

**THE ASSESSMENT OF AGROFORESTRY IN THE CONSERVATION
OF FOREST RESOURCE IN CENTRAL DISTRICTS OF UGANDA
A CASE STUDY OF BUSUJJU COUNTY - MITYANA
DISTRICT**

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DECLARATION

I TUSIIME LONARD, declare that the dissertation, "*The Assessment of Agroforestry in the Conservation of Forest Resource in Central District of Uganda: A Case Study of Busujju County - Mityana District*", has never been submitted to any University or institution of learning, the completion of this research has been my own investigation with maximum originality of data and information got from secondary sources or references.

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APPROVAL

This is to certify that the dissertation entitled, "*The Assessment of Agroforestry in the Conservation of Forest Resource in Central District of Uganda: A Case Study of Busujju County - Mityana District*", has been done under my supervision.

MR. ORISHABA AMON

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Date

DEDICATION

I dedicate this work to my dear parents; Mr. Tumusiime Charles and Mrs. Kyohairwe Scovia, Brother and sisters and Entire friends. May the almighty God Bless you for the tireless contributions towards my whole education career!

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TABLE OF CONTENTS

Declaration.....	i
Approval	ii
Dedication	iii
Acknowledgments	iv
Table of contents	v
List of tables.....	viii
List of acronyms	ix
Abstract.....	x
CHAPTER ONE	1
1.0 Introduction.....	1
1.1 Background	1
1.2 Statement of the problem	2
1.3 Purpose of the study	3
1.4 Objectives of the study.....	3
1.5 Research questions	3
1.6 Scope of the study	3
1.6.1 Geographical Scope	3
1.6.2 Conceptual Scope.....	4
1.6.3 Time Scope	4
1.7 Significances of the study	4
CHAPTER TWO	5
REVIEW OF RELATED LITERATURE.....	5
2.0 Introduction	5
2.1 Definition of terms	5
2.2 Theoretical Background	5
2.3 Agro-forestry practices.....	6
2.4 Causes of forests degradation in Uganda	10

2.5 Impact of forest conservation in Uganda	11
2.6 Effects of agro-forestry practices in the conservation of forest resource.....	12
2.6.1 Natural resources and Ecosystems	12
2.6.2 Livelihoods and natural resources.....	14
CHAPTER THREE	16
METHODOLOGY.....	16
3.0 Introduction.....	16
3.1 Research Design.....	16
3.2 Area of study	16
3.2.1 Study population	16
3.3 Sample Framework	17
3.3.1 Sample Size.....	17
3.3.2 Sample Technique.....	17
3.3.3 Sampling Procedure	17
3.4 Data Collection Instruments.....	18
3.4.2 Sources of data	19
3.5 Research Variables and Measurement	19
3.6 Data Quality Control.....	19
3.6.1 Validity.....	19
3.6.2 Reliability.....	19
3.7 Data Analysis	19
3.7.1 Descriptive statistics of percentages	20
3.7.2 Qualitative descriptions based on themes studied.....	20
3.8 Ethical Considerations	20
CHAPTER FOUR.....	21
DATA PRESENTATION, ANALYSIS AND DISCUSSIONS.....	21
4.0 Introduction.....	21
4.1 Presentation of Demographic Information	21
4.1.1 Respondents' gender	21

4.1.2 Respondents' Age groups	21
4.1.3 Respondents' Marital Status	22
4.1.4 Respondents' Education level	23
4.2 Responses on the Agro-forestry practices	23
4.3 Responses on the Causes of forests degradation in Uganda	24
4.4 Impact of forest degradation in Uganda	25
4.5 Effects of agro-forestry practices in the conservation of forest resource	26
 CHAPTER FIVE.....	27
CONCLUSIONS AND RECOMMENDATIONS	27
5.0 Introduction	27
5.1 Conclusions	27
5.2 Recommendations of the Study	28
5.2.1 Adaptation and up scaling of appropriate technologies	28
5.2.2 Capacity building of major stakeholders	28
5.2.3 Building strategic partnerships	29
5.2.4 Development of a communication and dissemination strategy	29
5.2.5 General Recommendations	29
5.2.6 Areas for future research	30
 REFERENCES	31
 APPENDICES	34
APPENDIX I: Questionnaire to Local Leaders & other Stakeholders	34
APPENDIX II: Questionnaire to the Farmers	37
APPENDIX III: Interview Guide	39

LIST OF TABLES

Table 1: The sample size used in the study	17
Table 2: The gender of Respondents	21
Table 3: The age Group of Respondents	22
Table 4: Marital Status of the Respondents	22
Table 5: The Education Level of the Respondents	23
Table 6: The Responses on the respondents understanding of the Agro-forestry practices	23
Table 7: The Causes of forests degradation in Uganda in Busujju County	24
Table 8: Impact of forest degradation in Uganda	25
Table 9: Respondents' view on the Effects of agro-forestry practices in the conservation of forest resource	26

LIST OF ACRONYMS

NEMA	National Environmental Management Authority
THF	Tropical High Forests
CFR	Central Forest Reserve
PFE	Permanent Forest Estate
UNEP	United nations environmental programme
USAID	United states aid for international development
NAADS	National Agricultural Advisory Services
NFA	National Forestry Authority
NEAP	National environmental act programme
NFA	National Forestry Authority
MWLE	Ministry of water, lands environment
MUIENR	Makerere university institute of environment and natural resource
FAO	Food and Agriculture Organisation
NGO	Non-Governmental Organisation
PAs	Protected Areas

ABSTRACT

The study assessed the role of Agroforestry in the Conservation of Forest Resource in Central District of Uganda: A Case Study of Busujju County - Mityana District. The objectives of the study included; to analyze the different agro-forestry practices, to examine the causes and impact of forest degradation and to assess the effect of agro-forestry practices in the conservation of forest resource in central districts of Uganda: a case study of Busujju County – Mityana District among others.

The research employed Descriptive research approach where simple random sampling technique was used to get the sample size which was used so that the problem at hand was described in-depth which required collecting information through questionnaire, interviews and a total sample size of 60 informants was interviewed. This size was more preferable due to time limit, the resources available to carry out the research and it was also used to ensure accuracy in data collection and data was analyzed quantitatively and qualitatively in form of; graphs, tables, charts, depending on the convenience and requirements of the data collected, and conclusion were drawn.

The major findings of the study was that approximately up to 78% of the natural resources continue to suffer from the effects of forest degradation and other Agroforestry activities such as encompass an entire spectrum of land use systems in which woody perennials are deliberately combined with agriculture crops and/or animals in some spatial temporal arrangement among others. The findings also suggested that promoting diversified farms with agro-forestry in buffer zones can enhance forest integrity (conservation). Responsible stakeholders such as the Government have done completely little to restore hopes to these practices / activities. Government, Civil Society Organizations, Local Community and Internal Community should do a lot to improve on the conservation of natural resources. The Government should take the lead on mobilizing all stakeholders to perform their duties accordingly. In conclusion, therefore, there is need for the international community to support the national and community efforts so as to prevent the negative contributions of Agroforestry practices on the conservation of natural resources by both the local farmers and other concerned local community members but long term, policies should aim to improve economic opportunities in Central Uganda, Busujju County – Mityana District, to offer communities more constructive alternatives rather than destroying these resources.

