School of Engineering and Applied Sciences seeking permission to carry out research in Base Camp Wetlands, Kasese Municipality (Kasese District). This was endorsed by the local authorities and stakeholders in NGOS that are involved in the fight against wetland encroachment. This therefore was to enable the researcher to seek data from the respondents with less resistance minimal disturbances from the public.

## CHAPTER FOUR

### PRESENTATION, INTERPRETATION AND DISCUSSION OF THE FINDINGS

#### 4.0 Introduction

This chapter contains the presentation and discussion of the research findings/ results and data analysis. It presents data that was collected using questionnaires and interviews. In the same chapter, data is interpreted, discussed and analyzed along the themes namely: age of respondents, gender/sex of respondents, education level of respondents, occupation of respondents and objectives of the study like importance of the wetland, causes of human occupancy on wetland, effects of human occupancy on a wetland and possible control measure of the problem.

#### 4.1 Socio - Demographic Background

##### 4.1.1 Age of respondents

By asking age group of the respondents the researchers sought to find out which age bracket were contributing to the research. Their age groups were summarized in the table below.

**Table 1: Age of respondents**

Age group	Frequency	Percentages (%)
15-19	02	3.33
20-25	10	16.67
26-30	10	16.67
31-35	11	18.33
36-40	12	20.0
41-45	15	25.0
<b>Total</b>	<b>60</b>	<b>100</b>

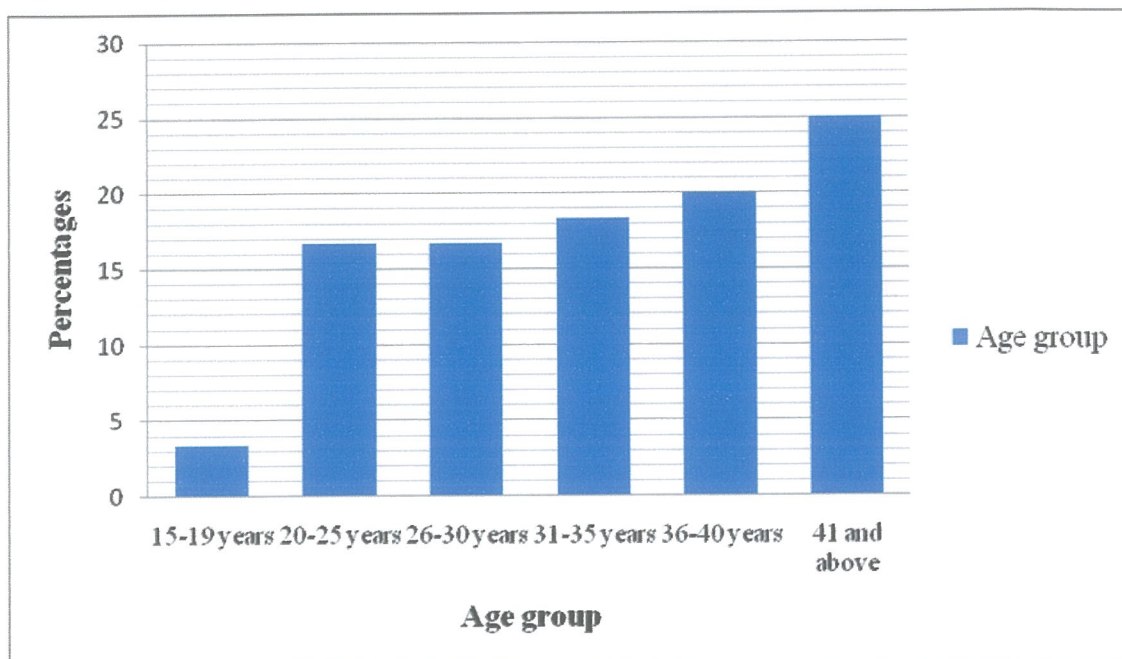
**Source: primary data**

According to the data collected most of the respondents were in age group 41-45 as shown by 25% of the respondents, 20% of the respondents are in age group 36-40,

18.33% in age group 31-35, 16.67% of the respondents are in age group 26-30, 16.67% in age group 20-25, while only 3.33% are in age group 15-19.

This is shown on figure 1 below.

