



BUSITEMA UNIVERSITY

**IMPACTS OF AGROFORESTRY TECHNOLOGIES ON ANKOLE TEA
ESTATE AND FARMLANDS ON THE LIVELIHOOD OF THE LOCAL
COMMUNITIES**

BY



RUSENGWE THADUS

BU/UG/2013/143

**ARESEARCH REPORT SUBMITTED TO THE FACULTY OF NATURAL
RESOURCES AND ENVIRONMETALSCIENCES IN PARTIAL FULFILMENT
OF THE REQUIREMENT FOR THE AWARD OF A DEGREE OF BACHELOR
OF SCIENCE IN NATURAL RESOURCES ECONOMIICS OF BUSITEMA
UNIVERSITY**

JUNE 2016

DECLARATION


I declare that this work embodied in this research report is my original work and therefore has never been submitted to any higher Institution of higher learning or University for the award of a Bachelor of Science in Natural Resources of Busitema University.

Signature.....Thadus.....Date.....8.7.2016.....

RUSENGWE THADUS

APPROVAL

This is to certify that **RUSENGWE THADUS** did research and this is a true representation of the findings. I am therefore recommending that this report be submitted to the Faculty of Natural Resources and Environmental Science of Busitema University.

Signature..........Date.....11/7/2016.....

HENRY KISU- KISIRA
UNIVERSITY SUPERVISOR

DEDICATION

This research report is dedicated to my beloved parents **Mrs. BINDEEBA BUSINGYE** late **Mr. SELESTIANO BINDEEBA (R.I.P.)**. You were such a blessing to us. GOD did not make it possible for you to see the road of success we have trodden.

ACKNOWLEDGEMENT

My special appreciation goes to the ANKOLE TEA ESTATE owners; McLEOD RUSSEL and others, staff under the management of Mr. KIRYA LAMEC allowed me carryout this research from their Tea Estate and supported me during data collection. Please keep up the spirit.

With great immeasurable Joy, I acknowledge BUSITEMA UNIVERSITY NAMASAGALI CAMPUS for the support and exposure accorded to me through out my entire stay, imparting knowledge and skills towards the award of this Degree.

The success of this research has been possible through the efforts of our living GOD and the willing co-operation of many resourceful people especially my supervisor Mr. Kisu-Kisira who tirelessly provided professional guidance to me towards the completion of this work. This report would have thus remained a mystery without the assistance of such people; I am thus indebted to them and I accord my overwhelming gratitude to them.

My heart felt, enormous and sincere thanks go to my dear parents Mrs. BINDEEBA BUSINGYE JOY and Mr. NESTORIAL JIBON for their encouragement, moral and emotional guidance and financial support they have given me towards the completion of this work and course in particular.

My dear thanks go to the family of Mr. and Mrs. BYARUHANGA NAZARIO for their financial and logistical support, care and comfort throughout my stay and education with them. May the Almighty GOD reward you exceedingly?

I wish to acknowledge the contribution of Mr. MUHEREZE RONALD, Mr. KAGUTA OSBERT, Mr. MUHANGI ALEXANDER, Mr. AGAABA BURNET, for their encouragement and prayers towards the completion of this work.

LIST OF ACRONYMS

AEL	Agricultural Enterprises Limited
AFRENA	Agroforestry Research Network for Africa
CDC	Common Wealth Development Co-operation
FAO	Food and Agriculture Organisation
HA	Hectares
ICRAF	International Centre for Research in Agroforestry
M	Metres
NAADS	National Agricultural Advisory Services
NARO	National Agricultural Research Organisation
NEMA	National Environment Management Authority
NFA	National Forestry Authority
NGOs	Non-Governmental Organizations
PMA	Plan for Modernization of Agriculture
UGADEN	Uganda Agroforestry Development Network
%	Percentage
°C	Degrees Centigrade