CHAPTER ONE

1.0 Introduction

This chapter presents the; background of the study, problem statement, purpose of the study, research objectives, research problem, scope of the study, hypothesis of the study, and the significance of the study.

1.1 Background

Agro forestry is the set of land use practice involving the combination of tree, agricultural crops and animal on the same place of land unit in some form of spatial arrangement or temporal sequence (NEMA 2003). Although advocates of agro forestry have promoted forest conservation to larger extent, empirical estimates of these benefits have been lacking due to the temporal and spatial complexity of agro forestry system and forest resource dynamics (changes). Uganda's forest resource comprises of both national forests (tropical high forests, and woodlands) and manmade forests such as plantations (both pines and hard woods). Forest and woodlands cover a total of 4.9 million hectares, about 24 per cent of the land area. Tropical High Forests (THF) cover 924208 ha, forest plantations cover 35066 ha and woodlands cover 3974102 ha. Of the 4.9 million hectares, 30 percent are in the protected areas (forest reserves, national parks and wildlife reserves) and 70 per cent are found on private land. Protected Areas (PAs) contain the country's Permanent Forest Estate (PFE), which is 1.9 million hectares of this, Central Forest Reserve (CFS) cover 1265752 ha. The forests on private land are largely being devastated, and those in National parks are inaccessible for provision of forest products. Therefore, CFRS constitute the forestland that will be available for a variety of uses (MWLE 2001)

The main pressures noted on Uganda's forestry resources are population growth, over harvesting encroachment, urbanization / industrialization and civil strife especially in the North. Population growth (estimated 3.3 percent a year) is leading to an increase in the demand for land, food and energy. Institutions such as schools prisons among others rely almost exclusively on fire wood for cooking, as does over 90% of the population.

Poor planning, weak regulations and inappropriate processing technology have resulted in the unsustainable harvesting of the forest products, and the degradation of the resource base. It is estimated that 800,000m³ of logs are cut each year, a rate of timber harvesting that exceeds sustainable cutting levels by a factor of four. This problem affects both governments and private

land. There is limited institutional capacity and limited resources in both central and local government to improve planning and regulation and little incentive for the private sector to improve its performance in the absence of firm regular and the enforcement of professional standards. However, it's critical to reduce the trend of forestry resource degradation in areas already unclear degradation, and to ensure sustainable forestry resource practices like agro forestry to conserve forest the areas more especially populated areas of central Uganda that will be placed under pleasure in the near future. Uganda's comparative advantage in climate and soils means that it has the potential to become an important produces of forest products if sustainable systems of production are implemented.

Cultivating trees in combination with crops and livestock (agro forestry) is ancient practice. However, several factors have contributed to a raising interest in agro forestry since 1970's: The degenerating economic situation in many parts of the developing world. Increased tropical deforestation, degradation and scarcity farming systems, inter-cropping and the environment (Acaye, 2004). Most research on economic aspects are gaming attention (Nicholson, Stall 1993) Main agro forestry practices include improve fallows, taungya (growing annual agriculture crops during the establishment of a forestry plantation), home gardens, alley cropping, growing multipurpose trees and shrubs on farmland, boundary planting/crop combination shelterbelts, wind break, conservation hedge, fodder banks, live fences, trees on pasture and apiculture with trees (IF PRI 2003).

1.2 Statement of the problem

Despite the fact that Uganda has a good percentage of forest resource, forest degradation is a big problem in the country. Generally it is estimated that 800,000m of logs are cut each year. This problem affects both government and private land many encroaches as well as politician, unaware of the arrangement where land is set aside for forestry resource development always claim that such areas are not forest reserves because they do not have tress in them. The worst affected areas are within the cattle corridor of Uganda, the Tarminalia woodlands of Northern Uganda and the acacia woodland of the Eastern Uganda, Hilly areas with gentle slopes in Mbarara, Kibale, Mityana and Rukungiri district. There has been relatively little national scale analysis of the cost of forest degradation to the national economy but the extent of the problem is documented in detailed studies of the land use change, which show declining little remaining forests, particularly central district of Uganda. Percentage of forest degradation range from 80% in Masaka, Katakwi 12 % (Nampidos, 2005). There are good national environmental plans in

Uganda instituted for forest conservation among which agro forestry practices is the key for forest conservation. Presently, there are poorly developed institutional structures to implement the practice in the most affected areas. It is for this reason that this study will be under taken to assess the impact of Agroforestry in the Conservation of Forest Resource in Central District of Uganda: A Case Study of Busujju County - Mityana District

1.3 Purpose of the study

The purpose of this study was to investigate, “The Assessment of Agroforestry in the Conservation of Forest Resource in Central District of Uganda: A Case Study of Busujju County - Mityana District.”

1.4 Objectives of the study

The specify objectives of the study are:

- i) To analyze the different agro-forestry practices in Busujju County - Mityana District, Uganda.
- ii) To examine the causes and impact of forest degradation in Busujju County - Mityana District.
- iii) To assess the effect of agro-forestry practices in the conservation of forest resource in Busujju County - Mityana District.

1.5 Research questions

- i) What agro-forestry practices are found in Busujju County - Mityana District of Uganda?
- ii) What are the causes and effects of forest degradation in Busujju County - Mityana District?
- iii) What are the effects of the different agro-forestry practices on forest conservation in Busujju County - Mityana District?

1.6 Scope of the study

The scope of the study fell under three major aspects; geographical, content and time scope. *Each of these was discussed in turn.*

1.6.1 Geographical Scope

The study was carried out in Busujju County, Mityana District. Mityana District is a district in Central Uganda. The district was created in 2005, by taking the Mityana and Busujju counties

from Mubende District. Like most Ugandan districts, it is named after its 'chief town' of Mityana. Mityana District is bordered by Kiboga District to the north, Nakaseke District to the northeast, Wakiso District to the east, Mpigi District to the southeast, Butambala District and Gomba District to the south. Mubende District lies to the west of Mityana District. The district headquarters at Mityana are located approximately 77 kilometers (48 mi), by road, west of Kampala, Uganda's capital and largest city. The coordinates of the district are: 00 27N, 32 03E. During the 2002 national census, the district had a population of approximately 266,100. It is estimated that in 2010, the population of Mityana District was approximately 354,000.

1.6.2 Conceptual Scope

The study was enshrined on examining the different agro forestry practices and their effect understanding of the subject under study. The causes and effects of forest degradation were investigated and examined

1.6.3 Time Scope

The study was carried out over the course 16 weeks that is from May – September, 2012 and that is 4 months time and covered literature between the years of 1985 – 2011.

1.7 Significances of the study

It is hoped that the findings of this study are likely to be of use in the following ways;

- i) The findings may be of useful to policy makers.
- ii) To other academicians interested in the assessing the impact of agro- forestry practices on forest conservation, may even want to make further research on the subject.
- iii) It will provide additional data and widen the information base for content selection on environmental education syllabus setting. The subject panels and academic boards that prove the syllabus in the National curriculum development center can utilize the results. This will partly complement the programme of initiating Environmental Education (EE) as an independent subject in primary and secondary schools which is in plan at present.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.0 Introduction

This chapter contains data that has already been presented by students, researchers, press, publishers, Government reports and data posted on the internet. This data is analyzed to only remain with the literature that is relevant to the problem of the study. That is, *"The Assessment of Agroforestry in the Conservation of Forest Resource in Central District of Uganda: A Case Study of Busujju County - Mityana District."*

2.1 Definition of terms

i) Agroforestry

Agroforestry is a collective name for land-use systems and technologies where woody perennials (trees, shrubs, bamboo, palms, etc.) are deliberately grown on the same land as agricultural crops and/or animals, in some form of spatial arrangement or temporal sequence.

ii) Deforestation

This involves a decrease in the area covered by forest. However, it cannot be so defined without adding a reference to its use (or allocation). In point of fact, there exist certain forms of forest utilization - and priority objectives of forest management - that clear temporarily the forest cover while guaranteeing its maintenance.

iii) Degradation

This does not involve a reduction of the forest area, but rather a quality decrease in its condition, this being related to one or a number of different forest ecosystem components (vegetation layer, fauna, soil etc), to the interactions between these components, and more generally to its functioning. The ambiguities of the term degradation, and the difficulties of estimating it, are additional reasons for clearly differentiating between deforestation and degradation.

