

**FACULTY OF NATURAL RESOURCES AND ENVIRONMENTAL  
SCIENCES**

**ASSESSING THE EFFECTS OF CLIMATE VARIABILITY ON THE  
LIVELIHOODS OF SUGARCANE OUTGROWERS**

**A CASE STUDY OF NAMASAGALI SUB-COUNTY, KAMULI  
DISTRICT**

**BY**

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**BU/UG/2019/0071**

**FEBRUARY 2023**

**A report submitted to the faculty of Natural Resource Economics and  
Environmental Sciences Busitema University in partial fulfillment of the  
requirements for the award of the degree of Bachelor of Science in Natural  
Resource Economics.**

**Declaration**

I PEDO LOKERIS CLAIRE hereby declare that this report is entirely the work of own endeavors and has not been submitted to any other institution for any award.

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**Approval**

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**Dedication**

I dedicate this piece of work to my beloved family, my loving and hardworking mother Nate Agnes Lona, my father Lokeris Paul De Aparite and my brothers Humphrey Emmy Angella, Victor Lokeris Locha and Francis Lokeris Koriang.

## **Acknowledgement**

I would like to firstly thank the Lord for having enabled me to ably conduct my research in good health and for life granted.

I extend my sincere appreciation and gratitude too all that made this academic research a success. To my beloved parents, for all the support rendered to make sure that I come up with this dissertation. Especially the financial support that covered all the expenses in the field and throughout the whole process, I cannot thank you enough. Be blessed always!

My supervisor whose tireless efforts cannot surely go unnoticed, I appreciate your time and corrections to make all that I had as an idea meaningful to the writing of this book. For the guidance all through, am grateful.

And to my friends and course mates; Oscar, Maureen, Agatha, Emmanuel, Lucky, Judith, Deborah and Simon. I cannot list all here, am so gratified for the time and all the support you rendered when I needed a shoulder to lean on.

## Table of Contents

<b>Declaration</b> .....	ii
<b>Approval</b> .....	iii
<b>Dedication</b> .....	iv
<b>Acknowledgement</b> .....	v
<b>List of figures</b> .....	x
<b>List of tables</b> .....	x
<b>List of abbreviations</b> .....	xi
<b>Abstract</b> .....	xii
<b>CHAPTER ONE: INTRODUCTION</b> .....	1
<b>1.1 Introduction</b> .....	1
<b>1.2 Background</b> .....	1
<b>1.2.1 Climate Variability and sugarcane growing</b> .....	1
<b>1.2.2 Sugarcane growing and community livelihoods</b> .....	2
<b>1.3 Problem statement</b> .....	4
<b>1.4 Objectives</b> .....	5
<b>1.4.1 Main objective</b> .....	5
<b>1.4.2 Specific objectives</b> .....	5
<b>1.5 Research questions</b> .....	5
<b>1.6 Conceptual framework</b> .....	6
<b>1.8 Scope of the study</b> .....	7
<b>CHAPTER TWO: LITERATURE REVIEW</b> .....	8
<b>2.1 The concept of sugarcane out growers/ Contract farming</b> .....	8
<b>2.2 The contribution of sugarcane growing to the livelihoods of sugarcane growers</b> .....	10
<b>CHAPTER THREE: RESEARCH METHODOLOGY</b> .....	12
<b>3.0 Introduction</b> .....	12
<b>3.1 Research design</b> .....	12
<b>3.2 Study area/ targeted population</b> .....	12

<b>3.3 Sample size and sampling procedure</b> .....	13
<b>3.3.1 Sample size</b> .....	13
<b>3.3.2 Sampling procedure</b> .....	13
<b>3.4 Data types and collection methods</b> .....	13
<b>3.4.1 Data types</b> .....	13
<b>3.4.2 Data collection methods</b> .....	14
<b>3.5 Validity and reliability of data collection instruments</b> .....	14
<b>3.5.1 Validity of data collection instruments</b> .....	14
<b>3.5.2 Reliability on the data collection instruments</b> .....	14
<b>3.6 Ethical considerations</b> .....	14
<b>3.7 Data analysis</b> .....	15
<b>CHAPTER FOUR: ANALYSIS</b> .....	16
<b>4.0 Introduction</b> .....	16
<b>4.1 Socio-economic characteristics</b> .....	16
<b>4.2 Livelihood Status</b> .....	17
<b>4.2.1 Livelihood activities</b> .....	17
<b>4.2.2 If sugarcane growing affects other livelihoods</b> .....	18
<b>4.2.3 Ways in which sugarcane growing affects other livelihoods</b> .....	18
<b>4.2.4 Other crops grown apart from sugarcane</b> .....	19
<b>4.2.5 Duration in sugarcane growing</b> .....	20
<b>4.3 Effects of climate variability</b> .....	20
<b>4.3.1 Change in quantity of agricultural output</b> .....	20
<b>4.3.2 Change realized in agricultural output</b> .....	21
<b>4.3.3 Trend of change in the output of sugarcane</b> .....	21
<b>4.3.4 If livelihoods activities engaged in affect the wetland</b> .....	22
<b>4.3.5 Effects of livelihood activities on the wetland</b> .....	22
<b>4.4 Measures to address the effects of climate change</b> .....	22
<b>4.4.1 Shows if the climate change impacts can be mitigated</b> .....	22