**Figure 1: Age of the respondents.**



Source: primary data

#### 4.1.2 Gender of Respondents

When the researcher carried out investigation, it was established that the males were 50 and the females were 30, an indication that the males dominated the females in responding as below:

**Table 2: Gender of respondents**

Gender	Respondents	Frequency
Males	50	70%
Females	30	30%
Total	80	100%

Source: primary data

Out of the 80 respondents to whom the questionnaires were administered 50(53.33%) were male and 30(46.67%) were females as shown in the table 2 above. This shows that

decision making especially in native communities' lies totally in the males. In some instances in homesteads where husbands were not there, women refuse to answer questions since they claimed not to have authority to discuss such questions in the absence of the husbands, cultural taboos that surround male supremacy were said to be that, if a woman discusses any important matters then the husband may die.

#### 4.1.3. Respondents level of education

The level of education of the respondents is shown by table 3.

**Table 3: Respondents levels of education.**

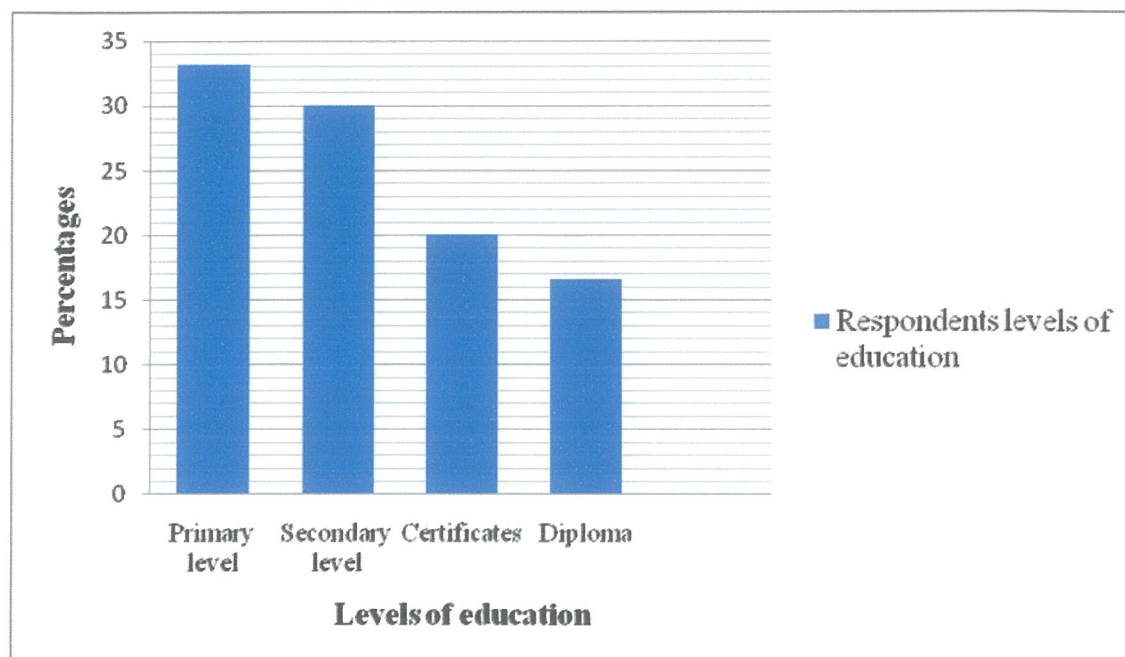
Level of education	Frequencies	Percentages (%)
Primary level	25	33.17
Secondary level	16	30
certificates	12	20
Diploma	10	16.63
<b>Total</b>	<b>60</b>	<b>100</b>

**Source: primary data**

The level of education was necessary to ascertain the knowledge and experience distribution of the respondents. According to the research study carried out 33.17% of the respondents attained education up to primary level, the reason that was given to the researcher was poverty, people can not afford school fees.

According to the research finding, 30% of the respondents attained education up to secondary level, 20% of the respondents had certificates in different fields, while 16.13% were diploma holders. In this place surprisingly there was no any person with a degree. This manifested the high illiteracy/ignorance rates which explain why people occupy wetlands that is they are not aware of the negative environmental effects of wetland degradation.

**Figure 1.shows respondents level of education.**



Source. Field data.

#### **4.1.3 Occupation of respondents.**

By asking the occupation of the respondents, the researcher sought to find out the area of occupation of the researcher respondents involved in and findings as were summarized as below:

**Table 4. Occupation of respondents.**

Occupation	frequency	Percentage (%)
Fishermen	10	12.5%
Farmers	40	50%
Business men	30	37.5%
<b>Total</b>	<b>80</b>	<b>100%</b>

Source: Field data

From the research carried on their occupations out of 10% of the respondents were fishermen, 30% of the respondents were Business men, and the majority of respondents

(50%) were farmers. This implies that farmers take the largest part on wetland encroachment in base camp wetlands followed by business men who have put their businesses in this place like small market known as base camp market which occupy part of the wetland. Lastly fishermen take the lowest percentage because in this wetland fish are limited due to excessive destruction that took place in 1990s.