2.2 Theoretical Background

Concepts, Opinions, Ideas from Authors/Experts

Declining food and wood security coupled with low income levels are major problems faced by small scale farmers in Africa in general and Uganda in particular. They translate into poverty,

which is the inability of people to meet basic necessities of life. The twin evil of environmental degradation is a common feature as poor people cannot conserve the environment. The Agroforestry programme in Uganda is solving these problems by generating technologies that enhance integration of trees on farms for increased production and environmental sustainability. We believe that trees can achieve this owing to the multiplicity of products and services they provide (timber, food, fuel wood, poles fodder, medicine, spices, gums, raisins, soil fertility improvement, erosion control wind breaks, shade etc). [Okorio J, and Nsita S. 2003]

There are several driving forces and pressures that exert a lot pressure on natural resources including forestry and tree resources in the Busujju County in Uganda. They occur at household, community or landscape levels.

i) Household level

At the household level several factors are the major driving forces that lead to unsustainable management and utilization of natural resources including forest and tree resources. They include lack of resources for investment in natural resources, low income levels, low levels of education, lack of awareness and knowledge on sustainable management and utilization of natural resources, gender imbalance on access and control of natural resources. [Place, F. and Okorio, J. 2004]

ii) Community /Landscape level

High population, lack of bye-laws or lack of their implementation, communal ownership of natural resources, low levels of awareness on importance of natural resources, lack of community action at landscape level, and lack of awareness on policies and regulations governing the management and utilization of natural resources are some of the major driving forces in the Busujju County in Uganda. [Place, F. and Okorio, J. 2004]

2.3 Agro-forestry practices

Agro forestry practices differ considerably from the country as farmers adapt to needs and circumstances. Agro forestry practices encompass an entire spectrum of land use systems in which woody perennials are deliberately combined with agriculture crops and/or animals in some spatial temporal arrangement (ECA 2005), Advocates have contents that forest conservation is one of its secondary benefits (UNEP/IISD, 2005). The presence of woody per annual in agro forestry systems may affect several bio-physical and bio-chemical process that determine the health of made forests such as plantations (both pines and hardwoods), (Magunda M, 1999).The

less disputed of the effect of trees on soil include; amelioration, maintenance or increase of organic matter and diversity through continues generation of forest roots and decomposition of litter (Wanyama Ronald 2005). Available information indicates that agro-forestry can provide a greater range of environmental good out comes (benefits) than conventional types of annual crop cultivation. Case in a point, Murniati et al (2001) found that in areas near national parks in Sumatra, Indonesia, house heads with diversified farming systems, including mixed perennial cultivating only wetland rice. Thus, tree felling (non-selective cutting) and unsustainable hunting practices in the nearby parks were reduced.

The findings suggested that promoting diversified farms with agro-forestry in buffer zones can enhance forest integrity (conservation). Many developing countries, nongovernmental organization and private companies exist as a good example in supporting agro forestry in exchange for carbon benefits. Kenya farmers association, over 7000 small-scale peasants in 40 communities are converting from Kenya agriculture to agro- forestry, either by intercropping timber trees with crops or by enriching fallow lands. (Lwakuba C. Mburu 2001), The international federation of automobile has managed to purchase the outcome 17000 tones of carbon off sets for Us \$10 to \$13 per tonne of carbon .sixty percent of the revenue to farmers. Ecuador, is also one of the country actively participating in this project of carbon trade by planting mixed woodlots of pine trees, and indigenous species without forgetting eucalyptus. pine and eucalyptus ate profitable providing fire wood, materials for industries for industries dealing in timber. This again puts into question the sustainability of carbon trading tree project involving activities that are not in themselves profitable (Zake 1997)

In united republic of Tanzania, District of tabora, about 9,000 farmers of tobacco have started woodlots to produce fuel wood for tobacco curing, intercropping the trees with maize during the first two years Ramadan et al (2002),Growing wood on the firms prevents the felling of trees from the forests reducing forest degradation and saving of transporting fuel wood. In United Kingdom, a range of timber/cereal and timber/ pasture systems have been profitable to farmers. MC Adam et al (1999) found that ash trees intercropping with ryegrass pastures did not influence the pasture yields for the first ten to 15-years of the 40 year rotation. In pastoral systems the uncertainty of meat prices Vs timber prices further encourages local people to practice agro forestry. The concepts of value in this study, reflects three perspectives, that is to say anthropocentric, economic and narrow adapsic view point. In the world of increasing environmental consumption and scarcity of resources, relative economic values and

anthropocentricism are central. Economic analyses view forest conservation in terms of its value relative to other scarce goods and services.

Economists argue that the theoretical to rigorous economic analysis of adopting agro forestry practices in conserving forest resource is lacking and empirical analysis is rare (Delve j, 2002). A case in point, after reviewing 102 agro forestry project evaluation, Delve j, (2002) concluding that only a few attempted to assess economic impacts on forest conservation. At the same period, while there has been considerably economic research on the causes of changing forest productivity, conventional neoclassical economics has not been fully used to know the use of national and artificial (forests) resource stock as forest in improving five of non- market services such as forest conservation. Even the few economic analysis of forest conservation have considered climate and weather quality/changes only in terms of desertification, floods and related problems (Delve, 2002). The issue of economic evaluation of forest conservation and adoption of agro forestry can be explained by several factors including: the spatial and temporal complexity of agro forestry systems; heterogeneous community conditions at the inner and inter-household level. Multiple input and output; and existence of several non- market costs and benefits all these factors make rigorous statistical analysis not easy. Understanding the long run impact of aching in soil quality on forest productivity in particulars and societal welfare requires extensive economic and agro-ecological panel data with significant length and width.

These stages analysis of this kind have been proposed by Freeman (1993) for examining the relationship between the economic concept of value and the biophysical dimension of natural resources systems being under taken (valued). This frame work is generally implied by Francisco (1997) for the estimation of water shed protection benefits of forest reserve in Eastern Nigeria. They concluded that agroforestry which is a traditional used method in conserving forests are very good / important, but have weakness and limitations. A study of evaluation of land use and forest degradation was conducted in Mityana using remote sensing field surveys, house hold and transects (olson,1995).The study found that since the 1940's, almost all forests are being managed with only short expectations. The only exception is planted forests mostly managed / owned by a few wealthy people around Mityana East who put aside land for agriculture and also put especial land for only trees being planted by them. In other natural forests, however forested areas are intensely over encroached. Characteristics forests management technologies employed include, "cut one and plant two tree seedling," community sensitization conservation techniques on sustainable harvesting of forest resources.

