BUSITEMA UNIVERSITY

Pursuing Excellence

DISSERTATION

CLIMATE CHANGE PERCEPTION AND ADAPTIVE STRATEGIES AMONG SMALLHOLDER COFFEE FARMERS IN SHEEMA DISTRICT, SOUTHWESTERN UGANDA

BY

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Abstract

The study focused on climate change perception and adaptive strategies among smallholder coffee farmers in Sheema District Southwestern Uganda. The specific objectives for the study were; describe how smallholder coffee farmers in Sheema District perceive climate change, examine the perceived impacts of climate variability on coffee production by smallholder coffee farmers and identify adaptive strategies to climate variability by smallholder coffee farmers in Sheema District. The study adopted a cross-sectional and descriptive design, and the study methods used were; Questionnaire survey, Key informant interviews, Field observations and Documentary review.

The study found out that coffee farmers had varying perceptions on climate change. They reported changes in rainfall onset and cessation, duration, frequency, intensity and predictability. It was alleged that there had been a drastic reduction in rainfall and an increase in temperatures across the district. The status of coffee management and production was generally poor in terms of performance, quantity, quality and yield as a result of rainfall and temperature changes. The study further discovered various climate change adaptive mechanisms used by farmers such as; rain water harvesting, agroforestry, small scale irrigation, afforestation, soil and moisture conservation, growing resistant varieties and integrated pest and disease management. However, choices of adaptive mechanisms relied heavily on factors like education of the household head, farm size, farming experience, economic status, and access to credit services and land ownership type.
Adjusted odd ratios were calculated and significant determinant factors interpreted at 95% confidence interval and 5% level of significance. Ten (10) determinant factors were hypothesized and among them, eight (8) factors remained significant.

From the study findings, it can be concluded that coffee farmers perceived climate change as extended dry season due to shifting and decreasing rainfall. On causes of climate change and variability, deforestation and degradation of natural resources was noted as the primary causes however, overgrazing and bush fire also contribute to climate change and variability.

Farmers' perception on change in rainfall patterns, shortened length of rainy season and change in planting time/date were noted. This gives rise to the need to design appropriate strategies for reducing vulnerability to climate change and variability. At the same time, there must be deliberate efforts for improving and protecting the environment as well as providing environmental management education to farmers.

Declaration

I, **Rwobusingye Elias,** declare that this dissertation titled "**Climate change perception and adaptive strategies among smallholder coffee farmers in Sheema District, Southwestern Uganda,"** is my original work. I declare that this work has not been submitted to this University or to any other institution for funding / partial fulfillment for any award.

…… Date: …….

RWOBUSINGYE Elias

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Approval

This dissertation submitted as a partial fulfillment for the award of the Degree of Master of Science in Climate change and Disaster Management of Busitema University, with our approval as the academic supervisors.

Nakiyemba Alice (PhD)

Signature:……. Date:……

Kiyingi Isaac (PhD)

Signature:……. Date:…….

Dedication

This dissertation is dedicated to my family; my dear wife and children, to all my friends and all those whose responsiveness contributed to the completion of this work.

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Acronyms

ACPCU	Ankole Coffee Producers Cooperative Union
AEZ	Agro Ecological Zone
BKCU	Banyankole Kweterena Cooperative Union
AOR	Adjusted Odd Ratio
CAO	Chief Administrative Officer
CBD	Coffee Berry Disease
CCSP	Climate Change Science Program
CIAT	International Center for Tropical Agriculture
CI	Conservation International
CO_2	Carbon dioxide
DAO	District Agricultural Officer
DPO	District Production Officer
FAO	Food and Agricultural Organization
GDP	Gross Domestic Product
GHG	Greenhouse Gases
GREAN	Growing Resilient Agricultural Enterprises
ICO	International Coffee Organization
IIED	International Institute for Environment and Development
IPCC	Intergovernmental Panel on Climate Change
ITC	International Trade Centre
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries
NMA	National Meteorological Agency
MWE	Ministry of Water and Environment
NAPA	National Adaptation Programmes of Action
NARO	National Agricultural Research Organization
NPK	Nitrogen Phosphorous Potassium
NUCAFE	National Union of Coffee Agro Businesses and Farm Enterprises
OWC	Operation Wealth Creation
QDA	Quality Data Analysis
SDGs	Sustainable Development Goals
SALM	Sustainable Agriculture Land Management
SSA	Sub-Saharan Africa
SPSS	Statistical Package for Social Scientists
UBOS	Uganda National Bureau of Statistics
UCDA	Uganda Coffee Development Authority
UNFCCC	United Nations Framework Convention on Climate Change
UNMA	Uganda National Meteorological Authority
URT	United Republic of Tanzania
WFR	Weather Forecast Report
WWO	World Weather Online