#### 4.2.0 Objectives of the study.

##### 4.2.1 Importance of wetlands to the people

The first objective of the study was to assess the importance of the wetland to the society around the local communities of people in Base camp community as in the table below;

**Table 5. The importance of wetlands.**

Importance of wetlands to people of Base camp village	Frequency	Percentages (%)
Source of water	13	18.33
Provision of fish	11	16.67
Source of medicine	16	18.33
Fertile soil for agriculture	20	33.33
Tourist attraction	10	13.33
<b>Total</b>	<b>60</b>	<b>100</b>

**Source: primary data**

As shown in the table above 8.33% of the respondents estimated that wetlands provides water for home use like in cooking, washing clothes, and water for irrigating their crops which are grown on a small scale. So, wetlands are very important to Base camp village and other urban dwellers around this wetland in supplying water for various activities. This implies that water was abundant.

According to the research findings, 33.33% of the respondent stated that wetlands provide fertile soils for agriculture which helps them to grow some crops like cassava, maize, sweet potatoes, yams and beans for home consumption and surplus for sale. This was also manifested by the many gardens that were seen by the researcher. This is said to

have reduced on famine because the majorities are able to produce their food to sustain their families. So wetlands are very important to the community.

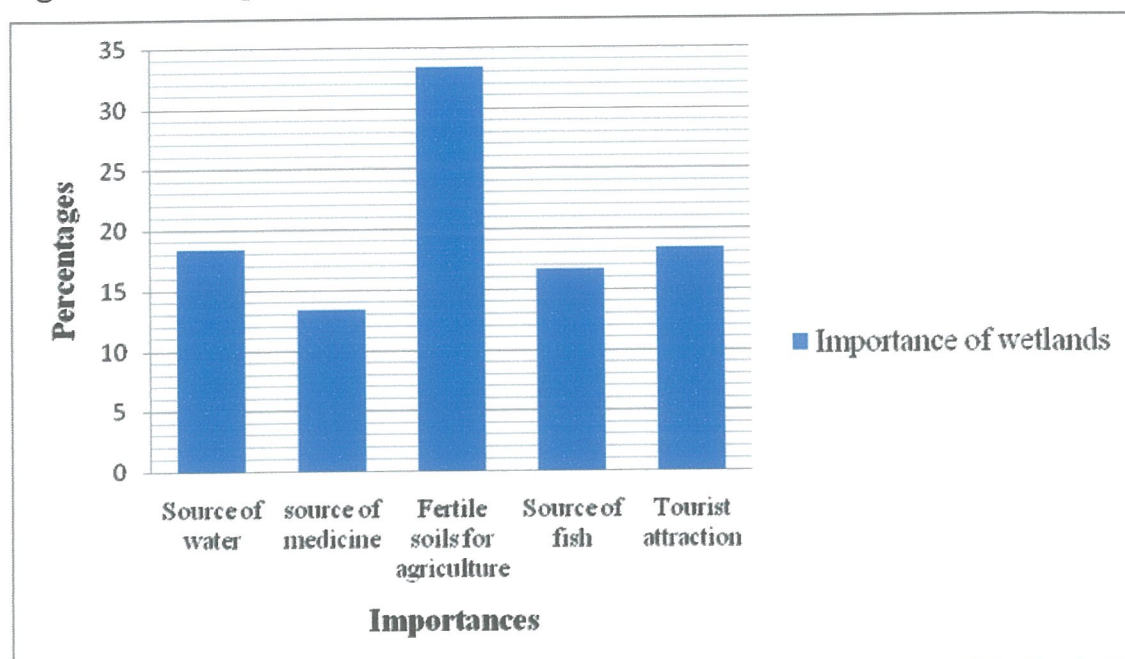
Wetlands was source of medicine with a percentage of about 18.33 of the respondents estimated which help them to cure several diseases, so many diseases are been treated from various ways through different herbs like *Phytolacca dodecandra* “omuhoko” medicine that cure skin rashes, ring worms and spring water that cure various diseases, many people from various places come for treatment. This implies that this wetland is of greater importance to the entire community.