Among the main pressure cause of forest degradation include physical factors and human activities that include degradation. Cases in point of physical features that cause forest degradation are climate, topography and soil type. The central (Mityana) is among the most affected by forest degradation in Uganda. Mainly due to its high population and high demand of forests products (firewood) by the nearby district like Kampala. Climate may contribute to forest degradation via dry periods and wind storms. For instance, even high intensity of dry season contributes to forest degradation, NEMA, (2006). Additionally, rural - poverty restricts the ability to invest in sustainable land use practices. Much of the current wood for consumption comes from the clearance of land for agriculture, especially as far as wood for charcoal production is concerned. However, it is reported that only one third of the wood that is cut in the clearance of land for agriculture is used in charcoal production, the remainder being burned off as waste used for fire wood, or in construction.

Over harvesting is worst in the natural high forest, where over half of the forests are suffering from over harvesting .The the forest department stopped licensing harvesting operations in the tropical high forests. A study by Forest Department and National Forestry Authority, (2006), record, the softwood plantations declined from around 16000 ha in 1990 to less than 2000 ha in 2006. On the others it encourages saw millers to move into the already over- maturing soft wood plantations. However, this move had its serious effects on the little remaining forests. Among the main pressure cause of forest degradation include physical factors and human activities that include degradation. A case in point of physical features that cause forest degradation are climate topography and soil type. Soil fertility declining, forest clearing, over harvesting and examples of arable harvesting practices are examples of human activities that include forest degradation. The central district (Mityana) is among the most affected by forest degradation in Uganda. Mainly due to its high population and high demand of forests products (firewood) by the nearby district like Kampala. Climate may contribute to forest degradation via dry periods and wind storms. For instance, even high intensity of dry season contributes to forest degradation, NEMA (2006). Additional, rural poverty restricts the ability to invest in sustainable land use practices. Much of the current wood for consumption comes from the clearance of land for agriculture, especially as far as wood for charcoal production is concerned. However, it is reported that only one third of land for agriculture is used in charcoal production, the remainder being burned off as waste used for fire wood, or in construction.

Poor farmers/community often survive by harvesting natural resources such as forest products, the resulting over harvesting leads to exhaustion of open access resources such as ungazetted forests (NEMA, 1999). Again, poor communities may discount future consumption heavily because of their limited short term gains. This implies forest conservation technologies should show demonstrable benefits in a reasonable short- term in order to be accepted to poor or less income farmer (Pender 2002). The second implication of farmer's high discount rate for future consumption is their undervaluing of future intrinsic value of natural resources for coming generation such as biodiversity. This shows that conservation of habitats plus biodiversity may not be important to poor communities. Therefore, poor community may not conserve habitat and biodiversity resources without enough compensation from government or conservation organization.

2.4 Causes of forests degradation in Uganda

Generally in the country, there are several challenges that need to be overcome in order for forestry and tree related activities to greatly contribute to national development. These challenges include but are not restricted to the following [Okorio *et al*, 2003]: - inadequate knowledge on tree growing, long gestation period of trees as a commodity, lack of and limited access to appropriate planting materials, inadequate information on market opportunities for forest and tree products, weak advisory services and farmer participation in planning, and the weak linkages between the relevant institutions in the sector.

One of the major constraints to the promotion and wide scale promotion and adoption of forestry and agroforestry innovations by farmers and the communities is the lack or inadequate knowledge on tree growing. However, through some training by several programmes, some achievements have been realized in this area but a lot more needs to be done. For most tree species being promoted, there is inadequate quantity and quality of planting material or germplasm. Under the NFA, the centre is trying to re-structure itself in order to have a country wide framework for distributing quality seeds to clients.

The long gestation periods for investments in tree growing make it unpopular especially among the poor who prefer to invest in areas where returns are short term. There is currently very little information on the demand and quantities of available forest and tree products in the country. This leads to low profits and production of low quality products since there is no link between the products and the markets. The establishment of NAADS has greatly improved agricultural

advisory services to farmers and communities. However, messages in forestry and agroforestry are not usually on the priority list of farmers and the communities. There is also need to have strong linkages between the various institutions in the sector for better development and utilization of forest and tree resources.

Other challenges faced in the sector include; damage to forest resources through uncontrolled bush burning, damage to planted trees by domestic livestock and drought, tree pests and diseases, and the perception that forests and tree harbour wild animals and birds that destroy both food and cash crops.

There is a lot of damage to natural forests and tree resources through uncontrolled bush burning especially during the dry seasons when livestock keepers induce fires to regenerate fresh grass for cattle.

In some cases damage to trees from strong winds is also reported as a problem. As far as newly planted trees are concerned, the major problems are damage from roaming domestic animals and prevalent droughts in these areas that lead to high mortality rates of newly planted seedlings.

Tree pests and diseases are also reported as major problems to tree growing especially such as on eucalyptus. Currently in the country, Eucalyptus is under very serious attack from the blue gum chalcid believed to have originated from Australia and was probably introduced in the region accidentally through seed scions [Kiwuso 2005].

The other major hindrance to tree growing by communities is the perception that forests & trees harbour wild animals and birds that destroy both food and cash crops. This in most cases discourages people to grow trees in as much as they know their value.

2.5 Impact of forest conservation in Uganda

Proper resource management is based on the recognition that less resource use can lead to long term economic benefits and reduced environmental costs (NEAP, 1995), NEMA 2006). In the thesis, the National forestry tree planting and tree planting act, the National Forestry Authority (NFA) over the last few years has a great impact in restoring and managing of the central forests. For example out of the 506 forest reserves, 405 have written forest conservation plan - NEMA, (2008).

The woody vegetation change 1985-2002 showed that the land cover of several forest reserves increased in woody vegetation. The forest reserve that showed significant increase in woody land cover include Mt. Kei Aswa Phillips G.P, (2005) Lusiba in Mityana, and Munaina Mubende district; Ofzi forest reserve. Wildlife sanctuary recorded the highest (40-59%) increase. The rest of the reserves (e.g.) Era, Zulia and Kilak showed low 1-19% increase in woodland cover, Mt. Moroto FR showed the highest woodland cover loss of 20-39%, while other forests experience a loss of 1-19% (e.g. Nyangena - Napore, Opit, Iwala and Rom); Environmental Extensioners (NEMA, 2006). Other small Natural forest reserves, particularly around Lira town suffered severe decreases in woodland cover (40-59%)

The state of the environment reports (2001,2006) other literatures describe the causes and severity of forest degradation in the country based on the available knowledge but without the benefit of a national level study the most common human reason cited as causing forest degradation is urbanization and industrial growth. The NEAP of 1995 and other reports have stated that most of the country has been affected by urbanization and industrialization putting pressure on the forest estate many urban and peri-urban reserves are under threat of being degazetted. The increasing demand for industrial land has led to the degazetting of nearly 10000ha, which will result in a permanent net reduction of the forest resources estates unless alternative non-forested area identified and developed (Zake et al 1999). The most affected forest reserve are those close to the urban and industrial centres, for example Namanve forest near the capital Kampala.

Agroforestry has an important role to play in the country both for food and wood security and the conservation of the environment. By integrating tree growing with crop production, the problems of poor agricultural production, worsening wood shortages and environmental degradation can be addressed. Furthermore, Agroforestry technologies/practices are seen as an opportunity to take pressure off the remaining natural forests and to increase the diversity of vegetation on existing farms.