TABLE OF CONTENTS

DECLARATION	I
APPROVAL	II
DEDICATION	III
ACKNOWLEDGEMENT	IV
LIST OF ACRONYMS	V
TABLE OF CONTENTS.....	VI
LIST OF TABLES	XII
LIST OF FIGURES	XIII
ABSTRACT.....	XIV
CHAPTER ONE: INTRODUCTION.....	1
1.1. Introduction.....	1
1.2 Background of the study	1
1.3 Problem statement.....	3
1.4 Objectives	4
1.4. 1 Main objective	4
1.4.2 Specific Objectives	4
1.5 Justification of the study	4
1.6 Significance of the study.....	4
1.7 Research Questions.....	4
1.8 Conceptual framework.....	5
CHAPTER TWO: LITERATURE REVIEW.....	6
2.1 Introduction.....	6

2.2 Agroforestry technologies practiced in the agro based sector	6
2.2.1 Definition of agroforestry	6
2.3.1 Woodlots	7
2.2.3. Scattered trees on crop lands.....	8
2.2.4 Wind breaks and Shelter belts.....	8
2.2.5 Trees for Soil Conservation and Reclamation	9
2.2.6 Multipurpose woodlots/Trees on Factory compounds.....	10
2.2.7. Home gardens	10
2.2.8 Silvopasture.....	11
2.2.9 Alley cropping.....	11
2.2.10 Forest Farming	12
2.2.11 Riparian forest buffers	12
2.3 Benefits of agroforestry technology practices	12
2.3.1 Provision of non-wood products:.....	12
2.3.3 Water/hydrological cycle:.....	13
2.3.4 Soil conservation and fertility amelioration:.....	13
2.3.5 Air quality and environmental services:	13
2.3.6 Biomass/Energy	13
2.3.7 Waste Management.....	14
2.3.8 Wildlife management.....	14
2.3.9 Carbon storage	14
2.3.10 Soil erosion prevention	15
2.3.11 watershed management.....	15

CHAPTER THREE: STUDY AREA AND METHODOLOGY	16
3.1 Introduction.....	16
3.2 Description of study area	16
3.3 Description of the Study Population.....	16
3.4 Research Design.....	16
3.5 Sample size and sampling procedure.....	16
3.5.1 Sample Size.....	16
3.5.2 Sampling technique.....	16
3.6 Data Collection methods.....	17
3.6.1 Direct Field Observations.....	17
3.6.2 Questionnaires.....	17
3.6.3 Personal Interviews.....	17
3.7 Validity and Reliability of data collection instruments.	17
3.8 Data types and data source.....	18
3.9 Data Analysis and Processing.....	18
3.10 Ethical considerations	18
CHAPTER FOUR: FINDINGS	19
4.1 Introduction.....	19
4.2 Farming activities in General.....	19
4.3 Age groups of respondents.....	20
4.4 Land acquisition by respondents in the study area	20
4.5 How farmers got their planting materials	21
4.6 Agroforestry technologies already adopted in Ankole Tea Estates	21

4.7 Woodlot.....	22
4.8 Wind breaks and shelter belts	23
4.9 Trees for soil conservation and reclamation	24
4.10 Home gardens	24
4.11 Dispersed trees on crop land	24
4.12 Multipurpose trees on factory compounds.....	24
4.13 Relationship between education and types of agroforestry technologies	25
4.14 Relationship between age and policyconservation of agroforestry technologies	25
4.15 Roles played by different agroforestry technologies on tea growing	26
4.15.1 Roles played by wind breaks and shelter belts	26
4.15.2 Increasing production/yields of tea crop.....	26
4.15.3 Roles played by agroforestry technologies on the farmlands.....	27
4.16 Benefits farmers get from agroforestry technologies.....	27
4.17 Problems faced by tea growers in the study area.....	28
CHAPTER FIVE: DISCUSSIONS OF FINDINGS	29
5.1 Introduction.....	29
5.2 Farming activities in general.....	29
5.3 Age groups of respondents.....	29
5.4 Land acquisition by respondents in the study area (Table 3).....	29
5.5 How farmers got their planting materials	30
5.6 Agroforestry technologies already adopted in Ankole Tea Estates	30
5.6.1 Commercial tea growing.....	30
5.6.2 Woodlot.....	31