According to the research carried out, 16.67% of respondents told the researcher that wetland provides fish which is used as their source of food for the whole community. As the majority of community members regard fish as their staple food, so fishing has been taking place for several years which has lead to disappearance of fish species in this wetland due to their poor methods of fishing like basket fishing method. More to that some respondents told the researcher that people have started fishing immature fish for consumption others do sell these immature fish in their markets like Base camp market every Thursday which has brought some excessive encroachment of the wetland.

Lastly, 13.33% of the respondents identified that wetlands contribute much to tourism industry. Some tourists come from various place to this place to see the hot springs, different birds and other natural resources like reeds and some come for study purpose. This has promoted tourism industry through generating revenue, foreign exchange and creating friendship. This implies that these wetlands contributes much to the community and the entire country. Importance of this wetland is illustrated in the graph below:



**Figure 2: The importance of wetlands in Base camp.**



Source: primary data

#### 4.2.2 Causes of human occupancy on a wetland

The second objective of the study was to find out the causes of human occupancy on wetlands among the people of Base camp village in Kasese. To achieve the objective, the respondents were to identify the causes of human occupancy on wetlands in the people around Kasese district a case study of Base camp community and their provision was summarized as below:

**Table 6. Causes of human occupancy on the wetland .**

Causes of human occupancy on a wetland	Frequencies	Percentages (%)
poverty	11	18.33
High population growth	20	33.33
Poor agricultural practices	8	13.33
Weak leaders	10	16.67
Illiteracy/ignorance	11	18.33
<b>Total</b>	<b>60</b>	<b>100</b>

Source: primary data

From the research findings, 18.33% of the respondents identified that poverty is the one that forces people to occupy the wetland looking for survival, many people in this place are unemployed which increases poverty in base camp village, this implies that there is excessive wetland encroachment in this place due to problem as respondents said. According to Smith 2006, poverty leads to over population because poor people can not afford to control birth and, since they are often poorly educated, they may not be able to realize the importance of preserving natural resource in short run. This shows that if poverty is not eradicated it could cause other natural resources to disappear in long run.

Also, 33.33% of the respondent said that they occupied this wetland due to increasing population in the village thus occupying this “free land” known as a wetland, because the people has exceeded the environment carrying capacity. People have no food, homes thus excessive encroachment. According to Enger 1998, excessively population growth leads to competition for land which contributes to environmental problems like encroaching wetlands looking where they can settle. In this process many species suffocate to death other migrate from that place to another which contributes to environmental degradation. This implies that increasing population is one of humans to occupy the wetland.

According to the research findings, 13.33% of the respondents suggested that human occupancy in this wetland is due to absence of land for agricultural practices which led them to occupy preserved or conserved wetlands to grow crops with their poor practices like mono-cultural which support soil erosion in this place. According to Smith 2006, it is clear that the areas of the world where human population is growing most rapidly are those that have the lowest standards of living. The more the human population the more the wetland is encroached and other natural resources for their benefit.

According to the research findings, 16.67% of respondents identified due to weak leaders who do not care about this wetland as having led to many people to occupy this natural area, one respondent told the researcher that leaders also involve in this encroachment and other are easily bribed to allow residents into the wetland.

Lastly, 18.33% of the respondents identified ignorance as one of the cause of wetland occupancy. That due too much illiteracy/ignorance has forced them to occupy this wetland, as the majority of the respondents were primary leavers this brings high illiteracy/ignorance. Different respondents told the researcher that they do not know any importance of the wetland to their environment. They put blame on the government for neglecting them by not putting standardized schools for their children and schools are limited with unqualified teachers. This shows that wetland encroachment will be very difficult to control because they have no knowledge about the wetland in Base camp village.

#### 4.2.3 Effects of human occupancy on a wetland

The third objective of the study was to find out the effects of human occupancy on wetlands among the people of Base camp village in Kasese. To achieve the objective, the respondents were to identify the effects of human occupancy on wetlands in the people around Kasese district a case study of Base camp community and their provision was summarized as below:

**Table 7. The effects of human occupancy on wetlands.**

<b>Effects of human occupancy on a wetland</b>	<b>Frequencies</b>	<b>Percentages (%)</b>
Habitant destruction	15	25
Floods	15	25
Low agricultural products	20	33.33
Soil erosion	10	16.67
<b>Total</b>	<b>60</b>	<b>100</b>

**Source: primary data**

According to this research 25% of the respondents observed that wetland encroachment leads to habitant destruction which in turn leads to the reduction of organism species. One respondent told the researcher that long ago they used to see many birds, buffer flies, and other species but are not able to be seen due to much encroachment of habitants. And

according to Harris 1988, said that habitat destruction, as wetlands are drained or hydrologically altered, may result in changes in species composition as wetlands species are replaced by upland species; loss of large, wide-ranging species; loss of genetic integrity when isolated habitats are too small to support viable populations; reduced populations of interior species that can only reproduce in large tracts; and increased numbers of competitor, predator, and parasite species tolerant of disturbed environments. This implies that the more the human occupies the wetland the more the habitat fragmentation in Base camp wetlands.