2.6 Effects of agro-forestry practices in the conservation of forest resource

2.6.1 Natural resources and Ecosystems

The high demand for food, fuel and fiber exert pressure on all natural resources including forest and tree resources. Continuing conversion of land to agriculture and increasingly intensive land use systems indicate serious land degradation in the future. Drastic changes in the forest cover in

the country during the past century. Forest cover has reduced from 52% in 1890 to only 24% of the land surface area in the country today (MWLE, 2002).

As indicated earlier land use/cover in the Busujju County has considerably reduced. The combined effects of deforestation and high consumption result in an accelerating imbalance between demand and supply of forest and tree products in the area. A recent study also indicates that the overall biodiversity in the country, including the Busujju County, is declining (MUIENR, 2000).

Overgrazing, rampant deforestation and encroachment on forested areas and rangelands for non-crop production have led to severe degradation of these areas. The relatively rich biodiversity in the Busujju County has been cleared for expansion of agricultural land; and by charcoal / firewood production for domestic cooking and income generation through charcoal sales to urban centres; and wild fires set by pastoralists. This has led to significant loss of the natural vegetation, and the role of trees acting as global carbon sink in controlling climate change is impaired and much of the native biodiversity of medicinal, cultural, food and economic value is being lost in the degradation process.

It was evident from the transect walks and discussions with the communities in the county that current farming practices have had a profound effect on forest and tree resources. Overall, there is a general decline on forest and tree resources resulting in the scarcity of products derived from them (National Biomass Study 2003). Generally, rural development has been found to be critically important for economic growth and poverty reduction and virtually all rural people depend on small holder agriculture as their primary economic activity (Von Braun, 2004).

Agriculture is the economic nexus of rural areas, generating employment (both on and off-farm sectors), income, and providing food security. There were several examples of income generating activities that are based on forest and tree resources that were highlighted by the communities in the study area. Most of them are based on the exploitation of forest and tree resources rather than on planned and managed harvesting. The result is the disruption of the ecosystems from which these forest and tree products are extracted.

It has been argued that, investment in rural areas is crucial for the efficient and sustainable use and management of natural resources (soils, water and forests) which are strongly linked to long-term growth and poverty reduction (Von Braun, 2004). However, the high levels of poverty in rural areas perpetuate the unsustainable utilization of natural resources including forest and tree

resources by rural communities. This implies that natural resources may be irrevocably harmed to the long-term detriment of rural areas. It is very clear that natural resources in the Busujju County in Uganda are facing serious exploitation with limited efforts aimed at reversing the trend.

2.6.2 Livelihoods and natural resources

In Uganda, as elsewhere, low funding and incentives, inadequate livelihoods perspectives, inappropriate skills, and over-centralization have all reduced the effectiveness of the management of natural resources (Harrison et al., 2004). The livelihoods approach has been found to be useful in understanding the livelihood options adopted by the resource poor rural farming households (Chambers and Conway 1992; Ashley and Carney, 1999) such as how household members access resources, barriers that prevent access (e.g. ethnicity, gender), ability of households to build and use assets, (physical, financial, natural, social, environmental, political); and structures that control resources, governance structures and long-term uncertainty.

The sustainability of the enterprises that farmers engage in, is put to question if the natural resource base on which they depend is continuously exploited. This underscores the need to understand the factors and actors that shape the livelihood options of these communities, as a basis for developing potential strategic options that respond to their unique circumstances, while ensuring sustainable use of the natural resources. For instance, policies, institutions and social processes play a pivotal role in helping or hindering peoples' livelihood options. This is even more significant in light of the fact that most natural resources are common property resources (FAO 1993; 1999).

A recent study north-eastern Uganda indicated that the livelihoods of rural communities rely heavily on the natural resources as a result of social and climatic changes that have reduced the dependence on subsistence agriculture (UPIMAC, 2004). However, this has resulted in the natural resources being mined to the detriment of the future generations. The major natural resources are diminishing in the face of increasing human population and changed livelihood coping mechanisms that have been adopted by the communities. Open access of communities to forest and wetland resources has reduced as they become restricted and privatized. Individual owners of these resources place more restrictive measures that limit their availability to the communities, who revert to the remaining common property resources for their livelihoods.

Although there are well known regulations on the utilization of various natural resources, these are not implemented due to lack of capacity by the local institutions and the insecurity that prevailed in these areas. The combination of these forces has rendered the natural resource base more vulnerable to depletion. There is a need, therefore, to build capacity to implement these regulations and consequently popularize them at various levels.

From the field visits and above experiences it is clear that a majority of the current livelihoods engaged in by the communities in the study area are based on the natural resources which unfortunately are being degraded hence endangering the very survival of these communities. It is, therefore, imperative that sustainable land management options be developed to ensure present and potential livelihoods options based on these resources are sustained and enhanced.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter covered the; Research design, population of the study, sample and size, sampling design and procedure, methods of data collection, measurement of variables and data analysis.

3.1 Research Design

Descriptive approach was used so that the problem at hand to be described in-depth. This led to collection of data that was related to impact of Agroforestry and conservation of natural resources was concerned. The techniques and tools that were used in collection of data were; questionnaires, interview and secondary data like reports, journals. This type of design was preferred for reason not limited to the fact it allowed for in-depth understanding of the subject under investigating and above all allowed for the collection of data from a cross-section of respondents in the shortest time possible using the appropriate instrument.

3.2 Area of study

The study was carried out in Busujju County, Mityana District. Mityana District is a district in Central Uganda. The district was created in 2005, by taking the Mityana and Busujju counties from Mubende District. Like most Ugandan districts, it is named after its 'chief town' of Mityana. Mityana District is bordered by Kiboga District to the north, Nakaseke District to the northeast, Wakiso District to the east, Mpigi District to the southeast, Butambala District and Gomba District to the south. Mubende District lies to the west of Mityana District. The district headquarters at Mityana are located approximately 77 kilometers (48 mi), by road, west of Kampala, Uganda's capital and largest city. The coordinates of the district are: 00 27N, 32 03E. During the 2002 national census, the district had a population of approximately 266,100. It is estimated that in 2010, the population of Mityana District was approximately 354,000. The study area has been chosen because is one of the area in Uganda greatly affected by forest degradation according to the ministry of lands and environment Report (2006).

3.2.1 Study population

The study population included; Local Council 1 Environment Committee Members, NEMA and Forest Officials at the county and district levels. Key informants were categorized as male and female parents, Local Leaders and the Local Farmers mainly affected by the impact of

Agroforestry and those that had prior knowledge on the tragedy. In total, 60 informants were interviewed out of which 31 were female and 29 female.

3.3 Sample Framework

3.3.1 Sample Size

The size of respondents expected was entry from each group that is 31 Males, 29 Females. This size was more preferable due to time limit and the resources available to carry out the research, and it was used to ensure accuracy in data collection not forgetting the fact that there is appropriately a small gap between the respondents because of the researcher's idea of having a balanced survey among the respondents.

