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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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

This is to confirm that this report is entirely the work of PEDO LOKERIS CLAIRE that has been done under my supervision and therefore ready for submission to the faculty of Natural Resources and Environmental Sciences.

Supervisor: PROFESSOR MWANJA WILSON WAISWA

Signature……..

Date……..

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.

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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_2 concentration [CO_2] has increased by about 30% since the mid-18^{th} century due to increases in combustion of fossil fuels, industrial processes, and deforestation (Houghton et al 2001). Projections indicate that atmospheric [CO_2] 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_2] and other greenhouse gases. (IPCC 2014). Global surface mean temperatures had increased from 0.55 to 0.67^0C in the last century and are project to rise from 1.1 to 2.9^0C (low emission) or 2.0 to 5.4^0C (high emission) by 2100 relative to 1980–1999, depending on GHG emission level, region, and geographic location (IPCC 2014).

Increases in atmospheric [CO_2] 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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