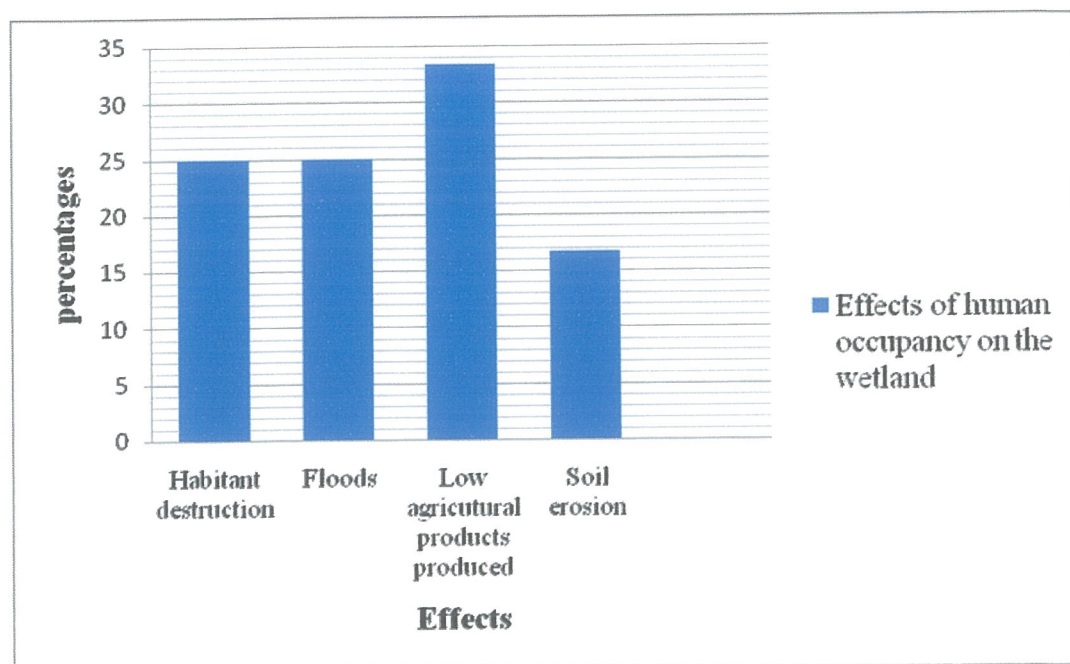
As shown in the table above, floods as an effect was represented by 25% out of 60 respondents; they informed the researcher that wetland encroachment has led to floods among different places that have led to destruction of many species with their habitats. According to Bernard 2000, the rate at which species are disappearing has increased dramatically over the last 150 years due human occupancy on the wetlands that led to many problems like floods. Human activities appear to have eliminated two or three species per decade, about double the natural extinction rate.

According to the research, low agricultural products produced due to human occupancy were the common effect that was a result of wetland encroachment with 33.33% of the respondents who identified it. This was accompanied by many problems like poor markets due to poor quality products, famine and poverty in the community.

Lastly, 16.67% of respondents when interviewed and others acknowledged that human occupancy on a wetland has led to severe soil erosion because all vegetation has been cleared for various activities like agriculture, settlement hence leaving soils bare easy for erosion in Base camp village. According to Enger 1998, erosion reduces stream and lake capacity, resulting in decreased water supply, irrigation water, flood control, hydropower production, water quality, and impairment of aquatic life and wetland habitat. This implies that human occupancy on the wetland leads to severe soil erosion with its associated effect above in Base camp village.

This is shown in figure 6 below.

**Figure 3. The effects of human occupancy on a wetland**



**Source:** primary data

#### **4.2.4 Possible control measures of human occupancy on a wetland**

The fourth objective of the study was to identify the possible control measure put forward by the local community, government and NGOs to address the causes and the challenges facing the people who are involved in the act to achieve the objective and NGOs may be organized in the places, have come to handle the issue of wetland encroachment in the country. Data on the objective was analyzed under the question, how has human occupancy on the wetland been controlled?