Table 1: The sample size used in the study

No	Respondents	Frequencies	Percentages [%]
1.	Males	31	52
2.	Females	29	48
	Total	60	100

Source: Primary Data

3.3.2 Sample Technique

Because of the large size of the population and other problems, the researcher used both random and purposive sampling to decrease on the size of the population. This was chosen because of the fact that the study targets wide range of respondents. Therefore, key respondents who included Local Council I Environment Committee Members, NEMA and Forest Officials were purposively selected while the farmers were selected randomly. Simple random method was administered to get the sample size; this was because not all respondents are knowledgeable about the major impact of Agroforestry on conservation of natural resources. So, only those indentified to have such information were selected.

3.3.3 Sampling Procedure

The researcher used quantitative selection method, where respondents were randomly selected to represent the population.

The following sampling techniques were used to select respondents participated in this study.

i) Purposive Sampling

Local Council I Environment Committee Members, NEMA and Forest Officials were selected purposively to participate in the study of virtue of their positions and direct involvement in the well being of these natural resources taking forests as our first target as a whole. Local leaders were considered as one of the key informants, and they were selected because they are in administrative and policy positions, therefore, with a critical observation to the study successful. Purposive sampling was suitable for selecting key informants because by virtue of their positions in the respective offices, they held relevant, key information required for the study.

ii) Systematic Random Sampling

A sample of 28 farmers out of the 60 most especially those directly involved in the activities that led to degradation of forest and other natural resources as a whole were systematically sampled to participate in the study. Systematic sampling was used to avoid bias in obtaining samples and a sampling interval was established by random method to select the participants consistently.

3.4 Data Collection Instruments

The main methods and instruments of data collection included;

i) Questionnaire

Semi structured questionnaires was used to collect data. They contained two sections; section A provided background information about respondents, and section B contained a mixture of open and closed ended questions. These were thought to be appropriate because they facilitated the collection of both qualitative and quantitative data. The open ended questionnaires allowed the respondents' wide latitude to express their views on the choice of option on the item. The structured options facilitated comparison of respondent's opinions.

ii) Interviews

The researcher conducted oral interviews with the respondents. A check list to reduce bias and maintain consistency was designed to guide the interviews. Interviews were preferred because they allowed key information to talk about the subject at length and provide background answers to the questions.

3.4.2 Sources of data

The researcher used both primary and secondary data sources. Under the primary data sources, the researcher focused on the raw data from the respondents of the study. This data was always reliable since first hand or original was obtained. Under secondary data sources, the researcher used information from various journals, magazines, textbooks and other published literature relating to the assessment of Agroforestry and conservation of natural forests in Busujju County – Mityana district and Uganda in general.

3.5 Research Variables and Measurement

The researcher focused on one independent variable – impact of Agroforestry and one dependent variable – conservation of natural resources. The researcher used such techniques as randomizing and holding constant so as to control the extraneous variables from interfering with data collection.

3.6 Data Quality Control

To ensure quality, reliability and validity of the research findings, triangulation was carried out. This involved the use of different sources of data, and use of multiple methods of data collection like interviews, questionnaires to reduce bias, errors and improve on the validity of the findings.

3.6.1 Validity

This refers to appropriateness of the instruments used in the study. It is the ability to produce findings that are accurate and in agreement with the theoretical and conceptual values of the study. To ensure validity, a pilot study was conducted to test the research design and the methods and the instruments. This helped to assess the language clarity, ability to tap information needed, acceptability, and privacy of the respondents.

3.6.2 Reliability

This refers to the dependability or trustworthiness in context of the research findings. It is the degree to which the instruments consistently bring accurate information to reduce bias on the research findings.

3.7 Data Analysis

The data was analysed in form of; graphs, table charts, depending on the convenience and requirements of the data collected, and conclusion was drawn.

The researcher used two techniques of data analysis;

3.7.1 Descriptive statistics of percentages

This was used because percentages are easy to interpret and they facilitated easy comparison of items. Tallies for each response for example; agree, strongly agree, disagree, not sure were tabulated and used to draw frequency counts for each item, which were used to compute percentages and presented in the tables or charts.

3.7.2 Qualitative descriptions based on themes studied

This was suitable for data obtained from oral interviews and open ended part of the questionnaires. The responses were categorized using data reduction method, and these were tallied and expressed in frequency counts for the key informants. Hand descriptions or explanation was employed to explain the choice of option in the semi-structured questionnaires. The inter-correlation between Agroforestry and natural resources' conservation was undertaken to establish the strength of the effect.

3.8 Ethical Considerations

An introductory letter from the College of Applied Sciences and Technology was obtained to enable the researcher access to the respondents of the study. The letter was addressed to all the Local Leaders and other Authority of all areas where study was to commenced, who in turn wrote a recommendation letter to the other authority concerned including the respondents' heads as well. The researcher made appointments with the respondents accordingly, and a promise of confidentiality was assured. The researcher made sure that the information provided was treated with all the confidentiality it deserved and that it was used exclusively for academic research purposes.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSIONS

4.0 Introduction

This chapter presents the research findings. The main objective of the research was to, “Assess the role of Agroforestry in the Conservation of Forest Resource in Central District of Uganda: A Case Study of Busujju County - Mityana District”. The results to the items were tabulated to figures [Bar graphs and pie charts], tables and percentages.

4.1 Presentation of Demographic Information

This section presents gender of the respondents; age, marital status and their education level as follows:

4.1.1 Respondents' gender

Having been asked about their gender differences, the following results were obtained from the respondents as shown in table 1 below;

Table 2: The gender of Respondents

Response	Frequency	Percentage
Male	31	52
Female	29	48
Total	60	100

Source: Primary Data, 2012

According to table 2, the first demographic characteristics to be discussed were the respondent's sex differences; it clearly shows the make-up of the study population which was further divided into 31 [52%] males and 29 [48%] female. There is appropriately a small gap between the respondents because of the researcher's idea of having a balanced survey among the respondents as intended by the researcher and as explained in chapter three under sample size.

4.1.2 Respondents' Age groups

In response to knowing their age groups, the respondents gave the following results as illustrated in table 3.

Table 3: The age Group of Respondents

Response	Frequency	Percentage [%]
18 – 25	8	13
26 – 35	17	28
36 – 45	25	42
45+	10	17
Total	60	100

Source: Primary Data, 2012

When the study related the age and number of local council one environment committee members, NEMA and forest officials at the county and district levels, it came out with the following results, the majority of the study population were aged between 36 – 45 years with that age group representing 42%. This is mainly because usually it's this age bracket involved in both the administrative, policy making / implementation and the able bodied farmers in the activities and programmes of agroforestry since the youth could be school goers and leaving the elderly of 45+ not be involved in such activities.

4.1.3 Respondents' Marital Status

Respondents were asked to show their marital status in the questionnaires given to them and the following results were obtained;

Table 4: Marital Status of the Respondents

Response	Frequency	Percentage [%]
Single	20	33
Married	30	50
Divorced	10	17
Total	60	100

Source: Primary Data, 2012

In our table 4, efforts were made in this study to find out whether marital status affected much of the participation in these agroforestry activities of this region of research and the research came up with the following results; 50% married, 17% divorced, 33% were single. The mere fact that the majority of the respondents were married is a pointer to the fact that the target group mainly consisted of the males who were either in their marital homesteads or those males who were majorly involved in the policy making positions or administrative seats which is always held by the men and in most cases, family people.