5.6.3 Trees for soil conservation and reclamation	31
5.6.4 Wind breaks and shelter belts	32
5.6.5 Multipurpose trees on factory compounds.....	32
5.6.6 Dispersed/Scattered trees on compounds.....	32
5.6.7 Home gardens	33
5.7 Relationship between education and types of agroforestry technologies practised....	33
5.8 Relationship between age and policyconservation of agroforestry technologies	34
5.9 Roles played by different agroforestry technologies on tea growing	34
5.9.1 Increasing production/yields of tea crop.....	34
5.9.2 Reduction in wind velocity	35
5.9.3 Protection against livestock	35
5.10 Roles played by agroforestry technologies in soil conservation.....	36
5.10.1 Reduction in the speed of running water	36
5.10.2 Water catchment	36
5.10.3 Reduced kinetic energy.....	36
5.11 Benefits farmers get from agroforestry technologies.....	37
5.11.1 Fuel wood.....	37
5.11.2 Medicine	37
5.11.3 Food security.....	37
5.11.4 Timber.....	38
5.11.5 Fodder	38
5.11.6 Income.....	38
5.12 Problems faced by tea growers in the study area.....	39

5.12.1 Land shortage.....	39
5.12.2 Limited supply of planting materials.....	39
5.12.3 Inadquate market.....	39
5.12.4 Lack of extension services.....	40
5.12.5 Labour shortage.....	40
5.12.6 Pests and diseases.....	40
5.12.7 Competition between trees and crops.....	40
CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS.....	41
6.1 introductions.....	41
6.2 Conclusions.....	41
6.3 Recommendations.....	41
REFERENCES.....	42
APPENDICES.....	44
APPENDIX 1: RESEARCH QUESTIONNAIRE.....	44
APPENDEX 2: MAP OF UGANDA.....	47
APPENDEX 3: AMAP OF STUDY AREA.....	48

LIST OF TABLES

Table 1; Indicates commercial land utilization in Ankole Tea Estates.....	19
Table 2: Age groups of respondents	20
Table 3: Showing how land was acquired	20
Table 4: Indicates the sources of planting materials.....	21
Table 5 Agroforestry technologies practiced in Ankole Tea Estates.....	21
Table 6 showing the relationship between education and types of agroforestry technologies	25
Table 7 shows the relationship between age and policy conservation of agroforestry technologies	25
Table 8 Benefits farmers get from agroforestry technologies	27
Table 9 Problems faced by agroforestry technologies to the communities growing tea ..	28

LIST OF FIGURES

Figure 1: conceptual framework	5
Figure 2 commercial tea growing and harvesting.....	22
Figure 3: A woodlot of <i>Eucalyptus grandis</i> at Ankole Tea Estates.....	23
Figure 4: A shelter belt of Eucalyptus trees at Ankole Tea Estate	23
Figure 5: Multipurpose trees on Ankole Tea Factory compound.....	24
Figure 6 Roles played by wind breaks and shelter belts in tea production.....	26
Figure 7 Roles played by trees/shrubs/grasses in soil conservation	27
Figure 8: Location of Kyamuhunga Sub County.....	48

ABSTRACT

The study was carried in ANKLOE TEA ESTATE and neighbouring farmlands in Kyamuhunga Sub-county, Bushenyi District. The study was carried out focusing to assess the impact of agroforestry technologies on tea growing to the livelihood of the neighbouring communities in Ankole Tea Estates, Kyamuhunga Sub-county, Bushenyi District. The objectives of study was to assess the impacts of agroforestry technologies and farmlands on the livelihoods of local communities