Operational Definitions

Climate: Climate encompasses the statistic of temperature, humidity, atmospheric pressure, wind, rainfall atmospheric particles count and other meteorological elements in a given region over the long period of time (Thornthwaite, 1988).

Climate change: Wilson (2006) defines climate change as the changes in the average climate over long period of time.

Climate variability: The IPCC (2007) defines climate variability as the variations in the mean state and other statistics (such as standard deviations, statistics of extremes) of the climate on all temporal and spatial scales beyond that of individual weather events.

Coffee: is a brewed drink from roasted coffee beans, the seeds of berries from a shrub of the genus Coffea.

Coffee growth and production: The agricultural practice of planting coffee and looking after it till harvest.

Quality of coffee: The size of coffee beans produced at their maturity.

Quantity of coffee: The amount of coffee in terms of coffee bean produced by the coffee tree.

Yield: The quantity of coffee harvested per tree or per hectare of land.

Adaptation: The (IPCC, 2001), adaptation means adjustment in a system's behavior and characteristics that enhance its ability to cope with external stress.

Vulnerability: IPCC, (2007) describes Vulnerability as "the degree which a system is susceptible to, or unable to cope with, adverse effects of; climate change, including climate variability and extremes."

Smallholder farmers:(Sabo et al. 2017) defines smallholder farmers as those farmers owning small- based plots of land on which they grow subsistence crops and one or two cash crops relying almost exclusively on family labor.

Adaptive capacity: Refers to "the ability of a system to adjust to climate change including climate variability and extremes.

CHAPTER ONE
INTRODUCTION

1.0 Introduction

The chapter presents the background to the study, the problem statement, purpose of the study, objectives of the study, research questions, scope of the study, justification/significance of the study and the theoretical conceptual framework.

1.1 Background of the study

Climate change is one of the key challenges facing the human race in the 21st century due to increased emissions of greenhouse gases (GHG) such as carbon dioxide, methane and nitrous Oxide (IPCC, 2013). Climate variability and changes in extreme weather have significant impacts and are among the most serious challenges to society in coping with a changing climate (CCSP, 2008). Toreti and Desiato (2008), further observes that climate change is characterized by variations of climatic variables in mean and extreme values.

Climate extremes are unusual weather events in their occurrence which always lie in the upper or lower ten percentile of the distribution and have destructive potential like hurricanes, tornadoes, hailstorms, very heavy rainfall and heat waves for long period of time (CCSP, 2008). Therefore, extreme climatic events have strong impact on society and ecosystems and are thus important to study (Moberg and Jones, 2005).

Adaptation to climate change and climate variability is a strategy that has been embraced by different communities to minimize the effect on human and natural systems (Epule et al., 2017). Adaptation is a continuous stream of activities, actions, decisions and attitudes that informs decisions and reflects the current social norm and processes (Wreford et al., 2010). Adaptation can be reactive once it is prompted by events and anticipatory if it is based on assessment of future conditions. It can also be purposeful and unintentional and both can produce short term and long-term benefits. Individuals, organizations and societies have responded to past climatic changes by adjusting their behaviour, and many are now considering adapting to altered future

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