4.1.4 Respondents' Education level

The education level of the respondents was one of the major needed requirements in the questionnaire and the following results were given

Table 5: The Education Level of the Respondents

Response	Frequency	Percentage
Primary	8	13
Secondary	12	20
College	11	18
Diploma	19	32
Degree	10	17
Total	60	100

Source: Primary Data, 2012

Table 5 shows that the level of education of the respondents is average and good with 17% degree, 50% tertiary level, 20% secondary, 13% primary. This was due to the fact that majority of the respondents and those who were majorly considered in the research were those stakeholders who are directly or indirectly involved the programmes and activities of agroforestry such as the local council one environment committee members, NEMA and forest officials at the county and district levels whose qualification should be high so as to attain such employments and even the response from lower levels wasn't that small since these were the farmers who were either primary dropouts or secondary going students but involved in these activities.

4.2 Responses on the Agro-forestry practices

According to the research objective number I, the respondents were asked whether they had any knowledge on the Agro-forestry practices and the following results were obtained as shown in table 6.

Table 6: The Responses on the respondents understanding of the Agro-forestry practices

Response	Frequency	Percentage [%]
Yes	40	67
No	20	33
Total	60	100

Source: Primary Data, 2012

As the table shows, a big percentage of the respondents 40 [67%] said that they did have knowledge on the major Agro-forestry practices in Busujju County – Mityana District, and these could be as a result of sensitization by the local community, local leaders and even those involved in the activities of agroforestry themselves whether at the low base or at the administrative sectors whereas a small number of only 20 [33%] said NO to the question since these could be the little ones who never gave in their time to go and attend the seminars or workshops that are sometimes or once in a while conducted in their communities by the concerned stakeholders such as NEMA officials or the NGOs.

4.3 Responses on the Causes of forests degradation in Uganda

Causes of forests degradation in Uganda in Busujju County, being our objective number II, saw the following results given by the respondents after filling in the questionnaires and they are given as follows.

Table 7: The Causes of forests degradation in Uganda in Busujju County

Response	Frequency	Percentage
Lack or inadequate knowledge on tree growing	19	31
The long gestation periods for investments in tree growing	13	22
Damage to natural forests and tree resources through uncontrolled bush burning	8	13
Damage to trees from strong winds	7	12
Tree pests and diseases	7	12
Wild animals and birds that destroy both food and cash crops	6	10
Total	60	100

Source: Primary Data, 2012

The table number 7: shows the Causes of forests degradation in Uganda in Busujju County, Mityana District, the biggest number of respondents came from those who said that Lack or inadequate knowledge on tree growing was one of the biggest causes of Causes of forests degradation in the area with 19 [31%] response out of the 60 [100%] respondents, this was followed by the long gestation periods for investments in tree growing with 13 [22%] which

make it unpopular especially among the poor who prefer to invest in areas where returns are short term, damage to natural forests and tree resources through uncontrolled bush burning followed with 8[13%] respondents, Damage to trees from strong winds and Tree pests and diseases received the same response with 7 [12%] whereas the remaining respondents attested to perception that forests & trees harbour wild animals and birds that destroy both food and cash crops and this in most cases discourages people to grow trees in as much as they know their value with 6[10%]

4.4 Impact of forest degradation in Uganda

Upon distribution of the questionnaires, and with relevance to research question III, the following response was obtained from the respondents as given in table 8 below to whether they had knowledge on the impact of forest degradation in Uganda;

Table 8: Impact of forest degradation in Uganda

Response	Frequency	Percentage [%]
Yes	25	47
No	35	53
Total	60	100

Source: Primary Data, 2012

In regard to the above table, the least respondents that is; 25 out 60 respondents representing 4% agreed that they had knowledge on the impact of forest conservation and said that Agroforestry has an important role to play in the country both for food and wood security and the conservation of the environment. By integrating tree growing with crop production, the problems of poor agricultural production, worsening wood shortages and environmental degradation can be addressed whereas the majority of the responses came from those who said that they did not had any knowledge with 35[53%] and these are likely to be the majority local farmers and the local community who spend most of their time in agricultural activities and fail to attend the seminars and workshops that are sometimes organized by various groups of people to sensitize the community about the dangers and impact of forest degradation.

4.5 Effects of agro-forestry practices in the conservation of forest resource

With accordance to the research question IV, the respondents were asked whether they have any ideas on the effects of agro-forestry practices in the conservation of forest resource as shown in table 9.

Table 9: Respondents' view on the Effects of agro-forestry practices in the conservation of forest resource

Response	Frequency	Percentage [%]
Yes	40	67
No	20	33
Total	60	100

Source: Primary Data, 2012

The table shows the Respondents' view on the Effects of agro-forestry practices in the conservation of forest resource in Busujju county, Mityana district with 40[57] and they went on to elaborate that agroforestry affects natural resources and Ecosystems in such a way that the high demand for food, fuel and fiber exert pressure on all natural resources including forest and tree resources and also showed that agroforestry affects the livelihoods and natural resources in such a way that in Uganda, as elsewhere, low funding and incentives, inadequate livelihoods perspectives, inappropriate skills, and over-centralization have all reduced the effectiveness of the management of natural resources.

A small number of 20[33%] said NO to having knowledge on the above topic at hand and these could be the deeper local farmers who are always minding about farming other than attending farming sensitization meetings and seminars that are sometimes conducted in their regions where.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter deals with discussion of the findings, draws the conclusions as well as making recommendations to the research carried out. After a brief presentation of the general information of the respondents, the conclusions are presented basing on the four objectives of the study set to assess the Assessment of Agroforestry in the Conservation of Forest Resource in Central District of Uganda: A Case Study of Busujju County - Mityana District. Specific recommendations emanating from the findings follow at the end of the chapter.

5.1 Conclusions

The study aimed at finding out the correlation between agroforestry and conservation of natural resources in Mityana district – Central Uganda; a Case Study of Busujju County, to analyze the different agro-forestry practices, examine the causes and impact of forest degradation and assess the effect of agro-forestry practices in the conservation of forest resource in central districts in central Uganda.

Lastly, if ending the causes and impact of forest degradation is not possible, as it might be in the central Ugandan case, then the international community should support national and community efforts to try to prevent the major or even least causes of forest degradation. This may involve, for example, monitoring rural areas or towns to make these areas aware of the various ways on how get out of this problem through sensitization methods like; training, seminars and workshops between the responsible stakeholders such as the NGOs and the government; however, this is clearly a short-term strategy. Long-term policies should aim to improve economic opportunities in rural areas of Uganda, to offer communities more constructive alternatives to fighting the outbreak of such problems and completely staying out of it or preventing it to the least cause if all works out possible when given all the necessary opportunities and resources.

5.2 Recommendations of the Study

Recommendations on specific interventions showed that given the findings of the study and the major challenges and opportunities that exist in the area, the following forestry and agroforestry interventions are proposed: -

5.2.1 Adaptation and up scaling of appropriate technologies

There will be need to adapt and promote relevant forestry & agroforestry technologies in these areas if current trends are to be reversed. Currently there are several existing technologies and innovations that can address these issues and they can be obtained from within the country, in the region or globally. They include technologies on wood & energy production, tree based land management technologies, tree based crop and livestock production technologies, growing and management of high value trees (e.g. fruits, medicinal) and many others. These need to be evaluated and promoted together with the communities and the local governments.

Numerous technologies have been developed by national, regional and international research centres and are being promoted in different areas by governments, NGO's and CBO's. There will be a need to select those that are appropriate for the Busujju County, Mityana District and then validating them with the communities and local governments. For those that are already being promoted in some parts of the County e.g. improved tropical fruits, it is necessary to upscale their promotion in the region., while for those technologies that have been found to be working elsewhere (e.g. improved fallows in Southern Africa) the acquisition of quality planting materials and then testing them will be paramount.