The methodology used for the study was a descriptive research design with qualitative and quantitative research approaches and explanatory research and secondary data was collected by reviewing estate reports ,district statistical abstract. The data collected using questionnaires and was coded cleaned and entered in ms excel and transferred to STATA 12 statistical software for analysis. Descriptive statistics like frequency tables and piecharts were used and inferential statistics like chi square were used to analyse relationships between agroforestry technologies and livelihoods of local communities

The key findings showed that tea growing, wood lot ,home gardens scattered trees in the garden boundary trees ,multipurpose trees ,wind breaks and shelter belts were the most practiced agroforestry technologies in the study area. The key benefits got by the tea estate and local communities were fuel wood medicine, timber ,shade ,soil protection ,water catchment areas. The major impacts of agroforestry technologies to the tea estate and local communities were increase in income, alternative fuel wood, water catchment places, increase in crop yields,

I recommended that agroforestry technologies on farm lands should be scaled up, local communities sensitised about the importance of agroforestry in the area

CHAPTER ONE: INTRODUCTION

1.1. Introduction

This is chapter one and presents the back ground of the study, Problem statement, Objectives, Justification of the study, Significance of the study, Research Questions, conceptual frame work

1.2 Background of the study

Various studies by the world agroforestry technology center have showed the different agroforestry practices and are beneficial to agro based sectors like tea growing and farmlands.

Today, Uganda is one of the countries in East Africa where agroforestry has spread in twelve ago-ecological zones. According to the World Agroforestry Center (ICRAF 1998), the high rate of advancement of agroforestry technologies in Africa and Uganda in particular is due to its ability in provision of fuel wood, wind breaks, greens manure, poles for building or construction of houses in our communities in general.

The most common types of agroforestry technologies are: woodlots ,home gardens windbreaks and shelterbelts, breaks and multipurpose trees ,scattered trees in the gardens Trees for Soil Conservation and Reclamation, This is an agroforestry practice consisting of trees, crops, herbs, grasses described as upper, medium and lower storey species. Combination of various trees and crops with animal component around homesteads (Rocheleau et al, 1998). They are characterized by a mixture of annual crops or perennial species grown in association and they commonly exhibit a layered vertical structure of trees, shrubs ground cover plants which increase some of the properties of nutrients, soil protection and effective use of space above and below the soil surface are found in the forest (Ninez, 1984), Fernande, 1986), (FAO, 1989). This is an agroforestry practice consisting of trees, crops, herbs, grasses described as upper, medium and lower storey species combination of various trees and crops with animals around homesteads (Rocheleau et al, 1988).

Simute.S (2011), Fruit harvesting and Marketing in Agroforestry Manual for Extension Workers with emphasis on small scale farmers in Eastern Province of Zambia, SIDA pg 20-21.

Simute.S, Phiri.C, TengnasB, Agroforestry Manual, Eastern Province Zambia pg 26.

Sanchez.P (2000), Agroforestry replenishing soil fertility and growing high value products, food security, poverty alleviation and environment conservation of Africa.

Tengnas.B (1994), Agroforestry Extension manual for Kenya, ICRAF, Nairobi.

Tengnas.B (1994), Agroforestry extension manual for Kenya, ICRAF, pg 61, ICRAF, Nairobi Kenya.

Tothill J.D, C.M.G, D.Sc (1940), Agriculture in Uganda, Oxford University Press Humphrey Milford.

UGADEN, 2002. Uganda Agroforestry Development Network Building Partnership to support modernization through Agroforestry. ICRAF, Nairobi Kenya.

Beinempaka A.B, Kato H and Others (1990), Principles and practices of Agriculture, Volume 1, Macmillan publishers, Oxford England.

Amin.M.E, 2005.Social science research: conception, methodology and analysis. Kampala: Makerere University.

Odiya.J.N.2009.Scholarly writing research proposals and reports in APA or MLA publication style, Kampala: Makerere University.