4.4.2 Table showing measures taken to adaptation to climate variability .....	23
4.4.3 Effectiveness of adaptation measures.....	23
4.4.4 Adaptation to flooding.....	24
4.4.5 Mitigation measures by government .....	24
4.4.6 Presence of supporting organizations .....	25
4.4.7 Organizations that aid in climate change adaptation .....	25
4.4.8 Benefits derived from the organizations .....	25
4.4.9 Limitations faced by organizations in implementing support programs.....	26
4.5 Recommended adaptation measures .....	27
<b>CHAPTER FIVE: DISCUSSION.....</b>	<b>28</b>
<b>5.0 Introduction.....</b>	<b>28</b>
<b>5.1 Socio-economic characteristics .....</b>	<b>28</b>
5.1.1 Age.....	28
5.1.2 Sex .....	28
5.1.3 Marital Status & Household position.....	28
5.1.4 Education level .....	29
5.1.5 Employment status.....	29
<b>5.2 Livelihood status .....</b>	<b>29</b>
5.2.1 The effects of sugarcane growing to other livelihoods.....	29
<b>5.3 Effects of climate variability .....</b>	<b>30</b>
5.3.1 Change in quantity of agricultural output.....	30
5.3.2 Trend of change in sugarcane output.....	30
5.3.3 The impacts of sugarcane growing on wetland ecosystems.....	30
<b>5.4 Mitigation.....</b>	<b>30</b>
5.4.1 Mitigation measures used.....	30
5.4.2 Effectiveness of the measures.....	30
5.4.3 Mitigation measures by government .....	31
5.4.4 Limitations to support in regard to mitigation and adaptation.....	31



<b>5.5 Recommendations</b> .....	31
<b>5.5.1 Recommended adaptation measures</b> .....	31
<b>CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS</b> .....	32
<b>6.0 Introduction</b> .....	32
<b>6.1 Conclusions</b> .....	32
<b>6.2 Recommendations</b> .....	33
<b>6.3 Areas of further study</b> .....	33
<b>REFERENCES</b> .....	34

## List of figures

Figure 1: A map of Kamuli district showing its sub counties.....	13
Figure 2: Showing whether sugarcane growing affects other livelihoods.....	18
Figure 3: Other crops grown apart from sugarcane .....	19
Figure 4: Showing how long farmers have been engaged in sugarcane growing.....	20
Figure 5: Showing approval of a change in agricultural output.....	20
Figure 6: Change has been realized in agricultural output .....	21
Figure 7: Trend of change in the output of sugarcane .....	21
Figure 8: Showing if livelihoods engaged in affect the wetland .....	22
Figure 9: Showiing if climate change impacts can be mitigated.....	22
Figure 10: Showing the effectiveness of adaptation measures.....	23
Figure 11: Showing the presence of supporting organisations .....	25
Figure 12: Showing organizations that aid in climate adaptation .....	25
Figure 13: Showing recommendations to climate adaptation .....	27

## List of tables

Table 1: Socio-economic characteristics.....	16
Table 2: Livelihood activities engaged in by the respondents.....	18
Table 3: Effects of sugarcane growing on other livelihoods.....	19
Table 4: Effects of livelihood activities on wetland ecosystems.....	22
Table 5: Adaptation measures to climate variability .....	23
Table 6: Adaptation measures to flooding .....	24
Table 7: Mitigation measures implemented by government .....	24
Table 8: Limitations to implementation of support programmes .....	26