5.2.2 Capacity building of major stakeholders

Building the capacity of the communities and local governments on the growing and management of forest and tree resources in the Busujju County, Mityana in Uganda will be critical to the success of the area. This can be done in several ways including but not restricted to awareness creation on importance of forest and tree resources, training on relevant forestry and agroforestry skills, training on the production of planting materials (seeds, seedlings and scions), production of promotion materials, and study tours or exchange visits. Without the capacity to establish, manage and utilize forest resources, communities and local governments will continue to witness more impacts of deforestation. In order to reverse this trend, it is important for them to develop this capacity in order to have sustainable management and utilization of forest and tree resources.

5.2.3 Building strategic partnerships

During the implementation of most objectives, it will be very crucial to develop partnerships with key partners involved in natural resource management in the Mityana District of Uganda. Such partners include those from research, development, local governments and the farming communities. Experience has shown that where such partnerships have been developed, the successes of the programmes being implemented are very high.

5.2.4 Development of a communication and dissemination strategy

In order to upscale those technologies that have been found to be effective, there is need to develop a communication and dissemination strategy that ensures that all the major stakeholders have access to this information. This will involve determining the status of their knowledge, attitudes and practices on forestry and tree resources. Based on the identified needs, a communication and dissemination strategy can be developed that is aimed at up scaling and sustaining the achievements made from the concerned stakeholders. Relevant dissemination materials can then be developed and distributed to relevant stakeholders at community, national and regional levels. These materials can include but are not restricted to the production and distribution of brochures, posters, leaflets, radio programmes, music, dance and drama.

5.2.5 General Recommendations

The local communities or the country at large cannot be the only source or remedy to be relied on issues concerned with agroforestry and conservation of natural resources but a variety of solutions can be put in place especially the government through provision of all reliable assistance such as the National Environmental Management Authority which should come up to sensitize and train these farmers on the various agricultural practices that a more technologies that the low level practices that they use in their regions and the government should also render a financial assistance hand to these farmers in various projects other than agriculture alone like poultry keeping given as an example.

Research and knowledge base, improving policy response through country level, promoting research, collecting data and compiling statistics particularly concerning agroforestry and conservation of natural resources to prevent the outbreak of forest degradation and other related negative impacts in due course.

Enhancing policy and legal process regarding the investigation and management of natural resources should be looked at in the first instance. The community leaders and government

officials should review and address service policy to establish good practice in accordance with better welfare of these resources.

5.2.6 Areas for future research

Since the study aimed at finding the correlation between agroforestry and conservation of natural resources, research findings revealed that no so much has been done to curb down the insurgency of forest degradation in Busujju County, Mityana district – Central Uganda, which was the case study in question; hence the need to find out the impact of agroforestry and conservation of natural resources in other regions of the country and how to overcome their insurgencies by the future researchers.

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APPENDICES

APPENDIX I: QUESTIONNAIRE TO THE LOCAL LEADERS & OTHER STAKEHOLDERS

Dear Respondent,

I am TUSIIME LONARD, a student at Kampala International University, offering a Bachelors Degree of Environment Management. I humbly ask you to participate in this research on the, *"The Assessment of Agroforestry in the Conservation of Forest Resource in Central District of Uganda: A Case Study of Busujju County - Mityana District."* I am privileged to have you as my respondent and the information given to me is purely academic and will be treated with confidentiality.

Instructions:

- i) Please help by answering the following questions as honestly as possible. Please Tick where appropriate and explain where necessary
- ii) All the information availed to me is to be treated with maximum confidentiality

Section I: Bio Data

1) Gender

- a) Male ☐
- b) Female ☐

2) Education background

- a) Primary ☐
- b) 0 level ☐
- c) A level ☐
- d) Diploma ☐
- e) Degree ☐

3) Age

.....

4) Marital status

- a) Single ☐
- b) Married ☐
- c) Divorced ☐

5) What is your job title?

.....

6) Does your community have operational meetings and seminars as far as natural resource conservation matters are concerned?

Yes ☐ No ☐

7) How often are the meetings and seminars held and in what periods?

.....

.....

8) Does your community have forums where the members confide with their leaders on their personal problems?

Yes ☐ No ☐

If yes, in 8 above, what are the personal issues mostly affecting the community members?

.....

.....

9) Do you have any idea on the different agro-forestry practices carried out in your community?

Yes ☐ No ☐

If yes, mention a few of these that you know?

.....

.....

10) Mention the causes of forest degradation that are identified in your area stressing out the major ones that need immediate attention

.....

.....

11) Are there any impacts of forest degradation that you can stress out according to your understanding in your community?

Yes ☐ No ☐

If yes, mention a few of these that you know?

.....

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12) What can you assess as the effect of agro-forestry practices in the conservation of forest resource in central districts taking your community as a case?

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Thank So Much for your Positive Cooperation

APPENDIX II: QUESTIONNAIRE TO THE FARMERS

Dear Respondent,

I am TUSIIME LONARD, a student at Kampala International University, offering a Bachelors Degree of Environment Management. I humbly ask you to participate in this research on the, *"The Assessment of Agroforestry in the Conservation of Forest Resource in Central District of Uganda: A Case Study of Busujju County - Mityana District."* I am privileged to have you as my respondent and the information given to me is purely academic and will be treated with confidentiality.

Instructions:

- iii) Please help by answering the following questions as honestly as possible. Please Tick where appropriate and explain where necessary
- iv) All the information availed to me is to be treated with maximum confidentiality

Section I: Bio Data

1) Gender

- a) Male ☐
- b) Female ☐

2) Education background

- a) Primary ☐
- b) 0 level ☐
- c) A level ☐
- d) Others, Specify

3) Age

.....

4) Marital status

- a) Single ☐
- b) Married ☐
- c) Divorced ☐

5) What is your job title?

.....

6) Does your community have seminars with your local leaders and other concerned authority as far as natural resource conservation matters are concerned?

Yes ☐ No ☐

7) How often are these meetings and seminars held and in what periods?

.....
.....

8) Does your community have forums where the members confide with their leaders on their personal problems?

Yes ☐ No ☐

9) Do you have any idea on the different agro-forestry practices carried out in your community?

Yes ☐ No ☐

If yes, mention a few of these that you know?

.....

10) Mention the causes of forest degradation that are identified in your area stressing out the major ones that need immediate attention

.....

11) Are there any impacts of forest degradation that you can stress out according to your understanding in your community?

Yes ☐ No ☐

12) What can you assess as the effect of agro-forestry practices in the conservation of forest resource in central districts taking your community as a case?

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.....
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Thank So Much for your Positive Cooperation

APPENDIX III

INTERVIEW GUIDE

- 1) Does your community have operational meetings and seminars as far as natural resource conservation matters are concerned?
- 2) Does your community have forums where the members confide with their leaders on their personal problems?
- 3) Do you have any idea on the different agro-forestry practices carried out in your community?
- 4) Mention the causes of forest degradation that are identified in your area stressing out the major ones that need immediate attention
- 5) Are there any impacts of forest degradation that you can stress out according to your understanding in your community?
- 6) What can you assess as the effect of agro-forestry practices in the conservation of forest resource in central districts taking your community as a case?