**Table 8. Possible control measures of human occupancy on a wetland.**

Possible control measures of human occupancy on a wetland	Frequencies	Percentages (%)
Re-allocation of people	15	25
Family planning	5	8.33
Putting penalties	10	16.67
Better agricultural practices	10	16.67
Public participation	8	13.33
<b>Total</b>	<b>60</b>	<b>100</b>

**Source:** primary data

From the research findings, it is shown that 25% of the respondents observed that government and NGOs should be called upon to re- allocate people from this place to another place is the appropriate way to solve this problem, some respondents argued that our families are increasing every time so if the government look for us some “free land” for settlement we are able to live this place in peace. And according to Rhymer 2001, said that it is a role for the government to re-allocate people from densely populated areas to sparsely populated areas. This may reduce on encroachment of wetlands and other natural resources thus creating a favorable environment.

According to the findings, 8.33% of respondent supported the suggestion of family planning method which was suggested by the members. Mr. Muhindo Cris one of the respondents observed that it could be among the best methods to control the increasing population in their area if government and NGOs are involved. According to Gosselink 2000, family planning is the best way of controlling high population growth from encroaching wetlands. This shows that family planning can help solve the problem of over population that has led to wetland encroachment in Base camp village.

As shown in the table above, 16.67% of the respondents agreed on suggestion of putting penalties to those who occupy wetlands directly /illegally especially farmers, occupants, fishermen and other activities that interfere with the wetland and this could solve this problem through community leaders, government and NGOs forces, penalties like removing sediments or solid particles in wetland areas by force if found using poor farming methods around the wetland and imprisonment for not less than 5 months if found using poor methods of fishing like basket method. According to Uganda's National Policy for the Conservation and Management of wetland Resources 1995, there is a need for the government to put wetland rules and legislation that are functioning that can not any individual to exploit the wetland areas. This can be done through government organizations like NEMA, NFA and other non governmental organizations like wetland conservation society among others. This show putting penalties could be one of best methods to solve wetland encroachment.

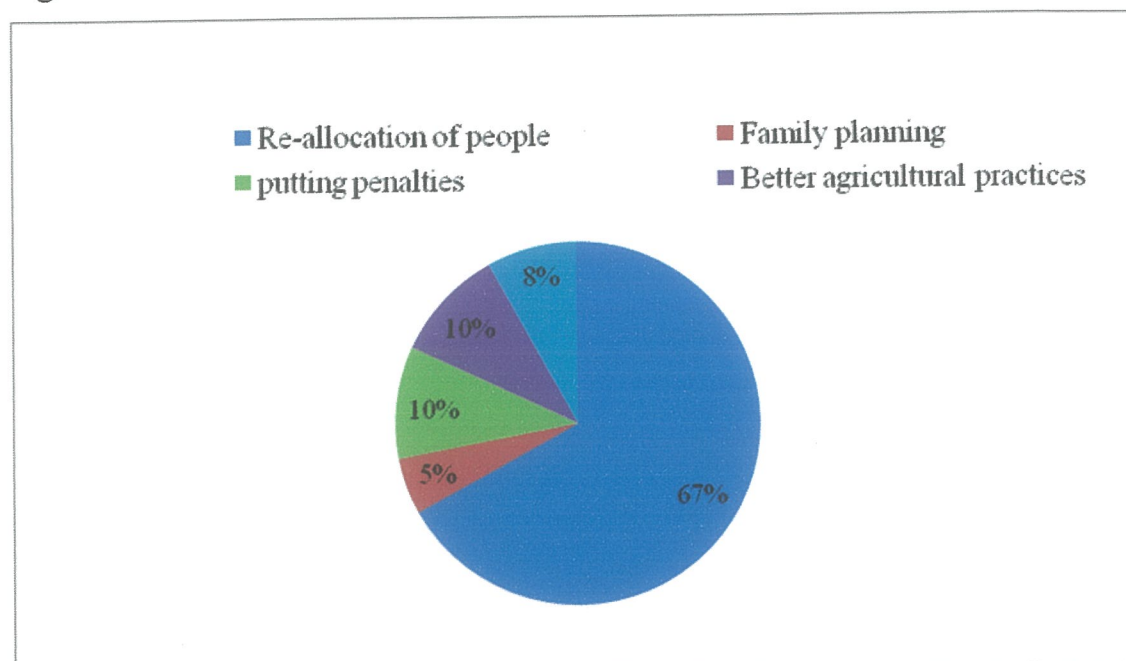
Also according to the research, 16.67% of respondents suggested that introduction of better agricultural practices around wetland areas; through government support, better methods may solve the problem of wetland encroachment around the area. Better agricultural practices like mixed farming, crop rotation among others were suggested by some members. According to Rhymer, 2000, there are certain traditional farming methods which are better for the land and are more sustainable than some of the methods used by commercial farmers. Rather than monoculture (a practice which involves only the growing of one just crop type) which removes all of the goodness from the soil and leaves crops very susceptible to disease, mixed crops or crop rotation can be a good way to replenishing valuable nutrients in the soil along with maintaining a high level of biodiversity in the area. This highlights that better agricultural practice a round wetland may solve this problem of wetland encroachment in Base camp village.