## **List of abbreviations**

CC	Climate Change
EAC:	East African Community
FAO:	Food and Agriculture Organization
GDP:	Gross Domestic Product
HBS:	Harvard Business School
KESREF:	Kenya Sugar Research Foundation
UBOS:	Uganda Bureau Of Statistics

## **Abstract**

Sugarcane growing is a livelihood activity that is largely carried out in Eastern Uganda, seen as a major source of income and employment by the farmers. This study assessed the effects of climate variability on the livelihoods of sugarcane growers in Namasagali sub-county, Kamuli district. It investigated the relationship between sugarcane growing and role of wetland ecosystems in the Namasagali sub-county. The study shows how sugarcane growing comparative contributing to Nalwekomba wetland's capacity to buffer the worsening hazards of climate change such as extreme flooding and rising temperatures and their impacts. This study shows how sugarcane growers are considerably vulnerable to the effects of climate change such as impacts of rising air and surface temperatures and extreme flooding that do not favor the growth of sugarcane which in turn affects their yields and sources of income for sustainable livelihood.

The study was based on questionnaires aided survey, direct field observations, and direct interviews with key informants. Data was collected from 51 sugarcane growers, chosen randomly from different villages in the study area. Entry and analysis of data was done using Microsoft Excel.

The study established that sugarcane growing is a livelihood that many have increasingly resorted to in the past five years. A number of the farmers usually carry out sugarcane growing as independent out growers and not contract farmers hoping to get market along the way especially as first timers. It is a male dominated livelihood activity perhaps due to the land tenure rights in societies, or probably the fact that women care more for household food security and emphasis food crops while men care more about household income status. The study established that sugarcane farmers were adapting to extreme flooding through comparatively affordable ways by mainly constructing trenches, which drains the wetland. Unfortunately, this limits the capacity for the wetland to deal with the major challenge of the rising and high temperatures and prolonged droughts since sugarcane requires a lot of water to grow, and yet the fields would have been drained during the extreme flooding.

In as much as sugarcane growing is a danger to wetland ecosystems, there is need to come up with and support alternative sources of livelihoods. Supporting several mitigation and adaptation program is also very vital to reduce conflicting loyalties in the face of climate variability.

## **CHAPTER ONE: INTRODUCTION**

### **1.1 Introduction**

This chapter introduces the background, problem statement, objectives, research questions, significance and the scope of the study.

### **1.2 Background**

#### **1.2.1 Climate Variability and sugarcane growing**

A combination of long-term change in the weather patterns worldwide (i.e., global climate change), caused by natural processes and anthropogenic factors, may result in major environmental issues that have affected and will continuously affect agriculture (IPCC 2014). Atmospheric CO<sub>2</sub> concentration [CO<sub>2</sub>] has increased by about 30% since the mid-18<sup>th</sup> century due to increases in combustion of fossil fuels, industrial processes, and deforestation (Houghton et al 2001). Projections indicate that atmospheric [CO<sub>2</sub>] would increase to about 550ppm in a low emission scenario or could double (800ppm) from current levels in a high emission scenario by the end of the 21st century. Global warming is directly associated with increasing atmospheric [CO<sub>2</sub>] and other greenhouse gases. (IPCC 2014). Global surface mean temperatures had increased from 0.55 to 0.67<sup>0</sup>C in the last century and are project to rise from 1.1 to 2.9<sup>0</sup>C (low emission) or 2.0 to 5.4<sup>0</sup>C (high emission) by 2100 relative to 1980–1999, depending on GHG emission level, region, and geographic location (IPCC 2014).

Increases in atmospheric [CO<sub>2</sub>] and air temperature can be beneficial for some crops (especially C3 plants) in some places (E. Tao Et al, 2006). Climate variability and climate change are projected to result in changes in sea levels, rainfall pattern, and the frequency of extreme high- and low-temperature events, floods, droughts, and other abiotic stresses (R. S Dhillon and G.vonWuelisch, 2013) as well as tornados and hurricanes. High temperatures accompanied by drought stress have been two of the major issues influencing agricultural production and economic impacts in many regions of the world. The challenges, faced by the agricultural sector under the climate change scenarios, are to provide food security for an increasing world population while protecting the environment and the functioning of its ecosystems (Cambridge University Press, 2007). For most countries that are highly dependent on rainfall with limited or no proper irrigation conditions and/or that have poor mitigation systems, these challenges may be amplified (P.K Thornton et al, 2009). Agriculture is vulnerable to climate change through the direct effects of changing climate conditions (e.g., changes in temperature and/or precipitation), as well as through the indirect

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