Lastly, 13.33% of the respondents observed that public participation can solve this problem above. That this can be achieved through coordination between local people, community leader in decision making and making suggestion on the problem. According to Schwartz 1953, wetland conservation can be achieved through public participation/a



co-ordinated and co-operative approach involving all concerned people and organizations in the country, including local communities to participate in decision making. This can create a good co-operation, friendship and awareness against wetlands which may promote sustainable development.

**Figure 4: Possible control measures of human occupancy on a wetland.**



Source: primary data



## **CHAPTER FIVE**

### **SUMMARY OF THE MAJOR FINDING, CONCLUSION AND RECOMMENDATIONS.**

#### **5.0 Introduction**

In this chapter, the conclusions from the study and the recommendations made are presented. The study used both qualitative and quantitative methods of analysis.

#### **5.1 SUMMARY OF FINDINGS**

The purpose of study was to assess the importance of the wetland was intended to examine the causes, effects and possible control measures of human occupancy on the wetland.

The research was conducted in Base camp village, Kasese Municipality, Kasese district and included 60 respondents who were both males and females.

Questionnaires and interviews were used in data collection. Analysis was done by use of frequencies, percentages and true findings were presented by using tables. The study findings were investigated in line with the research questions and then conclusion and recommendations were done after presentation and interpretation of data.

#### **5.2 CONCLUSION:**

Basing on the case study, it has been found out that human occupancy as shown above has diverse effects on wetlands. There is uncontrolled encroachment, degradation and abuse of natural resources and ecosystems in Base Camp village, Kasese Municipality Kasese District, despite the existence of policy, legal and institution frameworks in the country considered among the best on the Africa continent. This is because of lack of capacity (human and financial) and professional and political commitment to ensure that the existing policy, legal and institutional provisions are adhered to. The duplication and multiplication of roles, responsibilities and services among the different government departments and ministries is complicating natural resources governance and making the exercise excessively expensive for the economy of the country. The rapidly population growth and the inadequate planning are worsening the environmental abuse in the

country. There is need for valuation to determine the values of wetlands and other different natural resources as basis for decision making

### **5.3 RECOMMENDATIONS**

The following are the recommendations that were made in this study in line with the findings and conclusion. These include the following.

Accelerate the law reform process to harmonize wetland encroachment legislation with the constitutional principles. Related to non- discrimination and equality between human and wetlands: undertake the speedy enactment of the human on a wetland relations bill: introduce public education and legal literacy campaigns relating to the convention and the international and national commitments on the elimination and discrimination against wetlands.

The government should carry out an assessment to the extent on which all its wetland policies have impacted on the ordinary people in the rural area, by way of uplifting them from the subject of poverty and un conducive environment they are facing ,or the policies have empowered all the ,most importantly the rural ones. This is the only way to find out if the government response to human occupancy on a wetland and wetland encroachment has been effective; however there is no record of its effectiveness in addressing the issues that it was intended to solve. I recommend that it should be revitalized.

Strengthen efforts to address attitude about the roles and responsibilities of human against wetland. To ensure that these efforts are effective, there is need to include education measures a t all level, the revision of school text books and curricula, and awareness-raising and public education campaigns directed at women and men to eradicate the stereotype attitude. The government must so under take an assessment of the impact of these measures in order to identify short coming and to improve them accordingly.

Under take protection and conservation sensitive training for all public officials, in particular law enforcement personnel, the judiciary, and health workers; establish counseling genital mutilation in order to eradicate this practice.

Intensify efforts to encourage local people within the community to take up leadership positions through further temporary special measures aimed at making wetlands. There is need to offer or support programmers for current and future local leader and under take awareness raising campaigns on the importance of public's participation in decision making.

There is a need to compute the value of natural resources in terms of economic, social and environmental benefits as basis for determining whether any given resources fit for replacement and exploitation for economic gains.

Development programs of action relating to protection, conservation and introduce legislation to ensure the prosecution of and stronger penalties for. Those who are engaged in the exploitation of wetlands, expand national programs for wetlands. Design and implement national programs, including monitoring programs, evaluation, Environmental Impact Assessment (EIA) and Environmental Audits to prevent and induce encroachment and damaging wetlands in rural and urban areas. This can be through a reinforcement of programs for protection, conservation and legislation programs by educating for the public.

There are many international conventions, treaties and protocols that would promote sustainable utilization and management of wetlands and other natural resources in the country that need to be adopted and domesticated.

There is need for a cultural and practice of jealously preserving the areas considered critical habitants, biodiversity centers, important cultural/spiritual sacred sites, and sites scenic beauty (tourists attraction);

There is need for professional and political commitment within government and its associated institution to enforce and implement national plans, policy and legal frameworks;

There is need to streamline the various roles, responsibilities and service provision from the different government organs.

It is hoped that these recommendations will make the realization of gender equality a reality and reduce the prevalence of gender based violence and gender discrimination.

There is need for continued inventory and update of the status of different natural resources and ecosystems in the country. This calls for continued research, monitoring and evaluation of natural resources status.

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## APPENDICES

### APPENDIX I: QUESTIONNAIRE

Dear Respondent,

I am Kato Asad, a student of Kampala International University, carrying out an academic research on the Topic “The Effects of Human Occupancy on Base Camp Wetlands in western Uganda: case study of Base camp village, Kasese Town Council (Kasese District)” You have been randomly selected to participate in the study and you are therefore kindly requested to provide an appropriate answer by either ticking the best option or give explanation where applicable.

NB; - The answers provided will only be used for academic purposes and will be treated with utmost confidentiality.

#### A) PERSONAL INFORMATION.

##### 1. GENDER.

a) Male ☐ b) Female ☐

##### 2. AGE

a) 25-30 ☐ b) 31-35 ☐  
c) 36-40 ☐ d) 41-45 ☐

##### 3. EDUCATION LEVEL.

b) Not sure ☐ b) Primary ☐  
c) Secondary ☐ d) College ☐

##### 4. OCCUPATION.

a) Farmer ☐ c) Business ☐  
b) Teacher ☐ d) House wife ☐  
e) Lawyer ☐  
f) Others (specify).....

g) NUMBER OF FAMILY MEMBERS

Males Number	Females Number

5. What are the importances of wetlands to the environment?

.....  
 .....

6. What are some of the causes of human occupancy on a wetland in your area?

.....

7. What are some of the possible control measures of human occupancy on a wetland in your area?

.....  
 .....

9. Are other wetlands also encroached? If yes, how are they encroached?

.....

10. What are some of the reasons why wetlands are encroached in your area?

.....

11 what activities do you carry out in the wetland?

.....

12 Have you realized any changes in wetland plants?

a) ☐ Yes

b) ☐ No

if yes, where did you report?

.....

13 Have you realized any changes in wetland water height/level?

a) ☐ Yes

b) ☐ No

14 What do you think is the cause of this?

.....

14. What has the community leaders in your area done to stop human occupancy on a wetland?



.....  
Thanks for your contribution towards the completion of my study.

**APPENDIX II: INTERVIEW GUIDE:-**

Name of interviewer

.....  
1. Socio- demographic information of respondent

a) Sex .....

b) Education level (highest)

.....  
c) Main occupation

.....  
d) Ethnicity

.....  
e) Nationality

.....  
f) Religion

.....  
g) Marital status

.....  
h) Duration lived in the area

.....  
2. Is human occupancy on a wetland a problem in your area? If so, list the different forms, causes, and the effects.

S/N	FORMS	CAUSES	EFFECTS
1			
2			
3			
4			
5			
6			

3. Who is the most affected and why? (Interviewer probes to get reasons why environment is most affected)

- i).....
- ii).....
- iii).....
- iv).....

4.) What are the effects of each form of human occupancy on wetland mentioned in question (2) above (probe for social psychological and physical effects)

a) On the victim/survivor.....

b) On perpetrators.....

c) Community development.....

5.) What support systems exist in your area for addressing human occupancy on a wetland?

.....

6.) How are the victims of human occupancy on a wetland handled in your community?

.....